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VIA ELECTRONIC SUBMISSION

6 December 2019

Regulatory Authority
1st Floor, Craig Appin House
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Hamilton HM 11

Dear Sir or Madam,

RE: Comments on the Review of the Electricity Sector

Algonquin Power & Utilities Corp. ("Algonquin") appreciates the opportunity to comment on the matters identified in the Review of the Electricity Sector Consultation Document ("Consultation"). While Algonquin does not operate in Bermuda at this time, it has entered into an agreement to acquire Ascendant Group Limited and has submitted notification to the Regulatory Authority (the "RA") of its proposed concentration by way of change of control of the Bulk Generation and TD&R licensee, Bermuda Electric Light Company Limited ("BELCO"). While the transaction is pending approval from the RA, Algonquin has expressed its commitment to investing in Bermuda for the long term, including its transition to a clean energy future. We look forward to a productive relationship working with the RA and the citizens of Bermuda for years to come.

Algonquin is a strong supporter of Bermuda's Integrated Resource Plan ("IRP"). As Ian Robertson, Algonquin's CEO, recently indicated in an article published in the Royal Gazette on November 6, 2019, 'the IRP was "music to our ears' as this is exactly what we do: replace fossil fuel generation with renewable technologies in a way that also creates savings for our customers."

We see significant opportunity to help Bermuda attain its sustainability goals – a theme that is closely aligned with our strategic direction and corporate purpose. We are aware the cost of electricity in Bermuda is high and are confident that through our experience in renewable energy and the economies of scale of our utility operations, we can help reduce these costs, while making Bermuda a leader in sustainability. Our focus will be on integrating utility-scale solar and exploring the feasibility of offshore wind, coupled with energy efficiency to steadily reduce Bermuda's reliance on fossil fuels and reduce customer electric bills.

Many of the matters raised in the Consultation are of interest to us and it is our intention to support the RA in its pursuit to improve the efficiency of the current regulatory framework.
We have provided comments on the following Consultation Questions for the RA's consideration:

**Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?**

Yes, the functions of the RA should explicitly include the promotion of clean energy. Algonquin believes that the RA can both promote clean energy while also meeting the other objectives of the Electricity Act related to cost, reliability, economic impact and sustainability.

**Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?**

Algonquin supports the added clarity and flexibility that the proposed amendments may bring, particularly as to the responsibilities of the RA and the TD&R Licensee. Algonquin supports this approach and recommends that consultation with key stakeholders be included as any proposed amendments are considered. Algonquin would welcome the opportunity to participate in such consultation and would bring the depth and breadth of its regulated utility experiences to the table.

**Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?**

Given the responsibilities of the TD&R licensee, Algonquin believes it is appropriate for the licensee to draft the IRP. The TD&R licensee should be directed by the RA on the alignment of the IRP with Bermuda's energy policy or other relevant directives that need to be reflected in the draft. An iterative process including consultation with stakeholders should continue to be used.
The advantage of this approach is that the TD&R licensee is uniquely positioned to address system needs, reliability considerations, interconnection and upgrade requirements, system performance, and future load requirements. These issues should be addressed as part of the IRP. The RA should hold the TD&R Licensee responsible for the development of an appropriate IRP, as well as accountable for the outcomes of that IRP. The disadvantage of the RA directly participating in drafting the document is that these lines of responsibility and accountability between the TD&R licensee and the RA may become blurred.

As part of Proposal (b) the RA indicates that the relative roles and responsibilities between the Authority and the TD&R would require further definition. Algonquin supports the proposal to provide clarity between the roles and responsibilities of affected parties and recommends that such changes to the framework should be completed in consultation with the TD&R Licensee and other stakeholders. Algonquin would welcome the opportunity to participate in any such consultation.

**Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?**

Algonquin recommends that the RA provide a framework, as it is doing through the Principles of Consumer Protection Preliminary Report, Preliminary Decision and Order, issued September 11, 2019, for how customer complaints or inquiries are addressed, as well as Licensee reporting requirements on the same. Having the RA establish the framework may provide comfort to customers that the complaint/inquiry process has aspects of independence from the licensee, and will provide the RA the ability to assess the TD&R Licensee's efficacy in handling any such complaints or inquiries. The TD&R Licensee should be responsible for establishing specific business policies and procedures to adhere to

the framework and is responsible for the outcome of those policies and procedures. In some jurisdictions the regulator applies balanced incentives based on performance, and this may be an area of further consideration by the RA.

**Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral?**

Algonquin believes both short-term and long-term targets for renewable energy procurement should be established. This will help ensure the path to Bermuda's clean energy future is quantifiable and clear. The short-term targets should be determined, not only as milestones in reaching the long-term objectives, but also be informed by price, reliability considerations, scale and timing of generation development, and alignment with the life span of existing generation facilities. However, it is noted that appropriate flexibility should be afforded to ensure meeting targets does not drive unintended behavior, such as making decisions that may have less than optimal price and rate impacts, in order to meet the short-term targets.

Targets do not need to pertain to specific renewable technologies unless a specific deficiency is threatening the attainment of long-term targets.

**Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?**

In the context of the current IRP, government promotion of specific emerging renewable technologies does not appear necessary to meet policy objectives. However, as the plan progresses and new technology matures, and policy objectives are updated, changes may be made in the future to specifically address particular technologies. Algonquin recommends that in making any such determination, consideration should be given to the desired outputs and put in provisions to support the delivery of the desired outcomes rather than specifically picking 'technology winners'. Clearly any new technology will need to be assessed for its efficacy on a standalone basis and as part of the broader energy system of Bermuda, potential cost impact on customers or the government, as well as the necessity of the emerging technology to meet renewable targets.

**Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?**

Algonquin believes community energy projects should be available for customers to elect to participate in, provided they are economically viable. Proposed community energy projects should be designed in a manner to provide benefits to participants and at the same time ensure no harm to non-participating customers or the reliability of the system. Given that location and cost are key to project development, consideration should be given to how such projects may benefit all Bermudians versus those who are able to invest in such a project and/or are fortunate to be located close to a development project. Each proposed project would need to be assessed by participants, the TD&R licensee and the RA, on its merits including cost, capacity, impact on system, and rates structures to ensure the appropriate share of the distribution system costs are paid by the community energy participants and not passed on to the non-participating electricity customers.

**Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if *Question 9* was answered with 'Yes'.)**

Either of the identified approaches may be beneficial to participants. However appropriate distribution rates should be set to cover the cost of the use of the system for the distribution of the electricity. The cash (dividend) approach may be more beneficial as it provides transparency for these distribution rates. It also allows greater flexibility in adjusting rates and dividends in the future.

**Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?**

Yes, Algonquin believes the TD&R Licensee should manage the procurement of new bulk generation. The TD&R Licensee has the expertise and the relevant information to manage the procurement process and assess projects and their potential impact on its transmission and distribution system, including any system upgrades required to meet the proposed generation projects and any potential impacts on reliability. Also the TD&R Licensee is responsible for the outcome of the procurement process in terms of providing adequate supply of electricity and maintaining the transmission and distribution system. The RA should monitor the procurement process to ensure it is transparent and fair, and hold the TD&R Licensee accountable for the results.

Algonquin recognizes the importance of the role of the RA in oversight of the procurement process to determine the best way to bring competitive pressures to bear, while at the same time ensuring access to low cost capital, and ultimately reduced costs for reliable electric utility service. Algonquin notes that under Proposal (i) of the proposed changes to the framework that the RA is currently preparing guidance for the competitive procurement of Bulk Generation. Algonquin supports the preparation of this guidance and recommends it be completed in consultation with the TD&R Licensee and other stakeholders. If such consultation is held, Algonquin would welcome the opportunity to participate. Based on its experience in competitive procurement processes in other jurisdictions in which Algonquin is very supportive of a robust competitive process, it believes it can be beneficial in providing support to this process.

In addition, as Bermuda transitions to a renewable energy future, Algonquin can bring its experience to help reach these goals, particularly in its role as an owner of utilities that have transitioned to greener fleets through IRP-like processes. Algonquin believes that three critical areas of expertise should be brought to bear to make this transition successful, each of which is described below.

**Project Development:** Algonquin has a long history of developing renewable energy projects with over 1 GW of wind power projects operating in Canada and the United States, with more than 1 GW of wind currently in development. Algonquin has existing teams of engineers and scientists who have significant experience in developing renewable energy projects, ensuring robust stakeholder consultation, comprehensive environmental planning, and project execution. Algonquin has strong relationships with key equipment suppliers and service providers, which is important to successful project development.

**Greening the Fleet:** Algonquin is a demonstrated leader in "Greening the Generation" fleets across its U.S. utilities in order to rapidly bring low cost renewables and reduced cost of electricity for our

customers. Key success factors to these initiatives are robust regulatory interaction, comprehensive planning, and efforts to bring Algonquin's entrepreneurial spirit solving complex utility projects.

**Financial Capability:** A key consideration to any successful project as ambitious as the Bermuda IRP, is to ensure that low cost capital is made available to ensure low cost renewable power is developed. Algonquin has the financial capability to ensure that large scale renewable projects will meet customer expectations.

In short, Algonquin believes that it would be appropriate for the licensee to manage future procurement of bulk generation, particularly where that licensee has significant experience developing and financing renewable generation.

**Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?**

Under the context of IPP procurement, clarity of rules as indicated above will aid in providing a clear, fair and transparent process.

In terms of roles and responsibilities, Algonquin notes that under Proposals (b), (i), and (j) of the Consultation, the RA is considering initiatives that will help clarify the roles and responsibilities of the TD&R Licensee and the RA, as well as, in some cases, other stakeholders. The outcome of these proposals will inform the roles in IPP procurement as well as other processes. Algonquin supports this clarification of roles and responsibilities and recommends the process for determining these roles include the opportunity for consultation with other stakeholders. If such consultation is held Algonquin would welcome the opportunity to participate.

**Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply):**
**(a) the cost of electricity;**
**(b) the EV charging infrastructure costs;**
**(c) the operational costs of the EV charging infrastructure; and/or**
**(d) none of the above.**
**If your answer is (d), how should these costs be recovered?**

The price paid by consumers at electric vehicle charging points may be driven by several factors including public policy, ownership of the charging points, and their location. To cover the full costs of the charging points, a rate would be designed that recovers the costs of (a), (b) and (c). However, if the utility owned the charging points the rate could be set as low as the cost of electricity and costs of (b) and (c) could be recovered as part of the utility's infrastructure. From an energy policy perspective this approach may be desirable to encourage EV up take. Likewise, a private owner would likely want to recover all of the costs of (a), (b) and (c) through rates. However there may be instances where private owners may wish to use reduced rates to encourage use, such as commercial entities providing low cost, or even free, charging to encourage consumers to frequent their business.

**Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?**

Algonquin supports the exploration of this type of project through research and potential pilot projects. However, the scope of any peer-to-peer trading, including pilot projects, would have to be scaled appropriately for the size of the market and the number of potential participants. Importantly, consideration should be given to the impact of peer-to-peer trading on the overall system. While peer-to-peer trading may provide some benefits to participants, the impact on the broader market will need to be assessed.

From a system operation view, consideration needs to be given to impact on the system, including safety, reliability, communication and system operation needs, costs related to the transmission or distribution of the electricity and associated billing processes. An appropriate rate reflecting these costs, and the cost of using the system for the distribution of electricity would have to be determined to ensure participants are paying the full costs associated with a peer-to-peer trading system and that non participating customers, especially low income customers, are not harmed by taking on a greater burden of system costs.

**Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?**

While it is likely that most EV customers will do a significant portion of their charging at home or place of business, especially with regards to the overall size of the island, in order to promote the electrification of transportation, it may be necessary to have public charging points which provide electric vehicle drivers with flexibility and adequate resources for mobility. This may be especially true in situations where individuals are not able to have a charger at their place of residence or employment. Analysis will be required to determine the extent public charging points are needed as well as their economic viability before concluding on a plan to do so.

**Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?**

BELCO does not need to be the sole owner and operator of commercial EV charging points and there may be benefits of allowing commercial entities to provide this service. Regardless of ownership, consideration should be given to ensuring that charging points are provided across the island as needed to serve the public, as opposed to only those areas considered the most profitable. Consideration should also be given to the cost of providing the charging points, and, while ensuring appropriate levels of service are provided, a least cost approach pursued.
Algonquin appreciates the opportunity to provide these comments and would be glad to provide any further information to the RA that would be helpful to this Consultation.

Sincerely,

Jody McEachran
Senior Director, Regulatory Strategy
Liberty Utilities (affiliate of Algonquin Power)

RENEWABLE ENERGY • EFFICIENCY • CONSERVATION

The Regulatory Authority of Bermuda,
Craig Appin House, 1st Floor
8 Wesley Street
Hamilton HM 11

6th December 2019
BY E-mail

Attn. Ms. Monique Lister

**Re: COMMENTS ON THE REVIEW OF THE ELECTRICITY SECTOR, Matter # 20191029**

Dear Sirs,

We are pleased to submit the following responses to your consultation document questions referenced above.

***Question 1:*** *Do you believe that the functions of the RA should explicitly include the promotion of clean energy?* Given the overwhelming evidence of the onset of global warming at an accelerating pace since the EA was drafted, our answer is a resounding **Yes**! As far as we are concerned, the EA already requires that the RA promote both renewable energy and energy efficiency. However, the RA's track record to date on the promotion of both is mostly poor, with the one exception being the initial IRP. So, either the EA needs to be revised or there needs to be Ministerial Directions that are more explicit on the promotion of both renewables and energy efficiency by the RA, or both. Without belabouring this point further at the start of our responses, please see further information on our response to this question in the Question 1 Appendix.

***Question 2:*** *Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?* Yes. The EA desperately needs amendments and there should be public consultation on these amendments. The distributed generator community should have adequate representation in the consultation as they have been adversely affected by the poor drafting of the existing act and the arbitrary interpretation of the EA by the RA. The Department of Energy has failed to have one meeting of the Energy Working group in perhaps three years now, so we recommend that consideration be given to establishing an Energy Advisory Committee along the lines of other industry advisory committees here.

***Question 3A****: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP?* The TDRL should prepare the first draft in accordance with guidelines set by the RA and evolving Government energy policy. ***Question 3B****: What advantages and disadvantages would your choice have?* We believe that the TDRL and BGL, together with Algonquin assuming the Ascendant sale goes through, will have more of the relevant expertise to produce the first draft of future IPRs, provided the guidelines set by the RA and Government are clear and concise,

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with sufficient flexibility for innovation. Also, we would hope that the existing license holders could produce the first draft more economically than the RA working with outside consultants. Furthermore, the existing license holders are more familiar with the Bermudian aspects of power generation, transmission and distribution.

