REGULATORY AUTHORITY OF BERMUDA

Review of the Electricity Sector Consultation document

Consultation Document
Matter Number: 20191028
Date: 28 October 2019

Responses Due: 6 December 2019

TABLE OF CONTENTS

I. INTRODUCTION

1. The Regulatory Authority of Bermuda (the "RA") is responsible for regulating the electricity and electronic communications sectors.

2. In accordance with the Regulatory Authority Act 2011 (the "RAA"), the RA should periodically conduct a comprehensive review of each regulated industry sector.

3. The purpose of this Review of the Electricity Sector Consultation Document (the "Consultation Document") is for the RA to: (i) present the main findings of RA's assessment of the electricity sector in Bermuda (the "Assessment"); (ii) the RA's preliminary proposals to improve the efficiency of the current regulatory framework; and (iii) to consult with the public on matters revealed by the Assessment and the corresponding proposals to address the relevant matters.

4. The approach of the Assessment included the following steps:

(i) assessing whether the functions conferred on various stakeholders within the legal framework are adequate to enable the sector to meet the stated purposes of the RAA and the Electricity Act 2016 (the "EA");

(ii) assessing whether the set of regulatory instruments currently forming the secondary legislation for the sector (i.e. regulations, general determinations, orders, licences and guidelines published by the RA) are adequate to enable the RA to fully discharge the functions conferred in the legal framework; and

(iii) assessing whether the full range of regulatory instruments forming the regulatory framework is still consistent with sectoral policy.

5. 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]

[1] Section 12 of the RAA

6. The Consultation Document is structured as follows:

(a) section II outlines the consultation process;

(b) section III sets out the legislative context for the Assessment;

(c) section IV provides context to the electricity sector describing the market structure, the main stakeholders and their roles, and the RA's views on the trends and future outlook of the sector;

(d) section V provides an overview of the legal, regulatory, and policy framework of the sector;

(e) section VI summarises the conclusions and findings of the Assessment;

(f) section VI summarises the RA's proposals to improve the efficiency of the current regulatory framework;

(g) section VIII lists the consultation questions;

(h) Appendix A sets out the list of documents reviewed during the Assessment; and

(i) Appendix B lists the main definitions.

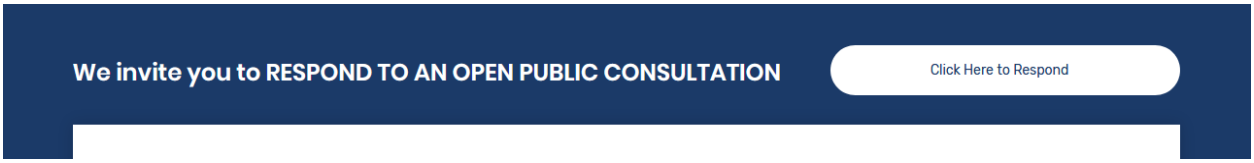
II. CONSULTATION PROCEDURE

7. This consultation is being undertaken in accordance with sections 17 and 69-73 of the RAA and sections 6, 14 and 17 of the EA. The procedure and accompanying timelines (as set out in section 70 of the RAA), under which this consultation is taking place is set out in paragraphs 8-16 below.

8. Written comments should be submitted before 5:00 PM (Bermuda time) on 6 December 2019.

9. The RA invites comments from members of the public, electricity sectoral participants, and other interested parties. The RA requests that commenting parties, in their responses, reference the number of the relevant questions, as set forth in this Consultation Document, to which they are responding. A complete list of questions presented by this Consultation Document appears in Section VIII.

10. Responses to this Consultation Document should be filed electronically in MS Word or Adobe Acrobat format. Parties wishing to file comments should go to the RA's website www.ra.bm and click on the "Click Here to Respond" button on the RA's home page:



11. All comments should be clearly marked "Comments on the Review of the Electricity Sector" and should otherwise comply with Rules 18 and 30 of the RA's Interim Administrative Rules, which are posted on the RA's website.

12. The RA intends to make responses to this Consultation Document available on its website. If a commenting party's response contains any information that is confidential in nature, a clearly marked "Non-Confidential Version", redacted to delete the confidential information, should be provided together with a complete version that is clearly marked as the "Confidential Version." Redactions should be strictly limited to "confidential information," meaning a trade secret, information whose commercial value would be diminished or destroyed by public disclosure, information whose disclosure would have an adverse effect on the commercial interests of the commenting party, or information that is legally subject to confidential treatment. The "Confidential Version" should highlight the information that has been redacted. Any person claiming confidentiality in respect of the information submitted must provide a full justification for the claim. Requests for confidentiality will be treated in the manner provided for in Rule 30 of the RA's Interim Administrative Rules.

