Capacity Planning Background

Summerside Electric, owned and operated by the City of Summerside, currently serves more than 7,000 commercial and residential customers, and, as part of its regular planning processes and service requirements, the utility is required to forecast future electricity needs of those customers.

Growth in the City's energy needs, and retiring assets, means that Summerside Electric must find new sources of capacity beginning at the end of 2024.

What is Energy and Capacity?

To understand capacity planning, it is helpful to define two key utility terms:

- **Energy** (in the terms of electric utility planning) refers to the total amount of electricity that Summerside supplies to customers throughout the year. This electricity is sourced from wind power (46%), imports from New Brunswick (53%), and very little diesel generation (1%).
- **Capacity** is the total amount of energy (electricity) that the utility can supply *at any one time.* It is also sourced from wind power (21% in 2018 because wind is not always blowing when needed), imports from New Brunswick (31%), and diesel (49%) which is required for the extra electricity used during peak electricity-using periods.

The text box to the right provides an analogy on the differences.

What is Capacity Planning?

Since capacity is the total amount of electricity that the utility can provide at any one time, capacity planning is therefore a process to ensure Summerside Electricity is able to meet the capacity needs of its customers. It involves:

1. **Forecasting how much electricity Summerside Electric's customers will require at any one time, at the time of year when they need the most (called peak demand).** For Summerside, this is in the winter, on a weekday evening, when residents are at home (often cooking) and businesses are still open.
2. **Ensuring the utility has the ability to meet those needs.**

How does it work?

Summerside Electric is required to follow strict capacity planning criteria set out by the **North American Electric Reliability Council (NERC)** for the Northeastern region. Some of the key criteria set by NERC include the following:

- Summerside Electric must have at least 15% capacity *above and beyond* the greatest forecasted needs of its customers.
- **Solar cannot be used for capacity purposes** (because the sun is not shining during Summerside's peak demand for electricity).
- **Only 14% of any new wind energy that is built will count towards capacity** (because it is not guaranteed that wind will be blowing during a peak demand period).

Analogy for Capacity Planning

A small car has much less storage space than a minivan. Due to its small size (among other reasons), it uses much less energy (gasoline) than the van.

As an analogy for capacity planning, think about a family of 5 or 6 people. If the family were planning which type of vehicle to purchase, they would need to consider the different situations the vehicle was needed for:

- For general, everyday purposes such as driving to work (overall use over the course of a year) a small car would be more appropriate because the extra space is not needed on a regular basis and the car is less expensive to operate.
- For family outings and events, however, the family needs to fit everyone in the vehicle. In these cases, a minivan van is more appropriate for the family's needs.

The family may decide it is more efficient to buy the car and borrow or rent a van for those times when it is needed. In reality, many families end up purchasing both, using the car for commuting and the minivan for family requirements, which also works for the analogy but may cost more.

In this analogy, the rationale for buying a car for regular, everyday use represents **energy planning: How much energy do we need over the course of the year, and how do we provide it in a cost-effective and sustainable way?**

However, the rationale for buying a van (or ensuring that one is available) for those times when we need more space represents **capacity planning: How much energy do we need at those few times when demand for energy (or space, in the case of our analogy) is highest?**

With capacity planning, we need to plan for those days when we need the extra space.

Capacity Planning Background

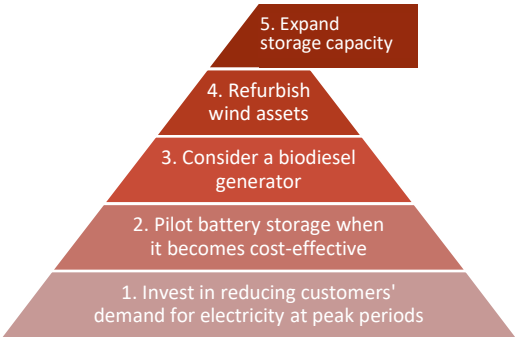
Analyzed Options

The options selected for a full quantitative analysis, based on primary and secondary research as well as stakeholder consultations, were:

- Expansion of the Heat For Less Now program
- Expansion of the Interruptible Load program
- Grid-scale battery storage
- Biodiesel generator
- New Brunswick Power imports
- Diesel generator

Recommended Option

Rather than investing in one large option, Summerside can "stack" smaller options:

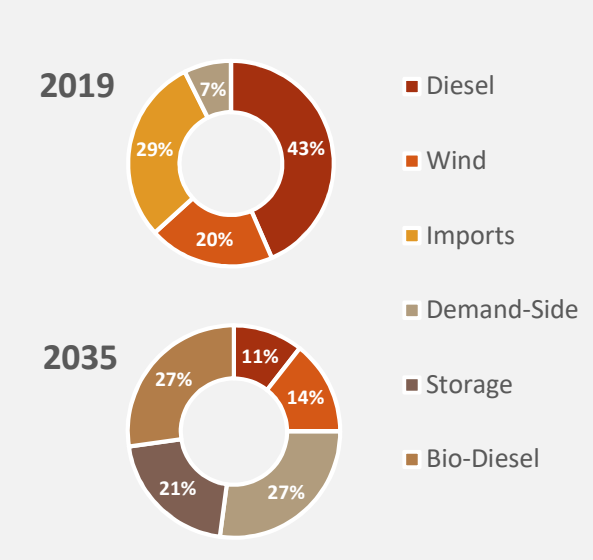


Rationale

While no one smaller option will address the City's needs on its own, "stacking" will allow the utility to:

- Increase diversity of its capacity mix;
- Avoid technology lock-in (investing in an option that may become too outdated in comparison to other emerging opportunities);
- Hedge against technology innovation (enable the incorporation of emerging technologies or take advantage of significant cost reductions in newer ones);
- Ensure Summerside's system can adapt to changing conditions (which may include uncertainty around future load growth in the context of electrification of heating and transportation);
- Adapt to changing policy directions and considerations related to increasing demand for renewable energy.

Resource Mix



Timeline