

Chapter 9 – Implementation/Action Plan

To ensure that BED sets a direction that is consistent with the anticipated outcomes of E4-C3-R2 and its strategic vision, BED established the following implementation plan. The sequencing of the action steps described herein is generally reflective of BED's priorities. Due to project timelines and events, however, their actual implementation dates may not necessarily follow in this order. As noted before, inclusion of these proposed action items does not reflect a request to approve these action items by the Public Service Board.

1. Energy Efficiency
 - a. Consistent with previous IRP's, BED is committed to continuing its investment in realistically achievable energy efficiency potential. Currently, BED is developing, in collaboration with the Department of Public Service, a new three – year demand resource plan commencing in 2018. The 2018 plan will establish new annual and cumulative MWh savings, peak demand savings, and budgets. Based on preliminary forecasts of efficiency potential, BED's energy efficiency programs will be seeking to acquire cost effective savings equal to 1.0 to 1.4 percent of annual electric sales with a total budget of \$3.0 million - \$3.2 million.
 - b. Since the most recent avoided energy and capacity cost projections included in the updated 2016 AESC are well aligned with the avoided cost included in this IRP, BED will continue to test program design assumptions and pursue all known strategies to make programs as cost-effective, and as easy to participate in, as possible.
 - c. BED intends to advance its Energy Champ partnership with Vermont Gas Systems to the mutual benefit of both company's ratepayers.
 - d. Advanced Metering Infrastructure (AMI) and smart grid technologies, which represent a new realm of potential empowerment tools for customers, are also being tested and deployed in Vermont. BED will continue to explore the possibilities for enhanced interaction with its customers and the potential benefits and capabilities of AMI technology.
2. Energy Transformation projects
 - a. Consistent with 30 V.S.A §8005 (a)(3)(B), BED is initiating a series of Tier III programs designed to encourage customers to reduce their consumption of fossil fuels and lower emissions of greenhouse gases associated with such consumption. The programs will target primarily the transportation sector but also provide support for the installation of

advanced heat pump technologies; construction of net zero buildings; and, PassivHaus building design training. Between 2017 and 2020, the technologies that BED proposes to promote and incentivize include: electric buses, electric vehicles (under \$50,000), electric vehicle supply equipment, electric bikes; and, ground-source and air source heat pumps. To achieve its MWh equivalent goals, BED plans to invest up to \$428,000, inclusive of overhead costs, in 2017. Each year thereafter, BED's obligations will increase until having accumulated no less than 14,500 MWh in 2020. In 2020, BED also expects to invest as much as \$927,000 in these programs. Specific actions related to Tier III activities include, but are not limited to, the following:¹

- i. Developing program designs and implementation strategies, including marketing and outreach initiatives;
- ii. Earmarking general operating funds for Tier III programs; and,
- iii. Providing internal training with respect to Tier III obligations.

3. Distribution / Reliability

- a. Investigating the development of an integrated system that will use the AMI meter capability to generate transformer loading reports and provide BED's dispatch center with real time outage notification. Specific timing of projects has not yet been finalized, but based on current assumptions it is likely this specific element would not occur until 2019.
- b. Undertaking a comprehensive examination of Outage Management and Distribution Management Systems. This project will be one of several initiatives undertaken as part of a 5 year information technology plan. Specific timing of projects has not yet been finalized, but based on current assumptions it is likely this specific element would not occur until 2019.
- c. Installing a redundant SCADA system in the Lake Street gas turbine building that will provide BED with an alternate dispatch center to operate and restore the distribution system. This is part of BED's plan to develop a Disaster Recovery Site and is expected to be completed by June 2018.
- d. Continuing to install new or replace/upgrade existing aerial switches and disconnects with Reclosers and SCADA controlled "smart" switches.

¹ Additional information about BED's Tier 3 plans can be found in a filing with the Public Service Board on November 1, 2016.

