



CLIMATE CHANGE
ADVISORY COMMITTEE
REGULAR MEETING
WEDNESDAY, DECEMBER 18, 2019
6:30 – 8:30 PM
CITY HALL
COUNCIL CONFERENCE ROOM
280 MADISON AVENUE NORTH
BAINBRIDGE ISLAND, WA 98110

AGENDA

MEMBERS: JENS BOEMER LARA HANSEN DAVID MCCAUGHEY (CO-CHAIR)
DERIK BROEKHOFF GARY LAGERLOEF NORA FERM NICKUM
MICHAEL COX (CO-CHAIR) JULIE MATTHEWS DEBORAH RUDNICK

LIAISON: JOE DEETS

6:30: CALL MEETING TO ORDER/ROLL CALL/ACCEPT OF MODIFY AGENDA/CONFLICT OF INTEREST DISCLOSURE

6:35: APPROVE NOVEMBER 18TH MINUTES

6:40: PUBLIC COMMENT

6:50: BI GREENWAYS (SUSAN LOFTUS)

7:00: REFLECTIONS ON COMMUNITY WORKSHOPS

7:10: UPDATES/REPORT OUTS/DISCUSSION

- DISCUSS DRAFT SCHEDULE FOR UPDATING CLIMATE ACTION PLAN (SEE ATTACHED)
- DRAFT 2019 PROGRESS REPORT AND 2020 WORKPLAN (SEE ATTACHED)
- PSE STUDY SESSION WITH UTILITIES ADVISORY COMMITTEE (SEE ATTACHED)
- PSE SLIDE DECK FROM JENS (SEE ATTACHED)
- ACCESS ICLEI INFORMATION FOR CCAC AND BISD
- GREEN BUILDING CODE
- SUSTAINABLE TRANSPORTATION
- POLICE/COURT BUILDING

8:15: OTHER BUSINESS

8:30: ADJOURN

MATERIALS

1. NOVEMBER MINUTES
2. DRAFT SCHEDULE FOR UPDATING CAP
3. 2019 PROGRESS REPORT AND 2020 WORKPLAN
4. PSE STUDY SESSION
5. PSE IRP AND CETA

CLIMATE CHANGE ADVISORY COMMITTEE

Regular Meeting

Monday, November 18, 2019, 6:30-8:30 PM

Bainbridge Island City Hall

MINUTES

Present: Committee members Michael Cox, David McCaughey, Julie Matthews, Gary Lagerloef, Council Liaison Joe Deets, Deputy City Manager Ellen Schroer

Absent: Committee member Nora Ferm Nickum, Deborah Rudnick, Derik Broekhoff, Lara Hansen

Others:

Public: Rick Freeman, Andy Swayne (PSE)

1. The meeting was called to order at 6:32 pm.
2. Minutes from the previous meeting (October 16, 2019) were approved.
3. Public comment
 - Rick Freeman wished to acknowledge the effort of the CCAC
 - Andy Swayne said that the PSE is still receiving RFI responses – 2 to date state-wide
4. Report Out GHG Emissions Inventory Discussion
 - Carbon Sequestration Analysis – a good first pass using a tool that is still being refined – suggestion to move this section to an Appendix and explain how it is preliminary info
 - Ellen will talk to Cascadia Consulting and ask for the 4 references within the Exec Summary and body of the GHG report to be removed/edited to support the appendix placement
 - Discussion ensued – nascent i-Tree technology – additional value could be applied if the following were considered:
 - Soil, species type, age, height and board foot data
 - Potential use in the future as the tech improves
 - What direction should we give to Cascadia with the time remaining – in order to have the report in front of council – if edits are possible, it would be preferred to have final by late Nov.
 - Given the proposed Emissions Inventory Community workshops in December
 - Dec 3rd council is to accept/receive it no need to approve it
5. Updates
 - Climate Action Plan (CAP) Development - Nov 20th conventions submitted to Mike from Julie Draft conventions (i.e. Island, periods, spaces); GHG piece to be cleared up to Mike and Gary; Energy – sharing the current version with UAC Andy Maron and/or Ted Jones; Building shared with the DRB
 - Community Workshops --- Dec 7th 10-12 COBI City Hall Dec 11th 6:30-8:30 pm BHS Library
 - o Reviewed the general structure of the meetings

- o Goals per Subject Area (facilitators could have Actions to share to stimulate the discussion)
- o CAP Overview – in the beginning
- o Timing was discussed: Open house 20min, Break-out 1-20 min, Break-out 2-20 min; then landed on 30 min open house and (one) 30 min breakout per topic
- o Possible COBI promotion of Workshops - weekly City Manager emails, COBI Connects, social media
 - CCAC webpage <https://www.bainbridgewa.gov/922/Climate-Change-Advisory-Committee>
 - HYL A shoot out Dec
 - WSF Wednesday Dec 4th Afternoon Commute – Kristen Drew to assist with protocol/contacts
- o PSE – offered to promote on their website <https://psebainbridge.com/>
- o Schools will post through their channels
- o BI Review and Islander – letter to the editor and calendar inclusion
- o Separate “Climate Change” or something to that effect COBI webpage (Ellen)
- o Discussion of roles of Facilitators and Note Takers
- December 3rd City Council Study Session – Cascadia Consulting GHG Inventory and Tree Canopy Discussion 45 min, CCAC CAP Discussion 15 min
 - o This session is in response the August 6th Study Session request by council – bearing in mind - What are your benchmarks and where are you headed?
 - o What is the purpose and ultimate goal 90% by 2040? So what?
 - o Each area will have goal – how did we get there – quantified if it can be
 - o What is the process for each focus area?
 - o Show the process as to how we can get there
 - o Monday, Nov 25th to get this information in the council packet
 - o Dec 3rd Mike and David to present at the session
- Green Building Code – green building code council memo that there will be more formal creation of the task force – how many people? What does balance look like?
 - o Potential members - DRB, CCAC, UAC, contractors
 - o GB requirements – incentives (easy solar permits)
 - o Reducing business as usual hurdles in the permitting process
- PSE - Franchise discussions – PSE viewed as one partner to our carbon emission reductions and very much tied to the success of the CAP rollout
 - o Last Tuesday Nov 11th Renne and Matt Barry a project developer (Barry)
 - o CETA goals are only going to be made by Conservation first (kWh)– AND reduction of peak load (capacity - kW) maximum output at a given time
 - o PSE must come up with models of how they propose to achieve the CETA goals
 - o Possible SME’s list from Jens --- 6 different topics: expected load growth, RE project development/RFI, RE for homes including smart inverters, financial expert for PSE’s Green Power and Solar Choice programs, Battery storage expert for non-wire (critical facilities & emergency preparedness)
 - o 9 hubs are proposed to provide - food medicine water --- AND possibly power Bainbridge Prepares – technical specs of what equipment would be necessary to provide this level of island-able energy

- o RFI – 4 sites submitted by COBI, only 2 responses thus far in the entire service area

6. Other business:

- Rights of Nature – Nassar and Peltier – recognition that nature has some “rights” – possible that acknowledgement of those rights as decisions are made
- 90% by 2040 not sure where that places us in the state or country
 - o net zero – not an option because this is not possible
 - o 2045 had to be carbon free at the state
- Increase parking spaces – university study (Palo Alto) with the goal of reducing auto use that you will save more money – best to “not” build additional parking
 - o Seattle Children’s Hospital employed a similar tactic by deploying employee ORCA, shuttles to reduce commuter congestion

7. Next meeting scheduled for Wednesday, December 18th at 6:30 pm.

8. The meeting was adjourned at 8:32 pm.

Co-Chair

12/18/19

Proposed Schedule for Climate Action Plan (12/13/19)

December 20th

- Authors update introduction and GHG Inventory sections and send to full CCAC.

January 8th

- Authors of individual section incorporate appropriate comments from Community Workshops into their CAP sections, add 5-10 individual actions, and fill out matrix of items like timeline, responsibility, individual milestones etc.
- Authors use the editorial consistence guidelines developed by Julie.
- Everyone provides comments on Introduction and GHG Inventory sections

January 15th (CCAC Meeting)

- Discuss revised energy, buildings, and transportation sections at CCAC meeting.
- Discuss revised introduction and GHG Inventory section.

February 5th

- Authors incorporate comments from CCAC meeting into energy, buildings, and transportation focus areas.
- Authors incorporate any remaining issues in introduction and GHG inventory sections.
- CCAC members receive implementation section for review.
- Start editorial process for energy, buildings, transportation, introduction, and GHG Inventory sections.
- CCAC members receive executive summary section for review.

February 19th (CCAC Meeting)

- Discuss waste, forests/ag/shorelines, and community engagement sections.
- Discuss draft executive summary and implementation section.

February 26th

- Editorial review is completed for energy, buildings, transportation, introduction, and GHG Inventory.

March 4th

- Editorial review and formatting Authors incorporate comments into waste, forests/ag/shorelines, and community engagement sections.
- Comments incorporated into executive summary and implementation section.

March 11th

- Draft CAP sent to CCAC for review.

March 18th (CCAC Meeting)

- CCAC reviews at monthly meeting

March 31st

- CCAC delivers Draft CAP to City Council.

Early April (need discussion on best way to receive public comment on draft and when?)

- Public meeting to discuss Draft CAP.

Early May

- All comments incorporated into CAP

Late May

- Final editorial review and formatting of the document

June

- Deliver final CAP to City Council

Climate Change Advisory Committee: 2019 Progress Report and Plans for 2020 (December 13th, 2019)

We wanted to provide the City Council with a report on the actions taken by the Climate Change Advisory Committee (CCAC) in 2019 and plans for 2020.

2019 Progress Report

- Finalized an Island-wide greenhouse gas (GHG) inventory.
- Worked with the Bainbridge Island School District to design a program where high school students can help update the GHG Inventory.
- Completed a Preliminary Assessment of Sea Level Rise on Bainbridge Island.
- Updated the Bainbridge Island Climate Impact Assessment.
- Provided input into the update to the Shoreline Management Program.
- Initiated the development of the first-ever Island-wide Climate Action Plan (CAP).
- Completed a Community Climate Survey to determine resident's knowledge of climate change, what impacts they believe are of most concern, and their willingness to take action to reduce greenhouse gas emissions and prepare the Island for climate impacts. Over 450 people responded.
- Held two Community Workshops with over 150 attending to receive input into the Island's first-ever CAP.
- Worked with the Design Review Board to provide recommendations to the City Council on green building standards.
- Provided presentations to the Bainbridge Island School Board, the Bainbridge High School, and the Bainbridge Island Parks Board on climate change.
- Participated in several local climate change forums: Climate and Energy Forum and Movies that Matter.
- Sponsored two interns from Western Washington University who completed projects on sustainable transportation and potential locations for Community Solar projects.

2020 Workplan

Climate Action Plan Development and Implementation

- We anticipate a draft CAP for City Council review in the first quarter of 2020 and a final CAP in the second quarter of 2020.
- We anticipate holding several workshops in 2020 to gather comments on the draft CAP and roll out the final CAP.
- We anticipate, if requested, to work with the City staff to develop a CAP implementation plan.
- We anticipate, if requested, to start implementation of the CAP in 2020.

If you have questions or would like us to attend a Council meeting to discuss these issues in more depth please contact either Michael Cox or David McCaughey.

Proposed Joint Sessions with Utilities Advisory Committee and CCAC with PSE (12/13/19)

Background: Jens, David, and Mike had a conversation with PSE representatives several weeks ago to discuss the possibility of having a few joint study sessions with the Utility Advisory Committee.

Purpose: The purpose of these study sessions would be to discuss several issues that are important for us to understand as we develop the Climate Action Plan (CAP).

Proposal

We are proposing to have two meetings looking at the issues identified below.

Meeting #1: Create a foundational understanding of PSE's work

1. PSE's plan to achieve the WA State Clean Energy Transformation Act (CETA)'s targets and the role PSE sees for Bainbridge Island in that transformation
2. Expected load growth on BI, key assumptions, and contributing factors (e.g., electric vehicles?)
3. Financial expert for PSE's green power and solar choice programs' revenue streams and state rules

Meeting #2: Understand and review potential solutions

4. Renewable energy project development like community solar (also relates to PSE's recent RFI)
5. Battery energy storage expert for opportunities beyond the non-wire solution / peak-shaving (e.g., islanded operation to power critical facilities for emergency preparedness).
6. Renewables for homes (roof-top solar, etc.) and plans to require "smart inverters" to enable high DER penetrations.
7. Options for energy conservation and demand response on BI & community outreach

Format

- PSE has agreed to send subject experts in each of these areas.
- For each issue area we would ask PSE to provide a short presentation/information on the topic and then we would ask questions and have a discussion.

Dates/Times

We are looking at three possible dates for the first meeting. We would also have our regular CCAC meeting on one of the three dates. The meeting would be from 6:00 pm to 8:00 pm.

Date	Mike	David	Jens	Deb	Gary	Lara	Nora	Julie	Derik
Mon. 2/3	Yes		Yes						
Wed. 2/19	Yes		No						
Wed. 2/26	Yes		Maybe						

Outcome: We hope that the information provided will assist us in drafting the CAP and may provide some background information for discussions related to the PSE Franchise negotiation.