13. In accordance with section 73 of the RAA, any interested person may make an ex parte communication during this consultation process, subject to the requirements set forth in this paragraph 13. An ex parte communication is defined as any communication to a Commissioner or member of staff of the RA regarding the matter being consulted on in this Consultation Document, other than a written submission made pursuant to this Section II. Within two business days after making an ex parte communication, the person who made the ex parte communication shall submit the following to the RA: (i) a written description of the issues discussed and positions espoused; and (ii) a copy of any written materials provided. This will be posted on the RA's website, along with a notice of the ex parte communication.

14. The principal point of contact at the RA for this Consultation Document is Monique Lister. She may be contacted by email, referencing "Comments on Review of the Electricity Sector" at consultation@ra.bm or by mail at:

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

15. In this Consultation Document, except insofar as the context otherwise requires, words or expressions shall have the meaning assigned to them by the EA, the RAA and the Interpretation Act 1951.

16. This Consultation Document is not a binding legal document and does not contain legal, commercial, financial, technical or other advice. The RA is not bound by this Consultation Document, nor does it necessarily set out the RA's final or definitive position on particular matters. To the extent that there might be any inconsistency between the contents of this Consultation Document and the due exercise by the RA of its functions and powers, and the carrying out of its duties and the achievement of relevant objectives under law, such contents are without prejudice to the legal position of the RA.

III. LEGISLATIVE CONTEXT

17. The RA has been established as a cross-sectoral, independent and accountable regulatory body according to the RAA, "to protect the rights of Consumers, encourage the deployment of innovative and affordable services, promote sustainable competition, foster investment, promote Bermudian ownership and employment and enhance Bermuda's position in the global market."[2]

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

(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.

21. The Minister responsible for electricity is currently the Minister of Home Affairs (the "Minister").

22. In accordance with section 17 of the RAA, the RA should periodically conduct a comprehensive review of each regulated industry sector, including all policies, legislation, regulations and administrative determinations applicable to the sector.

23. Furthermore, the review process should be initiated by the RA publishing a consultation document, as described in section 70 of the RAA, inviting comment regarding (i) market conditions in the sector; (ii) regulations and administrative determinations applicable to the sector that should be made, modified or revoked; and (iii) any other relevant issues.

24. Pursuant to the above sections of the RAA, the RA hereby issues this Consultation Document for the 2019 review of the electricity sector.