***Question 4:*** *Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?* Yes.

***Question 5A:*** *Should both short-term and long-term targets for renewable energy procurement be established?* Yes. There should be targets for both procurement of bulk renewables and targets for the adoption of distributed generation (DG). We add the latter because Bermuda lacks the available real estate for much more land based bulk renewables deployment, but there is a huge acreage of roof space and private property for ground mounted solar PV. The present IRP does not contain a target for DG, only a limit and we believe this is a fundamental mistake in the IRP. ***Question 5B:*** *Should targets pertain to specific renewable technologies or be technology neutral?* Given the overwhelming evidence of global warming and the increased rate of its temperature increases, the targets should favour renewables with zero $CO_2$ emissions (solar PV, solar thermal, offshore wind, ocean thermal together with storage where and when economically viable, etc.) over $CO_2$ producing technologies such as biomass. We are not saying that these CO2 producing renewable technologies should be excluded, only that they probably should have a lower percentage of the generation mix. The targets should also take into consideration the seasonality of the two principal renewables that are applicable in Bermuda, solar PV and offshore wind. Given that Bermuda's peak energy usage occurs in the summer when solar PV is at its strongest and offshore wind is at its weakest, we recommend that the ratio of these two technologies should reflect how they match the annual energy usage pattern.

***Question 6:*** *Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?* The policy should be flexible to allow the adoption of these technologies as they become commercially feasible. However, the policy should also promote energy storage for intermittent renewables as this looks like it will become even more commercially viable before wave, tidal etc. approach viability.

***Question 7:*** *Should the supply of electricity into the electricity grid from non-renewable sources of any size require a license?* No. There should be a lower limit to the need for a license from the RA, although an emissions license may still be required from DENR. As an example, the lower limit for cogeneration or trigeneration, (CHP or CCHP) systems that do not require a RA license could perhaps be 10 kW for per residential unit and 25 KW for commercial applications.

***Question 8:*** *Should the definition of "distributed generation" only be applicable to renewable energy technologies?* No, CHP and CCHP and similar technologies that are far more efficient than the Bulk Generator's generation units or biomass should also be included. Also, the size limit for CHP and CCHP systems needing a license should be approximately the service entrance capacity

of the facility with CHP or CCHP. Similarly, large hotels and the hospitals with service entrance capacities in excess of 1 MW should be allowed to install a combination of renewable distributed generation and CHP or CCHP, where the total on site generation capacity should be allowed up to the service entrance capacity, before needing a license.

***Question 9:*** *Do you agree that community energy projects would be beneficial for the local communities and they should be supported?* Yes. As an example, Florida Power and Light (FPL) is promoting the largest community solar system in the US at 1,490 MW. This project is specifically aimed at helping low income customers. This is the type of thing that we should be looking to do here on a smaller scale although the TDRL should not be granted an exclusive right to such community solar programs. As a consequence, the wheeling restrictions of the present EA need to be diluted or eliminated in order for community renewables to occur. Furthermore, at the local level, the Department of Energy and the RA need to recognize the high number of condominiums, apartment buildings and similar developments here that share the same piece of land and who have paid for and own the transmission cables on the piece of property. The present EA and other regulations have already been interpreted to prohibit these properties from sharing a common solar array with one BECLO meter and a system of submeters for metering individual units. This is counterproductive to the wider adoption of renewables in these types of developments/communities. Therefore the EA, regulations etc. need to be revised to allow this specific type of community renewables.

***Question 10:*** *What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)* We recommend that all widely adopted approaches in other mature jurisdictions should be considered.

***Question 11:*** *Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?* We recommend that Bermuda looks at how this is being done in other islands with mature regulators before deciding how this will be done here.

***Question 12:*** *In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?* Yes, but again we recommend that Bermuda looks at how this is being done in other islands with mature regulators before deciding how this will be done here.

***Question 13:*** *Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?* Firstly, Bermuda needs to acknowledge that we presently have a dirty grid and have a detailed study done to establish whether charging EVs with BELCO power produces more $CO_2$ per kilometer than conventional

gas and diesel vehicles. We appreciate that EVs may reduce local pollution in congested areas but when trying to do our part to arrest global warming we need to consider the global impact of EVs given our current generation mix. If the study shows EVs cause more $CO_2$ production by BELCO than conventional vehicles, the study should also then determine at what percentage of renewables in the generation mix does EV use present a net global improvement over conventional vehicles. If the study shows that EV rollout is not yet a net benefit to global $CO_2$ reduction, then EV charging station prices should include a, b, c above plus a carbon tax or similar fee if they are powered by BELCO. Once we reach the point where BELCO powered EV charging stations become a net benefit for carbon emissions, the charging prices should be reduced to promote wider EV adoption. The one exception to the above would be EV charging stations powered in whole or in part by on site renewables. For these the rates could be lower and perhaps closer to the FIT. Again, without belabouring this point further here, please see additional information on our response to this question in the Question 13 Appendix.

***Question 14:*** *Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?* Yes, this technology will become viable soon and we should be able to adopt it when it becomes viable. Again, the wheeling provisions of the EA will have to be amended or removed to allow this to happen.

***Question 15:*** *Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?* Yes, but the rate of roll out should be dependent on the $CO_2$ impact issue discussed in 13 above.

***Question 16A:*** *Should BELCO be the sole owner and operator of commercial EV charging points?* No, if a distributed generator wants to roll out solar powered EV charging stations in locations where many cars remain parked for several daylight hours per day, they should be able to do so. Other jurisdictions use private enterprises for this service, which should increase competition and thus reduce costs to the consumer. ***Question 16B:*** *What advantages and/or disadvantages would this have?* As per our answer to 16A above, we see few if any advantages and more disadvantages in granting the TDRL exclusive rights to public EV charging stations, especially when considering solar assisted charging.

Please contact myself should you require any further information on our answers, comments and recommendations.

Yours Sincerely,

C. E. Nash, P. Eng.
Engineering Manager

CEN/nec
Cc Nick Duffy
SEA

# APPENDICES

***Question 1 Appendix:*** The RA reduced the annual adoption of distributed solar by perhaps 50% or more with the introduction of their first feed in tariff (FIT) by the EGD, based on solar permit volume data from the Department of Planning's web site. The EA calls for the FIT to be set within 2 years of the act coming into effect, but the RA rushed in a temporary FIT that was too low and kept it in effect until approximately 3 years from the date of the EA coming into effect. The new FIT, which came into effect in November 2019, is the first FIT where the RA attempted to calculate the true avoided cost, but failed to include any economic benefit, even though they had three years to come up with one, or obtain Ministerial direction on the economic benefit. In our opinion the new FIT is too low and the T&D losses the RA included are an insult to the DG community. In an effort to help the RA in the promotion of renewables, Bermuda needs to adopt mandatory reporting on the adoption of renewable energy here. The reporting should be done on an annual basis and should include at least 5 years of adoption history and GWHs generated by the renewables. In other islands such as Hawaii and Cayman, this reporting is produced by the local electric utility, as presumably they have the most accurate information available. Once this information is published, we will be able to accurately measure the negative impact of the first FIT on the adoption of renewable energy here and use that information to amend the EA, related policy and regulations to further promote the use of renewables here. That information will also serve as a yardstick by which to measure whether we are meeting our renewable energy targets. Furthermore the RA is mandated under the EA to monitor the efficiency of the TDRL and BGL in comparison to utilities in other similar jurisdictions. The fact that the RA included the same transmission losses of 1.6% in the latest FIT that was used in the initial FIT indicates to us that the RA is not yet monitoring the efficiency of BELCO and consequently still doing a poor job of promoting distributed solar, the only renewable with meaningful penetration here to date.

We need to recognize that the current EA is based on the Electricity Sector Policy Published in 2015 in the context of how much we and our neighboring islands have been affected already by global warming since then. Prior to 2014, Bermuda averaged close to one hurricane per decade, but we now have had five hurricanes in six years. How much more is this costing us in terms of lost GDP etc. And what would be our cost if we encountered a hurricane similar to Dorian that so devasted islands in the Bahamas for two days, with 200 mph winds, a 24 foot storm surge, a very large loss of life and perhaps $7 billion in damages? The EA already calls for the RA to promote renewables and Bermudian employment, yet for three years you have severely suppressed the adoption of distributed solar PV and the employment in that industry. Why do you need to wait for more explicit legislation to promote renewables now?

***Question 13 Appendix:*** With regard to our comment on Bermuda's grid being a dirty grid, please note the following. In a Fuel mix disclosure recently published by a UK utility, the UK average generation mix for GWH produced is quoted at 33% renewable, 19% nuclear, 41% natural gas, 5% coal and 2% other. In other words, for the average kWh sold in the UK, more than 50% comes from zero carbon sources (renewables + nuclear). As a result, the average UK carbon dioxide emissions per kWh sold is 208 g/kWh. By comparison, the Energy Green Paper for Bermuda from

2009 quoted Bermuda's emissions at 751 g/Kwh or 3.62 times the present UK average. We doubt that the adoption of renewables to date here has reduced our emissions by more than 2% from the 2009 figure. When you add in other emissions from BELCO, including sulfur and nitrogen compounds, we truly have a dirty grid compared to many other jurisdictions. Based on the above, we calculated back in 2013 that an electric vehicle (Nissan Leaf) that is charged by BELCO would produce approximately 10% more $CO_2$ at BELCO than a comparable gasoline vehicle (Nissan Quashqai). Given that gasoline vehicle emissions have probably improved more in the past six years than the electric vehicles, charging electric vehicles here would appear to produce more $CO_2$ than driving a gasoline vehicle. Furthermore, it would appear that this will remain the case until we add an offshore wind farm in perhaps 2026, unless solar PV adoption accelerates at a much faster rate before 2026. The only exception at present is solar PV owners that charge their EV from home during the PV production hours.

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5 December, 2019

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ELECTRICITY SECTOR ASSESSMENT CONSULTATION RESPONSE

Dear Regulatory Authority Team,

Thank you for the opportunity to submit responses to the 'Review of the Electricity Sector' document.

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BE Solar Review of the Electricity Sector - Consultation Response

CONSULTATION QUESTIONS 72. Interested parties are invited to comment on the proposals set forth in this Consultation Document, in particular in relation to the following questions.

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?

Yes, the desire for more clean energy has been made abundantly clear, Bermudian society wants clean renewable energy. The IRP process public responses, mind maps and other surveys and the growing focus on the facts of the accelerating dangers of the climate crisis and tipping points mean there is no other sensible choice. Add to that the fact that only clean free local clean energy can reduce and eliminate the approximate $80 Million dollars Bermuda exports from its economy each year to purchase foreign fossil fuels. That additional money recirculating on island could instead create an additional 1,000+ annual salaries for new jobs in a clean, new energy economy.

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?

Yes, recognizing the limitations and impediments of the Electricity Act (EA) and the issues these would create in reaching the IRP targets is important. Examples of enabling peer-peer electricity transmission, allowing the power of blockchain for administration efficiency, more inclusive stakeholder preparation of future IRPs and other items need to be brought in line with evidence-based best practices. It is also important to recognize these and other updates need to happen in an expedient manner, at the speed of business and how fast the world is changing.

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP?

Many stakeholders should come together in the preparation of the first draft of future IRPs as is best practice in numerous jurisdictions. Where there has been increased success of IRP implementation and adoption by the majority of the community in a given jurisdiction, there has first been a collaborative approach to agreeing on and setting goals and priorities. The TD&R Licensee (Belco) and/or the RA should not prepare the first draft of the IRP in isolation. As an example it proved to be inefficient and dangerous to allow Belco to produce the previous draft of the initial IRP which was Bermuda's default plan. The final result of the IRP in its current version looks markedly different to what Belco spent significant time and money producing.

Professional experts and representatives from the Clinton Climate Initiative and the Rocky Mountain Institute strongly advised that the IRP process includes as many stakeholders as possible. This

would include Bermuda Government representatives, community and union leaders, student and youth representation and private businesses.

What advantages and disadvantages would your choice have?

The main advantage would be an IRP that far more people in Bermuda would understand and trust. They would be more likely to know what the IRP is, what it means and would have more buy-in to see it succeed. There would be an enhanced trust factor and reduced confusion, which are significant issues at present.

The disadvantage for some people would be the need to temper their egos and reduce their need for control and power to ensure more alignment with utilitarian solutions, a renewed focus on the greater good. This is imperative in a small island nation where there are natural monopolies on essential services such as electricity and its effect on the economy, international attractiveness and the living standard of every citizen. The IRP process needs to be a community and technocrat led process.

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?

If there are significant complaints in terms of quantity or severity of complaints then the RA could consider the potential to analyze and become involved. However there should first be consideration of existing bodies that may have already been involved in the complaint and can assist effectively including Consumer Affairs. At the end of the day a just outcome must be the conclusion for any genuine issue/complaint and if this is not happening the RA should get involved to assist. Yet this should not create a culture within the RA of creating additional costs and time to process complaints as the rule, being as efficient, effective, lean and expedient as possible to all community needs must be the focus.

Question 5: Should both short-term and long-term targets for renewable energy procurement be established?

Yes this would be sensible and follow best practice. Things that don't get measured or planned out don't tend to get accomplished, and time is ticking. There also needs to be public awareness of the targets and how the public can help and what the actual plan is. After more than four months it is fair to say the majority of the Bermuda population are still not aware of the targets and more importantly what they can do to assist in achieving them, despite positive attempts to relay messaging on social media.

Should targets pertain to specific renewable technologies or be technology neutral?

Yes, there should be specific targets for each category of energy specified in the IRP report. There should be a focus on renewable technologies as that is what the majority of the country want to focus on as stated above and most likely to have targets increase as time goes on. Renewable energy is what the present and future generations care most about and what we need to move to implement our island home as fast as possible to adapt to and mitigate the effects of Climate Change.

It should also be noted that referring to biomass as renewable energy can be interpreted as disingenuous. There needs to be a clear distinction between renewable energy where the fuel source is absolutely clean, free and local vs. biomass who's harvest and transport adds significantly to its carbon footprint and will need to be imported from overseas.

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?

This is unclear, does this mean promotion in the way of reducing red tape and bureaucracy for new foreign investment into Bermuda that would stimulate the economy? And the Government promoting the fact we are in a Climate emergency to engage the population's collective consciousness? If the answer to those questions is yes, then this would make sense, the Government should do this with important caveats such as protecting any fragile marine or terrestrial environments.

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However, if provisions to promote emerging (i.e. untested, less than a 10 year track record of commercial/operational success) include spending taxpayers' money and going deeper into debt the answer would be no. As a small island state we can ill afford the risk of squandered resources that could otherwise go directly to creating jobs and achieving IRP targets etc.

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?

Yes, there should not be any promotion of non-renewable grid supply unless its pollution and other negative characteristics and externalities per kWh are significantly better than the status quo. The IRP makes it abundantly clear the focus should be on implementing renewable energy grid sources as a priority. We should expect to see, plan for and realize a reduced supply of electricity into the electricity grid from non-renewable sources starting yesterday.

Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies?

Yes, there should not be any other distributed generation as stated above, there needs to be alignment with the IRP and all scarce resources available need to focus on hitting the targets and timelines.

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?