Thoughts on PSE's Integrated Resource Plan and Bainbridge Island Initiative

Jens C Boemer, Bainbridge Island Resident since 2014

DRAFT of Dec 12, 2019

Author's Disclaimer

Given the nature of this review, I'd like to remind everyone of my potential conflict of interest, disclosed in the COI form on 8/1/2019 as follows:

- ▶ *As part of my employment with the Electric Power Research Institute (EPRI), I regularly work with electric utilities around the country. PSE is one of our clients and I may be working with PSE on research and demonstration projects in the future. Thus, I may recuse myself from dealings and committee votes that relate to the city's electric utility business decisions, in particular those that relate to the city's tactical dealings with PSE during the negotiations over a new franchise agreement.*

The thoughts expressed in this presentation are the author's personal views as a resident of Bainbridge Island and not a position of EPRI. The **information presented is draft** and the author does not warrant any accuracy. This draft presentation is subject to change.

Summary

- Bainbridge Island's first Greenhouse Gas Emissions (GHG) Inventory identified electricity use as the largest source of GHG on the island.
- This slide deck collects information on two topics relating to Puget Sound Energy (PSE)'s business as they impact GHG emissions, reliability, and resilience (emergency preparedness) on Bainbridge Island:
 - Implications of new WA state legislation, known as Clean Energy Transformation Act (CETA), on PSE's Integrated Resource Plans (IRPs)
 - Opportunities of PSE's recently announced Bainbridge Initiative to improve reliability of service
- Although not obvious at first sight, there may be opportunities for synergies between the two areas that may inform conversations between PSE and the City's Climate Change Advisory Committee (CCAC).

Content

- PSE Integrated Resource Plan(s)
- Deeper Dive Into PSE's 2017 IRP
- PSE's Bainbridge Island Initiative
- What Does That Mean For Bainbridge Island?

Overview on PSE Integrated Resource Plan(s) in the Context of the 2019 Clean Energy Transformation Act

PSE Integrated Resource Plan(s)

2017 Integrated resource plan

- PSE's [2017 Draft IRP](#) was available September 12, 2017. The Final was filed with the Washington Utilities and Transportation Commission on November 14, 2017 and is also available at pse.com.

2019 IRP meeting schedule and materials are available [online](#)

- The 2019 IRP will be filed with the Washington Utilities and Transportation Commission on or before **January 15, 2020**.
- The [IRP Advisory Group \(IRPAG\)](#) and the [Technical Advisory Group \(TAG\)](#) are teams of external stakeholders and regulators who meet to provide input during the integrated resource planning process.
- The WA Clean Energy Transformation Act (CETA) changes key assumptions in PSE's 2019 IRP as explained in [this presentation](#).



2019 Clean Energy Transformation Act

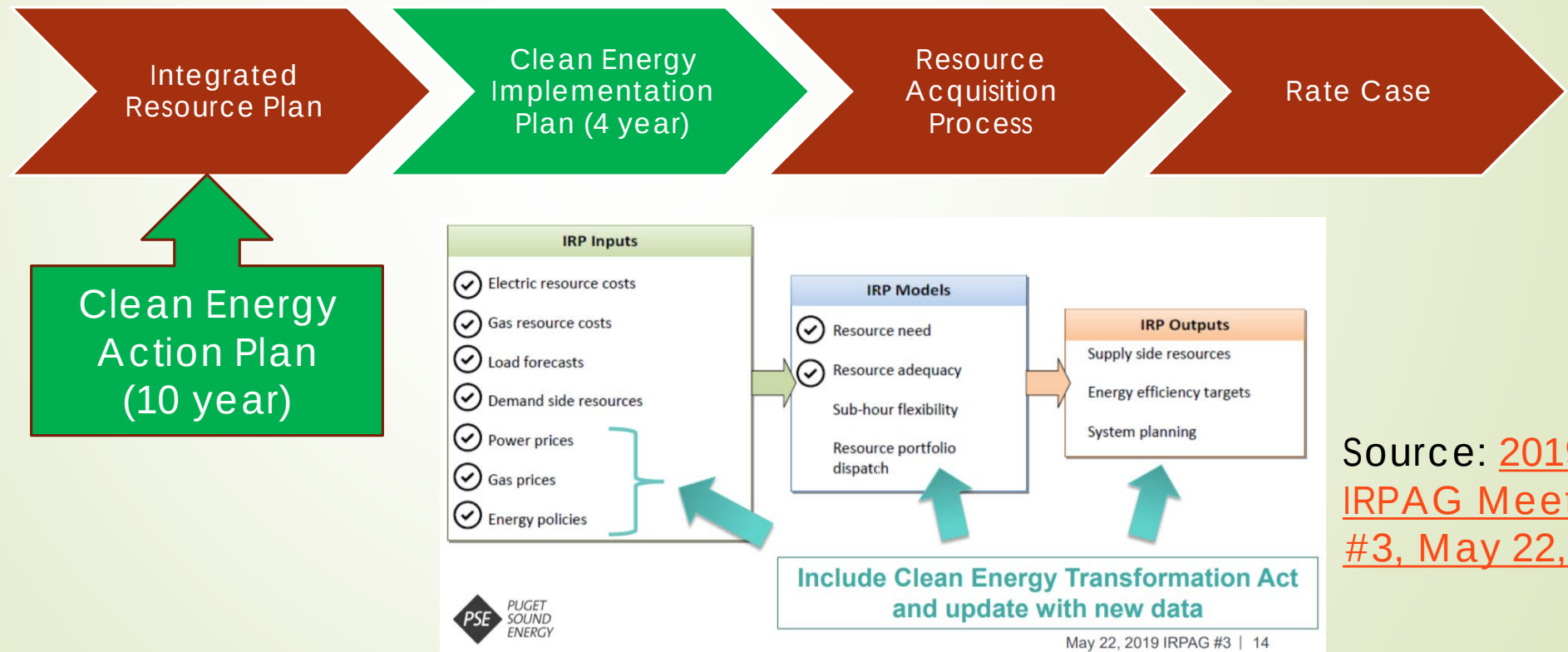
- The information presented in the following is based on PSE's 2017 IRP and does not consider the 2019 WA Clean Energy Transformation Act (CETA).
- The Clean Energy Transformation Act requires utilities to:
 - **2025:** eliminate coal-fired resources from electric power supply
 - **2030:** carbon neutral energy supply
 - At least 80% **non-emitting** and **renewable** resources
 - Up to 20% **alternative compliance** options
 - **2045:** carbon free energy supply
 - 100% non-emitting and renewable resources
 - Electric utilities shall use the social cost of greenhouse gas emissions when developing IRPs and clean energy action plans.
 - The law also includes: • Safety and reliability protections • Customer protections

Source: [2019 IRPAG Meeting #3, May 22, 2019](#)

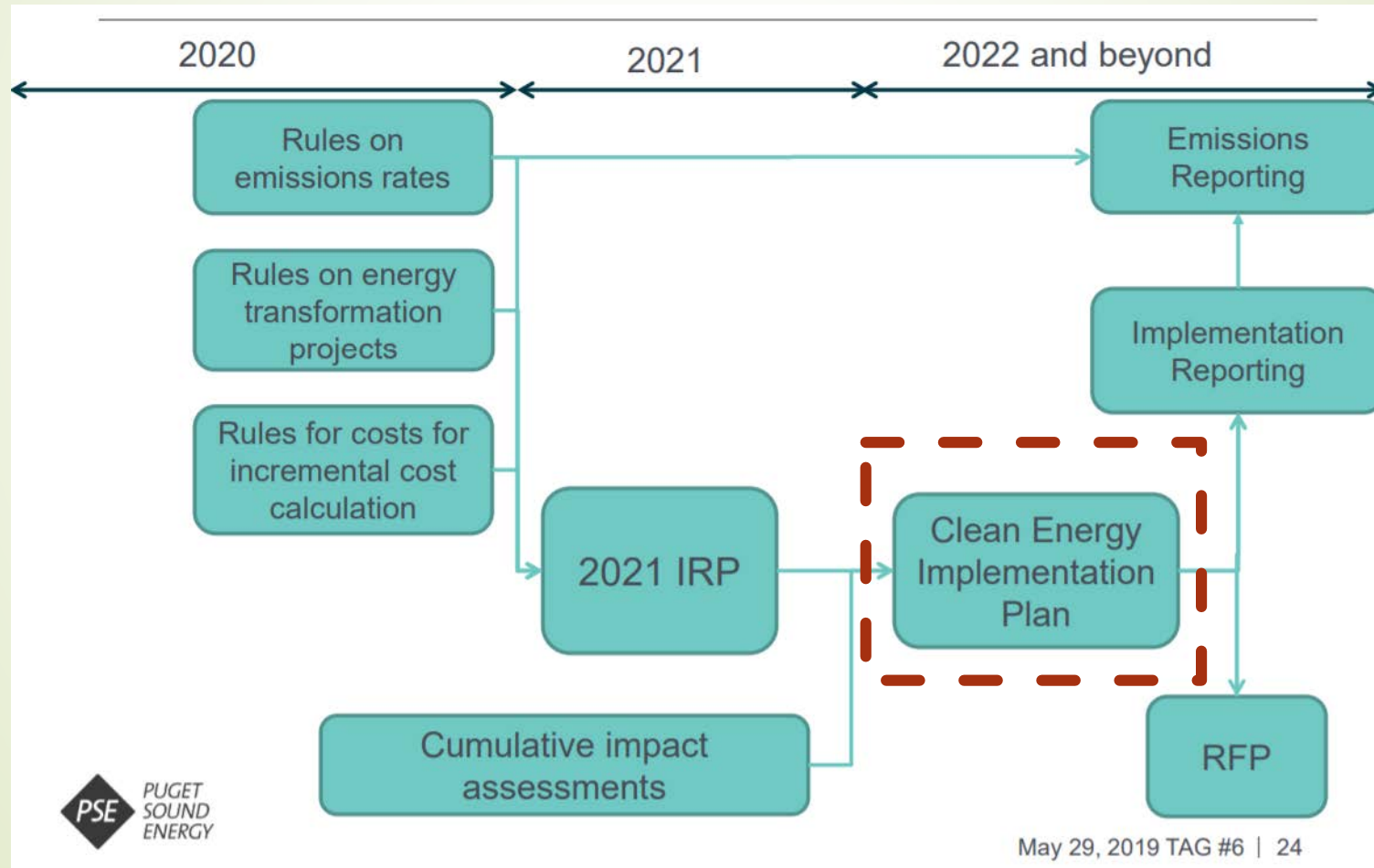
What does this mean for PSE? ... And what could it mean for Bainbridge?

- ▶ **Conservation:** expand PSE's conservation programs to our customers
 - ▶ COBI and CCAC/UAC to work with BI residents to implement demand response
- ▶ **Coal:** remove coal from PSE's energy supply portfolio
 - ▶ Greenhouse gas emissions of BI's electricity mix will decrease
- ▶ **Resources:** acquire significant amounts of non-emitting and renewable resources
 - ▶ Opportunities for local residential, commercial, and community renewable energy projects
- ▶ **Transmission:** begin developing new transmission corridors to renewable energy zones
 - ▶ No direct impact on BI residents, may lead to rate increases and thus incentive energy conservation

Clean Energy Transformation Act changes the role of the IRP – *An Opportunity for BI?*



Timeline for PSE's first Clean Energy Implementation Plan (CEIP)

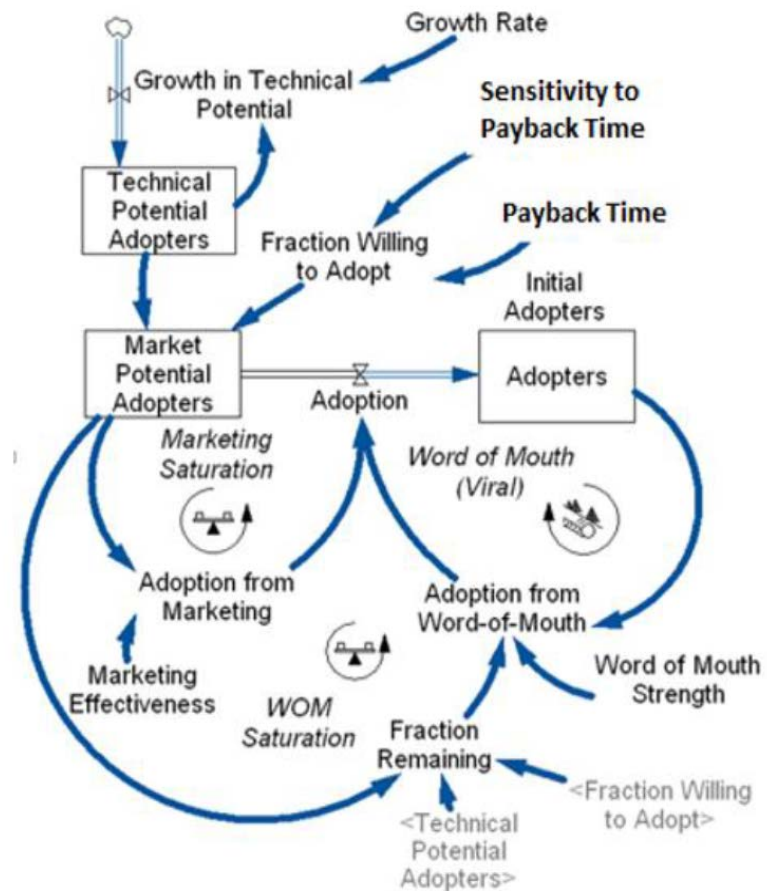


Source: [2019 TAG Meeting #6, May 29, 2019](#)

Deeper Dive Into PSE's 2017 IRP

For Its 2017 IRP, PSE Hired Navigant to Assess the PV Adoption in its Service Territory