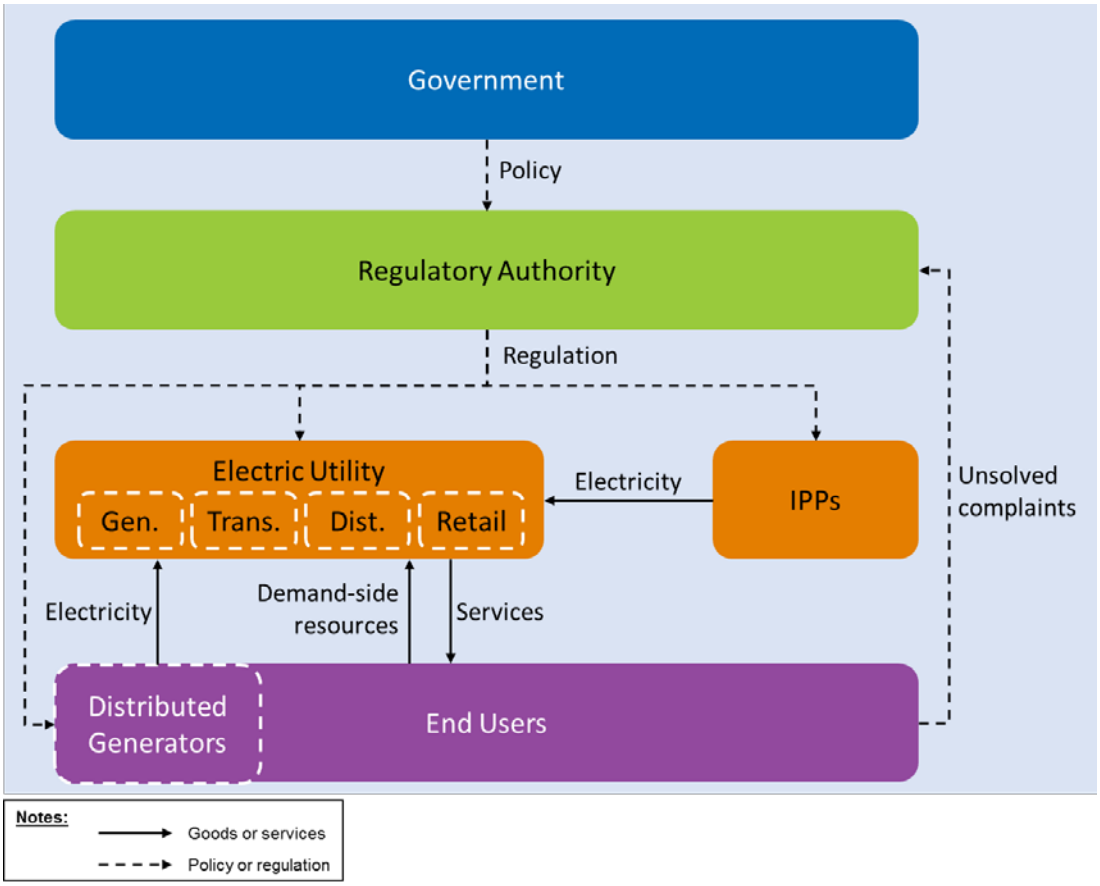
IV. SECTOR OVERVIEW

IV.1 Current structure of the electricity sector

(a) Overview

25. The National Electricity Sector Policy of Bermuda 2015 (the "Electricity Policy") sets out the structure of the sector (see Figure 1).

Figure 1: Structure of the electricity sector (Source: National Electricity Sector Policy of Bermuda 2015)



26. The Minister provides policy to guide the electricity sector, which articulates the government's visions and objectives for the sector and defines its desired structure. The Minister also participates in the process of selecting commissioners of the RA and ensuring the RA performs its responsibilities as required by law.

27. The RA has principle responsibility for the regulation of the electricity sector and acts independently from the government. The RA regulates tariffs and quality of service in a manner that promotes the public interest while allowing investors in the Electric Utility, Bermuda Electric Light Company Limited ("BELCO"), an opportunity to earn a fair return on investment. It ensures that all generation, whether owned by BELCO or by third parties, has a fair opportunity to connect to the grid and sell electricity on commercially competitive terms.

28. BELCO is vertically integrated and as the sole transmission, distribution and retail ("TD&R") licensee, acts as the single buyer of electricity generated by all generators, mainly under long-term contracts, and is responsible for providing TD&R services on the island. As a Bulk Generation licensee, BELCO also currently provides most of the island's electricity generation.

29. Independent Power Producers ("IPPs") are bulk generation suppliers that sell electricity to BELCO. IPPs may provide various services including energy, generation capacity and ancillary services.

30. End users buy electricity from BELCO. They may also reduce their consumption during times of high demand and, in the future, they may receive compensation provided by BELCO. This is known as demand-side response.

31. Distributed generators are end users with generation capacity that is connected to the distribution network. Their generation is used to offset some or all of their electricity consumption from the grid. They may also be "prosumers" of electricity, which are users who provide electricity back into the grid and receive compensation for this through a feed-in tariff ("FIT").

(b) Demand

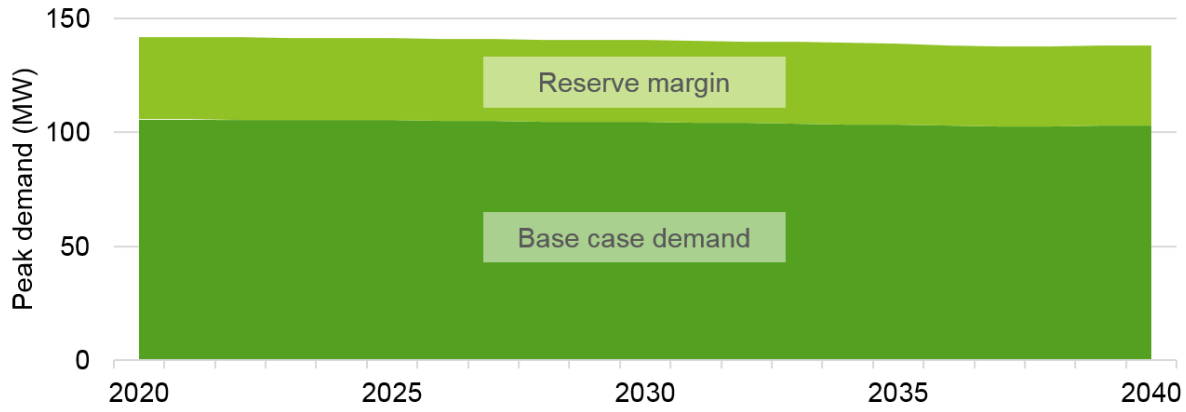
32. In 2018, the peak demand in Bermuda was 104 MW and electricity sales totalled 568 MWh.[3] From this volume, 42% of the electricity was sold to residential and 48% was sold to commercial customers.[4]