In general yes, there needs to be ways to access renewable energy investment benefits for all members of society. This is especially relevant to those who are renters and for those who have a limited sum of money to invest and would realize diseconomies of scale if investing on their own limited project. Crowdfunding or pooling of funds to create projects with economies of scale and greater marginal value and return per $ invested, ideally with reduced administration burden through appropriate blockchain solutions could really empower communities beneficially if done right.

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption?
Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)

A cash dividend would likely be more appealing on a psychological level to investors in community energy projects and in some ways would be simpler to achieve and build community buy-in. An off-setting electricity consumption approach could also work but what would the mechanism be for those who effectively made more energy with their share of the community project than they consumed at their property, would a cash payment system then also be needed? As such I would prefer the approach that gets the most buy-in and most efficient method of deploying as much renewable energy and creating the most benefits to society as fast as possible. The cash dividend approach seems more likely to achieve those goals, if the off-setting approach is designed in a way that it is even better, then it should be chosen.

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?

This depends, and in general, the answer should be based on who will manage procurement in the most efficient, fair and transparent manner. If that entity is the RA it should be the RA who manages procurement. New bulk generation would likely be for renewable energy only, it would seem odd to think there would be any additional fossil fuel bulk generation after Belco's North power station expansion is complete and operation. As such, the RA may be the best candidate to manage procurement of new bulk generation to ensure efficiency and fairness of the procurement processes and alignment with the current IRP.

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Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?

It is understood that it is already the RA's plan to play a bigger role in IPP procurement as stated in the question. It is also sensible in general as the more unambiguous the procurement process is, through reduction of uncertainty and thus risk, the higher the chance of more submissions, increased competitiveness and greater end value to society.

The caveat is that the RA must ensure the most efficient and effective use of resources for involvement in the procurement process. This will be a constant concern and note for all questions, that rate payer's money is being used as effectively as expediently as possible to enhance the greater good in the energy sector of Bermuda and hitting the IRP targets and not overinflating costs and inefficiency in any process.

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?

This question needs to be more defined, are we talking about public charging stations? If so then the consumer should have choices on where they wish to charge. It would ultimately depend on the end price and it would seem sensible for the price to include (a) (b) and (c) with the caveat the charging infrastructure, installation and maintenance were performed as cost effectively as possible.

The reality of Bermuda's topography and geography means that the majority of charging will be performed at EV owner's properties. The driving range of EVs now averaging over 150 miles means many commuters would only need to charge once or twice a week. Our island is very small with approximately 23 miles of road between St. George's and Dockyard and the battery storage in the EVs relatively large in comparison. For those EVs being rented the situation may be different and the market will dictate the cost to plug in publicly, we are already seeing that businesses are allowing essentially free EV charging as a way to attract more footfall in their establishments for example.

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?

I am in complete agreement with analyzing, and implementing the best approach to peer-peer trading of renewable energy for Bermuda as expediently as possible. Peer-to-peer trading has been well established in other markets for some years and if it empowers more homes and businesses it should be allowed as soon as possible. There was mention made that there was a flaw in the original EA draft document's request for comments. The EA missed the opportunity of allowing the flexibility to offer peer-to-peer trading at a time when it was being highlighted in renewable energy publications as a success in other jurisdictions.

Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?

Sure, options are good and, psychologically, if there are more EV 'fueling' stations and it affords peace of mind and drives increased adoption of EVs there should be more public charge points. However, it should be noted that possibly the biggest hurdle to EV adoption at the moment is Bermuda's antiquated annual licensing class fee scheme.

If vehicle annual licensing fees were based on emissions vs. physical size there would be a much higher adoption of EVs and less polluting vehicles. This separate issue should be addressed as a matter of priority if we are truly serious about increasing EV adoption, and we should be. Other jurisdictions have implemented this program with great benefit to their countries. Bermuda must stop lagging behind and

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hopefully the RA can assist as EV adoption and EV-grid technology will become an increasingly important component of enabling and achieving the goals of the IRP.

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?

To clarify are we talking about public charging points for all vehicles or something specific to commercial vehicles?

If we are discussing public charging points for any common EV with a standard J1772 plug then we should allow any property owner or municipality to install charge points at their own risk of underutilization and cost. For Belco to be the monopoly owner and provider of EV charging points could create a situation where costs go into the ratepayers' base rate that may or may not be fully utilized.
It would be sensible to ensure a certain standard for those approved charger options such that those that get installed are 'smart grid' ready and future-proofed to allow EV to home/business/grid two way charging.

It may be that more jobs and value would be created at a lower cost to society to have more than one installer, owner and operator of EV charge points. These variables would be important in the final decision making process, would open market forces provide best value for money or a monopoly?

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We will continue to work towards an efficient Bermuda powered by affordable renewable energy and provide the highest quality energy solutions accessible to all. We appreciate the work of everyone who helps make this a reality for our island home and all our people as soon as possible.

Kind regards,

Stuart Kriendler, Managing Director

BE Solar

Our Ref: B-R162

**POSTED ON WWW.RAB.BM**

6 December 2019

Regulatory Authority
1st Floor, Craig Appin House
8 Wesley Street
Hamilton HM 11

**Attention: Monique Lister, Director – Legal Services**

Dear Sirs,

**Re: Comments on the Review of the Electricity Sector**

This letter provides the response of Bermuda Electric Light Company Limited ("BELCO") to the Regulatory Authority's (the "RA" or the "Authority") consultation document entitled, "Review of the Electricity Sector Consultation Document (the "Consultation Document").

The questions posed in the Consultation Document to which BELCO wishes to provide responses are addressed below using the numbering set out therein, and BELCO reserves all rights and remedies available to it, now and in the future, to provide additional and/or complementary submissions in relation to the subject matter contained herein or in the Consultation Document and/or otherwise to modify and amend its position as set out herein.

Prior to answering the questions posed in the Consultation Document, BELCO wishes to comment on the general framework under which the attendant electricity sector review is being conducted. The Consultation Document states that the review is being conducted pursuant to section 17 of the Regulatory Authority Act 2011 (the "RAA"). BELCO notes that, under section 17(2)(a) of the RAA, the RA is to initiate the review process by inviting comment on the market conditions in the sector, regulations and administrative determinations that should be made, modified or revoked and any other issues the RA deems relevant. Instead, the Consultation Document provides the RA's assessment of the electricity sector in Bermuda.

As BELCO offers a wealth of expertise in the electricity sector in Bermuda, it would have welcomed the opportunity to have been canvassed along with other stakeholders prior to the sector being assessed. BELCO hopes to be more closely involved in future reviews.

**Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?**

It is BELCO's view that the functions of the RA already explicitly include the promotion of clean energy. The Electricity Act 2016 (the "EA") provides that the functions of the RA shall include those "functions necessary to effectively and

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efficiently achieve the purposes set out in section 6." Section 6(c) of the EA provides that the purposes include promotion "of cleaner energy sources and technologies, including alternative energy sources and renewable energy sources."

BELCO has no objection to the relevant provision of the EA as drafted. In fact, BELCO supports the provision and the EA's existing explicit inclusion of the promotion of clean energy. It is BELCO's view that cleaner energy should continue to be part of the suite of goals addressed by the RA provided that those goals reflect reliability, cost-control and promotion of secure and efficient electricity for Bermuda.

As further elucidated elsewhere in this letter, BELCO also believes that any changes to the functions of the RA ought to be driven by electricity policy set by government.

**Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?**

BELCO is hesitant to support any changes to the EA at this time given that:

1. with respect to aspects of the EA that remain to be implemented, it is premature to make pronouncements about any perceived gaps in the framework; and

2. certain aspects of the EA regime that are underway already use many stakeholder resources that would be further stretched in the event of any efforts to amend legislation at this time (i.e., the current retail tariff review and the anticipated 2021 retail tariff review). Further stretching resources may inevitably impact the quality of any decisions taken for the electricity sector.

BELCO's hesitation having been noted, with respect to any amendments to add clarity or flexibility to achieve the amendments proposed by this review, through public consultation BELCO would wish a further opportunity to consider each specific amendment being proposed in case there are implications upon which it would like to comment. Further, as BELCO has in the past raised concerns about the inconsistency and unworkability of certain provisions within the EA, it would welcome the opportunity to repeat those comments in the context of any general review of the EA.

Although related comments may be made in BELCO's responses to the questions posed in the Consultation Document, the remainder of this section addresses the various proposed changes to the EA. This section of this letter was also deemed the appropriate one in which to comment on the proposed changes to the regulatory framework generally. Comments, whether relating to the EA or the framework generally, are addressed in this section in the same order in which they arise in the Consultation Document.

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## Review Periods for Retail Tariffs and Feed-in-Tariffs

In paragraph 61 of the Consultation Document, the RA suggests that "[t]he wording defining the timeline and periodicity under which retail and feed-in tariff reviews should be undertaken…is open to multiple interpretations and as such requires further clarification." Further, in paragraph 71(a), the RA suggests that, "[t]he EA's wording on the responsibility of the RA in relation to retail tariff and feed-in tariff reviews should be clarified regarding the timing of reviews."

BELCO would support an amendment to the EA that would provide for clarity and certainty of timing for retail and feed-in tariff reviews. BELCO does, however, believe that time periods ought to be reasonable given the cost and effort involved in tariff setting. With respect to the retail tariff reviews, BELCO believes that current short-term review periods of one year and three years are appropriate given that a new rate regime is being implemented. After the transition period, however, BELCO believes that a five-year review period is appropriate. Maintaining reasonable periods between reviews is in the best interests of customers who would otherwise bear the cost burden of overly-frequent reviews. Tariff reviews should also be coordinated to ensure the outcomes are mutually consistent and based on a thorough understanding of the cost inputs.

## Process for Delivering the IRP

In paragraph 62 of the Consultation Document, the RA suggests modification of the process for delivery of the integrated resource plan (the "IRP"). BELCO's comments on such modification are provided in response to Question 3 of the Consultation Document set out below.

## Policy Alignment

In paragraph 64 of the Consultation Document, the RA points out that The National Electricity Sector Policy of Bermuda dated 26 May 2015 (the "Electricity Policy"), the National Fuels Policy dated 24 July 2018, and Bermuda's first IRP dated 30 June 2019 published in July 2019 (the "June 2019 IRP") are misaligned with respect to targets for renewables penetration, strategies and targets to reduce carbon emissions, carbon footprint of baseload fuels and electricity demand forecasts. BELCO agrees.

As the RA notes in paragraph 26 of the Consultation Document, policy is set by the Minister. It should not, therefore, be set in the IRP. As such, BELCO looks forward to updated policies on fuels and electricity and hopes that such policies will be drafted following consultation with all stakeholders, including the general public, BELCO's customers, the Department of Energy, the RA and BELCO.

## Self-consumption and Wheeling

The RA intimates, in paragraphs 67 and 68 of the Consultation Document, that the EA ought to be amended to allow for non-renewable generation producers to self-consume while connected to BELCO's grid or to allow for wheeling while connected to BELCO's grid. BELCO sees the following challenges with these practices at this time:

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1. Such practices, whether for renewable or non-renewable generation, are inappropriate for a jurisdiction of Bermuda's size. The potential erosion of economies of scale will increase the cost of electricity for all users of the system. BELCO questions the benefits to be derived.

2. The aim of such practices is to enable customers to avoid the cost of generation, and there is already a mechanism in place to do so – the feed-in-tariff (the "FIT").

3. Customers who wheel or self-consume while continuing to access the grid must pay their fair share of the costs of the system (for example, the cost of back up supply and the cost of using the grid to transmit electricity). There is not today a rate structure to ensure these users pay their fair share of such costs. Without such a rate structure, any users of the system who are already disadvantaged and who are unable to afford to take advantage of such practices will continue to pay the system costs of those who are self-consuming or wheeling. BELCO has no objection to self-consumption by users that are off grid.

4. With respect to wheeling, direct access models (or, indeed, any competitive market approach) depend on a complete unbundling of the system to enable open competition and the development of a liquid spot market for electricity. Fully competitive markets have proven to be costly and problematic for electric systems in the thousands of megawatts and have never been attempted for a small island-based system. Without a liquid and competitive spot market the cost and benefit of new sources of energy may be unevenly shared by different consumer groups and could cause costs of providing service to increase over time.

**Active Involvement in Preparation of Key Sectoral Documents**

In paragraph 71(b) of the Consultation Document, the RA writes, "The legal and licensing framework should explicitly entitle the Authority to be involved more actively in the preparation of key sectoral documents (e.g. the IRP) drafted by the TD&R Licensee. In some circumstances the allocation of the roles and responsibilities between the Authority and the TD&R Licensee in producing key sectoral documents is not defined well enough."

BELCO's comments on suggested changes to the IRP process are set out below in response to Question 3 of the Consultation Document. Although BELCO advocates working collaboratively with all stakeholders, including the RA, in the creation of key sectoral documents, it does not believe that the RA's role is to be a partner in the management of sectoral providers. After all, it is BELCO, and not the RA or any other stakeholder, that has the obligation to serve. It is BELCO that takes on the legal and other liability if that obligation is not fulfilled.

**Consumer Protection**

In paragraph 71(c) of the Consultation Document, the RA notes that "[t]he General Determination on Principles for Consumer Protection should be amended by the Authority to also include provisions for a process of validation of any complaint

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handling policy before it becomes applicable." Please see BELCO's response to Question 4 of the Consultation Document set out below for BELCO's response on this issue.

**Long-term Targets**

In paragraph 71(d) of the Consultation Document, the RA states that, "Given that the IRP is expected to be updated every 3 to 5 years based on the latest available information, sector policies should include only a small number of key long-term targets."

BELCO's comments on this issue are set out below in its response to Question 5 of the Consultation Document.

**Licence Threshold**

In paragraph 71(e) of the Consultation Document, the RA calls for a stakeholder consultation to test the adequacy of the licence exemption threshold level. BELCO would welcome the opportunity to participate in any consultation in relation to the licence threshold.

**Distributed Generation Definition**

In paragraph 71(f) of the Consultation Document, the RA grapples with whether the EA should be amended to limit distributed generation to renewable energy technologies. BELCO's thoughts on this matter are set out fully in its response to Question 8 of the Consultation Document set out below.

**Additional Licences**

In paragraph 71(g) of the Consultation Document, the RA states that "the EA should provide flexibility to permit the RA to create additional types of licences." BELCO believes that any new licences permitted to be granted under the EA ought to be considered through government policy and public consultation and expressly defined and added to the list of potential licences set out under the relevant section of the EA (currently, section 20(1)).

**Community Energy Projects**

At paragraph 71(h) of the Consultation Document, the RA proposes a potential amendment to the legal framework to allow the sale of electricity by community energy projects or the use of BELCO's network to transmit power procured by such power plants.

BELCO's substantive response to this proposed amendment is included in its response to Question 9 set out below.

**Competitive Procurement of Bulk Generation**

The RA states that, "[a] specific regulatory instrument should cover the detailed provisions for competitive procurement of Bulk Generation. This should include

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setting up adequate timelines, nature of information to be provided by participants, selection criteria, roles and responsibilities of the TD&R Licensee, the RA, and the Minister in the process. It should be noted that the RA is currently preparing guidance for the competitive procurement of Bulk Generation."

