

PRESENTATION FOR:



CITY OF SUMMERSIDE
ELECTRICITY CAPACITY RESOURCE PLAN
OPEN HOUSE

February 28th, 2019



DUNSKY OVERVIEW



EXPERTISE



EFFICIENCY



RENEWABLES



MOBILITY

SERVICES



ASSESS
opportunities



DESIGN
strategies



EVALUATE
performance

Governments ▪ Utilities ▪ **CLIENTELE*** ▪ Private firms ▪ Non-profits



* selection of clients

INTRODUCTION TO CAPACITY PLANNING

CONTEXT OF THE STUDY

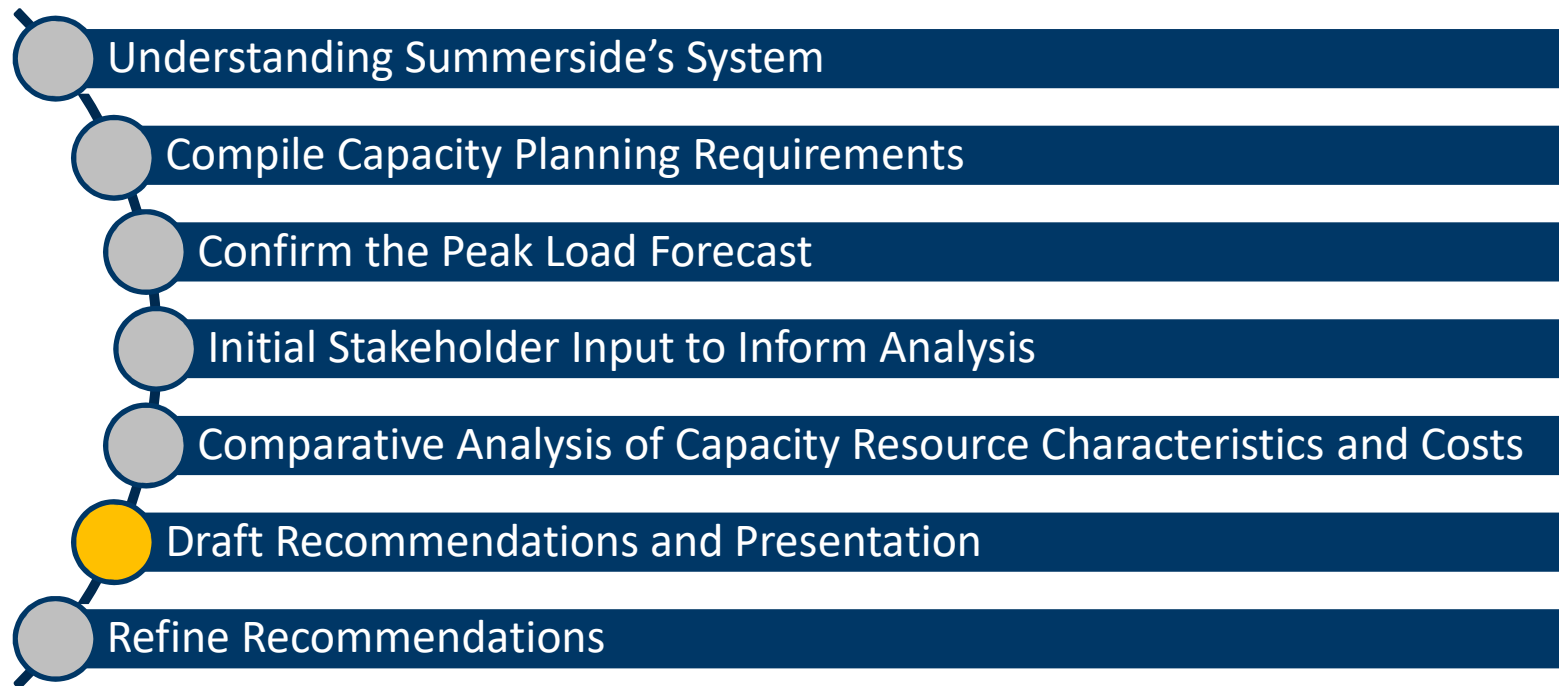
CAPACITY OPTIONS

RECOMMENDATION

NEXT STEPS



The City of Summerside hired Dunsky to study options and make recommendations on how to deal with Summerside Electric's capacity needs 15 years into the future.