33. Bermuda's first integrated resource plan ("IRP"), published by the RA in July 2019,[5] includes a forecast of the island's load requirements until 2040. This forecast shows a relatively stable demand with a slight reduction in base demand from current levels to 103

[3] https://ascendant.bm/wp-content/uploads/2019/07/AGL-Annual-Report-for-BSX-28Jun19.pdf
[4] https://ascendant.bm/wp-content/uploads/2019/07/AGL-Annual-Report-for-BSX-28Jun19.pdf
[5] https://www.ra.bm/documents/bermuda-integrated-resource-plan-irp-2019/?wpdmdl=13822&refresh=5d9f30ea17d531570713834

MW in the year 2040 (see Figure 2 below). The demand includes a 24% reserve margin to avoid system disruption in the event of two generator outages.

Figure 2: Demand forecast from the IRP.



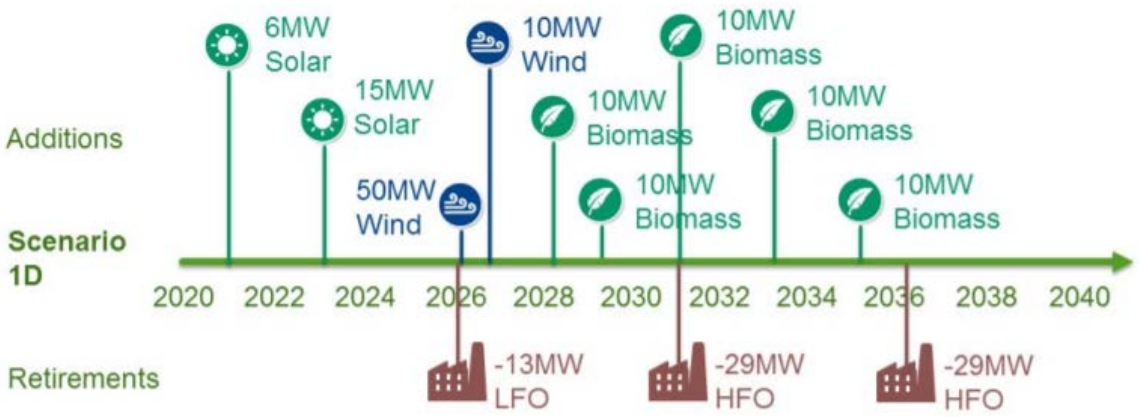
(c) Supply

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 waste-to-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.

Figure 3: Planned commissioning and retirement on generation plants[6]



36. Currently, BELCO occupies a dominant position,[7] as it is the only TD&R licensee supplying all customers with electricity and it also owns all of the bulk generation assets in Bermuda, with the exception of the Tyne's Bay waste-to-energy plant. The RA seeks to facilitate increased competition in the generation market.

(d) Tariffs

37. According to the EA, the RA is responsible for setting the methodology for electricity tariffs. In practice, the tariffs are currently proposed by BELCO, and then assessed and established by the RA. The EA stipulates that the RA shall determine the retail tariff in line with the methodology set out in the relevant General Determination ("GD"). The methodology seeks to ensure that the TD&R licensee recovers the following:[8]

- Operating expenses;
- Fuel procured for generation;
- Generation procured;
- Other expenses (taxes and statutory fees); and
- Fair return on investment.

[6] IRP, 2019
[7] Section 51 of the EA
[8] https://www.ra.bm/tarriffs-retail-tariff/

IV.2 Trends that may influence the future market

38. This Sub-section IV.2 sets out the range of international changes and technological trends that the electricity sector may be exposed to in the short to medium-term that could also be relevant to Bermuda's future.

39. Some of these trends may need to be addressed by considering the review of Bermuda's policies, legislation, and regulatory framework to ensure that they are fit for purpose and does not hinder modernisation opportunities. These international trends are discussed in subsections (a) to (h) below.