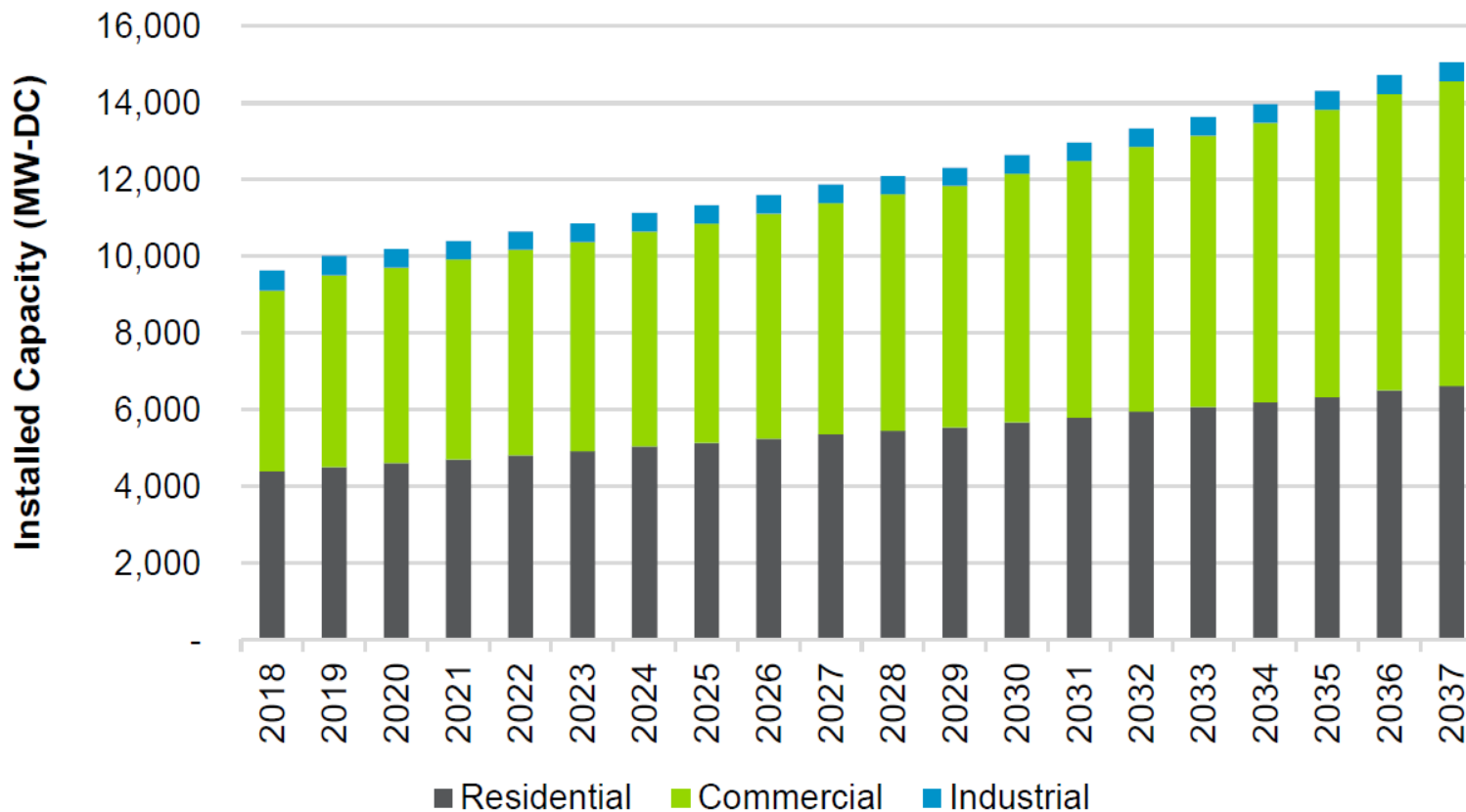
Figure C-1. Illustration of PV Adoption Model Methodology



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

The Solar PV *Technical* Potential is More Than *Twice* of PSE's Peak Load

Figure C-4. Solar PV Technical Potential by Sector

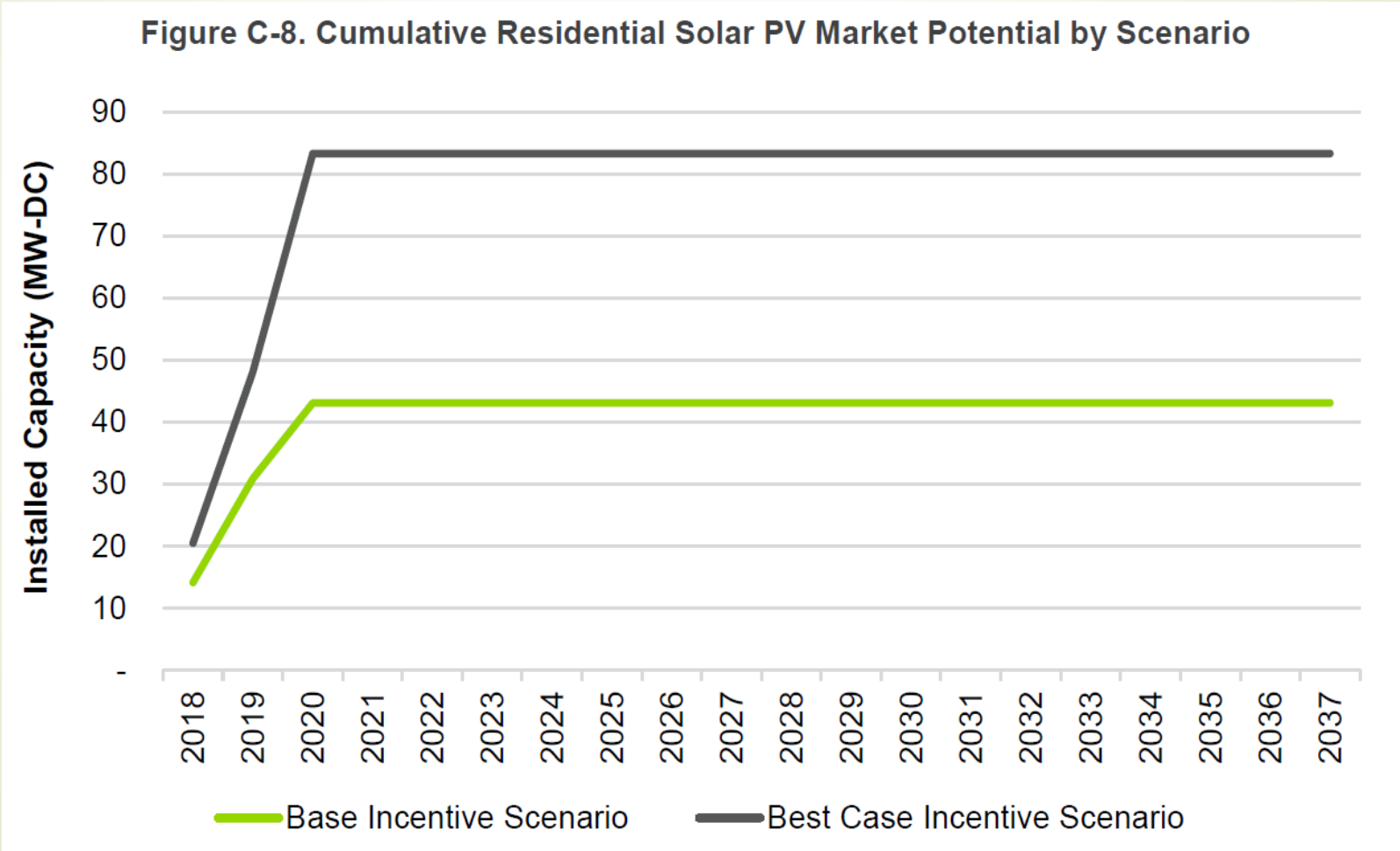


PSE Peak Load:

- 2018: 5,098 MW
- 2037: 6,511 MW

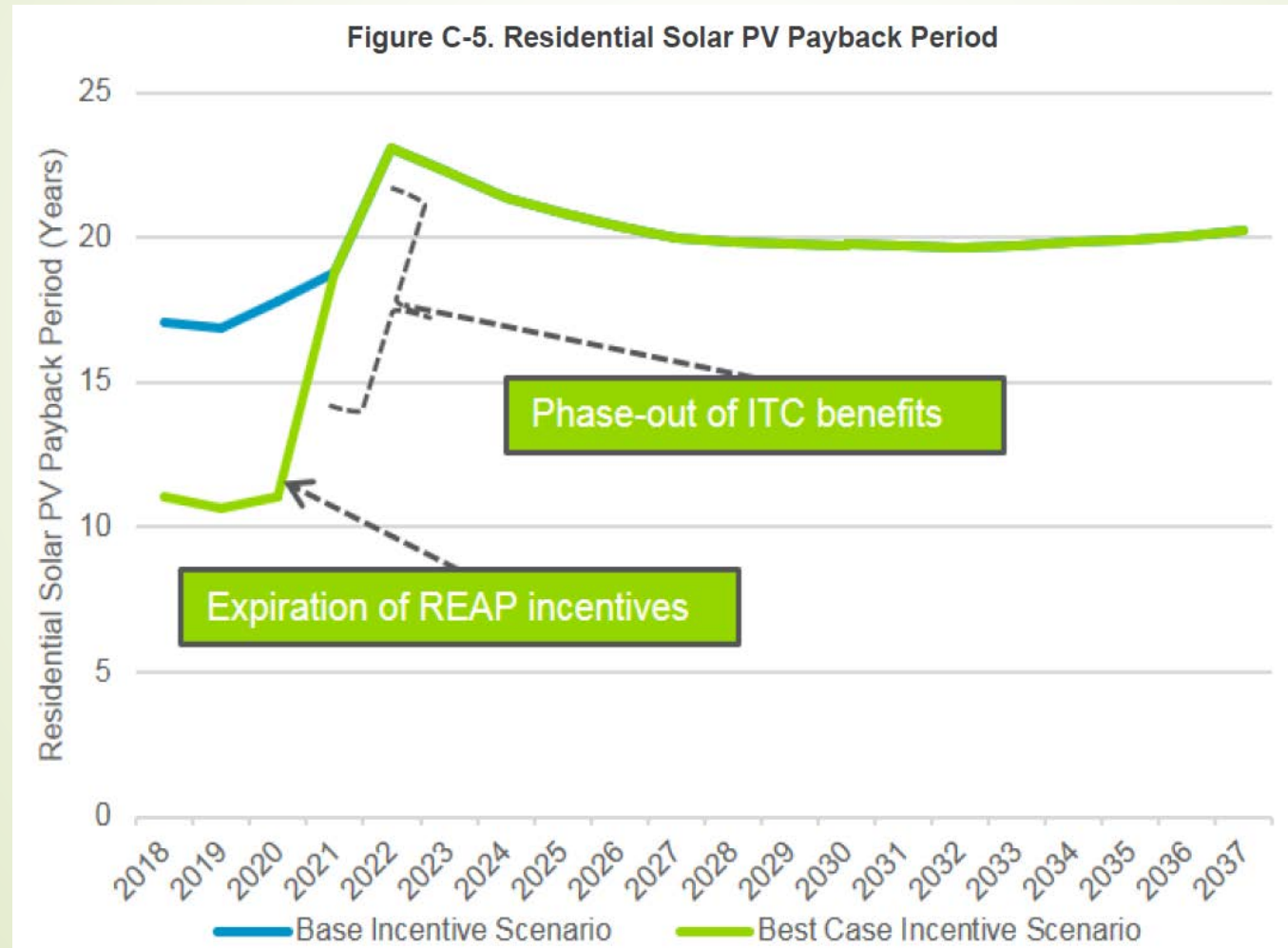
Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Modest Incentives Lead to Small Cumulative Residential Solar PV Market Potential



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

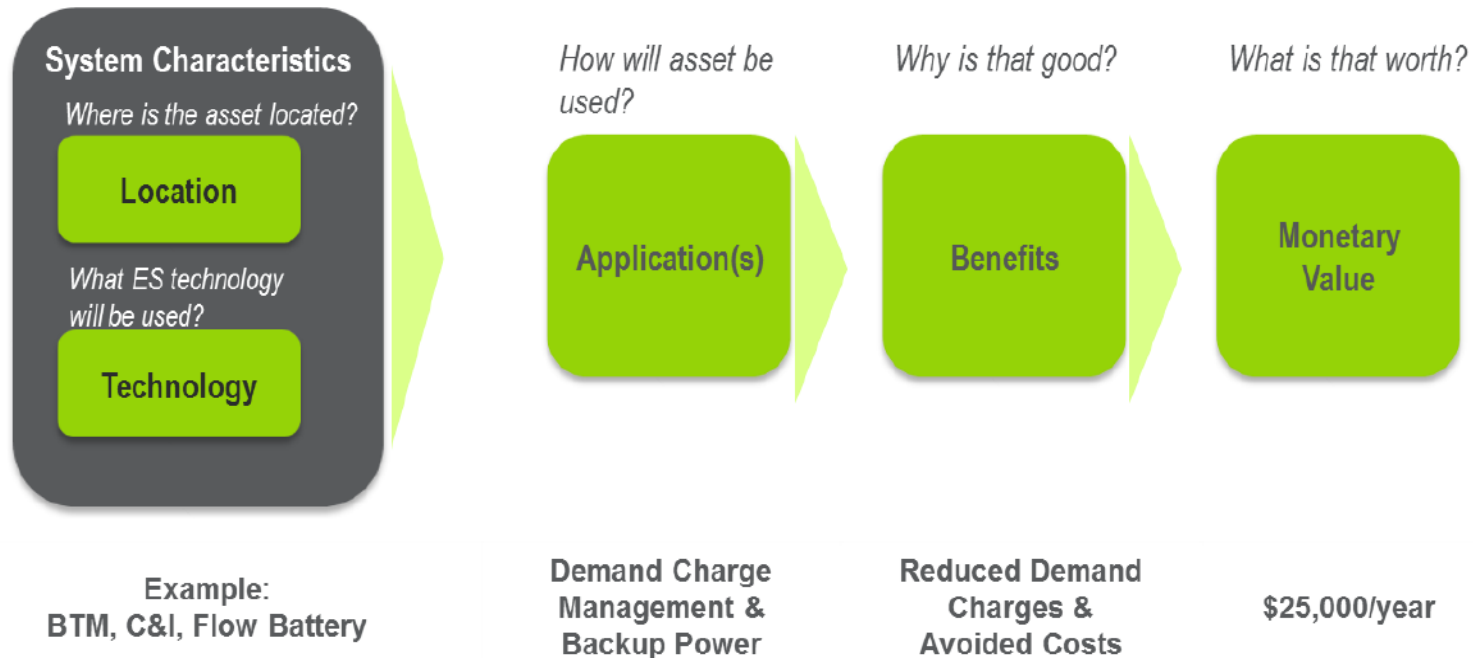
Expiration/Phase-out of Incentives Kill the Residential Solar PV Economic Viability