INTRODUCTION TO CAPACITY PLANNING

CAPACITY AND ITS ROLE

WHAT IS CAPACITY PLANNING?



■ Capacity planning:

- ▶ Forecasting what is needed to meet customers' demands for electricity at all times given foreseeable emergencies and contingencies.

■ Requirements:

- ▶ North American Electric Reliability Corporation (NERC) reliability standards.



More efficient/cost-effective for general, everyday purposes such as driving to work

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?



Required for family outings and events, when everyone needs to fit

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.

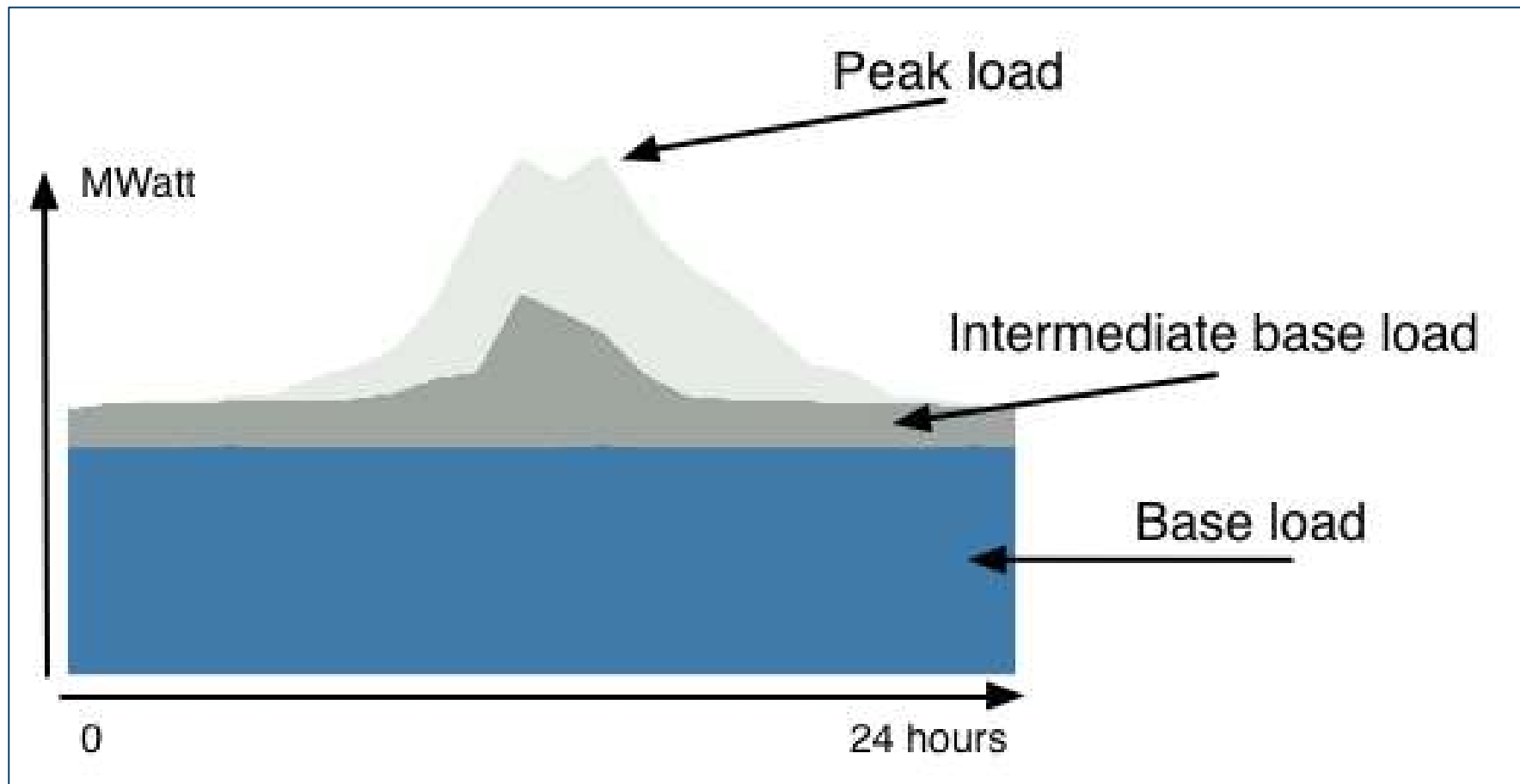
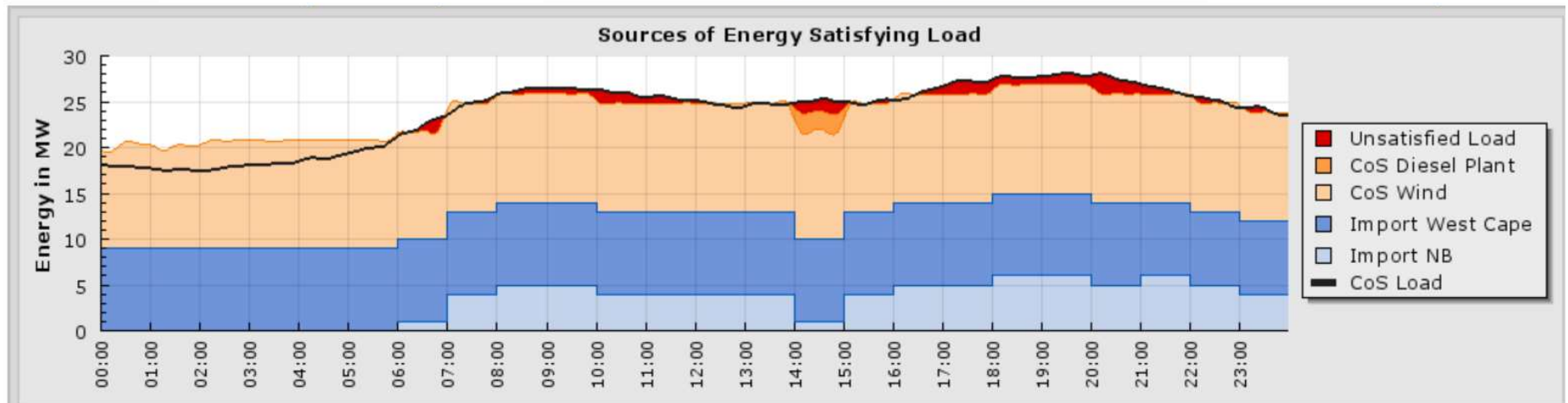