(a) Smart grid implications

40. The term "smart grid" is "an electricity supply network that uses digital communications technology to detect and react to local changes in usage." [9] Improvements in wireless communications have provided an opportunity for an upgraded electricity network where two-way digital communication between supplier and consumer, advanced metering and monitoring systems can be added. The shift to a smarter grid is presenting both challenges and opportunities for industry stakeholders.

41. In Bermuda, BELCO has begun the process of installing smart meters for consumers under its 'Advanced Meter Infrastructure' scheme. These meters allow BELCO greater insight into customers' energy usage and to retrieve usage data more frequently, at a higher degree of accuracy and potentially at a lower cost.

(b) Energy Efficiency

42. Energy efficiency helps to reduce carbon emissions from electricity generation by potentially reducing energy demand. Building codes and electrical appliance efficiency labelling standards are examples of governmental regulations designed to continuously reduce demand.

(c) Intermittent renewable sources, grid resilience and energy storage

43. Fluctuations in weather conditions cause changes to the output from solar and wind generation plants, which can cause sudden disturbances to the frequency of the electricity grid. Batteries can address this by reacting and delivering support to the grid in times of constraints on the system.

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

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

[10] http://communityshares.org.uk/find-out-more/what-are-community-shares

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 Ledger[11] and the RENeW Nexus Plan[12] 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.

[11] https://www.powerledger.io/article/power-ledgers-peer-to-peer-energy-trading-trial-in-fremantle-extended/
[12] https://www.synergy.net.au/Our-energy/Future-energy/RENeW-Nexus-Trial

V. OVERVIEW OF THE POLICY, LEGAL AND REGULATORY FRAMEWORK

53. The Assessment covered the review of the documents that make up the electricity sector policy, legal, and regulatory framework (the detailed list of documents is included in Appendix A).

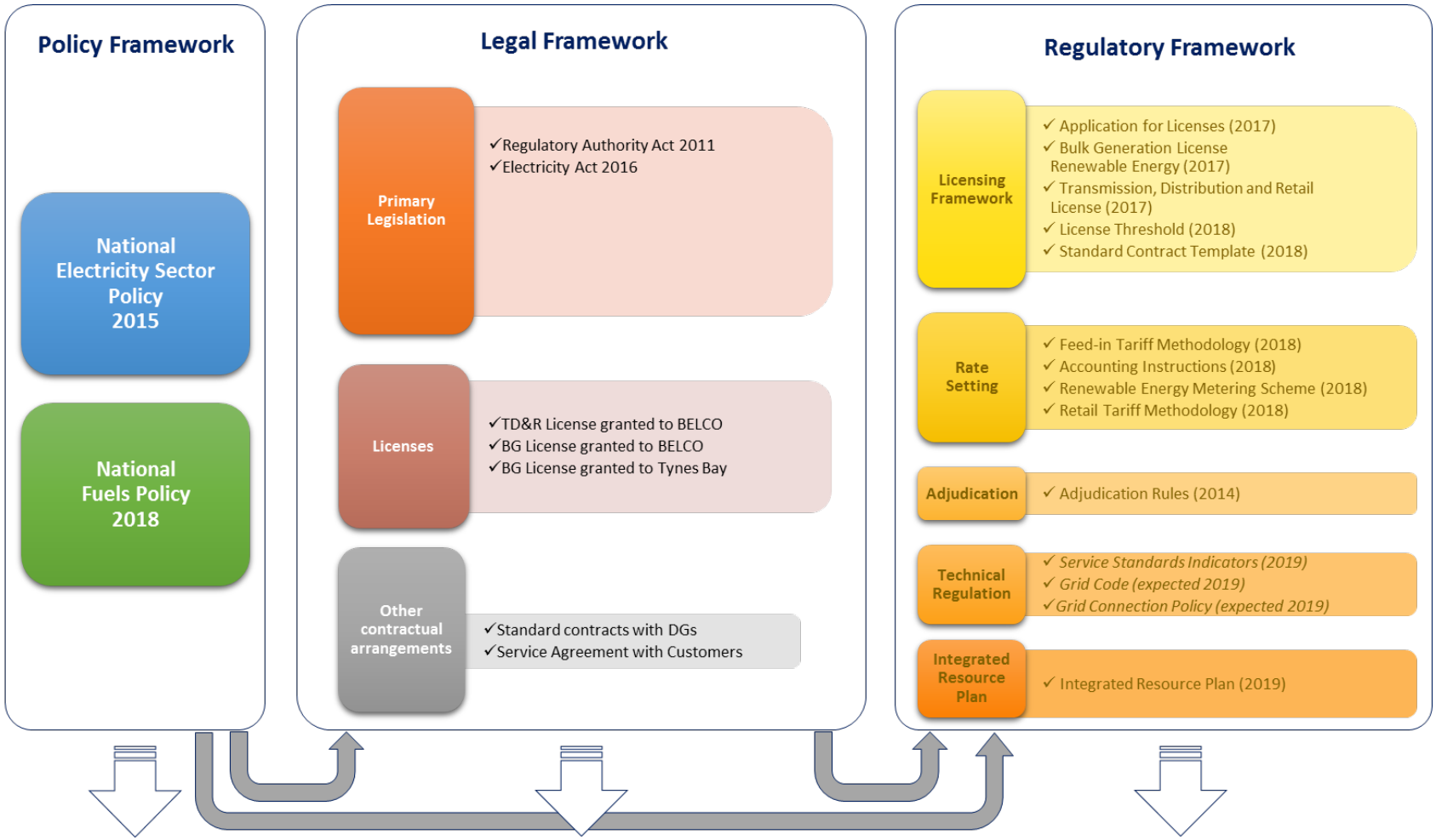
54. The policy framework, including Ministerial directions for the sector (when issued), establishes objectives to be achieved under the framework.