As the RA notes above, it is already preparing guidance for competitive procurement of bulk generation. We look forward to receiving these guidelines that we trust will ensure the reliability and integrity of the electricity system. Every stakeholder has a role with respect to the provision of electricity in this jurisdiction, and we look forward to working collaboratively with the RA to ensure that competitive procurement is implemented.

At this time, the EA remains a piece of legislation that is yet to be fully implemented and tested. The process for procurement contemplated in the EA ought to be fully implemented so that lessons learned may be gleaned for the future.

BELCO's further thoughts are included in its response to Question 12 of the Consultation Document set out below.

**Level Playing-field Competition**

The RA notes, at paragraph 71(j) of the Consultation Document, that "[t]he provisions in the TD&R Licence promoting level-playing field competition in the sector should be reviewed and possibly supplemented by additional requirements and guidance. In parallel, provisions for procurement in the TD&R Licence should be reviewed and aligned with the provisions for competitive procurement of Bulk Generation. This may prompt a review of the nature of the role and responsibilities of the TD&R Licensee and the RA in the process."

BELCO does not believe that new provisions for competitive procurement of bulk generation are required at this time. The EA was designed to promote competition, and the legislation should be fully implemented and tested before gaps that may not exist are assumed to exist. In any case, BELCO looks forward to working collaboratively with the RA to ensure competitive generation in electricity.

**EV Charging**

At paragraph 71(k) of the Consultation Document, the RA suggests that "considerations for accommodating EV charging demand will need to form part of core network planning activities to ensure the realisation of clean transport aspirations in Bermuda. The policy framework should make reference to this."

BELCO agrees that policy should set the tone for Bermuda's energy future. Its thoughts on electric vehicle ("EV") charging are further set out in the responses to questions 13, 15 and 16 set out below.

**Peer-to-Peer Trading**

In paragraph 71(l) of the Consultation Document it is suggested that "it could be beneficial to test the advantages and challenges of peer-to-peer trading by encouraging [BELCO] to initiate a pilot scheme." It is further suggested that, in lieu

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of amendments to the legal or regulatory framework, BELCO could initiate the pilot through a waiver.

BELCO's comments with respect to peer-to-peer trading are provided below in response to Question 14 of the Consultation Document. However, BELCO notes that, as long as the legislation prohibits peer-to-peer trading, BELCO will be unable to launch any pilot relating to the same whether under a purported waiver or otherwise.

**EV Charging Points**

Further to the suggestion by the RA set out in paragraph 71(m) of the Consultation Document, BELCO does not believe it is necessary to revise legislation to allow set up of independent EV charging point operators. BELCO's views are set out in its responses to Questions 13, 15 and 16 below. That said, BELCO is supportive of any approach that is proven to be economical.

**Customer Rights and Duties**

BELCO does not agree that the RA "should issue a General Determination or guidance listing customer rights and duties." BELCO notes that such guidance or general determination would include the circumstances in which the TD&R Licensee has the obligation to connect and supply a new customer.

BELCO's relationships with its customers are governed by its Service Rules and the Grid Code that is presently awaiting approval by the RA. Further, under section 20(3)(a) of the EA, BELCO has an obligation to ensure that all Bermuda residents are provided with access to a supply of electricity. The RA also will take steps to protect customers through the publication of the consumer protection general determination. In all the circumstances, it is unclear why the RA believes that BELCO requires further oversight with respect to customer rights and duties.

**Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?**

In paragraph 62 of the Consultation Document, the RA suggests modification of the process for delivery of the IRP to "provide further flexibility on the nature of the respective roles of both the RA and the TD&R licensee in producing the final version of the document." Having recently completed the process for the production of Bermuda's first IRP, BELCO wishes to share its observations on the process and the lessons learned.

The existing process is set out in Part 8 of the EA, and under such process, the RA approves the final version of the IRP that is drafted by BELCO, as the TD&R Licensee, and must include the RA's comments.

The RA sent BELCO the statutorily-required request for the first IRP on 17 November 2017. On 6 December 2017, BELCO received the RA's guidelines for the content of the IRP. BELCO's draft IRP, which followed such provided guidelines, was submitted to the RA on the 15 February 2018 deadline. Public

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consultation commenced in May 2018. After considering the comments, proposals for bulk generation and demand side resources and its own analysis, on 25 January 2019, the RA requested that BELCO undertake significant new analysis and answer certain questions. One request was that BELCO consider scenarios exploring certain targets for investment in renewable generation by 2035.

The requested scenarios included an assessment of the feasibility of investing in renewable generation to achieve targets of 35%, 50% and 75% contribution from renewable sources by 2035. The RA linked the first target of 35% to the Electricity Policy. In the end, the June 2019 IRP called for a scenario that would result in a contribution of 85% of energy from renewable sources by 2035. This aim was well in excess of the target set in the Electricity Policy.

Although the EA requires that BELCO will incorporate the requested changes indicated by the RA, the June 2019 IRP was a new document separate from the IRP that had been submitted by BELCO.

One takeaway for BELCO is that there was no alignment on the intentions for Bermuda's energy future during the preparation of the June 2019 IRP. BELCO believes that, had it known the ultimate target at the outset, it would have been better placed to draft an IRP that reflected the desires of all stakeholders (with the appropriate underlying technical and financial analysis).

There can be no doubt that BELCO ought to be integrally involved in the creation of future IRPs for Bermuda. After all:

1. BELCO, as the TD&R Licensee, is the only stakeholder legally responsible for procuring power and energy in a reliable manner to serve customers. Most regulated power jurisdictions with IRP requirements place this responsibility on the grid operator/utility, and BELCO is the closest comparable entity in Bermuda.

2. BELCO is the only stakeholder in this jurisdiction with the knowledge and expertise to best determine how generation fits into the system in a manner that ensures the integrity of the system and will avoid stranded assets.

3. To best meet the purposes of the EA, including ensuring sustainability and reliability of electricity supply, the TD&R Licensee must have control over influences upon the system.

Having noted BELCO's critical role, however, BELCO believes that a revised process would benefit from up front involvement of the community to inform policies to be set; a clear policy objective set by the Minister and communicated to all stakeholders before the RA requests the IRP from the TD&R Licensee; and greater collaboration among stakeholders during the process (including the meetings contemplated under section 43(b) of the EA).

Having now been through the process of setting the first IRP, it is hoped that BELCO will be better placed to understand the positions of all stakeholders regarding its development. BELCO looks forward to working collaboratively with all stakeholders on the next iteration of the IRP. It hopes that the RA agrees that

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other collaborative processes in which the parties have engaged in recent months have been productive and are worth aiming to replicate.

To explain more fully, the process of which BELCO is supportive is as follows:

1. The public will be consulted on its desires for Bermuda's energy future.

2. Government will set clear policy on matters including renewable targets.

3. Clear priorities will be set including realistic timelines.

4. BELCO will make initial presentation to stakeholders on key assumptions and goals and will solicit and receive stakeholder input to inform various aspects of the IRP's development.

5. BELCO, in its expertise, will prepare the draft IRP.

6. The RA will comment on the draft IRP.

7. The public will comment on the draft IRP.

8. A stakeholder session or technical conference will be held in which the public's comments and recommendations will be discussed by all parties.

9. Informed by the above stakeholder session and technical conference, the RA will request that BELCO make certain amendments to the IRP.

10. BELCO will draft and submit for approval a version of the IRP incorporating the RA's requested amendments.

11. If the amended draft is deemed the best approach to meeting the purposes of the EA and compliant with ministerial directions, the RA will approve the amended IRP.

**Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?**

With respect to this question, BELCO notes the following:

1. The RA's consumer protection consultation is currently underway, and the general determination is expected in due course. Given that the complaints handling process set out in the Principles of Consumer Protection Preliminary Report, Preliminary Decision and Order dated 11 September 2019 is robust and comprehensive, the RA will arguably approve BELCO's complaints handling procedure by virtue of BELCO's required adherence to the ultimate general determination.

2. It is understood that, relative to other sectoral providers, BELCO receives few customer complaints. BELCO therefore wonders what the RA is attempting to address with the imposition of an additional requirement for approval of the complaints handling process.

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3. The reality is that BELCO operates as a small island utility and, as compared with comparators, it offers some of the most reliable service. Arguably, it is among the best island utilities in the world in terms of reliability.

4. If the RA has a specific concern about BELCO's handling of customer complaints, it is unclear why the public's perception of the same was not tested during the consumer protection consultation process to determine whether the additional time and expense that would be incurred for approval of the complaint handling policy is indeed warranted.

**Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral?**

Both short-term and long-term targets for renewable energy procurement should be established, but there should be allowances for adjustment of long-term targets to reflect changes in markets. BELCO believes that establishing both short term and long term targets will provide important signals to industry regarding future needs and planning. Further, it will provide the necessary "stakes in the ground" that are needed to then assess specific administrative determinations needed to achieve those targets (such as the FIT). In general, targets should be technology neutral, but it may be appropriate to align targets with general categories, such as non-GHG emitting renewable energy technology. BELCO reiterates that targets should be set through government policy.

**Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?**

It is BELCO's view that the renewable policy framework should not promote any one technology over another. However, if the government is considering promoting certain emerging renewable technologies, it should first study the same to value the economics. Thereafter, such technologies should only be promoted if they have been found to be economically viable. Further, technologies that are cost effective should not face barriers to entry due to an unsupportive policy framework.

**Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?**

Every generator of electricity feeding into the grid must comply with the required laws and regulations and must meet the interconnection standards and pay its fair share of the costs associated with use of the system. In addition, provided that the licence threshold is set at an appropriate level, BELCO has no objection to generators using non-renewable technologies being permitted classification as distributed generators.

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**Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies?**

BELCO is generally indifferent as to the type of technology that should be classified as distributed generation, provided the threshold level is appropriate and that all distributed generators meet the interconnection standards and pay their share of the costs of operating the system. BELCO does, however, suggest it is premature to change definitions at this time, given outstanding issues with the FIT pricing regime. In particular, BELCO suggests that the FIT pricing regime may need further refinement since the price currently allowed for renewable energy does not seem to fit with the value of energy on the system. Moreover, the pricing of the TD&R and power generation portions of the system have implications for the value of non-renewable generation. The interaction between the network pricing and the decision to install local generation is complicated, and the pricing regime for the unbundled system (i.e., separating power generation from TD&R) has not yet been finalized. Once the pricing regime is rationalized, it may be appropriate to change definitions to recognize these new potential resources. Moving forward with non-renewable distributed generation without a full understanding of the costs and implications of the pricing structure may cause unintended consequences.

**Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?**

BELCO does not believe that community energy projects are viable in this jurisdiction for these reasons:

1. There seems to be little merit in fragmenting a tiny market when there is already a mechanism in place by which prosumers can avoid the cost of generation – the FIT.

2. Community project participants would be required to continue to pay their fair share for use of BELCO's grid so that those who are unable to participate in the community projects would not be left to shoulder the costs of the system. At this time, however, the requisite rate structure is not in place.

The above having been said, BELCO would encourage alternative financing for low income customers to enable them to independently take advantage of renewable energy opportunities.

**Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?**

Yes. BELCO, strictly in its capacity as the TD&R Licensee, is the optimal party to manage the procurement of new bulk generation. It would be happy to work collaboratively with the RA to ensure that the process is adequately transparent and fair.

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**Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?**

The EA, a piece of legislation remaining to be fully implemented, sets out a procurement process that remains to be tested but is robust and comprehensive and requires the RA and BELCO to work collaboratively. Relevant provisions include the following:

1. Section 44(2) of the EA provides that the Authority may approve the IRP.

2. Section 46(1) of the EA provides that the TD&R Licensee shall, in accordance with the IRP approved by the RA, procure resources from third parties.

3. Section 46(2) of the EA enables the RA to issue an administrative determination to amend any provision of the IRP if such amendment is required to achieve the purposes of the Act.

4. Under section 47(2) of the EA, procurement of power is to be effected in accordance with the generation procurement set by administrative determination for the IRP (both documents made by the RA).

5. Any power purchase agreement must be approved by the RA.

If anything, a review of this aspect of the electricity sector regime would be best considered after the process has been fully implemented and tested.

**Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply):**

**(a) the cost of electricity;**
**(b) the EV charging infrastructure costs;**
**(c) the operational costs of the EV charging infrastructure; and/or**
**(d) none of the above.**

**If your answer is (d), how should these costs be recovered?**

Please see BELCO's response to question 15 below.

**Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?**

BELCO does not support deploying peer-to-peer trading for this jurisdiction, as it is appropriate that the TD&R Licensee serves as the only supplier of electricity. Further, BELCO notes the following on this issue:

1. Peer-to-peer traders would need to continue to pay their fair share for use of the grid. There is, however, not yet a rate structure in place that would allow for the use of the TD&R Licensee's resources.

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2. As explained with respect to wheeling in the above response to Question 2 of the Consultation Document, Bermuda is likely too small to be able to generate the liquid and competitive spot market that will be able to support peer-to-peer trading.

3. System costs will continue to rise for the other users of the grid who are not using peer-to-peer technology and are already likely to be disadvantaged users of the system.

4. It is also repeated that the FIT already enables customers to avoid the cost of generation (the aim of peer-to-peer trading).

**Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?**

Bermuda is a small island and most EVs, even older generation, have sufficient battery capacity to meet the need of most local drivers. Usage of public charging points may therefore not be cost-justifiable given that the vast majority of charging occurs at home.

BELCO is, however, open to a framework that is proven to be economical. If public charging points are deemed economical and critical to broad adoption by consumers, BELCO could present a proposal to address the issues involved. BELCO can draw on its experience, as it boasts a sizable fleet of EVs that are charged at its main campus and do not rely on an island-wide network of charging stations.

**Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?**

BELCO repeats its response to Question 15 above. Provided that BELCO serving as the sole owner and operator of commercial EV charging points is found to be economical, BELCO would be happy to facilitate such a regime.

BELCO looks forward to participating in the second round of the current consultation in due course.

Yours faithfully,

Dennis Pimentel
President

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6th December, 2019

The Regulatory Authority of Bermuda
Sent by emai: info@rab.bm

The following represents the BEST submission to the proposals set forth in the Review of the Electricity Sector Consultation document, specifically in relation to the consultation questions:

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?

Answer: YES

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?

Answer: YES

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP?

Answer: The RA

Question: What advantages and disadvantages would your choice have?

Answer: The RA has, with effective public consultation, proven itself to be capable of producing a comprehensive IRP. BELCO should be expected to submit a technically detailed submission as part of the process. The advantage is a more streamlined, cost-effective process. There is no disadvantage to the public interest that I can see.

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the?

Answer: The RA should reserve that option to be implemented if it becomes evident that BELCO is not handling complaints to the satisfaction of the public.

Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral?

Answer: YES and those targets should be technology neutral in order to have the flexibility to adapt to rapidly evolving renewable technologies.

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?