Image from:

<https://consequential-lca.org/clca/the-functional-unit/determining-market-boundaries/example-temporal-markets-electricity/>



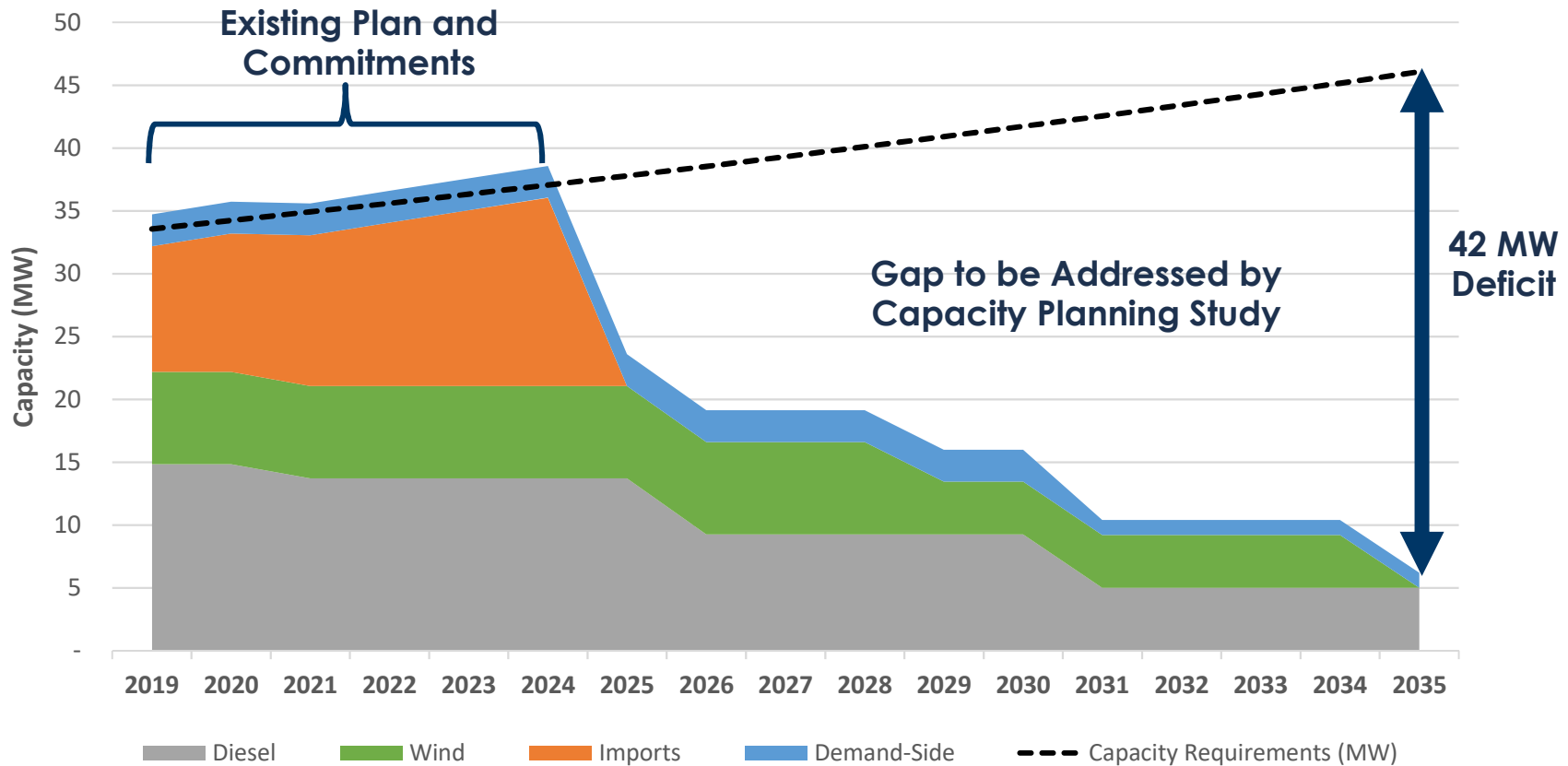
Tuesday February 26th, 2019



CONTEXT

WHAT WE'RE DOING AND WHY WE'RE DOING IT

SUMMERSIDE'S EXISTING CAPACITY MIX



CAPACITY OPTIONS



Identifying Capacity Options

Qualitative Evaluation

Quantitative Assessment

Recommended Capacity Option

- Imports
- Diesel Generator - Petrodiesel
- Diesel Generator - Biodiesel
- Grid-Scale Battery Storage
- Behind-the-Meter Battery
- Wind
- Biomass
- Municipal Solid Waste

Supply-Side Options to Pursue



- Compressed-Air Energy Storage
- Solar
- Coal
- Geothermal
- Hydro and Pumped Storage
- Natural Gas
- Nuclear

Supply-Side Options Not to Pursue



- Expand Heat for Less Now (HFLN)
- Expand Interruptible Load Program

Demand-Side Options



QUALITATIVE EVALUATION



Identifying Capacity Options

Qualitative Evaluation

Quantitative Assessment

Recommended Capacity Option

Type of Objective	Attribute	Definition/Description
Policy	Approvable	Acceptable to policy makers and citizenry
	Low Cost	Does not significantly increase electric rates
	GHG Intensity	Qualitative assessment of level of GHG emissions in comparison to other options
	Renewable	Resources that are replenished on a human timescale
Technical	Black Start	Provides the ability to restore an electrical system's operations without relying on an external transmission network to recover from a shutdown (known as "black start" capability)
	Reliable	Available to serve winter peak load; meets NERC requirements
	Resilient	Available during long-duration outage events
Policy & Technical	Secure	Located on-Island
	Diversity	Contributes to greater fuel and/or technology diversity on the system
	Modular & Scalable	Can be installed in smaller increments over time instead of in one large investment