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

PSE Hired Navigant to Assess Behind-The-Meter (Customer) Energy Storage

Figure D-1. Energy Storage Benefit Framework



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Four Use Cases Were Studied for Behind-The-Meter Energy Storage

D.3 Energy Storage Results

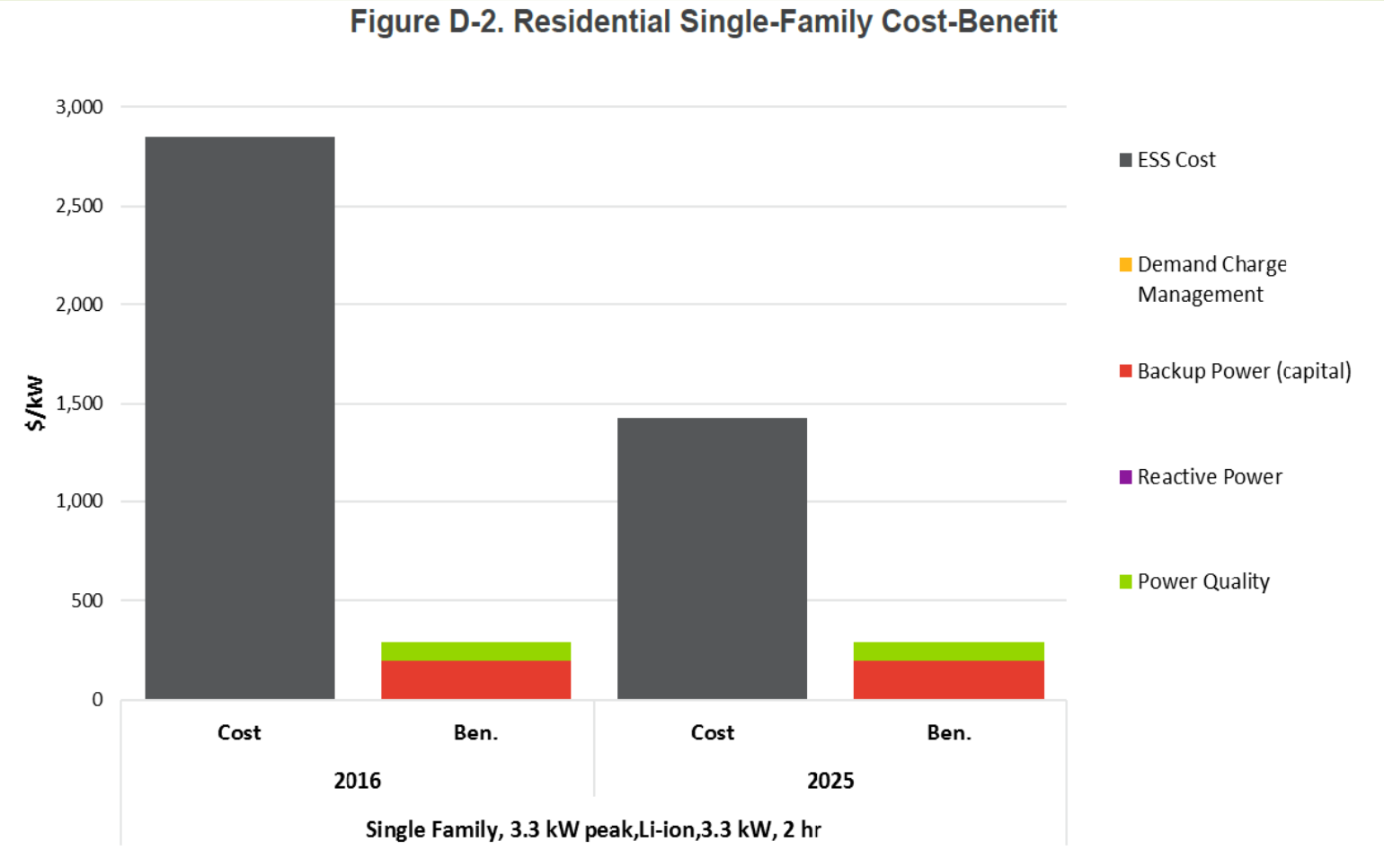
Relevant Applications

Given the current rate structure in PSE's service territory, the potential BTM energy storage applications with associated monetary benefits were:

- **Demand charge management**, where storage systems discharge to limit the peak usage of a facility to reduce the associated demand charges
- **Power factor charge management**, where storage systems provide reactive power to lower the associated power factor charges
- **Sustained outages**, where systems provide power when the grid is down, instead of having this power provided by a traditional backup generator
- **Momentary outages**, where systems prevent momentary outages and the associated customer inconvenience

Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Economics *Will Not* Drive Energy Storage for Residential Single-Family Customers

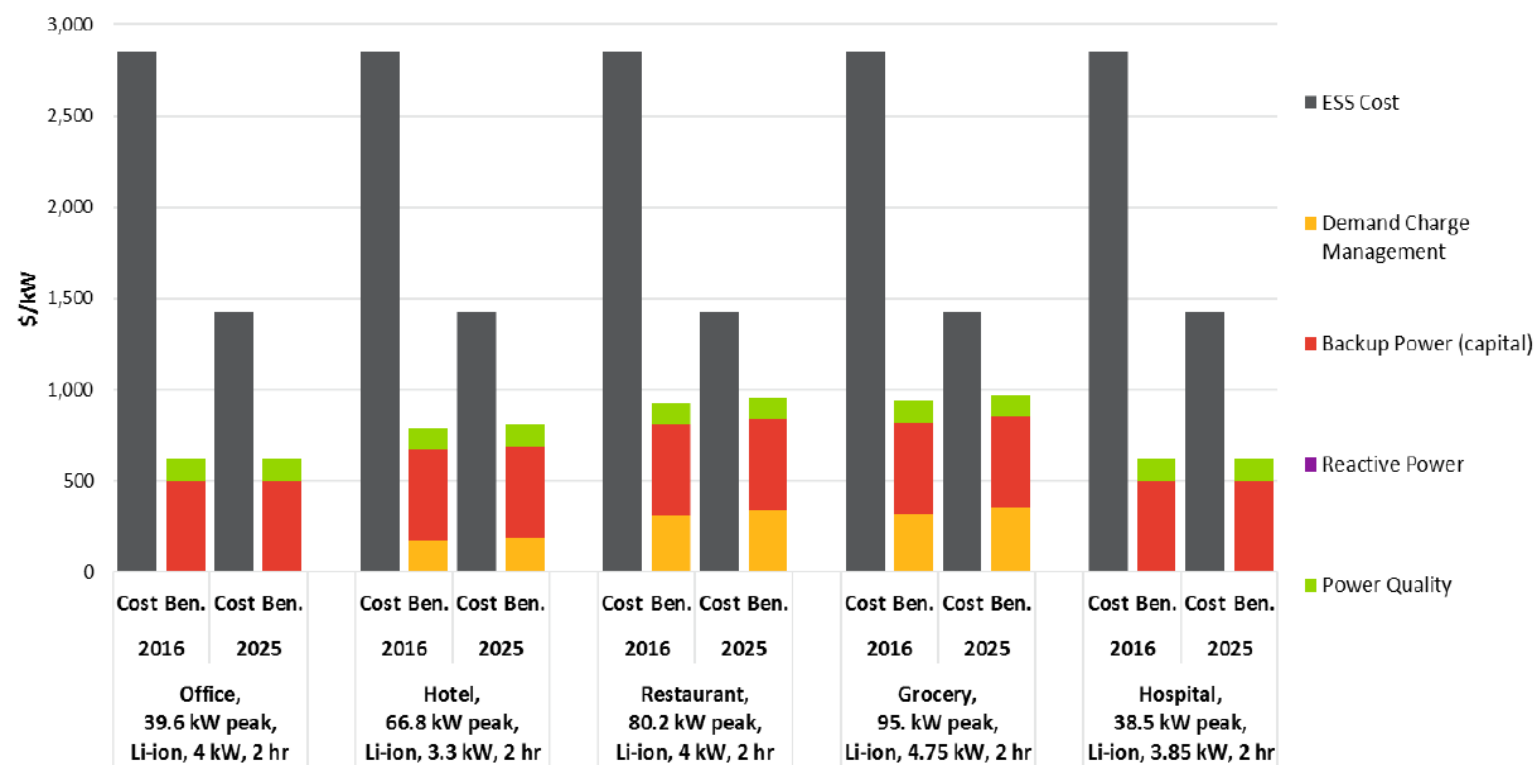


Minimum size:
3 kW

Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Economics *May Drive* Energy Storage for Commercial Customers

Figure D-3. Commercial Customer Cost-Benefit



Minimum size:
10 kW

Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

PSE Hired Navigant to Assess PSE-Wide Demand-Side Resource (DR) Conservation

Table 30. Unit Energy Impact Assumptions by DR Option, Customer Class, and End Use

DR Option	Customer Class	End Use	Units	Impact Assumptions (Winter 4 hr. Load Reduction) ⁸⁰
Direct Load Control-Thermostat	Residential	Central Heating, Heat Pump	kW per unit	1.75 ⁸¹
Direct Load Control-Switch		Water Heating	kW per unit	0.581 ⁸²
Direct Load Control-Thermostat	Small and Medium C&I	Central Heating, Heat Pump	kW per unit	2.63 ⁸³
C&I Curtailment, Economic DR ⁸⁴	Large C&I, Extra Large C&I	Central Heating, Heat Pump	% of end use load	35%-42% (manual) 72% (Auto-DR)
C&I Curtailment, Economic DR	Large C&I, Extra Large C&I	Lighting	% of end use load	37-61% ⁸⁵
		Process	% of end use load	30%-36%
		Refrigeration	% of end use load	10%
		Water Heating	% of end use load	25%
Dynamic Pricing – w/o enabling tech. ⁸⁶	Residential	All	% of total load	14%
	Small C&I	All	% of total load	0.5%
	Medium C&I, Large C&I, Extra Large C&I	All	% of total load	6%
Dynamic Pricing – with enabling tech. ⁸⁷	Residential	All	% of total load	27%
	Small C&I, Medium C&I	All	% of total load	8-9%
	Large C&I, Extra Large C&I	All	% of total load	12%

Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

The Devil Is in the Detail (or in the Footnotes)

Footnotes to Table 30:

⁸⁰ 2-hour event impacts are approximately 10% higher than 4-hour event impacts.

⁸¹ Based on PSE's Direct Load Control Pilot experience.

⁸² Based on PSE's Direct Load Control Pilot experience.

⁸³ Impact is assumed to be 1.5 times residential impact.

⁸⁴ Participation assumptions for C&I Curtailment and Economic DR are based on best available information sources in the industry (References: 2015 CA DR Potential Study, Phase II Appendices, 2016; Grid Integration of Aggregated Demand Response, Part I, Load Availability Profiles and Constraints for the Western Interconnection; 2013).

⁸⁵ Range represents variation by building type for lighting controls.