- e. Installing stand-alone capacitor bank voltage and VAR control units on all aerial SCADA controlled capacitor banks. This project is expected to be complete by June 2017.
 - f. Replacing all substation transformer LTC controllers with new components that allow for multiple voltage set points. This project is expected to be complete by December 2019.
4. Investigate new energy and capacity options
- a. As noted in the preferred path chapter, BED will continue to seek out new energy contracts from renewable sources to ensure that the existing energy gap does not widen much further than it is currently (and potentially if favorable opportunities emerge to close a portion of the future gap with renewable resources). Such energy contracts could be long term in nature depending on the proposed terms and conditions. As existing purchase power contracts expire, BED will also need to search for cost effective replacements, including the possibility for negotiating extensions of those contracts. Additionally, new capacity resources will be investigated further over the coming months to consider whether the capacity gap can be closed economically (and to hedge against possible future increases in capacity prices).
5. Pursue active demand response programs - Over the next few years, BED proposes to re-establish an active demand response program(s) for all customers.
- a. BED has engaged in a pilot partnership with a Burlington based distributed energy resource management company, known as Packetized Energy Management (PEM). This company developed at the University of Vermont, and has been recognized by the U.S. Department of Energy as a promising technology for coordinated distributed energy resources that allow for cost effective and reliable renewable energy integration into the grid. The partnership will draw on the expertise of BED staff regarding the electric grid and energy markets, while PEM will provide their product to control a subset of behind the meter electric storage water heaters to dispatch according to market signals that BED identifies. Based on the results of the pilot, a broader deployment of this technology is possible.
 - b. BED will also explore whether re-initiating its larger C&I demand response program merits further attention and investment. The intent of any such program would be to reduce BED's summer peak load requirements which are due in part to BED's customers need for power at times when the system peak is also strained to near capacity.

- c. BED plans a voluntary demand response program for the summer 2017 that will be linked to game theory concepts and will be designed to maximize customer engagement. This program is expected to become a formal Peak Time Rebate Program that BED plans to include in revised tariffs for the Summer of 2018.
- 6. McNeil Biomass Power plant
 - a. As in past IRPs, efficient operation of the McNeil power plant is mandatory to ensure compliance with 218c. Accordingly, BED will continue its current work to enhance and optimize McNeil's operations, maximize economic output, maintain safe operation and assure the joint owners of its ability to reliably provide electric power.
- 7. Maintain Renewability
 - a. Consistent with BED's 2016 Strategic plan, maintaining 100 percent renewably sourced electric energy was a priority during the development of this IRP. Accordingly, BED will continue with efforts to constantly monitor the market for new sources of renewable power, especially sources that are local. Such efforts will consist of a variety of initiatives; such as further investigating the viability of existing renewable resources; engaging with market actors who are developing new renewable projects; and, negotiating or extending competitively priced purchase power agreements. In addition, BED will continue to monitor McNeil's generation and seek to optimize plant output, as noted above.
- 8. Continue REC sales for the present
 - a. To mitigate rate pressures associated with maintaining its renewability, this IRP also determined that extending its practice of arbitraging RECs is still prudent. Accordingly, BED will sell Class I RECs to generate additional revenues and purchase sufficient amounts of lower valued Class II RECs to maintain claims of renewability without double-counting.
 - b. Actions will also be taken to closely monitor REC markets for price movements that could either enhance or undermine BED's REC arbitrage strategies. Such actions are essential as the rules governing REC trading are constantly evolving.
 - c. BED may request permission to continue arbitraging RECs for the 2020 – 2022, which is the period immediately after the currently approved window for REC sales (which ends in 2019). BED will seek to continue its arbitrage practice to avoid the potential of having to increase rates in the future. Maintaining a window of forward REC sales tends to prevent any rate effect from happening suddenly (i.e. in a single year).

9. Other activities

- a. While the technology chapter determined that storage based micro grids may not be cost-effective at this time, it also recognized that the cost of storage is likely to fall significantly. In light of this, BED believes that implementing pilot storage – based micro grids, at strategically targeted locations where reliability would add value, is desirable. Such pilot grids would increase BED’s understanding of the challenges with integrating and operating such systems in advance of their becoming more prevalent.
- b. BED plans to seek ways to increase to amount of renewable energy generated locally in Burlington (tentatively calling this its “Grow Local Energy” program). This program is intended to try to address some of the challenges faced by renewable energy in general, and some of the additional challenges to renewable energy that may be unique to Burlington.
- c. BED will continue to be a trusted member of the community and assist our customers with their energy decisions, regardless of whether those energy decisions are based on purchasing power from BED or not. BED will also seek to improve its customer’s quality of interactions with their utility by improving customer service and their supporting systems.
- d. BED will encourage data use and efficiency, while maintaining high cyber security standards.
- e. BED staff will monitor assumptions and rules underlying this IRP and insure that actions taken conform to the decision making processes laid out herein.