QUALITATIVE EVALUATION

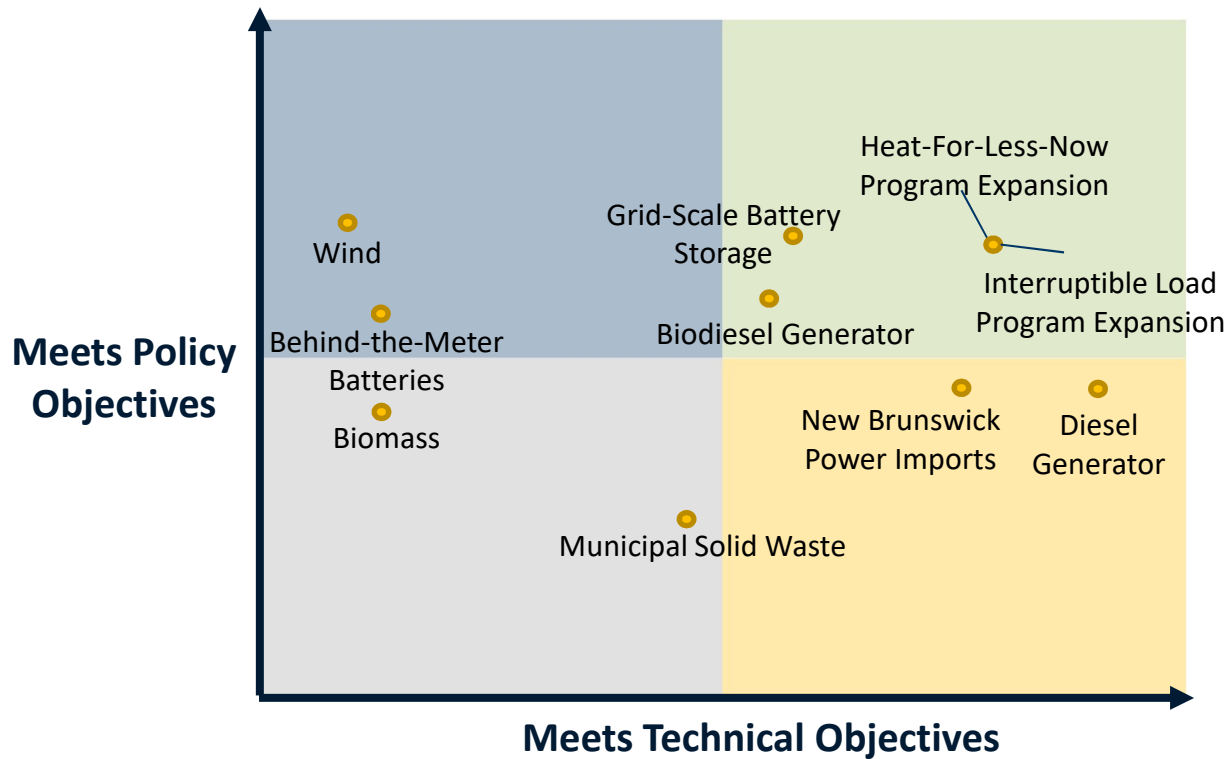


Identifying Capacity Options

Qualitative Evaluation

Quantitative Assessment

Recommended Capacity Option





Identifying Capacity Options

Qualitative Evaluation

Quantitative Assessment

Recommended
Capacity Option

Selected for Quantitative Analysis:

- New Brunswick Power imports (baseline option)
- Expansion of the Heat For Less Now (HFLN) program
- Expansion of the Interruptible Load program (ILP)
- Grid-scale battery storage
- Biodiesel generator
- Diesel generator

ANALYSIS RESULTS



- Demand-side options have the most advantageous business case to Summerside
- Based on projected cost assumptions for imports, every assessed option has a positive economic case relative to imports either immediately or in the medium term (2025)
- All analyzed capacity options result in a reduction in revenue requirements
- No single capacity option except for imports is capable of covering all of Summerside's future capacity deficit

ANALYSIS RESULTS SUMMARY



Options		Levelized Unit Cost (\$/kW/year)	Net Present Value (NPV)	Average Revenue Requirement Impacts (% over lifetime)	% of Capacity Resources On-Island (by 2035)	Relative GHG Emissions (qualitative)
Imports		(Baseline against which alternatives are compared)				
Diesel	2020	\$ 96	\$ 0.2 M	-0.2%	49%	High
	2025	\$ 96	\$ 3.2 M	-0.6%	49%	High
Heat for Less Now		\$ 72	\$ 7.0 M	-2.2%	36%	Low
Interruptible Load		\$ 12	\$ 3.4 M	-0.5%	28%	Medium
Battery Storage	2020	\$ 249	(\$ 4.2 M)	+ 1.4%	31%	Low
	2025	\$ 166	\$ 1.7 M	-0.7%	31%	Low
	2030	\$ 120	\$ 4.4 M	-1.8%	31%	Low
Biodiesel	2020	\$ 97	(\$ 0.8 M)	-0.1%	49%	Medium
	2025	\$ 97	\$ 2.4 M	-0.4%	49%	Medium