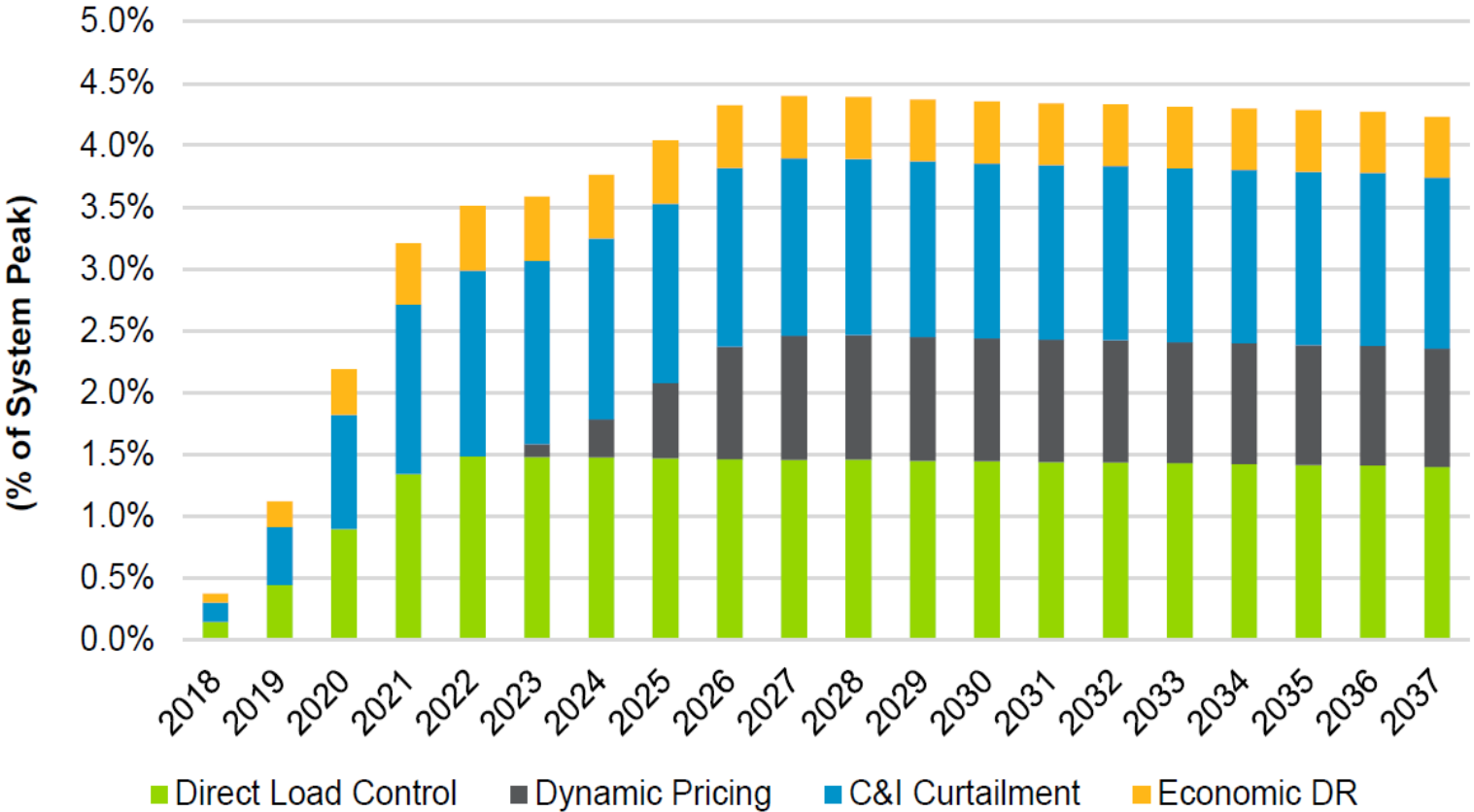
⁸⁶ Assumes a CPP offer with 4:1 peak to off-peak price ratio. Assumptions are based on Brattle Group's Pricing Program Database. (Ref: Demand Response Market Research: Portland General Electric, 2016 to 2035; January 2016).

⁸⁷ Assumes a CPP offer with 4:1 peak to off-peak price ratio. Assumptions are based on Brattle Group's Pricing Program Database and General Electric, 2016 to 2035; January 2016).

Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

More than 4% of Demand Reduction May Be Achieved Across the PSE Service Territory

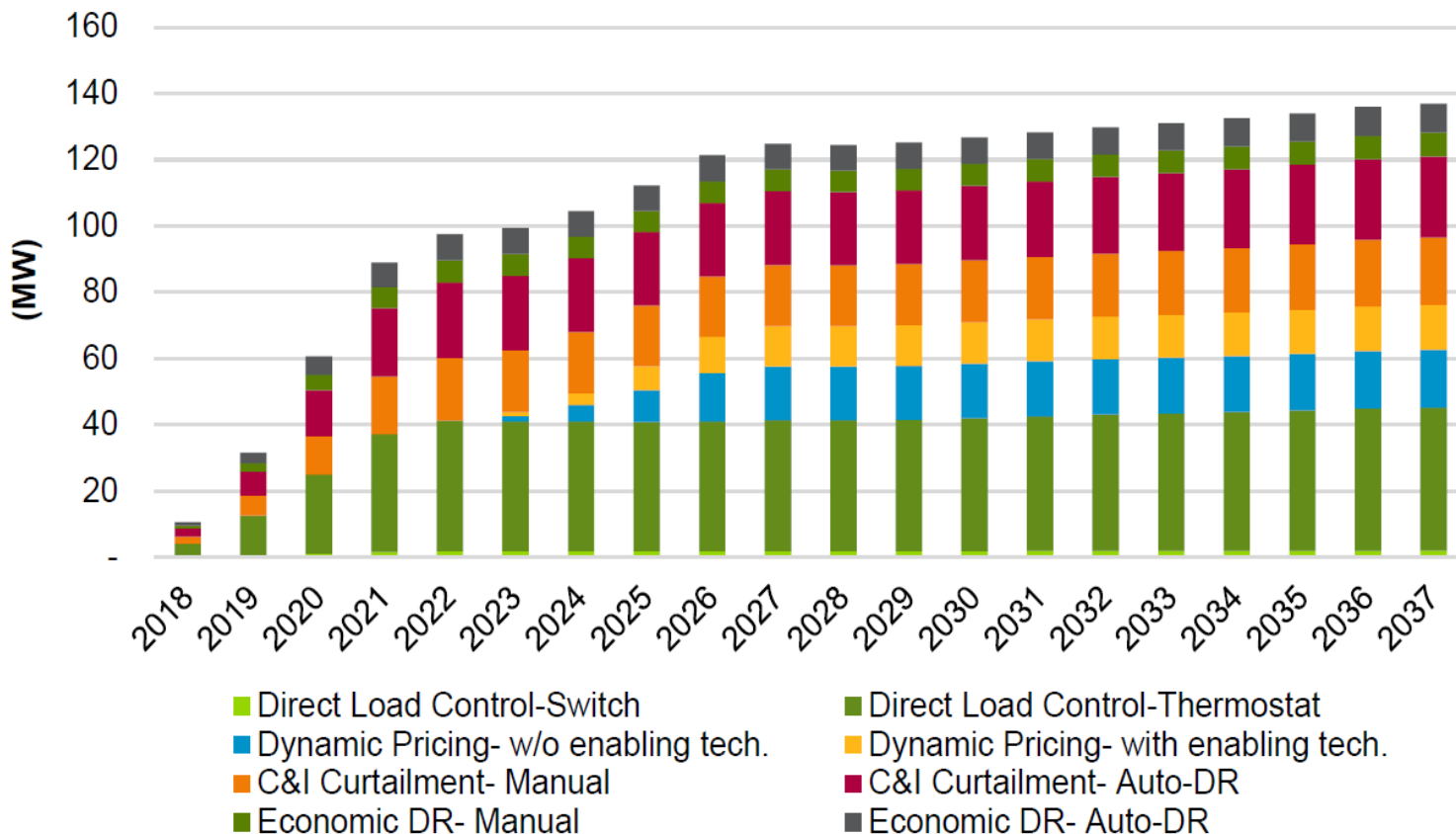
Figure E-2. Summer DR Achievable Technical Potential by DR Option, 4-Hour Event Duration (Percentage of System Peak): 2018-2037



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

A Portfolio of Various Demand Reduction Measures Can Offer ~120 MW of Flexibility

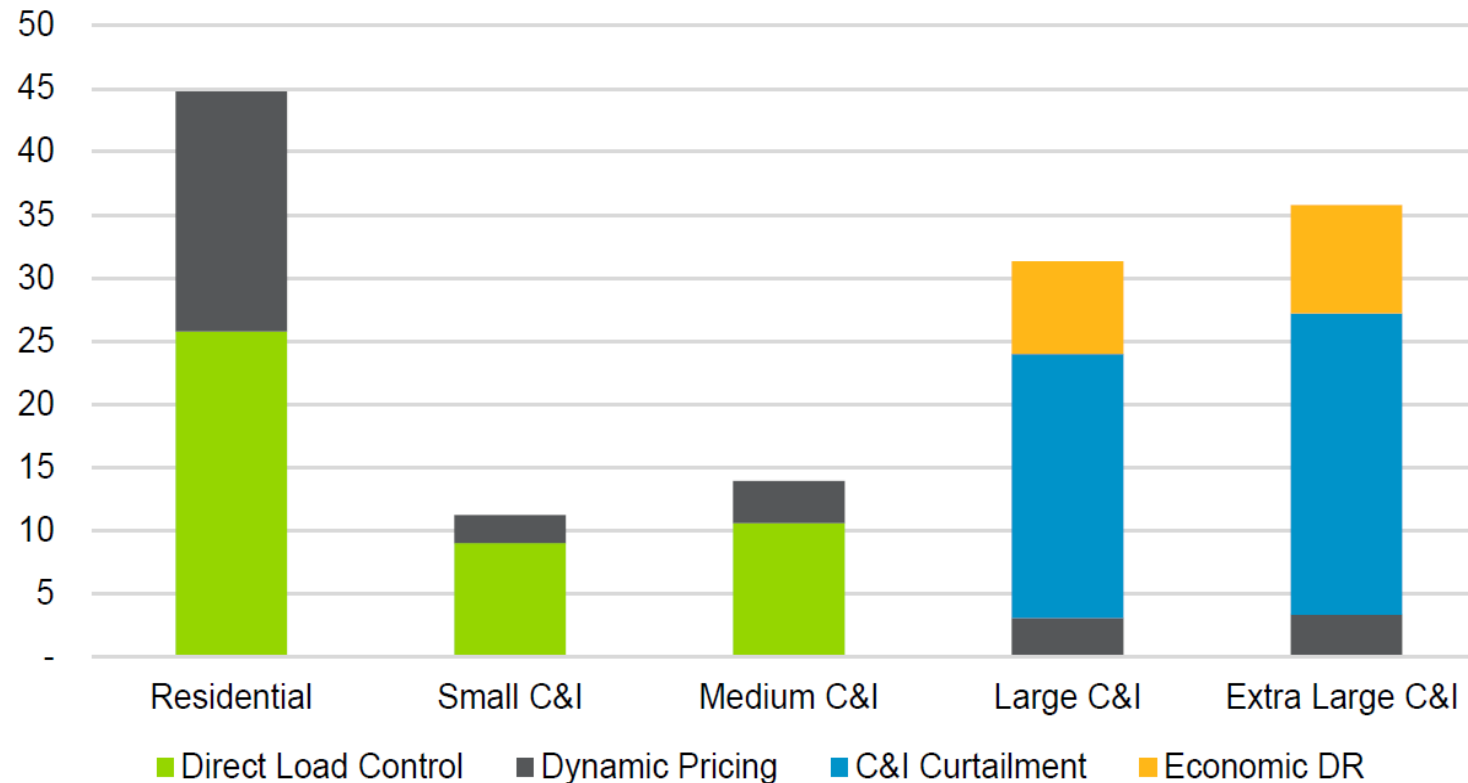
Figure E-3. Summer DR Achievable Technical Potential by DR Sub-Option, 4-Hour Event Duration (MW): 2018-2037



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Residential and “Larger” Commercial & Industrial DR Can Contribute Most

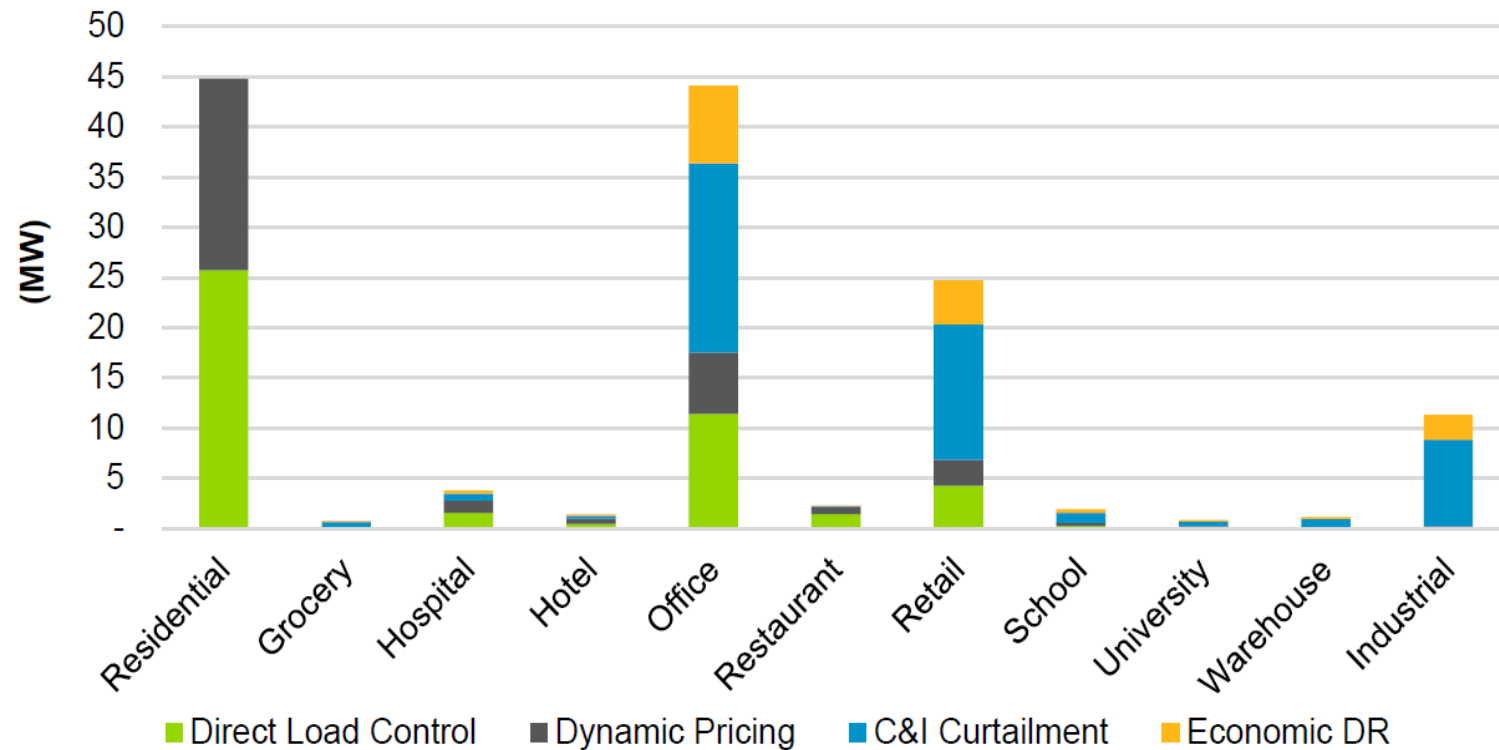
Figure E-6. Summer DR Achievable Technical Potential by Customer Class, 4-Hour Event Duration (MW): 2037