Answer: The Government should streamline access to the “Queens Bottom” and, appropriate areas made available at low or no rent to help promote emerging renewable technologies.

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a license?

Answer: YES

Question 8: Should the definition of “distributed generation” only be applicable to renewable energy technologies?

Answer: NO, but there should be a distinction made between renewable and non-renewable generation.

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?

Answer: YES

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with ‘Yes’.

Answer: Both options should be supported as they both have their advantages and disadvantages depending on participants’ expectations. The benefit of both is that they promote much larger and more diverse public participation in, and therefore opportunity to benefit from, the many advantages of distributed solar projects.

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?

Answer: Only if they are paying for it.

Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?

Answer: As the licensing body, it makes sense to clarify its expectations of license applications.

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?

Answer: A, B and C

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?

Answer: YES, the current regressive anti-wheeling clause in the EA is prejudicial to renters and landlords as only homeowners living in their own homes have access to the financial opportunity inherent in self-generation. As well peer to peer trading would allow a more decentralized grid which would be beneficial in the event of a catastrophe at the central plant. We have concerns about a Cat 5 hurricane dropping unprecedented amounts of rain alongside an 8 foot storm surge flooding the basin of Mills Creek.

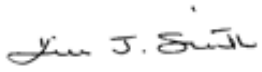
Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?

Answer: YES

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?

Answer: NO, this opportunity should go out to tender.

BEST regards



Kim J. Smith - Executive Director

Chris Worboys
55 Parc Godrevy
Newquay, Cornwall
TR7 1TY
United Kingdom

Monique Lister
Regulatory Authority
1st Floor, Craig Appin House
8 Wesley Street
Hamilton, Bermuda

06 December 2019

**Subject: Comments on the Review of the Electricity Sector**

Dear Ms. Lister,

I am writing to submit a response to the Regulatory Authority of Bermuda's consultation on their Review of the Electricity Sector and look forward to learning of the final outcome of the consultation process.

Yours sincerely,

Chris Worboys

**Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?**

Yes, however the definition of clean energy should be clear. While there is a strong international consensus within the energy industry that renewable energy technologies such as solar, wind and geothermal produce 'clean' energy, this is not the case for biomass.

Combustion of biomass releases large amounts of carbon dioxide and a variety of air pollutants that are harmful to human health. The net carbon benefits of biomass combustion are highly variable depending on the source of biomass and what its alternative use might have been had it not been burned.

The UK Committee on Climate Change (CCC) recommends biomass is only burned when combined with carbon capture and storage facilities. While the CCC have no jurisdiction in Bermuda, their view may be a useful indicator of where future policy on biomass is likely to lead.

**Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?**

-

**Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?**

The RAB and BELCO occupy unique positions in Bermuda's energy industry in having sufficient revenue to develop a comprehensive IRP for the islands. This is not the case for the majority of BELCO's competitors, a group of whom had to resort to crowdfunding to finance development of an alternative more progressive IRP last year.

The RAB should prepare the first draft of the IRP as they are best placed to develop one objectively in line with the Electricity Act and needs of Bermuda's people. It is reasonable to expect BELCo to develop an IRP that is biased toward the interests of their shareholders and maintains their position of market dominance.

It is more efficient for the industry if the first IRP is broadly in line with the interests of a broad section of the energy market and Bermuda's population. This limits resource requirements on the industry associated with reviewing the IRP and responding to associated consultations. If BELCO produces the first draft it is likely that substantial amounts of resource would be required to review and respond comprehensively to it. It is unlikely that the broader energy industry will have sufficient resources or interest to do this on a long-term basis.

**Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?**

It would be sensible for there to be an independent third party such as the RAB that has some legal authority, which could be used to resolve disputes, if this is not already the case with other consumer protection bodies.

**Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral?**

Absolutely. This would provide much needed long-term stability. Targets should be technology specific based on the most recent IRP. The 'market' is not capable of looking into the future to deliver an appropriate mix of renewable energy technologies in the correct proportions. The IRP development process offers a time for technical and financial analysis to determine the most appropriate mix based on the latest data. The time spent in between IRP development would be well spent on deploying technologies to realise the goals of the IRP.

**Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?**

Mature renewable technologies should be deployed rapidly at scale in Bermuda. Wind and solar technologies dominate global investment in renewable energy for a reason and Bermuda has excellent resources to power both of these technologies.

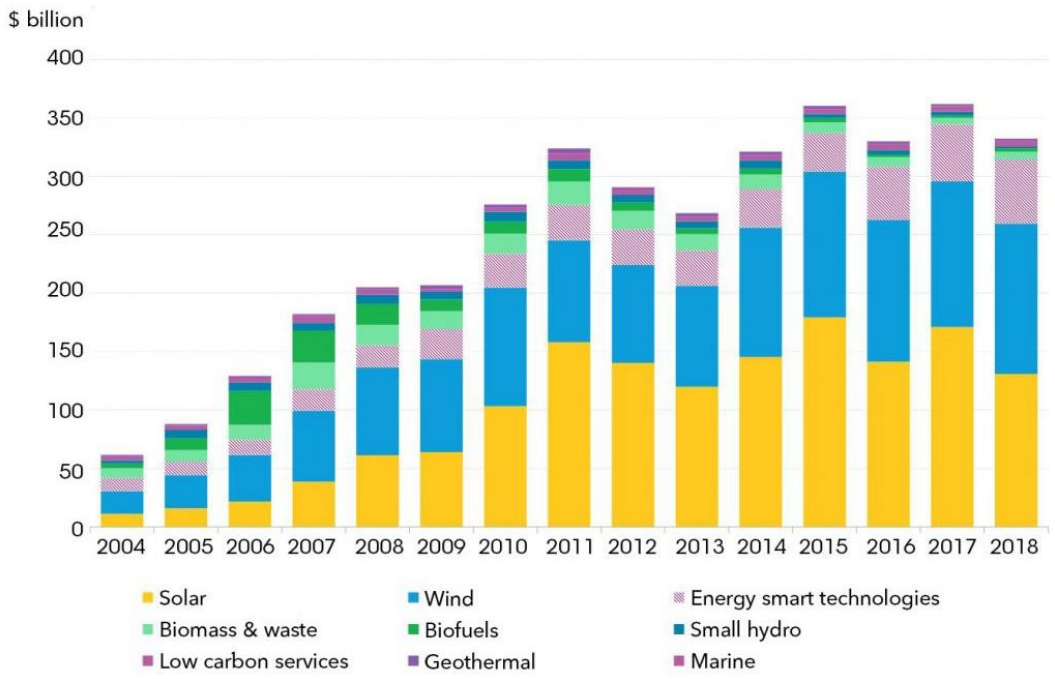



*Figure 1 – Global annual investment in clean energy technologies (©Bloomberg New Energy Finance, 2019)*

Studies have indicated Bermuda's wave resource could provide useful amounts of energy and there are promising technologies such as CETO. However, any provisions to 'support' the technology should recognise the technology's infancy. Low regrets measures of government support for such technologies could include offering trial sites for low or no cost, helping facilitate grid connections and ensuring the power can be sold for a fair price.

Bermuda has no significant tidal resource.

**Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?**

The decision on whether or not to require licencing for any specific generator class should be based on normal practice from other jurisdictions, taking into account any concerns from BELCo regarding safety. Proposals to require licences and charge fees for small scale renewable energy systems do not mirror common practice in other jurisdictions and should be scrapped.

**Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies?**

A simple solution would be to introduce a second definition of 'distributed renewable generation' as well as 'distributed generation' into the relevant legislation and policy documents.

**Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?**

Yes.

**Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)**

It may be sensible to explore both and see which are favoured by consumers.

**Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?**

With suitable regulation, fair treatment of BELCo and alignment of incentives this may be the most sensible approach. It is very important that BELCO are not allowed to profit excessively from simply delivering power that someone else has produced as this will drive up costs for the consumer.

For example, if a wind farm generates electricity for 16c/kWh and it costs 2c/kWh to deliver it, BELCO should be permitted a reasonable rate of return on the 2c delivery cost, while the investors in the wind farm should be permitted a reasonable rate of return on the 16c generation cost. This has not necessarily happened for kWh's purchased from solar PV systems to date.

**Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?**

-

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply):
(a)the cost of electricity;
(b)the EV charging infrastructure costs;
(c)the operational costs of the EV charging infrastructure; and/or(
d)none of the above.If your answer is (d), how should these costs be recovered?

Ultimately all of these costs will have to be recovered somehow. It is a question of whether they are allocated specifically to EV drivers, or shared among BELCO's entire rate base. As it is a long-term investment, it may be more equitable for the entire rate base to share the cost, rather than early adopters of EV's.

It is in the public interest to see greater use of EVs powered by renewable electricity as this will decarbonise transportation and reduce air pollution that is harmful to human health.

There is also a potential social fairness issue at stake as homeowners with off street parking will be able to charge their EV's at home at residential retail rates, or cheaper if using their own solar, where as private renters without driveways would have to pay BELCO's EV charging rates. It may be fairer to spread costs of infrastructure among everyone to avoid EV street charging costs being discriminatory to those who cannot afford properties with off street parking.

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?

Yes, this has powerful potential to unlock much needed competition in Bermuda's energy market. It could drive down electricity costs and is increasingly practical with new metering technology. There is no downside to this whatsoever.

Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?

Yes, not everyone will have access to charging facilities. It is important that public facilities are available so everyone can drive an EV if they wish.

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?
No. Third parties may wish to sell excess electricity produced by renewable energy systems. Permitting this would encourage competition and drive down prices.

Regulatory Authority of Bermuda
Attn Monique Lister

6 December 2019

**Comments on Review of the Electricity Sector**

**Question 1**: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?
Yes, strongly.

**Question 2**: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?
Yes.

**Question 3**: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?
Now that we have an IRP that is aligned with Government policy and the country's interest it should be up to BELCO to prepare the first draft of future IRPs. We need BELCO buy-in; if the RA prepares the first draft this is less likely to happen. Besides, the IRP requires a detailed implementation plan that BELCO is best placed to devise in accordance with the framework set by Government and the RA.

**Question 4**: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?
Yes.

**Question 5**: Should both short-term and long-term targets for renewable energy procurement be established?
Yes.
Should targets pertain to specific renewable technologies or be technology neutral?
Normally I would prefer targets to be technology neutral. In the case of Bermuda, however, I believe that specific renewable technology targets would have a better chance of being met within a reasonable time frame.

**Question 6**: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?
If by "promote" you mean "provide a viable framework to encourage research and development of", the answer would be yes, especially floating solar.

**Question 7**: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?
Yes. We should not be encouraging the generation of electricity from non-renewable sources.

**Question 8**: Should the definition of "distributed generation" only be applicable to renewable energy technologies?
Distributed generation should be limited to renewable energy technologies. (See answer to question 7, above.)

**Question 9**: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?
Yes, strongly.

**Question 10**: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)
I do not see the two as mutually exclusive. Consumer/Prosumer choice should be encouraged and it would seem that Blockchain and other smart technology should allow different community energy projects to operate under different approaches.

**Question 11**: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?
Not in isolation. BELCO should be actively (even aggressively) supervised by the RA to ensure best practices and competitive prices.

**Question 12**: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?
Yes.

**Question 13**: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?
(a), (b) and (c). However, the supply of electricity should be solely from renewable energy sources.

**Question 14**: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?
Yes.

**Question 15**: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?
Yes. That said, greater penetration of DE generation – especially at homes and commercial premises – would allow for a reduced number of public charging stations to be required.

**Question 16**: Should BELCO be the sole owner and operator of commercial EV charging points?
Absolutely not.

What advantages and/or disadvantages would this have?
While BELCO may be able to secure a lower price for the charging infrastructure, allowing them a monopoly on this new and growing sector would, by definition, stifle competition and eliminate the incentive to follow best practices, maintain the charging infrastructure adequately (see street lighting!), and adopt advances in technology. Payment for electricity at commercial EV charging points should take advantage of wireless (smart phones) and Blockchain technologies.

Submitted by David JOLL, Chairman & CEO, Sargasso Consulting LLC

**From:** Deborah Lombardo <debardo49@gmail.com>
**Sent:** Thursday, 5 December 2019 1:51:46 PM
**To:** info <info@ra.bm>
**Subject:** response to public consultation

Q 1 YES

Q 2 YES

Q 3 RA! BELCO HAS SHOWN ITS TRUE COLORS BY NOT EVEN PUTTING SOLAR PANELS ON ITS NEW FACILITY!

Q 4 YES

Q 5 YES. SHORT TERM TARGETS SHOULD PERTAIN TO THE MOST ADVANTAGEOUS TECHNOLOGY AT THE TIME. LONGER TERM TARGETS SHOULD REMAIN OPEN TO ADVANCES IN ALL ALTERNATIVES.

Q 6 YES

Q 7 YES

Q 8 YES

Q 9 YES

Q 10 COMMUNITIES WHO INVEST IN THEMSELVES ARE STRONGER FOR IT. PERSONAL;L;Y, PREFER OFF-SETTING, BUT AM OPEN

Q 11 NO

Q 12 YES, IF APPLIED IN A TIMELY AND JUDICIOUS MANNER

Q 13 (a) IMPORTERS OF EVs SHOULD HELP PAY FOR INSTALLATIONS

Q 14 YES

Q 15 YES

Q 16 YES. IF THEY ARE PROVIDING THE ELECTRICITY

**From:** tcole@northrock.bm <tcole@northrock.bm>
**Sent:** Thursday, 5 December 2019 1:42:46 PM
**To:** info <info@ra.bm>
**Subject:** Energy-coalition-bermuda

There are some important and specific questions re: renewables to answer here that if not answered could default to a less than ideal position. Please share this to get answers submitted by as many people as possible in such a short time, this is due **this** Friday: CONSULTATION QUESTIONS 72. Interested parties are invited to comment on the proposals set forth in this Consultation Document, in particular in relation to the following questions.

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy? YES

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review? YES

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? NO

What advantages and disadvantages would your choice have? Give more credence to the draft.

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA? YES

Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral? YES

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)? YES

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a license? YES

Question 8: Should the definition of “distributed generation” only be applicable to renewable energy technologies? YES

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported? YES

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with ‘Yes’.) Cash dividends would boost interest in energy projects.

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation? NO

Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)? YES Total transparency in decision making.

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered? A,B & C.

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)? Yes, An individual should be able to sell energy that he produced to help pay for initial system cost .

Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)? **Yes Definately**

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have? No We could never have too many!

## OVERALL COMMENTS

There is a strong argument to consider separation of the Generation and TD&R businesses of BELCO into independent and entirely separate companies in order to inspire efficiencies and remove any potential conflict of interest in BELCO procurement and operations or even the perception of a conflict. This would enable the TD&R to focus on providing value to customers and the bottom line by optimizing the grid and related services without distractions from a generation division. Renewables and distributed storage might be better enabled to flourish in this scenario. These events would be to the public good and to the benefit of fair competition between IPPs in generation procurement.