Most desirable Least desirable

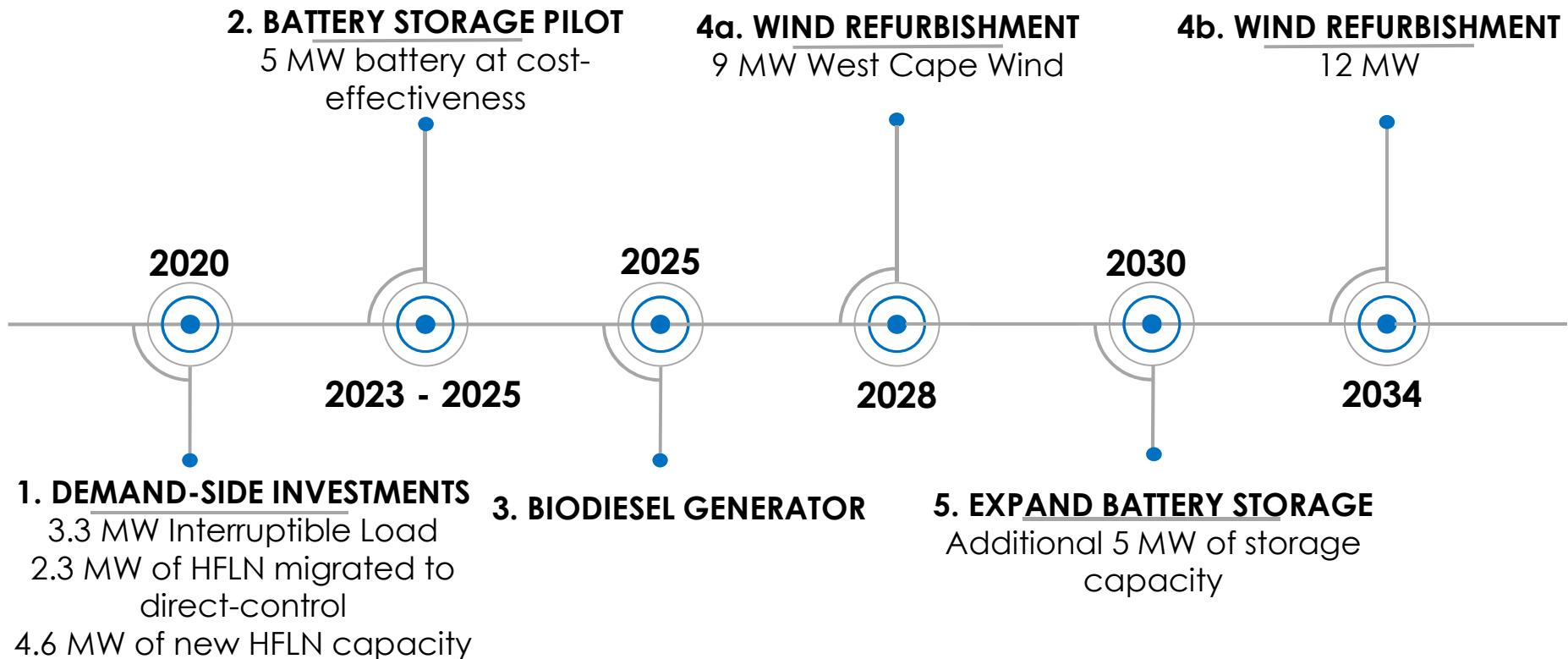
RECOMMENDATION

RECOMMENDATION

STACKED, STAGED APPROACH

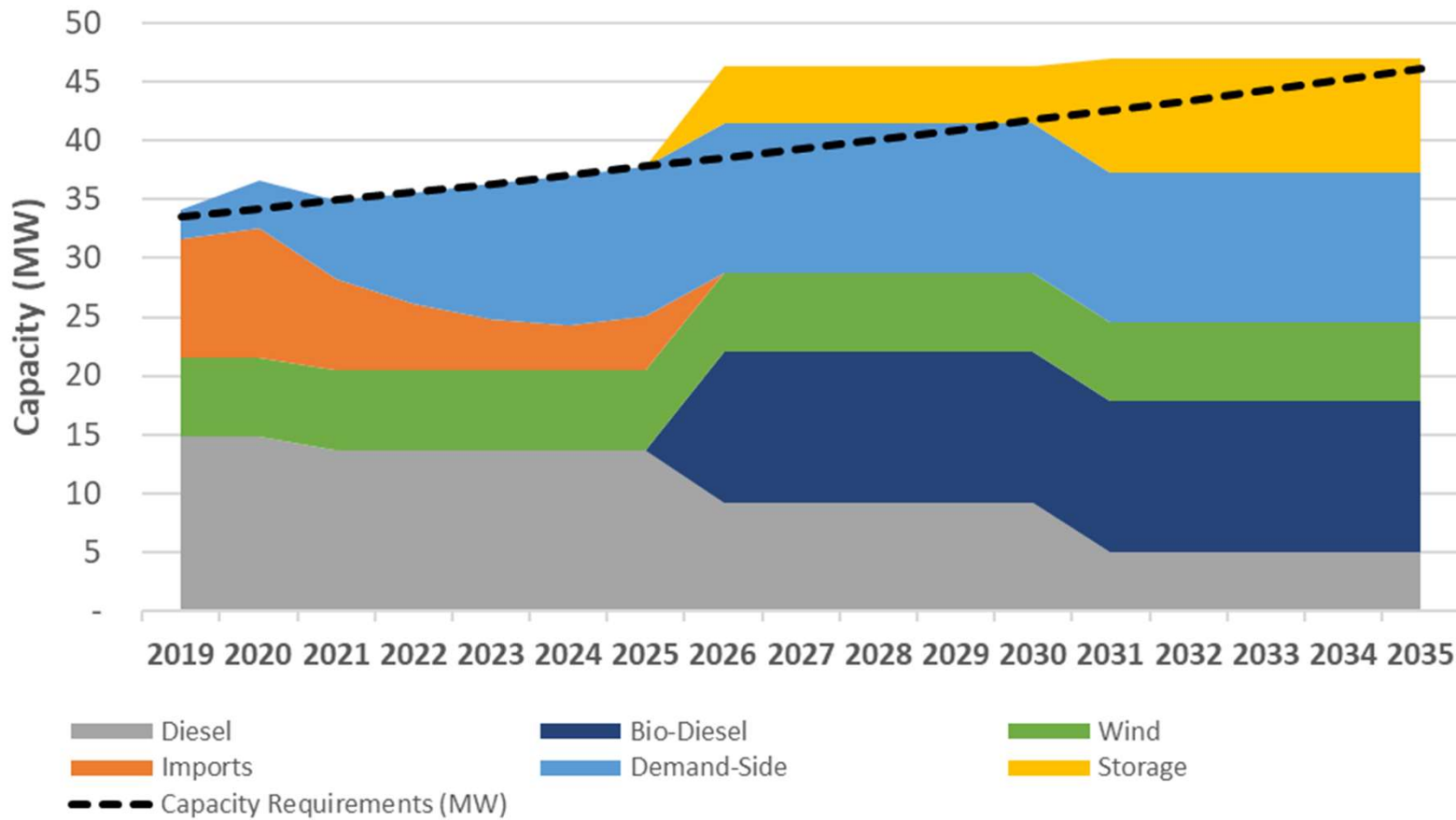


- A staged approach that “stacks” multiple capacity sources rather than relying on one option only may allow Summerside to meet its goal of supplying a greater share of its capacity needs with on-Island resources.



RECOMMENDATION

ANALYZED CAPACITY MIX





- Recommendation results in positive NPV and net-positive cash-flow beginning in 2020.
- Results in a decline in Summerside's revenue requirement as a result of the avoided energy and capacity import costs.