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Residential, Office, and Retail DR Can Contribute Most

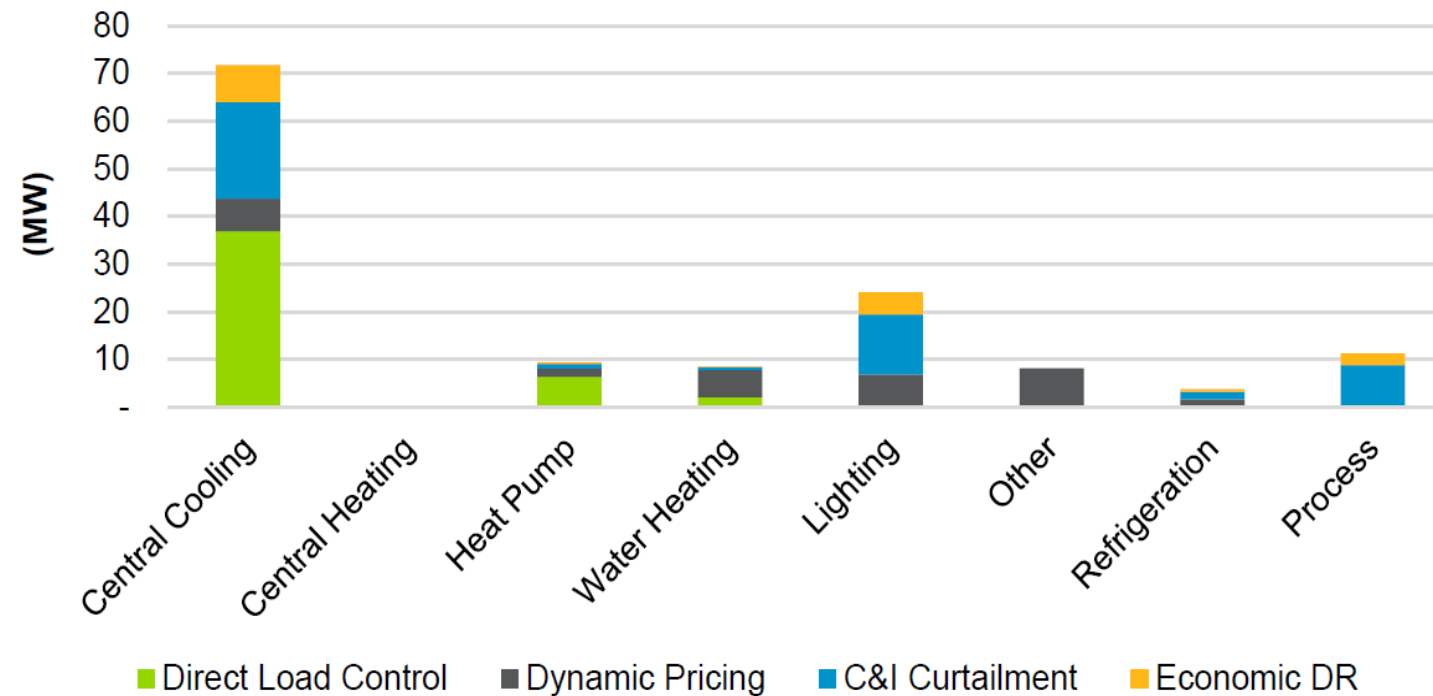
Figure E-8. Summer DR Achievable Technical Potential by Building Type, 4-Hour Event Duration (MW): 2037



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

Central Cooling and Lighting DR Can Contribute Most

Figure E-10. Summer DR Achievable Technical Potential by End Use, 4-Hour Event Duration (MW): 2037



Source: [PSE's Integrated Resource Plan \(IRP\) 2017](#)

PSE's Bainbridge Island Initiative

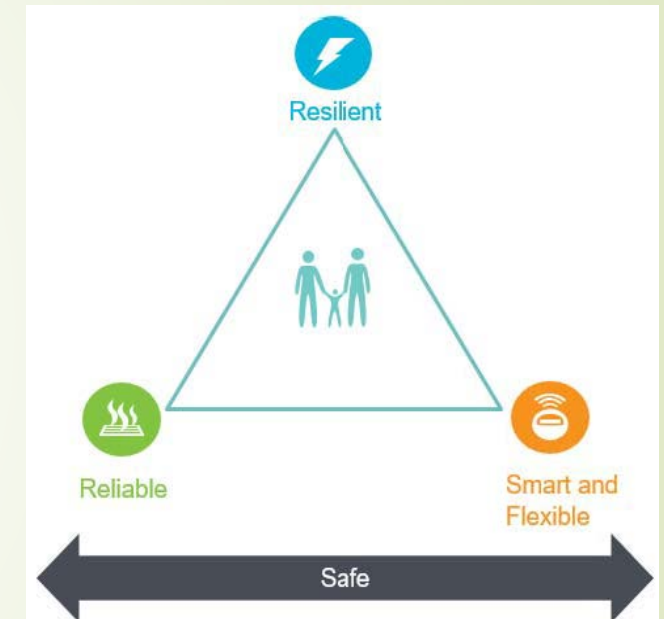
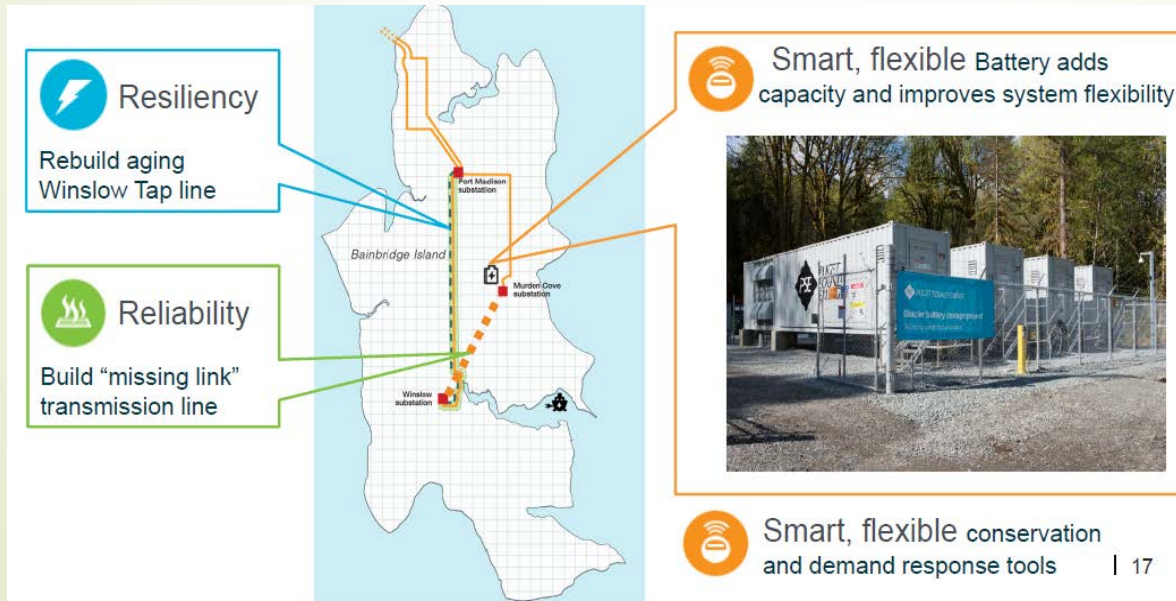
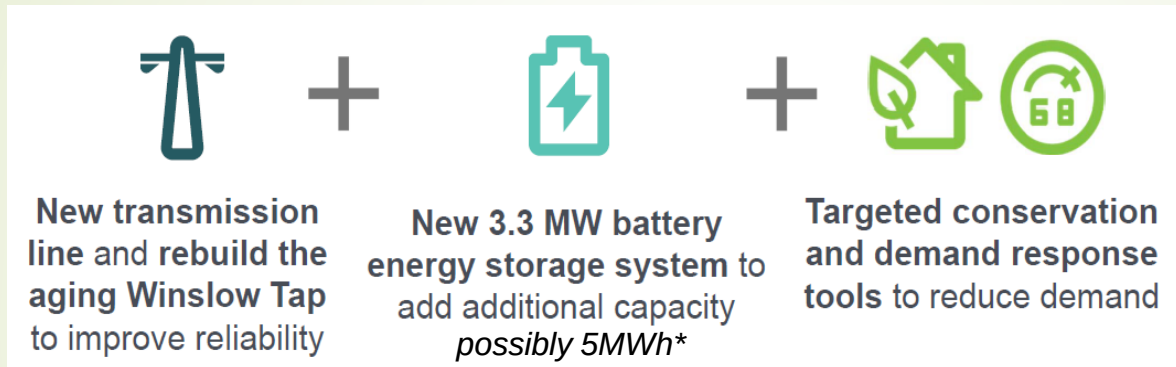
PSE Held a Town Hall on Oct 17, 2019, to Inform About The Bainbridge Island Initiative

- The problem deconstruction and definition
 - was limited to Capacity, Reliability, Operational Flexibility, and Aging Infrastructure;
 - did not include any of the new WA Clean Energy Transformation Act's GHG reduction and renewable energy deployment targets.
- The solutions deconstruction included
 - Traditional Wired Approach, e.g., grid infrastructure like new lines
 - Exclusively Non-Wired Alternative Approach, e.g., utility-scale energy storage, demand-side resource (DR) conservation
 - Hybrid Non-Wired Solution Approach, a combination of the above



Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

PSE's Proposed Bainbridge Island Initiative Has Three Key Elements



*Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

Source: [PSE's town hall on Oct 17, 2019, final slide deck](#)

PSE Performed Detailed, Independent Cost-Benefit Analyses to Identify Top Alternatives

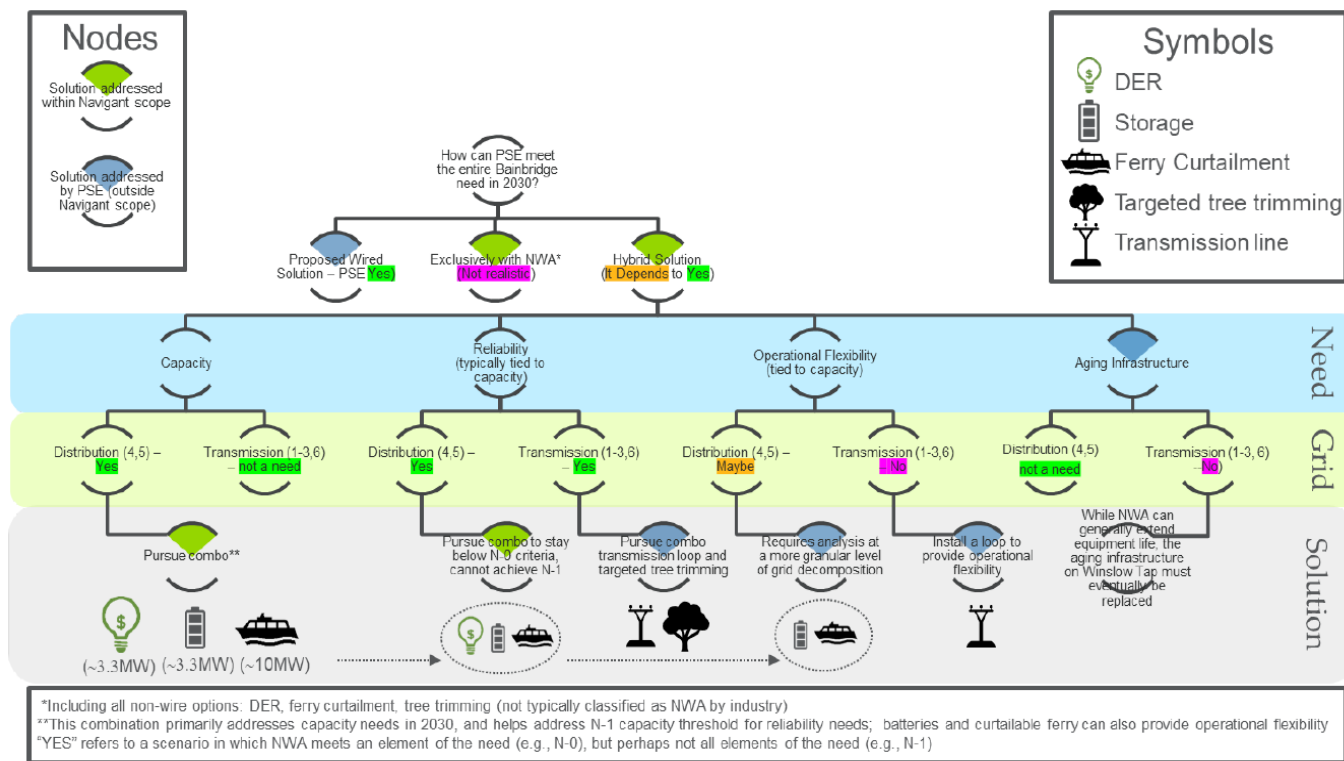
Table 0-1: Summary of Top Alternatives^{10 11 12 13}