## SECTION VIII. CONSULTATION QUESTIONS ADDRESSED

**Question 1:** Do you believe that the functions of the RA should explicitly include the promotion of clean energy?

Yes

**Question 2:** Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?

I do not agree
I do not believe in all the amendments proposed.
I support some changes to achieve some clarity and flexibility in the EA with some proposed amendments and appropriate other differing or contrary amendments with some of the indicated areas to be left as they are.

**Question 3:** Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?

The first draft should be done by BELCO
This is as the TD&R has greater knowledge of and experience with the electric environment in Bermuda, is closer to many of the challenges and has greater ability to bring more technical and consultative resource expertise to the initial effort in a timely manner.

**Question 4:** Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?

Yes

**Question 5:** Should both short-term and long-term targets for renewable energy procurement be established?

Yes
They should be derived from approved IRPs.
These should balance market needs with critical climate change impacts.
Should targets pertain to specific renewable technologies or be technology neutral?
They should be derived from approved IRPs.

**Question 6:** Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?

I do not believe that government policy and taxpayers dollars should sponsor emerging renewable technologies development as these are generally best done, and are being done, in other jurisdictions and by deep pocket enterprises. Emerging renewable technologies will stand on their own track record of economic and environmental viability in other jurisdictions. Then once proven, they might be imported to Bermuda. However, there is a place for innovation in the distribution subsector for demand response schemes and smart grid projects as indicated in the proposals.

**Question 7:** Should the supply of electricity into the electricity grid from non-renewable sources of any size require a license?

I recommend that no new nonrenewable distributed generation be considered again in Bermuda. Alternatives can be distributed bulk storage integrated with renewables.
Existing and already licensed diesel gensets should be allowed to continue to run with in environmental guidelines if they are economically viable for the owners. “Plants” traditionally require regulation in Bermuda, primarily for safety and emissions reasons I believe.
The application for and issue of renewables licenses should be done as appropriate with considerations including health, safety, the environment and the integrity of the grid.

**Question 8:** Should the definition of “distributed generation” only be applicable to renewable energy technologies?

No

**Question 9:** Do you agree that community energy projects would be beneficial for the local communities and they should be supported?

Yes

**Question 10:** What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if *Question 9* was answered with ‘Yes’.)

I prefer off-setting of electricity consumption as this has a defined and monitorable benefit to each recipient. Bermuda and the individual communities will know where the benefit is going. This would build trust in the programmes by all stakeholders.

**Question 11:** Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?

Yes
However, there is a strong argument to separate the Generation and TD&R businesses of BELCO into independent and entirely separate companies in order to remove any potential conflict of interest in their procurement and operations or even the perception of such. This would be to the public good and to the benefit of fair competition between IPPs.

**Question 12:** In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?

Generally, No.
However, some regulatory oversight of the procurement process might be provided particularly to support success of the processes and goals laid out in approved IRPs. For example, to enable and ensure that procurement is done in a timely manner.

**Question 13:** Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply):
(a) the cost of electricity;
(b) the EV charging infrastructure costs;
(c) the operational costs of the EV charging infrastructure; and/or
(d) none of the above.
If your answer is (d), how should these costs be recovered?

I select a.
The other costs should be covered in general electricity rates. These include all operating and investment costs for the TD&R including installing and operating the charging points. There use is inevitable if intelligently located. This results in ROI for the operator based on fair rates.

**Question 14:** Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?

No
No wheeling and no peer-to-peer trading please for Bermuda. This is said with the awareness that our electricity infrastructure is tiny by any other regional standards, both in terms of demand and the size of our grid. The focus of the TD&R should primarily be on economies of scale to evolve to a highly functional, robust grid. This will require a focus on system upgrades and replacements including integrated software and communications systems as well as cables, switches, transformers, distributed storage and ancillary equipment to create an integrated and stable grid. These investments are critical to Bermuda's success and require income from the grid to fund. Wheeling and trading would siphon off the TD&Rs economic ability to do these essential and desperately needed tasks. A robust, intelligent and flexible grid with also support the very desirable adoption of more utility scale, commercial and distributed renewables. We need a strong and profitable grid for Bermuda's economic future to be realized. Wheeling and trading in Bermuda would undermine this significant goal and be an assault on our society's potential success.

**Question 15:** Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?

Yes

**Question 16:** Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?

Yes

Economies of scale and accountability would be obtained with this approach.

**From:** Janice Atcheson <info@ra.bm>
**Sent:** Friday, 6 December 2019 4:58:59 PM
**To:** rab.relay@gmail.com <rab.relay@gmail.com>
**Subject:** Submitted Response to a Consultation from RAB Website "[subject]"

From: Janice Atcheson

Email: jwatcheson@cogeco.net
Company Name: BE Solar

Active Public Consultation: Electricity Sector Assessment

Submit details of your response: CONSULTATION QUESTIONS 72. Interested parties are invited to comment on the proposals set forth in this Consultation Document, in particular in relation to the following questions.
Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?
Yes
Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?
Yes
Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP?
Not Belco, RA and more community stakeholders to get it right the first time
What advantages and disadvantages would your choice have? Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?
Yes
Question 5: Should both short-term and long-term targets for renewable energy procurement be established?
Yes
Should targets pertain to specific renewable technologies or be technology neutral?
Specific
Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?
Yes
Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?
Yes
Question 8: Should the definition of “distributed generation” only be applicable to renewable energy technologies?
Yes
Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?
Yes
Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if

there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)
Cash dividend is what people need in this economy
Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?
No
Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)? 26
Yes
Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?
A, B & C
Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?
Yes
Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?
Yes we need options for EV to grid etc.
Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?
No

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# BE Solar Review of the Electricity Sector - Consultation Response

CONSULTATION QUESTIONS 72.
Interested parties are invited to comment on the proposals set forth in this Consultation Document, in particular in relation to the following questions.

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?
Yes, the desire for more clean energy has been made abundantly clear, Bermudian society wants clean renewable energy. The IRP process public responses, mind maps and other surveys and the growing focus on the facts of the accelerating dangers of the climate crisis and tipping points mean there is no other sensible choice. Add to that the fact that only clean free local clean energy can reduce and eliminate the approximate $80 Million dollars Bermuda exports from its economy each year to purchase foreign fossil fuels. That additional money recirculating on island could instead create an additional 1,000+ annual salaries for new jobs in a clean, new energy economy.

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?
Recognizing the limitations and impediments of the Electricity Act (EA) and the issues these would create in reaching the IRP targets is important. Examples of enabling peer-peer electricity transmission, allowing the power of blockchain for administration efficiency, more inclusive stakeholder preparation of future IRPs and other items need to be brought in line with evidence-based best practices. It is also important to recognize these and other updates need to happen in an expedient manner, at the speed of business and how fast the world is changing.

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP?
Many stakeholders should come together in the preparation of the first draft of future IRPs as is best practice in numerous jurisdictions. Where there has been increased success of IRP implementation and adoption by the majority of the community in a given jurisdiction, there has first been a collaborative approach to agreeing on and setting goals and priorities. The TD&R Licensee (Belco) and/or the RA should not prepare the first draft of the IRP in isolation. As an example it proved to be inefficient and dangerous to allow Belco to produce the previous draft of the initial IRP which was Bermuda's default plan. The final result of the IRP in its current version looks markedly different to what Belco spent significant time and money producing.
Professional experts and representatives from the Clinton Climate Initiative and the Rocky Mountain Institute strongly advised that the IRP process includes as many stakeholders as possible. This would include Bermuda Government representatives, community and union leaders, student and youth representation and private businesses.

What advantages and disadvantages would your choice have?

The main advantage would be an IRP that far more people in Bermuda would understand and trust. They would be more likely to know what the IRP is, what it means and would have more buy-in to see it succeed. There would be an enhanced trust factor and reduced confusion, which are significant issues at present.
The disadvantage for some people would be the need to temper their egos and reduce their need for control and power to ensure more alignment with utilitarian solutions, a renewed focus on the greater good. This is imperative in a small island nation where there are natural monopolies on essential services such as electricity and its effect on the economy, international attractiveness and the living standard of every citizen. The IRP process needs to be a community and technocrat led process.

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?
If there are significant complaints in terms of quantity or severity of complaints then the RA could consider the potential to analyze and become involved. However there should first be consideration of existing bodies that may have already been involved in the complaint and can assist effectively including Consumer Affairs. At the end of the day a just outcome must be the conclusion for any genuine issue/complaint and if this is not happening the RA should get involved to assist. Yet this should not create a culture within the RA of creating additional costs and time to process complaints as the rule, being as efficient, effective, lean and expedient as possible to all community needs must be the focus.

Question 5: Should both short-term and long-term targets for renewable energy procurement be established?
Yes this would be sensible and follow best practice. Things that don't get measured or planned out don't tend to get accomplished, and time is ticking. There also needs to be public awareness of the targets and how the public can help and what the actual plan is. After more than four months it is fair to say the majority of the Bermuda population are still not aware of the targets and more importantly what they can do to assist in achieving them, despite positive attempts to relay messaging on social media.

Should targets pertain to specific renewable technologies or be technology neutral?
There should be specific targets for each category of energy specified in the IRP report. There should be a focus on renewable technologies as that is what the majority of the country want to focus on as stated above and most likely to have targets increase as time goes on. Renewable energy is what the present and future generations care most about and what we need to move to implement our island home as fast as possible to adapt to and mitigate the effects of Climate Change.
It should also be noted that referring to biomass as renewable energy can be interpreted as disingenuous. There needs to be a clear distinction between renewable energy where the fuel source is absolutely clean, free and local vs. biomass who's harvest and transport adds significantly to its carbon footprint and will need to be imported from overseas.

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?
This is unclear, does this mean promotion in the way of reducing red tape and bureaucracy for new foreign investment into Bermuda that would stimulate the economy? And the Government promoting the fact we are in a Climate emergency to engage the population's collective consciousness? If the answer to those questions is yes, then this would make sense, the Government should do this with important caveats such as protecting any fragile marine or terrestrial environments.
However, if provisions to promote emerging (i.e. untested, less than a 10 year track record of commercial/operational success) include spending taxpayers' money and going deeper into debt the answer would be no. As a small island state we can ill afford the risk of squandered resources that could otherwise go directly to creating jobs and achieving IRP targets etc.

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?
Yes, there should not be any promotion of non-renewable grid supply unless its pollution and other negative characteristics and externalities per kWh are significantly better than the status quo. The IRP makes it abundantly clear the focus should be on implementing renewable energy grid sources as a priority. We should expect to see, plan for and realize a reduced supply of electricity into the electricity grid from non-renewable sources starting yesterday.

Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies?
Yes, there should not be any other distributed generation as stated above, there needs to be alignment with the IRP and all scarce resources available need to focus on hitting the targets and timelines.

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?
In general yes, there needs to be ways to access renewable energy investment benefits for all members of society. This is especially relevant to those who are renters and for those who have a limited sum of money to invest and would realize diseconomies of scale if investing on their own limited project. Crowdfunding or pooling of funds to create projects with economies of scale and greater marginal value and return per $ invested, ideally with reduced administration burden through appropriate blockchain solutions could really empower communities beneficially if done right.

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption?
Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)
A cash dividend would likely be more appealing on a psychological level to investors in community energy projects and in some ways would be simpler to achieve and build community

buy-in. An off-setting electricity consumption approach could also work but what would the mechanism be for those who effectively made more energy with their share of the community project than they consumed at their property, would a cash payment system then also be needed? As such I would prefer the approach that gets the most buy-in and most efficient method of deploying as much renewable energy and creating the most benefits to society as fast as possible. The cash dividend approach seems more likely to achieve those goals, if the off-setting approach is designed in a way that it is even better, then it should be chosen.

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?
This depends, and in general, the answer should be based on who will manage procurement in the most efficient, fair and transparent manner. If that entity is the RA it should be the RA who manages procurement. New bulk generation would likely be for renewable energy only, it would seem odd to think there would be any additional fossil fuel bulk generation after Belco's North power station expansion is complete and operation. As such, the RA may be the best candidate to manage procurement of new bulk generation to ensure efficiency and fairness of the procurement processes and alignment with the current IRP.

Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?
It is understood that it is already the RA's plan to play a bigger role in IPP procurement as stated in the question. It is also sensible in general as the more unambiguous the procurement process is, through reduction of uncertainty and thus risk, the higher the chance of more submissions, increased competitiveness and greater end value to society.
The caveat is that the RA must ensure the most efficient and effective use of resources for involvement in the procurement process.
This will be a constant concern and note for all questions, that rate payer's money is being used as effectively as expediently as possible to enhance the greater good in the energy sector of Bermuda and hitting the IRP targets and not overinflating costs and inefficiency in any process.

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?
This question needs to be more defined, are we talking about public charging stations? If so then the consumer should have choices on where they wish to charge. It would ultimately depend on the end price and it would seem sensible for the price to include (a) (b) and (c) with the caveat the charging infrastructure, installation and maintenance were performed as cost effectively as possible.
The reality of Bermuda's topography and geography means that the majority of charging will be performed at EV owner's properties. The driving range of EVs now averaging over 150 miles means many commuters would only need to charge once or twice a week. Our island is very

small with approximately 23 miles of road between St. George's and Dockyard and the battery storage in the EVs relatively large in comparison. For those EVs being rented the situation may be different and the market will dictate the cost to plug in publicly, we are already seeing that businesses are allowing essentially free EV charging as a way to attract more footfall in their establishments for example.

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?
I am in complete agreement with analyzing, and implementing the best approach to peer-peer trading of renewable energy for Bermuda as expediently as possible. Peer-to-peer trading has been well established in other markets for some years and if it empowers more homes and businesses it should be allowed as soon as possible. There was mention made that there was a flaw in the original EA draft document's request for comments. The EA missed the opportunity of allowing the flexibility to offer peer-to-peer trading at a time when it was being highlighted in renewable energy publications as a success in other jurisdictions.

Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?
Sure, options are good and, psychologically, if there are more EV 'fuelling' stations and it affords peace of mind and drives increased adoption of EVs there should be more public charge points. However it should be noted that possibly the biggest hurdle to EV adoption at the moment is Bermuda's antiquated annual licensing class fee scheme.
If vehicle annual licensing fees were based on emissions vs. physical size there would be a much higher adoption of EVs and less polluting vehicles. This separate issue should be addressed as a matter of priority if we are truly serious about increasing EV adoption, and we should be. Other jurisdictions have implemented this program with great benefit to their countries. Bermuda must stop lagging behind and hopefully the RA can assist as EV adoption and EV-grid technology will become an increasingly important component of enabling and achieving the goals of the IRP.

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?
To clarify are we talking about public charging points for all vehicles or something specific to commercial vehicles?
If we are discussing public charging points for any common EV with a standard J1772 plug then we should allow any property owner or municipality to install charge points at their own risk of underutilization and cost. For Belco to be the monopoly owner and provider of EV charging points could create a situation where costs go into the ratepayers' base rate that may or may not be fully utilized.
It would be sensible to ensure a certain standard for those approved charger options such that those that get installed are 'smart grid' ready and future-proofed to allow EV to home/business/grid two way charging.