Capacity Options	Levelized Cost of Capacity (\$/kW/year)	Net Present Value	Average Revenue Requirements Impacts Over Lifetime	% of Capacity Resources on-Island by 2035
Recommendation	\$52	\$18.9M	-2.9%	100%



- Secure, reliable and diverse resource mix
- Maintains flexibility moving forward, despite fast-paced technological and policy changes
 - ▶ Avoids technology lock-in (e.g. investing in an option that may become too outdated in comparison to other emerging opportunities)
 - ▶ Hedges against technology innovation (e.g., emerging technologies or significant cost reductions in newer options)
 - ▶ Allows Summerside to adapt its system to changing conditions (e.g. electrification of heating and transportation)
 - ▶ Enables adaptation to changing policy directions and considerations related to increasing demand for renewable energy
 - ▶ Allows additional analysis prior to any particular option being implemented (for example, the ability to decommission existing diesel generators earlier or adding imports for diversity purposes)



■ While imports are not included in the presented analysis, they can be a beneficial part of Summerside's electric system:

- ▶ Enhances ability to monitor technology advancements
 - *Locking all aspects of the system into today's technology can be expensive and less effective*
- ▶ Increases diversity of supply
 - *Greater diversity provides a more reliable system and can reduce costs*
- ▶ Enables demand-side opportunities analysis
 - *Potential has not been analyzed in detail*

■ Role of imports

- ▶ No single option should exceed 50% of the portfolio
- ▶ Performance of resources should not be closely correlated
- ▶ Stagger lifetimes of resources

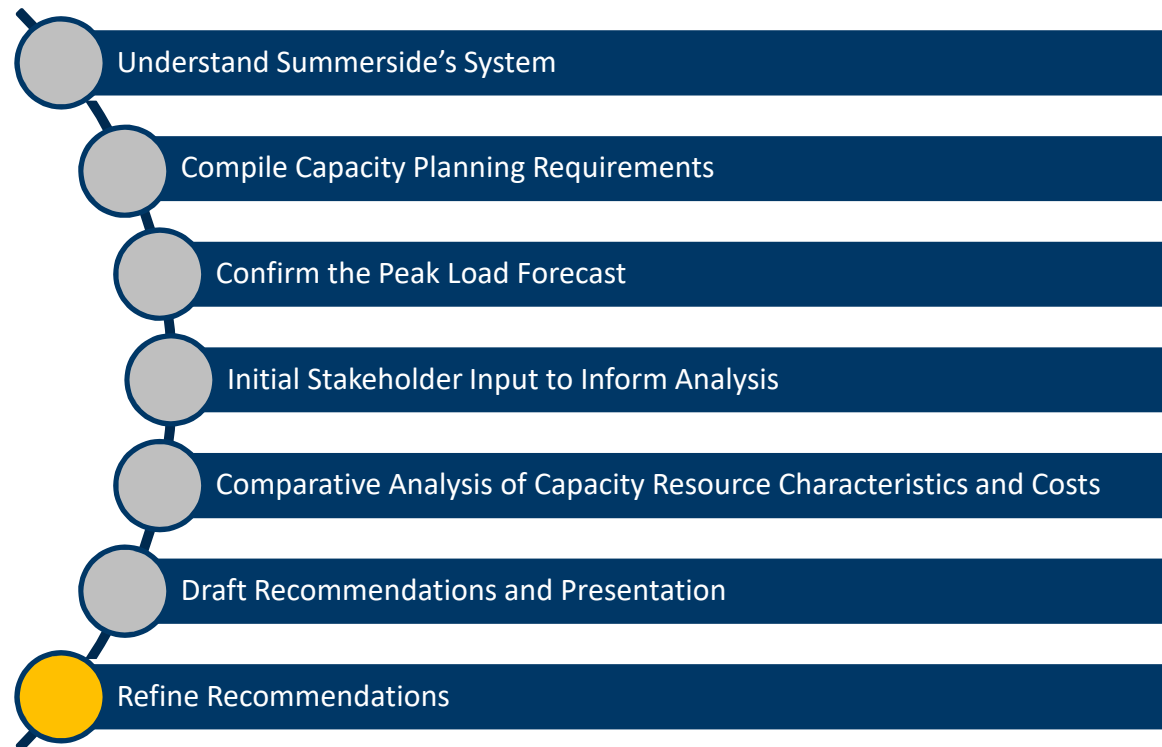
NEXT STEPS

SCHEDULE & NEXT STEPS

NEXT STEPS



- Receive and engage with stakeholder input
- Revise report as necessary
- Submit final report to City



LEARN MORE

dunsky.com



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CONTACT