	Top Wires Alternative	Top Non-Wires Alternative (All BESS)	Top Hybrid Alternative
Primary Need: Winslow Tap Transmission Reliability	Transmission Loop (Winslow to Murden Cove)	TOTAL BESS: 25.1 MW/79.2 MWH MUR: 13.7 MW/34.8 MWH MUR-15: 0.4 MW/0.4 MWH, PMA-13/WIN-12: 3.2 MW/9 MWH, MUR-17/WIN-15: 3.4 MW/15 MWH WIN-13: 4.4 MW/20 MWH	Transmission Loop (Winslow to Murden Cove)
Primary Need: Substation Group Capacity	New Distribution Substation		Ferry Curtailment: 10 MW up to 182 hours 50% BESS@MUR: 3.3 MW/5 MWH 50% DER: 3.3 MW
Primary Need: Winslow Tap Aging Infrastructure	Rebuild Transmission Line-Replace Poles & Wire, Improve Corridor Access, Acquire Necessary Rights & Veg Mgmt	Rebuild Transmission Line-Replace Poles & Wire, Improve Corridor Access, Acquire Necessary Rights & Veg Mgmt	Rebuild Transmission Line-Replace Poles & Wire, Improve Corridor Access, Acquire Necessary Rights & Veg Mgmt
Total Cost Estimate Range (Base to High)	\$42.5 million to \$85 million	\$66 million to \$132 million	\$38 million to \$76 million
Decision Factors	- Expertise - Long term solution - High reliability	- 10 year solution - Add with growth - New operational strategies needed - High cost	- 10 year solution - Add with growth - New operational strategies needed - Local EE and DR

- PSE favors a “hybrid alternative” with wires and non-wires solutions.
- The total cost estimate ranges significantly overlap and may warrant some further analysis.
- Opportunities for the “all battery solution” like emergency preparedness may not have been considered sufficiently.

PSE's Proposed Solution Seems to Have Withstood External Review & Corroboration

Figure 2. Bainbridge Island NWA Decision Tree



Source: Navigant Analysis

- 1st Consultant: Navigant
- Energy storage use cases are limited to capacity (peak shaving) and do not include increased reliability and/or provision of resilience to critical facilities

Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

However, PSE's Proposed Solution Does Not Seem to Follow the 2nd Consultant's Findings

Top Non-wires Alternative (all-battery)

Battery energy storage system, aging infrastructure replacement and vegetation management

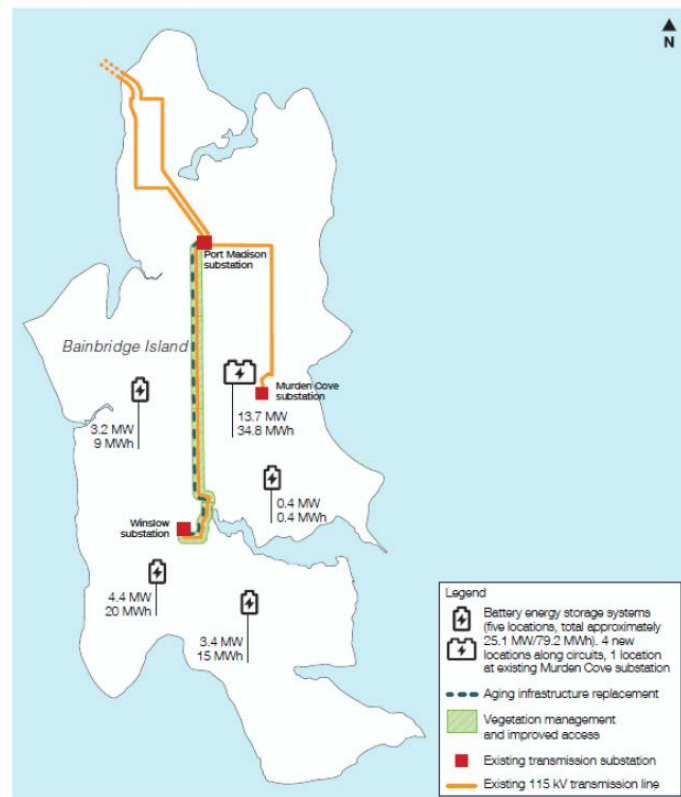


Figure 3-2: All BESS Alternative

ID	Location	Storage-Only Solution	System Need
1	PMA-13/WIN-12	3.2 MW/ 9 MWH	Winslow Tap Reliability
2	WIN-13	4.4 MW/20 MWH	Winslow Tap Reliability & Winslow-13 Feeder Reliability
		4.2 MW/12 MWH	Winslow-13 Feeder Reliability (exclusive)
3	MUR-17/WIN-15	3.4 MW/ 15 MWH	Winslow Tap Reliability
4	MUR-15	0.4 MW/ 0.4 MWH	Winslow Tap Reliability
5	Murden Cove Distribution Station	13.7 MW/ 34.8 MWH	Winslow Tap Reliability & Substation Capacity Needs
Total		29.3 MW / 91.2 MWH	All 3 Needs

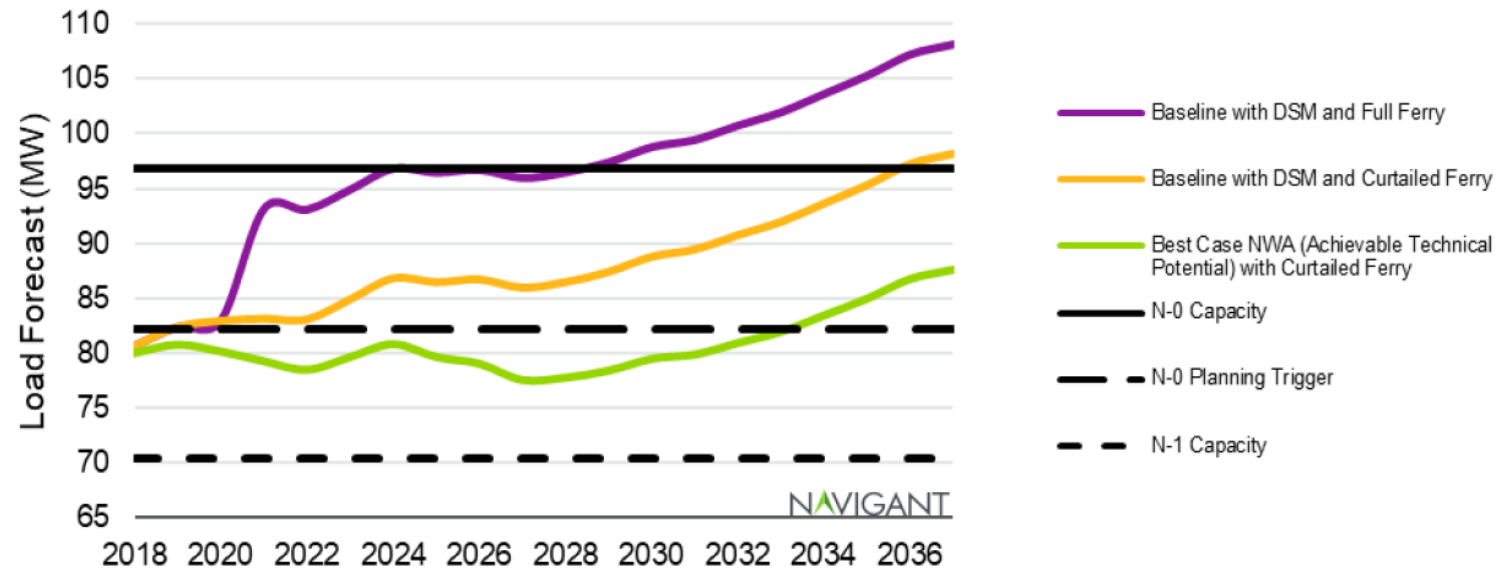
- Although the Quanta report suggests that curtailment of ferry load was considered, it appears as if the study results are based on the **important assumption** that the **ferry load could not be curtailed**.

- 2nd Consultant: Quanta Technology
- Focuses on an “all battery solution”
- Broadens the energy storage use cases to provide reliability improvements
- Proposes almost 10x as much storage, with multiple locations across BI

Source: [PSE's town hall on Oct 17, 2019, Appendix E](#)

If Implemented Fully, PSE's Bainbridge Island Initiative Would Defer Grid Upgrades to 2030

Figure 1. Bainbridge Island Potential NWA Load Forecast Scenarios

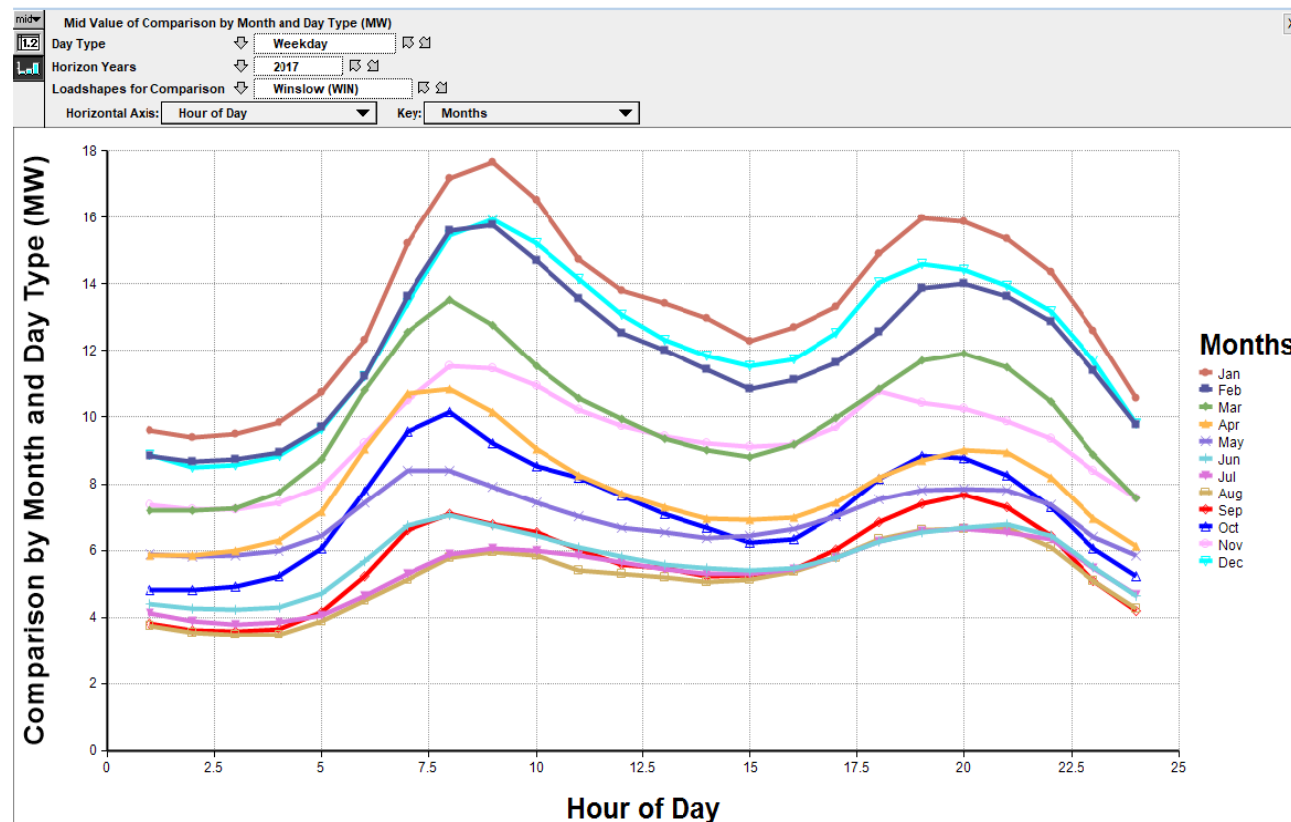


Source: Navigant Analysis

Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

BI's Daily Load Profile Suggests A Traditional Work/Life Pattern and Electric Heating

Figure B-2. Average Daily Load by Month for a Selected Bainbridge Substation and Year