55. The legal framework contains all the primary legislation, licences, and contracts that establish the functions, role, powers, and responsibilities of stakeholders.

56. The regulatory framework includes the regulatory instruments that are necessary for all participants to fulfil their role and to clarify the nature of their responsibilities.

57. The structure of the policy, legal, and regulatory framework of the electricity sector is summarised in Figure 4 below.

Figure 4: Overview of the policy, legal, and regulatory framework in Bermuda



V.1 Methodology for the Assessment

58. The approach the RA used when undertaking the review included the following steps:

(a) Assess whether the functions conferred on various stakeholders within the legal framework are adequate to enable the sector to meet the stated purposes of the RAA and the EA (driven by policy guidance);

(b) Assess whether the set of regulatory instruments currently forming the secondary legislation for the sector (i.e. regulations, orders, licences, guidelines published by the RA) is adequate to enable the RA to fully discharge the functions conferred in the legal framework; and

(c) Assess whether the full range of regulatory instruments remains consistent with the policy documents.

VI. CONCLUSION FROM THE ASSESSMENT

59. Based on the approach described in Section V, the assessment carried out by the RA has considered the following:

a) Completeness and adequacy of the functions, role, and responsibilities of electricity sector stakeholders conferred by the legal framework and in existing licences;

b) Lack of alignment in certain targets, definitions, and approaches between policy documents, the EA, and the IRP;

c) Relevance and completeness of provisions pertaining to unlicensed electricity generation stakeholders;

d) Adequacy of current measures to promote competition in Bulk Generation; and

e) Conditions creating an enabling environment for accelerating EV deployment and promoting other emerging technological trends in Bermuda.

60. The following sub-sections outline the main conclusions identified under each of these key themes.

VI.1 Completeness and adequacy of the functions, role, and responsibilities of electricity sector stakeholders conferred by the legal framework and in existing licences

61. The wording defining the timeline and periodicity under which retail and feed-in tariff reviews should be undertaken, set out in section 34 of the EA,[13] is open to multiple interpretations and as such requires further clarification;

62. The process defined in the EA for delivering the IRP could be modified 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; and

63. BELCO's complaint handling policy (and potential updates) are not currently subject to sufficient review and validation by the RA.

VI.2 Lack of alignment in targets, definitions, and approaches between policy documents, the EA, and the IRP

[13] EA, section 37: "Within two years from the commencement date of this Part, and every five years or less as determined by the Authority, or as directed by the Minister, the Authority shall conduct (…) a retail tariff review (…) and a feed-in tariff review."

64. The National Fuels Policy (the "Fuels Policy") was issued by the government in 2018 "to direct the fuels sector towards an affordable, sustainable, safe, and secure energy future, in line with international best practice." It includes an aspirational scenario that includes replacement of HFO and LFO with liquefied natural gas as the main fuel for BELCO's generators, whilst the plan outlined in the IRP does not. However, the Fuels Policy states that "the [IRP] process defines which power generation solution shall be adopted."