It may be that more jobs and value would be created at a lower cost to society to have more than one installer, owner and operator of EV charge points, that would be an important variable in decision making, would open market forces provide best value for money or a monopoly?
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The RA's functions and objectives for the electricity sector, which will guide its decisions and interventions, are to: • Promote and preserve competition; • Promote the interests of the residents and consumers of Bermuda; • Promote the development of the Bermudian economy, employment and ownership; • Promote innovation; and, • Provide for the control and conduct of the grant, renewal, modification, suspension or revocation of licences for the provision of electricity.1

18. The principal functions of the RA, in relation to any regulated industry sector, are described in section 12 of the RAA as follows: (a) to promote and preserve competition; (b) to promote the interests of the residents and consumers of Bermuda; (c) to promote the development of the Bermudian economy, Bermudian employment and Bermudian ownership; (d) to promote innovation; and (e) to fulfil any additional functions specified by sectoral legislation.

19. Section 14 of the EA gives the RA the function "generally to monitor and regulate the electricity sector" together with the detailed functions described in the RAA and elsewhere in the EA. Hence, the RA regulates the electricity sector in Bermuda. 20. The RA has the powers to supervise, monitor and regulate the electricity sector in Bermuda in accordance with the purposes of the EA. Such purposes, as set forth in section 6 of the EA, are: (a) to ensure the adequacy, safety, sustainability and reliability of electricity supply in Bermuda so that Bermuda continues to be well positioned to compete in the international business and global tourism markets; (b) to encourage electricity conservation and the efficient use of electricity; (c) to promote the use of cleaner energy sources and technologies, including alternative energy sources and renewable energy sources; (d) to provide sectoral participants and end-users with non-discriminatory interconnection to transmission and distribution systems; 2 Preamble to the RAA 8 (e) to protect the interests of end-users with respect to prices and affordability, and the adequacy, reliability and quality of electricity service; and (f) to promote economic efficiency and sustainability in the generation, transmission, distribution and sale of electricity.

34. The IRP provides a roadmap for the electricity sector that is adequate to serve the domestic demand and meets with various policy drivers such as: • Cleaner and more diverse energy mix; • Increase contributions from renewables; • Reduce greenhouse gas emissions; • Increase contributions from demand response and energy efficiency improvements; and • Increase competition in the generation market. 35. The IRP presents Bermuda's blueprint to increase renewable energy contribution and diversify from the current generation mix, which is currently dependent on a combination of heavy fuel oil ("HFO"), light fuel oil ("LFO") and a small amount of wasteto-energy. The move away from fossil fuels (HFO and LFO) is set to reduce the risk of uncertainty in changing fuel prices and provide increased energy independence. The IRP includes a target to have 85% of Bermuda's energy requirements supplied by renewable

sources by 2035. This could be achieved by commissioning 21 MW of solar, 60 MW of offshore wind and 50 MW of biomass generation whilst gradually retiring fossil fuel generators, as indicated in Figure 3.

44. There have been developments in Bermuda in this area recently, as BELCO installed and commissioned a 10 MW Battery Energy Storage Solution in 2019 to assist with stabilising grid frequency and provide back-up electricity for short periods. The 9 https://www.lexico.com/en/definition/smart_grid 14 planned increase in renewable uptake according to the IRP may require more energy storage devices to promote grid stability. (d) Innovation in the sector and emerging technologies 45. Internationally, many new generation technologies are emerging and being tested, such as wave power and ocean thermal energy conversion. Although these technologies are still in development stages, potentially supporting them through pilot projects would provide opportunities for innovation and development of local expertise that could be exported in future. (e) Distributed generation and distributed energy resources 46. The global rise of distributed electricity generation is paving the way for end-users to rely more on their own electricity. This may reduce the need for infrastructure investments and provide cheaper electricity to homeowners. 47. One form of distributed generation is community energy projects, which aim to take collective action to generate energy while putting emphasis on local engagement, local ownership and the collective benefits of the outputs. 48. Two possible approaches are suggested for community energy projects in Bermuda. The first approach would see the profits from community energy projects distributed to shareholders in the form of dividend. Projects could be financed fully or partially through a crowd-funding platform such as the community share program in the UK.10 The second approach could involve off-setting the electricity consumption of the end-users. In this case the generator could sell the energy to the customers (who may or may not be also owners of the facility), facilitated by BELCO as the licenced supplier. (f) Increasing use of demand side response 49. Consumers can assist grid management by shifting their energy usage from peak periods, when the load on the grid is the highest during the day, to a time when the grid is less utilised. International examples show that some tariffs have been adjusted to provide cheaper electricity at times of lower demand, typically during the night, to provide incentives to consumers to change their consumption habits. The use of battery systems may provide other demand management options for customers by storing electricity during the day and discharging it at night. (g) Peer-to-peer electricity trading

50. As electricity generation has become more decentralised, peer-to-peer electricity trading has become an emerging area of focus for the structure of future energy systems. This involves users purchasing electricity directly from other users who generate more electricity than they use. Blockchain technology may play an important role in facilitating and enabling these transactions because trading can be conducted between individuals and the number of potential transactions is quite high. Although this technology is still very new, several pilot projects for peer-to-peer trading have been launched globally, such as the Power Ledger11 and the RENeW Nexus Plan12 in Australia. (h) Electric vehicles and vehicle-to-grid 51. The use of electric vehicles (“EVs”) is gaining momentum in many developed markets. Bermuda seems to

be well-placed for utilising EVs due to the small size of the island. Rental car companies already offer EVs in Bermuda and the government is supportive of a transition to EVs. The government is currently assessing the identified impediments to EV purchases with a view to determine what reasonable incentives can be developed to encourage uptake. There is also public support for the transition, with the 2018 Public Transport Survey revealing that 63% of responders would be willing to replace their car with a hybrid or EV. With both government and public support, the outlook for EVs is promising in Bermuda. In addition, further adoption of EVs would contribute to decarbonisation efforts and improved local air quality, while providing more energy efficient transportation.

52. EVs can also be used for “vehicle-to-grid” services, which enables the electricity stored in the vehicles to be fed back to the grid to help the electricity supply in periods where it is needed. Under this kind of arrangement, the vehicle owners are compensated by the grid operator for access to electricity stored in their vehicle’s battery. As the EV adoption rate increases, Bermuda may be well placed to take advantage of vehicle-to-grid technology.

67. There is an inconsistency emerging from the fact that the threshold and definition of “distributed generation” in the EA and the Electricity Policy are technology-neutral, but the definition of “feed-in tariff” in the EA and the template for the Standard Contract for unlicensed generation are specific to renewable distributed generation. The practical consequence of this is that any non-renewable source supplying electricity to the grid needs a licence, regardless of size. In addition, there is no provision for non-renewable generation producers to self-consume without being completely disconnected from the grid. This poses a risk of disproportionate transaction costs per unit of generation output installed and may discourage the development of small DG units. 68. The legal framework currently prohibits the sale of electricity by any entity other than the TD&R Licensee and the use of the TD&R Licensee’s network to transmit power that was not procured by the TD&R Licensee (wheeling). In practice, this prohibits third party access and sale (e.g. IPPs using the TD&R’s network or a private network to sell directly to a third-party consumer), or peer-to-peer trading (i.e. localised trading of electricity between individual consumers with DG infrastructure such as community solar plants using either the TD&R’s network or a private network).

Comments on the Review of the Electricity Sector- Consultation Document

Consultation Document Matter Number: 20191028

CONSULTATION COMMENTS:

*Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?*

**YES**

*Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?*

**YES**

*Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?*

**The Regulatory Authority should prepare the first draft of the IRP; BELCO as the single Licensee of TD&R would not be in a unbiased position to produce an IRP for Bermuda due to the fact that any IRP would need to foster competition and growth in generation sectors beyond BELCO's business model. It is a conflict of interest therefore for BELCO to produce the draft of the IRP.**

*Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?*

**YES**

*Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral?*

**YES- short term and long-term targets should be established although targets should be set around which technologies offer the most comprehensive benefit to Bermuda. This needs to consider, economic, social, environmental and geographical factors for each technology.**

*Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?*

**YES- As the Ocean is our greatest natural resource, we should explore its possibilities to produce electricity to the fullest.**

*Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a license?*

**NO- Combined Heat and Power, Co-gen or Waste to Energy plants should be considered on a micro scale within the context of potential micro-grids**

*Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies?*

**NO- see point above. This should include Batteries for demand side management and time of use tariff applications. For example, peak demand energy that is distributed into the grid from privately or third party owned battery storage.**

*Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?*

**YES-But they need to be regulated.**

*Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)*

**I would say both potential benefits as you will could have a 'free market' approach to micro gridding. Due to likely costs, it is unlikely that communities will be able to independently finance such projects themselves, therefore 'mini utility' or third-party financing makes most sense. This would lend itself more towards a 'Preferred Equity' structure of financing for potential investors.**

*Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?*

**IF BELCO wish to own and operate said Bulk Generation then yes, if you have bulk generation in terms of a renewable source that BELCO will not own and operate, how do you ensure fair terms for the independent bulk generator when they can only sell to one buyer?**

*Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)?*

**YES, as any IPP proposal would need guidelines that meet the IRP which is determined by Legislation. If the RA do not administer these functions then policy and legislative changes will not be as beneficial without the guidance of the RA across procurement and feedback from the RA to Government on procurement factors. One consideration would simply be the role of the Planning Department and Zoning for larger scale renewables which is a new consideration.**

*Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply):*

(a) the cost of electricity; -**YES**

(b) the EV charging infrastructure costs; **- No that is the cost of whomever provides the EV stations.**

(c) the operational costs of the EV charging infrastructure; and/or – **No, that is the cost to the infrastructure provider.**

(d) none of the above.

If your answer is (d), how should these costs be recovered?

*Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?*

**YES- as Bermuda has a growing Fintech sector that could support such projects.**

*Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?*

**YES-but only applicable to certain business models. Personal Cars or Utility Vehicles should not require public charging if users manage charging correctly.**

*Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?*

**NO-The monopoly risk would be significant, which could lead to bottlenecks for installations and high costs to the consumer. One example would be, mini-car liveries having to rely on BELCO to deploy their infrastructure and price gouge which could cripple their business model. This could be for any commercial EV user.**

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy? **ABSOLUTELY, we are in a Climate Emergency!**

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review? **YES, this should be updated regularly to keep up with technology changes and changes specific to Bermuda.**

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? **In my opinion, the first draft should come from the RA based on what the public wants and from there BELCO should give input on what is achievable.** What advantages and disadvantages would your choice have? **This would waste less time as the TD&R will always provide the minimum to protect its financial interests and the public will always demand more so best to start with the public and work backwards from there.**

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA? **Of course, yes.**

Question 5: Should both short-term and long-term targets for renewable energy procurement be established? **Yes, we are now in a situation of climate emergency and we need to make renewable energy targets a top priority in Bermuda. We need to have more short-term targets than long-term targets aiming at 100% renewable energy in the shortest time frame possible.**

Should targets pertain to specific renewable technologies or be technology neutral? **Targets should be specific to renewable technologies but should also be flexible to permit new technologies to adjust our targets from time to time.**

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)? **Government policy should be promoting in every way emerging renewable technologies. Whatever gets us to 100% renewable energy in the fastest time frame possible should be the goal.**

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence? **Yes, any supply of electricity into the grid should either require a permit or a license. Permits and licenses for renewable energy sources should be fast tracked.**

Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies? **No, distributed generation should be just that, any form of energy that is distributed on the grid.**

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported? **Absolutely, yes. There is no logical reason why "wheeling" should be prohibited in Bermuda. This is a protectionist part of our legislation favouring the TD&R. In the event of a hurricane, if I can produce renewable energy for myself and my neighbour, I should be able to wheel that energy to them.**

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? **The cash**

**dividend approach seems more fair because if you produce more than you consume, you will at least be compensated for what is produced.**

Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)

**A good practice with regard to community-owned solar projects has been accomplished in the City of Freiburg, Germany. The City of Freiburg strongly supports the installation of solar Photovoltaics (PV) and thermal installations on public buildings (especially schools). Through transparent administrational procedures, citizens shall be motivated to invest in such projects. With the development of an online tool called "FREE-SUN", citizens are able to easily identify roof spaces available for solar PV and thermal installations. This facilitates the planning process of community based PV projects for citizens. Via "FREE-SUN" citizens can access information on the suitability of certain building structures for PV and thermal installations and on how projects could be realised.**

**Some roofs are not conducive to solar while others are, therefore, permitting solar community projects, it helps to pool our resources together. Profits from projects can contribute towards a number of local projects including, youth sports initiatives, a school allotment and community play areas.**

https://medium.com/@TheCCoalition/5-community-energy-projects-you-should-know-af5398efec8d

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation? **No, as the TD&R, their only responsibility should be for the Transmission, Distribution and Retail of energy.**

Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)? **Yes**

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply):

(a) the cost of electricity; **Yes**

(b) the EV charging infrastructure costs**; In an effort to incentivise EV purchases in Bermuda and bearing in mind our climate emergency, no.**

(c) the operational costs of the EV charging infrastructure; and/or **No**

(d) none of the above.

If your answer is (d), how should these costs be recovered? **The costs for b) and c) above should be recovered from drivers of non EVs in the form of a carbon tax for combustion engines, which will hopefully incentivise people to switch to an EV.**

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)? **Absolutely, best place to start would be in the**

**condominium developments around Bermuda. A small mini-grid within these complexes already generally exists whereby the owners / developers of those complexes would have paid for that infrastructure initially. People living in those developments should be permitted to trade energy and pilot projects should be permitted.**

Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)? **Yes, everywhere. Long overdue, Bermuda!**

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have? **Absolutely not. These should be owned by the Government or Private Enterprise. The only thing that BELCO should be doing as the TD&R Licensee is to concentrate on keeping our grid up to date for up to date Transmission, Distribution and Retail based on the latest technologies.**

**From:** Nathaniel (Nick) Hutchings <info@ra.bm>
**Sent:** Friday, 6 December 2019 3:49:38 PM
**To:** rab.relay@gmail.com <rab.relay@gmail.com>
**Subject:** Submitted Response to a Consultation from RAB Website "[subject]"

From: Nathaniel (Nick) Hutchings

Email: nhutchings@logic.bm
Company Name: Personal Interest

Active Public Consultation: Electricity Sector Assessment

Submit details of your response: SUBMISSION TO THE REGULATORY AUTHORITY OF BERMUDA BY NICK HUTCHINGS

RE; CONSULTATION QUESTIONS 72.
Note: See answers in red.

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy? YES

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review? YES

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? RA
What advantages and disadvantages would your choice have? The RA has, with effective public consultation, proven itself to be capable of producing a comprehensive IRP. BELCO should be expected to submit a technically detailed submission as part of the process. The advantage is a more streamlined, cost effective process. There is no disadvantage to the public interest that I can see.

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the? The RA should reserve that option to be implemented if it becomes evident that BELCO is not handling complaints to the satisfaction of the public.

Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Should targets pertain to specific renewable technologies or be technology neutral? YES, and those targets should be technology neutral in order to have the flexibility to adapt to rapidly evolving renewable technologies.

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)? The Government should streamline access to the “Queens Bottom” and, appropriate areas made available at low or no rent to help promote emerging offshore renewable technologies.

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence? YES

Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies? NO, but there should be a distinction made between renewable and non-renewable generation.

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported? YES

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.) Both options should be supported as they both have their advantages and disadvantages depending on participants expectations. The benefit of both, is that they promote much larger and more diverse public participation in, and therefore opportunity to benefit from, the many advantages of distributed solar projects. See more on this in the answer to Question 14 below.

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation? Only if they are paying for it.

Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)? Yes, as the licensing body, it makes sense to clarify its expectations of license applications.

Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered? A, B and C

Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)? YES, the current regressive anti-wheeling clause in the EA is prejudicial to renters and landlords as only homeowners living in their own homes have access to the financial opportunity inherent in self-generation.
Also, all the risk analyses experts, both scientific and actuarial, who spoke at the Bermuda Climate Risk Forum last month highlighted the emerging threat of heavy rainfall storms e.g. hurricanes Henry, Florence and Dorian all 36" plus rainfall storms.
We now face a quantifiable risk that, if such a storm hits Bermuda, the combined rainfall and storm surge would likely put BELCO under 8' of water.
That, in and of itself, would not be catastrophic as the utility would eventually recover and restore power. The real problem lies in the probability that at least some of the island's reinsurance capacity will have relocated by the time it takes and, the further probability that once relocated, it is unlikely to come back. That level of loss to an already vulnerable economy would be truly transformational.

To mitigate this new climate risk Bermuda needs to get as much of its generating capacity spread out across the island and, up as high as possible. Distributed solar with battery storage is the obvious solution, the adoption of which should be aggressively pursued as a matter of national urgency.
Just 20% of Bermuda's 5 square kilometers of roof area will house 180 MW of solar which combined with the energy sector's predicted 30% reduction in consumption from efficiency and conservation, amounts to 75% of the island's total annual energy demand.
Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)? YES

Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have? NO, this opportunity should go out to tender.

**From:** Raphael Knight-Packwood <info@ra.bm>
**Sent:** Friday, 6 December 2019 4:54:39 PM
**To:** rab.relay@gmail.com <rab.relay@gmail.com>
**Subject:** Submitted Response to a Consultation from RAB Website "[subject]"

From: Raphael Knight-Packwood

Email: raphael@besolar.bm
Company Name: BE Solar

Active Public Consultation: Electricity Sector Assessment

Submit details of your response: CONSULTATION QUESTIONS 72. Interested parties are invited to comment on the proposals set forth in this Consultation Document, in particular in relation to the following questions.
Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy?
Yes
Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review?
Yes
Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP?
Should be RA
What advantages and disadvantages would your choice have? Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA?
Yes
Question 5: Should both short-term and long-term targets for renewable energy procurement be established?
Yes
Should targets pertain to specific renewable technologies or be technology neutral?
Neutral
Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)?
Yes
Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a licence?
Yes
Question 8: Should the definition of “distributed generation” only be applicable to renewable energy technologies?
Yes
Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported?
Yes
Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if

there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.)
Cash dividend approach
Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation?
No
Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders)? 26
No
Question 13: Which of the following should be included in prices paid by consumers at electric vehicle charging points (select all that apply): (a) the cost of electricity; (b) the EV charging infrastructure costs; (c) the operational costs of the EV charging infrastructure; and/or (d) none of the above. If your answer is (d), how should these costs be recovered?
A & C
Question 14: Do you agree that the potential benefits of allowing peer-to-peer trading should be explored (e.g. through research or pilot projects)?
Yes
Question 15: Do you believe that there should be public charging points for electric vehicles across Bermuda that consumers can pay to use (i.e. commercial EV charging points)?
No
Question 16: Should BELCO be the sole owner and operator of commercial EV charging points? What advantages and/or disadvantages would this have?
No

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**Comments on the review of the Electricity Sector**
**By**
**Sir John Swan and Michael Murphy**

We have reviewed your consultation paper extensively and concluded that the best way to respond would be to layout for you a key plan based on technologies that exist now of what we feel is the best choice to implement soonest for Bermuda and the Regulatory Authority to accomplish its objectives in the energy sector as stated in section 5 of the consultation document as follows:

promote and preserve competition

promote interests of the residents and consumers in Bermuda

promote the development of the Bermuda economy ,employment and ownership

promote innovation.

Our following example is simple. It uses competitive free market principles encouraging local investment by locals, using the latest innovative technology now on the market created abroad to generate profits-or significant savings for the investors in E.Vs', and solar panels at home.. and /or on commercial buildings ,maximizing the use of the two way plugging system. It will significantly increase jobs for laborers; particular electricians, solar panel installers and computer software technicians. The plan also reduces fossil fuel dependency significantly and foreign exchange waste while cleaning up the air we breathe to meet the objectives of the R.A.'s integrated resource plan.

PLAN.

The RA would join with or encourage the government to support the importation of E.V.s' having the most kWh. storage in their battery packs so that the EV. could store the excess electrical power not needed to run the car and discharge it daily using a two way plug system at home or the most convenient location for the owner to supply its power at home or perhaps in the place of business before delivering any excess to the Belco grid. A two way plug system permits the electrical transfer from solar or grid to E.V. and from E.V. to home circuit or to grid. This could get savings directly to the investor/ user/ customer before billing calculations of BELCO apply since the customer purchasing the E.V. and or solar panels is effectively a direct investor in it's own power supply. It may also be able to keep power on for these investors /users in hurricanes or other outage situations rather than using the current alternative, noisy and highly polluting gas run generators so common in Bermuda today. These users/suppliers would most likely continue to be connected to the grid as well.

The following video and descriptive links provide an example of a package kit currently being produced and sold in Japan and starting to be exported.
https://www.youtube.com/watch?v=KhRSV0-5VP4

https://www.bloomberg.com/press-releases/2019-10-02/mitsubishi-motors-starts-limited-sales-of-dendo-drive-house-in

Please review this video link provided to see that an analogous remote island similar to Bermuda has been chosen by Renault to test this system(https://www.bbc.com/news/av/science-environment-48530488/the-solar-power-charged-electric-cars-making-money).

Primarily because of the 2020 EEU tough emission standards

and California commitments to use of 100% renewals in the near future, auto companies are now in production and fully committed to developing a variety of EV solutions.

From our research it appears that the Nissan Leaf's latest model with a 62 kWh battery pack and the Renault EV are currently at the forefront of this sea change in car production of EV's combined with two way charging plug systems. While we are indifferent about which brand of EV will emerge as the best choice, we chose the Nissan Leaf as our example below as it also appears to be at the forefront of change and is referred to in the detailed links we provide hereinafter to explain clearly how to proceed.

We have not explored how quickly either the Mitsubishi model described in the links above or the Nissan program could be imported to BDA. and set up because both the R.A. & Bermuda government must first facilitate or commit to the changes in regulation necessary accomplish some parts of the plan.

It appears that the Leaf model would have about a 320 mile range on a single battery charge. If the average Bermuda commuter to Hamilton went more than 32 miles per day it would be surprising. Assuming this is correct perhaps 80% to 90% of the battery charge or 40 to 50 kWh stored in the car battery could be used in the evenings and mornings at home to cut electricity bills significantly if the homeowner/renter had use of a two way plug to transfer the electricity from the car battery to the home electrical system. It is easy to see that the two way plug at home could also be used ,if the homeowner had solar panels on the roof to feed the home power needs and store the excess power in the E.V.car battery depending on where the E.V. is located when the sun shines during the day. To accomplish an ideal result, the EV owner/commuter also would need added to it's parking space in the daytime at or near the office the use of another two way or bidirectional plug to charge the E.V.battery while working. If the office building roof or car park had solar panels to feed the E.Vs' during the daytime as well a back-up battery storage system or simply electricity taken from the grid ,the E.V. owner would be billed accordingly by the parking lot providing the two way plug,or the building producing solar energy on it's roof or from it's own storage batteries or the grid depending on the costs or source of power charging the E.V. There are now companies abroad putting these systems in operation and measuring savings and profitability to the users.( See V2G PROPOSITIONS,Oct.6th 2019 appearing in CHARGED Electric Vehicles Magazine; for a detailed up to date explanation )

We would strongly encourage an immediate effort to set up a pilot project (similar to the one explained in the article above referenced)with a small number of EVs', by a few homeowners in Bermuda preferably with solar panels on their roof and a commercial building with parking or at a parking lot in Hamilton to demonstrate to all interested parties the profits to investors in EV's and solar panels that can quickly evolve from this plan.

Alternatively the Mitsubishi package for home use could be encouraged by the R.A.and may not need further consultation or governmental changes to start a program in private homes.

Comments on Various Sections of the Consultation Document

It appears that sections 6 d,e,& f of the Electricity Act support the PLAN we present as above stated, which is also referred to under section 20 d,e.&f of the consultation document.

Sections 50,51 and 52 on page 15 of the consultation document need to be modified to give the building owner ,parking lot owner ,or homeowner the ability to use the two way bidirectional plugs currently available to bypass the grid and either deliver the electricity to the EV's or from them to satisfy their own power circuit needs.

Section 70 of the consultation document raises the question and urgent need to significantly broaden the ownership of commercial public charging points to permit the sale of electricity by persons providing solar energy to E.Vs' as described in our PLAN above.

If the electricity produced by a homeowner in the Mitsubishi example is also consumed by the same owner no approvals appear to be necessary.

If the R.A.and Bermuda government want to have a transfer from fossil fuels to renewables take place quickly, we must urge the implementing changes be made to legislation as soon as possible to take maximum advantage of the technology developing now. Endorsing and fast tracking a pilot project along the lines of our PLAN ,while the legislative changes are considered seems most appropriate.

EV charging points you should be independent of BELCO ownership or control. Since there are many convenient locations in Hamilton where they could be located and owned by the persons owning or controlling the building or parking lots, these convenient locations should be encouraged to use .(see section 71 k,&m of consultation document.)

Response to Consultation Document questions:

VIII. CONSULTATION QUESTIONS

72. Interested parties are invited to comment on the proposals set forth in this Consultation Document, in particular in relation to the following questions.

Question 1: Do you believe that the functions of the RA should explicitly include the promotion of clean energy? Yes

Question 2: Do you agree that EA should be amended to add clarity and flexibility as necessary to achieve the amendments proposed by this review? In most instances referred to Yes, but if the rule change will create more bureaucracy or impede rather than streamline or encourage the market embrace he changes & implement the renewable technology in BDA. then No

Question 3: Should the RA or BELCO (in its capacity as the TD&R Licensee) prepare the first draft of the IRP? What advantages and disadvantages would your choice have?

As BDA. should be developing use of renewables and local businesses around the new technology ,the R.A. should take the lead in consultation with BELCO & other energy providers.

Question 4: Do you believe that the complaint handling policy of the TD&R Licensee should be subject to review and approval by the RA? Sounds like more bureaucracy &cost to customer ; no R.A. should at most be a place for complaint to be appealed.

Question 5: Should both short-term and long-term targets for renewable energy procurement be established? Yes ,Should targets pertain to specific renewable technologies or be technology neutral? Targets should focus on specific renewable technology that suits BDA's unique size,lack of space,urban trending,and hurricane prone area concerns.

Question 6: Do you believe that the government policy should make provisions to promote emerging renewable technologies (e.g. wave and tidal power, etc.)? No we are a very small population and economy that can not afford this type of R&D. Let the big countries make such large investments as our deficit spending is already very large.

Question 7: Should the supply of electricity into the electricity grid from non-renewable sources of any size require a license? Yes .It should be at least reviewed as we should no be accepting use of non-renewables in today's atmosphere of climate change especially with the commitment to 85% renewables in the IRP.

Question 8: Should the definition of "distributed generation" only be applicable to renewable energy technologies? Yes

Question 9: Do you agree that community energy projects would be beneficial for the local communities and they should be supported? Hard to say;we would need a model to study.There May be too much work involved to make it economically efficient ie.legal accounting,administrative costs may be too much depending on size of the community participants. East end of the island would be the area to consider.

Question 10: What do you see as the potential benefits of the two proposed approaches to community energy projects: cash (dividend) or off-setting electricity consumption? Please state if there is an approach that you prefer. (This question only needs to be answered if Question 9 was answered with 'Yes'.) offsetting energy consumption preferred.

Question 11: Should BELCO (as the TD&R Licensee) manage the procurement of new bulk generation? This seems like a moot point as the new BELCO power generators have already been delivered . If bulk generation procurement arises ,presumably in renewables then the R.A. should manage ,providing that they can do it without increasing staff size.

Question 12: In the context of IPP procurement, should the Authority play a bigger role (e.g. defining the information request for new entrants, timeline for evaluating proposals, evaluation criteria, and roles and responsibilities of stakeholders. Similar to question 11 it may be preferable to have the R.A. involvement as BELCO's interest would be conflicted by a new entrant.

**From:** William Jewell <info@ra.bm>
**Sent:** Friday, 6 December 2019 5:52:52 AM
**To:** rab.relay@gmail.com <rab.relay@gmail.com>
**Subject:** Submitted Response to a Consultation from RAB Website "[subject]"

From: William Jewell

Email: billandcindy@ntlworld.com
Company Name:

Active Public Consultation: Electricity Sector Assessment

Submit details of your response: Responses to Questions 1-16 as follows:=
Q1 Yes
Q2 Yes
Q3 Clearly we already have the 2019 IRP. In future propose it is prepared by RA as lead, but within consultation with BELCO(or its new purchaser), particularly if it is sold to a new company with significant renewable expertise
Q4 Yes
Q5 Yes, inclusion of long term targets is very important as developments often require significant research and studies before implementation. The IRP will identify technologies to focus on, hence presently omitting wave power at this time, and studies I carried out whilst working for BELCO back in 2001 identified the Bermuda's sea temperature differences will always be too low to facilitate Ocean Thermal Energy Conversion (OTEC).
Q6 NO – The IRP should be based on promoting only viable (now or with genuine future potential) technologies, and adequate funds should be allocated to allow preparation of next IRP to research and study alternative new technologies and thus rule out "non-starters" within IRP study horizon period.
Q7 Yes
Q8 Yes
Q9 Yes
Q10 No comment
Q11Yes, if the only supplier. Suggest you may wish to refer to BELCO or its new purchaser?
Q12 Yes
Q13 Customer charge should include a), b) and c)
Q14 Yes
Q15 Yes
Q16 No – every effort should be made to promote this without BELCO limitations.
Finally I wish to commend the RA for this excellent paper and invitation for feedback from all interested parties – also the IRP was an excellent and refreshingly well researched and totally unbiased document. However I would mention that I have reservations on the 30MW of biomass (assume imported wood chip), but as this does not commence until 2019 this may be amended in the next IRP should further research and studies deem this technology inappropriate.