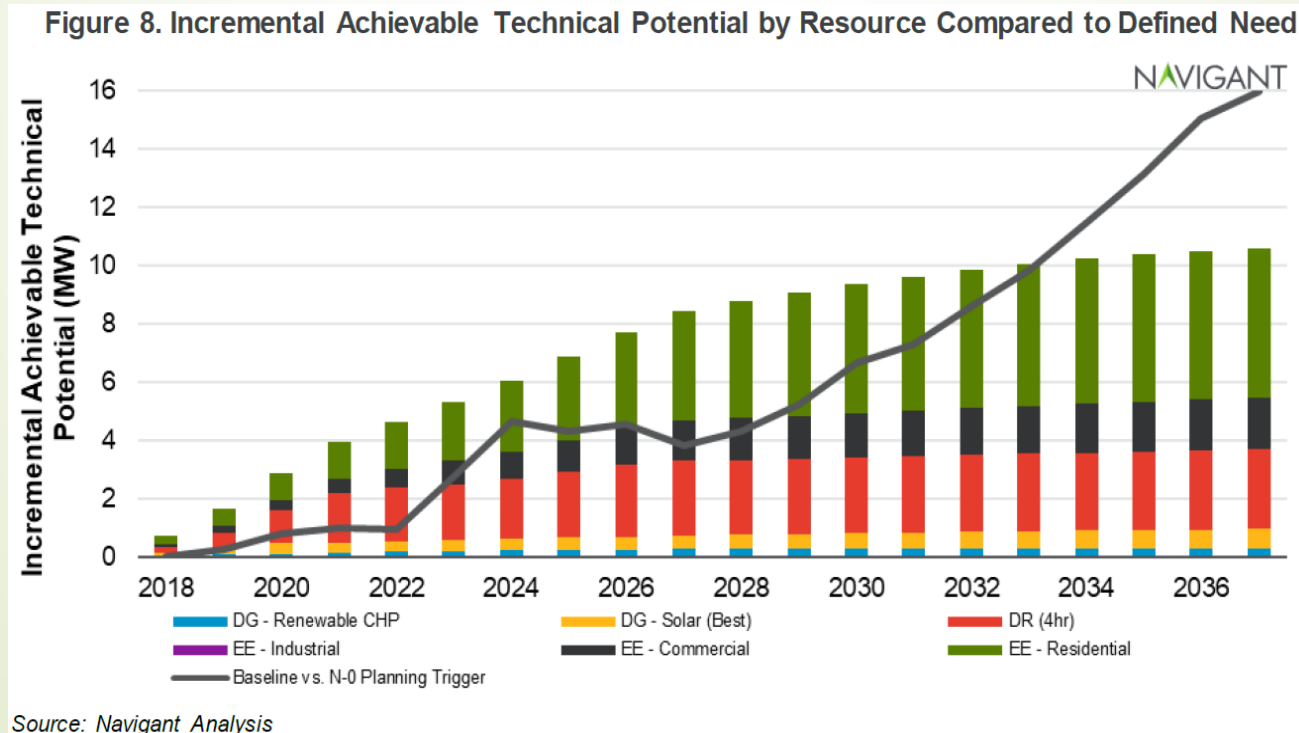


Source: Navigant Analysis

Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

The Targeted Conservation and Demand Response Tools Require BI Resident's Action

- DERs considered in the analysis include energy efficiency (EE), demand response (DR), customer-sited solar photovoltaics (PV), energy storage, and combined heat and power (CHP) (renewable anaerobic digesters only).



- Note the cost-effective contribution from the anaerobic digester CHP

Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

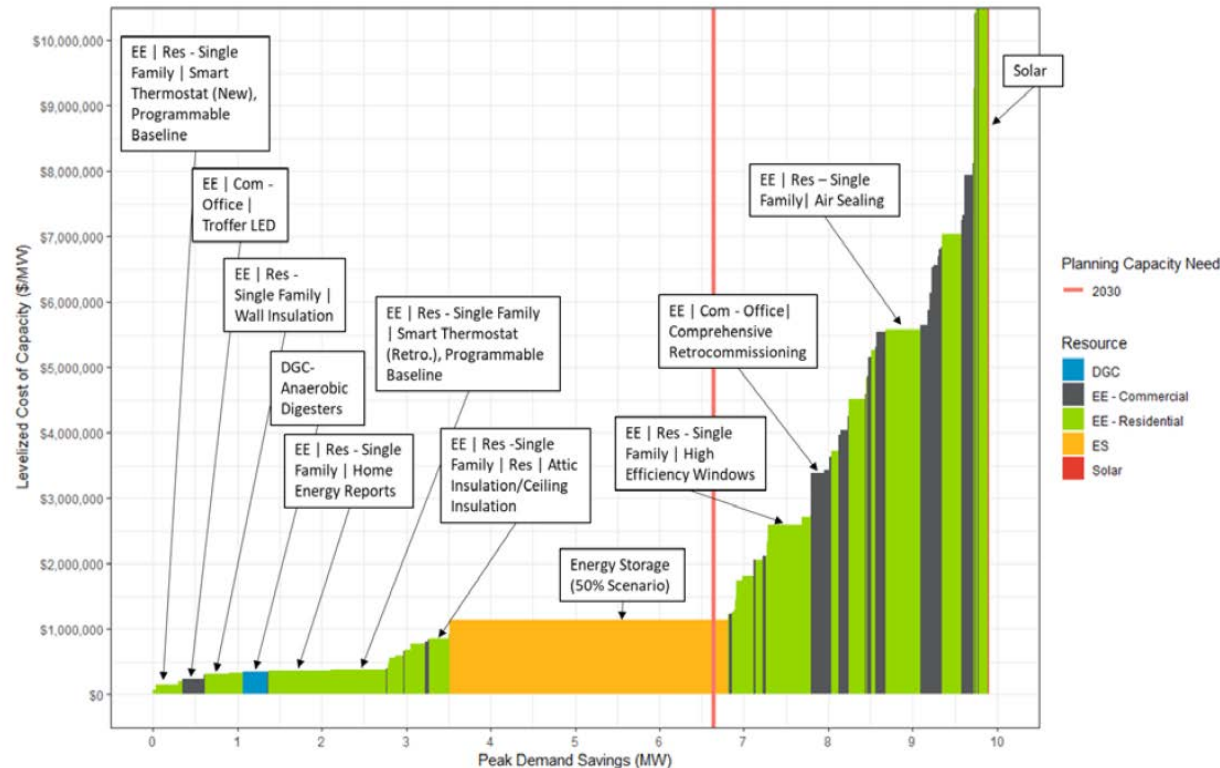
PSE Conducted a Residential Demand Reduction Pilot (DRP) on BI in 2009-2011

- PSE conducted a residential Demand Reduction Pilot (DRP) project **from October 2009 through September 2011**, as part of an effort to work with the residents of **Bainbridge Island** to reduce their load in an attempt to defer a need for additional substation capacity.
- During the pilot, PSE used special equipment to monitor and reduce residential household energy use on peak load days.
- One of the goals of the pilot project was to determine the potential peak electric demand reduction achievable on Bainbridge Island through the control of residential space and water heating equipment.
- Approximately **8% of the target customers participated** in the pilot and an average aggregate demand **reduction of 683 kW** were realized in the target area.

Source:
[Bainbridge
Island Electric
System Needs
Assessment
\(July 2019\)](#)

The “Low Hanging Fruits” in Conservation Relate to the CCAC CAP’s Buildings Section

Figure 14. DER Supply Curve (Excluding DR) Based on Levelized Cost of Winter Peak Capacity for Bainbridge Island



Source: Navigant Analysis

Topic 3 measures from least to higher costs:

- EE | Res – Single Family | Smart Thermostat (New)
- EE | Com – Office | Troffer LED
- EE | Res – Single Family | Wall Insulation
- ...

Source: [PSE's town hall on Oct 17, 2019, Appendix D](#)

The Anticipated Schedule of PSE's Bainbridge Island Initiative Could Be Accelerated and Broadened in Scope

Targeted conservation/demand
response tools deployed
2020-2030

Battery in-service
2022

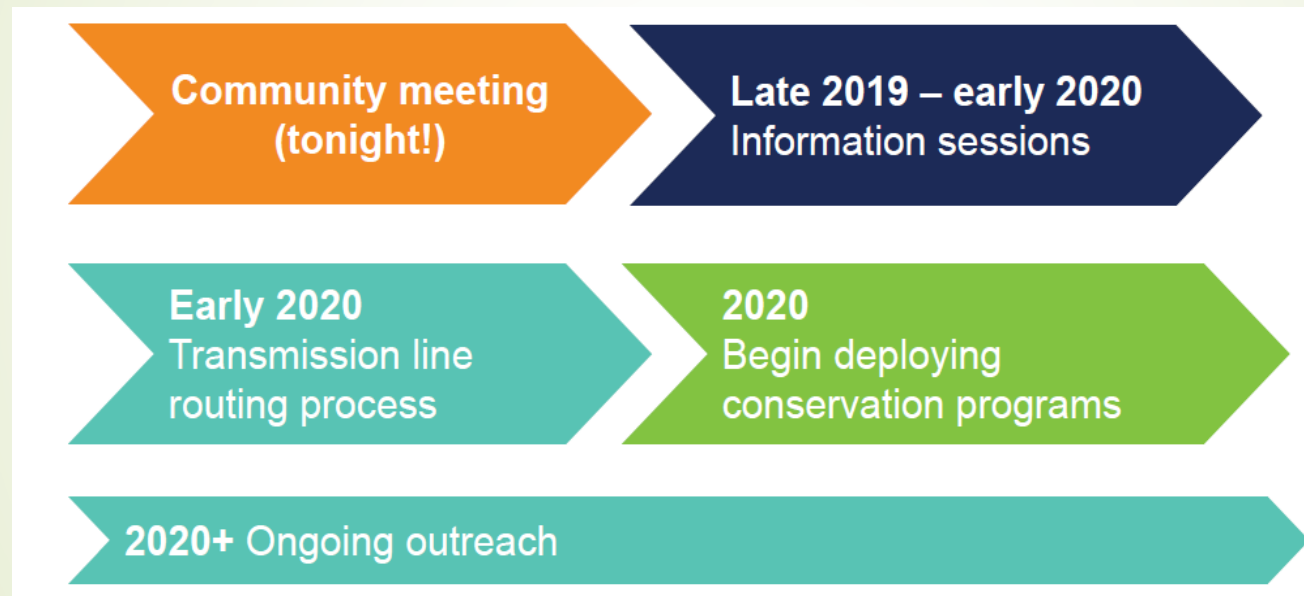
Winslow Tap rebuilt
2023

Transmission line loop built
2024

- COBI, UAC, and CCAC to work with community to create public support for proposed traditional, wire-based solutions.
- PSE to aim for battery in-service in 2021 and to consider islanded battery operation for increased customer reliability and provision of resilience of critical facilities.

Source: [PSE's town hall on Oct 17, 2019, final slide deck](#)

The Time To *Engage* With PSE in a Constructive Dialogue is *Now*



- COBI, UAC, and CCAC to work with community to create public support for proposed traditional, wire-based solutions.
- PSE to aim for battery in-service in 2021 and to consider islanded battery operation for increased customer reliability and provision of resilience of critical facilities.

Source: [PSE's town hall on Oct 17, 2019, final slide deck](#)

What Does That Mean For Bainbridge Island?

- COBI, UAC, & CCAC to work with BI residents to embrace PSE's demand-side resource conservation measures, especially those related to buildings
- Encourage BI residents to use less electricity for cooling and lighting, e.g.,
 - increase thermostat temperature during summer months,
 - replace old fridges/freezers with more efficient ones,
 - replace incandescent light bulbs with LEDs
- Unless federal or state renewable and storage incentives increase significantly, economics will not drive the adoption of these technologies
 - Creation of a BI sustainability fund may accelerate renewable & storage adoption
- COBI, UAC, & CCAC to work with community to create public support for proposed traditional, wire-based solutions
- COBI, UAC, & CCAC to work with PSE to aim for battery in-service in 2021 and to consider islanded battery operation for increased customer reliability and provision of resilience of critical facilities.
- COBI & CCAC to work with "Friends of the Farms" to pursue biomass CHPs

Topics to be Discussed with PSE

- **Meeting #1 – Creation a foundational understanding**
 - PSE's plan to achieve the WA State Clean Energy Transformation Act (CETA)'s targets and the role PSE sees for Bainbridge Island in that transformation
 - Expected load growth on BI, key assumptions, and contributing factors (e.g., EVs?)
 - Financial expert for PSE's green power and solar choice programs' revenue streams and state rules
- **Meeting #2 – Understanding and reviewing potential solutions**
 - Renewable energy project development like community solar (also relates to PSE's recent RFI)
 - Battery energy storage expert for opportunities beyond the non-wire solution / peak-shaving (e.g., islanded operation to power critical facilities for emergency preparedness).
 - Renewables for homes (roof-top solar, etc.) and plans to require "smart inverters" to enable high DER penetrations
 - Options for energy conservation and demand response on BI & community outreach

CCAC's Questions for PSE

- ▶ How confident is PSE that it can achieve the WA State Clean Energy Transformation Act (CETA)'s targets?
- ▶ What role does PSE see for Bainbridge Island in the transformation required by the CETA?
- ▶ How can the CCAC and COBI support PSE in the community outreach to promote energy conservation and demand response options on Bainbridge Island?
- ▶ What are PSE's key assumptions in estimating expected load growth on BI, what are contributing factors and has, e.g., electric vehicle deployment been considered?
- ▶ What are PSE's green power and solar choice programs' revenue streams off the island, and to what extent do UTC rules allow (parts of) these revenues to be used locally on Bainbridge Island?
- ▶ What renewable energy project development opportunities, like community solar, does PSE see on Bainbridge Island? How can the CCAC and COBI support PSE in developing these?
- ▶ Why did PSE not propose a more ambitious battery energy storage solution, similar to the one proposed in the Quanta report (All-BESS) that appears to go beyond capacity / peak-shaving use case.
- ▶ Would PSE be open to considering islanded operation of the BESS to power critical facilities for emergency preparedness? Could grid-forming capability be required for the BESS's inverters upfront to avoid later retrofit costs?
- ▶ What vision does PSE have for technical interconnection requirements and capabilities of future home renewables solutions (roof-top solar, etc.)? Does PSE plan to require "smart inverters" to enable high DER penetrations?
- ▶ ...to be continued...