65. There is a lack of alignment between the Electricity Policy, the Fuels Policy, and the IRP regarding the targets for renewables penetration, strategies and targets to reduce carbon emissions, carbon footprint of baseload fuels and electricity demand forecasts.

VI.3 Relevance and completeness of provisions pertaining to unlicensed electricity generation stakeholders

66. The relevance and applicability of the installed capacity threshold above which a licence is needed to operate (500 kW) should be validated; and

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).

VI.4 Adequacy of current measures to promote competition in Bulk Generation

69. Specific measures to promote competition in Bulk Generation are limited to those included in the TD&R licence, where the TD&R licensee (BELCO) is expected to play a central role in managing the tendering process and selecting the preferred bidder. These provisions may need to be adjusted so that BELCO and other bidders are able to compete for new Bulk Generation projects on fair terms.

VI.5 Conditions creating an enabling environment for accelerating EV deployment and promoting other emerging technological trends in Bermuda.

70. The legal framework currently prohibits the sale of electricity by any entity other than the TD&R Licensee. In practice, this prohibits the following to be carried out by any other entity than BELCO: (i) ownership and operation of commercial public charging points for EVs (i.e. for providing EV charging in exchange for a fee); and (ii) peer-to-peer trading (i.e. localised trading of electricity between individual consumers with distributed generation infrastructure, again using either the TD&R's network or a private network). The relaxation of these prohibitions and possible cost implications need to be further considered if these trends are to be enabled in Bermuda.

VII. PROPOSED CHANGES TO THE FRAMEWORK

71. The RA proposes that key changes in the regulatory scheme should include the following:

(a) The EA's wording on the responsibility of the Authority in relation to retail tariff and feed-in tariff reviews should be clarified regarding the timing of the reviews.

(b) 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.

(c) The 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 handling policy before it becomes applicable.

(d) 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.

(e) A stakeholder consultation should be conducted to test the adequacy of the licence exemption threshold level, which is currently set at 500 kW. This should consider pre-existing network constraints and whether different types of technologies should have a dedicated threshold depending on circumstances. The current individual threshold level should be validated, to ensure it enables an agreeable trade-off between ensuring system stability at all times and at minimum cost and providing sufficient incentives to fast-track behind-the-meter and renewable energy development.

(f) The definition of "distributed generation" should be limited to renewable energy technologies in the EA. Alternatively, the definition of "feed-in tariff" and the Standard Contract for distributed generation could be amended to allow owners of non-renewable generation below the capacity threshold to enter into a "non-renewable energy" Standard Contract with the TD&R Licensee. This would need specific tariff provisions, which could be reviewed on a case-by-case basis or set up in advance by the RA.

(g) The EA should provide flexibility to permit the RA to create additional types of licences. These additional types of licences may include, but not be limited to licences that would allow the self-consumption of distributed generators using non-renewable energy sources.

(h) The legal framework could be amended to allow the sale of electricity by community energy projects and/or the use of the TD&R Licensee's network to transmit power that was procured by such power plants, as both transactions are currently prohibited.

(i) A specific regulatory instrument should cover the detailed provisions for competitive procurement of Bulk Generation. This should include 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.

(j) The 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.

(k) Technological and market trends indicate 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.

(l) It could be beneficial to test the advantages and challenges of peer-to-peer trading in Bermuda ahead of the next framework review by encouraging the TD&R Licensee to initiate a pilot scheme. It might not be necessary to make specific provisions for this in the legal or regulatory framework at this stage, but this could be enabled through a waiver.

(m) The legislative environment should allow the setup of independent EV charging point operators or allow BELCO to operate it under the current legislation. This could be achieved either by including vehicle-to-grid infrastructure requirements in future versions of the IRP or by amending the current legal framework such that the RA could, on a case by case basis, waive the need for a supply licence.

(n) The policy framework should be amended to promote innovation including emerging renewable technologies (e.g. floating solar, wave energy, or thermal conversion) and the distribution subsector (smart grid projects, demand-side response schemes). This could be addressed through a "sandbox" to pilot such technologies.

(o) The RA should issue a General Determination or guidance listing customer rights and duties. This section could include circumstances in which the TD&R Licensee has the obligation to connect and supply a new customer.

(p) Minor amendments should be made to the standard clauses of the renewable licence template in the (Bulk Generation Licence Renewable Energy Class) General Determination 2017. The insurance clause in the standard bulk supply renewable energy licence terms should consider potential damages to the environment and the force majeure clause in the standard bulk supply renewable energy licence terms should make more explicit mention of extreme climate conditions such as hurricanes.

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?

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?

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?

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?

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

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

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

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

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'.)

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

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?

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)?

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)?

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

APPENDIX A: LIST OF DOCUMENTS REVIEWED UNDER THE ASSESSMENT

Policy framework

- National Electricity Sector Policy of Bermuda (2015)
- National Fuels Policy (2018)

Legal framework – primary legislation

- Regulatory Authority Act 2011 and amendments (2014)
- Electricity Act 2016 and amendments (2017, 2019)

Regulations, General Determinations and others

- Bermuda Integrated Resource Plan (2019)
- Decision and Order Setting Standard Contract Template (16th August 2018)
- Regulatory Authority (Retail Tariff Methodology) General Determination 2018
- Regulatory Authority (Service Standards Indicators for Electricity Licensees) General Determination 2018
- Regulatory Authority (Renewable Energy Metering Scheme) General Determination 2018
- Electricity (Licence Threshold) Regulations 2018
- Electricity (Regulatory Authority Fees) Regulations 2018
- Regulatory Authority (Feed-in Tariff Methodology) General Determination 2018
- Regulatory Authority (Regulatory Accounting Instructions for Electricity Sector) General Determination 2018
- Regulatory Authority (Application Process for Electricity Licences) General Determination 2017
- Regulatory Authority (Bulk Generation Licence Renewable Energy Class) General Determination 2017
- Regulatory Authority (Bulk Generation Licence) General Determination 2017
- Regulatory Authority (Transmission, Distribution, and Retail Licence) General Determination 2017
- Regulatory Authority (Adjudication Rules) General Determination 2014

Regulatory Framework: Licensing

- Bulk Generation Licence granted to BELCO (2017)
- Bulk Generation Licence granted to Tyne's Bay (2017)
- TD&R Licence granted to BELCO (2017)

Sector documents

- Grid Code (to be issued by the TD&R Licensee)
- Grid Connection Policy (issued by the TD&R Licensee)
- Preliminary Report and proposed General Determination on Principles of Consumer Protection

APPENDIX B: DEFINITIONS

Bulk generation: means an electricity generating system that is built on a dedicated site, is developed for commercial purposes of selling all electricity produced and is connected to higher voltage lines for being distributed to the entire customer base.

Distributed generation: means electricity that is generated by a plant directly connected to the distribution network and therefore located at or close to the end users of power.

Demand-side management: means a utility action that reduces or curtails end-use equipment or processes. Demand-side management is often used in order to reduce customer load during peak demand and/or in times of supply constraint.[14]

Demand-side response: means any commitments from consumers to reduce or shift their energy consumption in real-time.

Electricity distribution: means the flow of electricity from a high-voltage transmission system through an electrical network of lower voltage that supplies electricity to customers.

Electricity transmission: means the activity of moving the generated electricity from power plants to distribution systems through high-voltage transmission lines.

Electric vehicle (EV): means a vehicle which uses an electric motor that is powered by electricity from batteries, fuel cells or overhead cables.

Feed-in tariff: means a rate at which the TD&R Licensee purchases electricity from customers who generate their own electricity from renewable energy sources, for example with solar panels or wind turbines.

Independent Power Producer (IPP): means a non-utility electricity generator that generates electricity for sale to BELCO (as the TD&R Licensee).

Integrated resource plan (IRP): means a long term roadmap used for planning the supply-side and demand-side resources of an electric system.

Kilowatt (kW): means a unit of electrical power equal to one thousand watts.

Megawatt (MW): means a unit of electrical power equal to one million watts.

Peer-to-peer electricity trading: means a process that allows producers and consumers to trade electricity directly among themselves rather than selling to or buying from the grid.

[14] U.S. Energy Information Administration Glossary

Reserve margin: means the amount of unused available capability of an electric power system (at peak load for a utility system) as a percentage of total capability.[15]

Smart grid: means "an electricity supply network that uses digital communications technology to detect and react to local changes in usage".[16]

Solar irradiation: means an electric power unit per area received from the Sun.

Vehicle-to-grid: means services which enable the electricity stored in EVs 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.

Watt: means the unit of electrical power equal to one ampere under a pressure of one volt. A Watt is equal to 1/746 horse power.[17]

[15] U.S. Energy Information Administration Glossary
[16] https://www.lexico.com/en/definition/smart_grid
[17] U.S. Energy Information Administration Glossary