AGENDA

Purpose: The purpose of the study sessions is to discuss issues that are important for the Climate Change Advisory Committee (CCAC) to understand as they develop the Climate Action Plan (CAP) and for the Utilities Advisory Committee (UAC) as they do their work.

6:00 – 6:10 Welcome/Introductions/Purpose (Mike Cox, CCAC Co-Chair)

6:10 – 6:20 Presentation – 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 (Jens Nedrud, Manager System Planning, Electric System Planning)

6:20 – 6:35 Discussion (All)

6:35 – 6:45 Presentation – Expected load growth on BI, key assumptions, and contributing factors (Jens Nedrud, Manager System Planning, Electric System Planning)

6:45 – 7:00 Discussion (All)

7:00 – 7:10 Presentation – Options for energy conservation and demand response on BI & community outreach (Mark Lenssen, Supervisor Energy Management Engineering)

7:10 – 7:25 Discussion (All)

7:25 – 7:35 Updates (Heather Mulligan, Manager Customer Energy Renewable Programs and Therese Miranda-Blackney, Manager New Products & Services)
   - PSE's green power and solar choice programs’ revenue streams and state rules
   - Renewable energy project development like community solar (also relates to PSE's recent RFI)

7:35 – 7:45 Discussion (All)

7:45 – 7:55 Public Comments

7:55 – 8:00 Wrap-up and Next Steps
Partnering on the Clean Energy Transformation Act

Jens Nedrud
Manager of System Planning
February 3, 2020
Commits WA to carbon neutral (and 80% renewable) electricity supply by 2030 and 100% clean electricity by 2045

• PSE worked with state leaders on landmark energy policy

• Policy includes other key priorities:
  • Affordability: Customer rate protection at 2% per year
  • Reliability: Planning and evaluation to maintain reliability

• Balancing these priorities remains our top priority as we work with the state agencies and other parties to develop implementation regulation

CETA timeline

• 2025: Elimination of coal-fire resources from electric power supply
  • 2030: Carbon neutral energy supply
  • 80% non-emitting and renewable resources
  • 20% can be met with alternative compliance

• 2045: 100 percent non-emitting electricity supply
Significant rulemaking will shape meeting CETA goals

Rulemaking Agencies: UTC  Commerce  Health  Ecology  L&I  EFSEC

2019
- Used and useful policy statement

2020
- Natural Gas IRP & conservation rulemaking
- EIA rulemaking
- Resource acquisition rulemaking
- IRP rulemaking
- Clean energy implementation plan rulemaking

2021
- Equity/social justice (multiple rulemakings)
- Market integration work group + rulemaking
- Transmission corridors work group

2022
- Cumulative impact analysis work group
- Cumulative impact analysis rulemaking
- Energy transformation projects
PSE has a significant renewable energy need to meet clean energy targets. PSE’s energy supply mix was 42% clean in 2018.

**2018 Generation Mix**

- **Hydro**: 32%
- **Wind**: 10%
- **Unspecified System**: 20%
- **Natural Gas**: 36%
- **Coal**
  - Will be eliminated by 2025
PSE plans to pursue a balanced energy supply portfolio

- Procure clean resources
- Expand markets to provide access to regional resources and manage oversupply
- Optimize existing transmission and acquire or build new transmission
- Proactively procure energy efficiency, distributed energy resources, and customer programs
Distributed resources and customer programs can help

Significant grid modernization investment required

- Add smart/flexible capabilities to PSE’s delivery system (transmission and distribution) with AMI, ADMS, grid infrastructure
- Supports clean energy goals

Planned Grid Modernization supports DER Potential

Resilient

Smart and Flexible

Reliable
Engaging and partnering with our customers and communities is essential to a successful clean energy transition.
Partnering with Bainbridge Island

• Need your support of PSE’s reliability and grid modernization projects

• Work together on ways to get further faster on clean energy and carbon reduction efforts

Source: Energy.gov
Stay tuned for updates

pse.com/together
pse.com/irp

TOGETHER, we’re creating a better energy future.
Planning for Bainbridge Island growth

Jens Nedrud
Manager of System Planning
Overview

• Delivery System Planning overview
• Expected load growth on Bainbridge Island
• What we’re doing
Delivery system plan – why

- Meet customers’ energy and capacity requirements – safe, reliable, 24/7

- Comply with:
  - State RCW on PSE’s obligation to serve
  - NERC and WECC reliability standards

- Expand system in cost effective manner

- Failure to reliably serve load can mean outages and significant economic loss and public safety risks to customers
Delivery system planning – how

How we determine grid needs and capacity

System Evaluation
- System performance
- Load forecasts
- External Inputs Goals
- Commitments

System needs, modeling & analysis
- Issue(s) identification
- System modeling
- Probabilistic outcomes
- Alternatives Financial analysis
  Cost / Benefit

Alternatives & recommended solution
- Peer and management review

Optimize with other projects
- Investment Decision
- Optimization Tool
- process
- Resource planning

Final Plan: portfolio of projects
- Management review
  and approval

Project Implementation
- Mobilize resources to complete project

Study frequency: Annual TPL studies
examine needs over 10-year time horizon
Traditional drivers of DSP

Traditional drivers/criteria

- Customer request
- Growth
- Reliability
- Compliance
- NERC & WECC rules
- Aging Infrastructure
- Integration of resources

Electric delivery system performance criteria are defined by:

- Safety and compliance
- The temperature at which the system is expected to perform
- The nature of service and level of reliability that each type of customer is contracted for
- The minimum voltage that must be maintained in the system
- The maximum voltage acceptable in the system
- The interconnectivity with other utility systems and resulting requirements, including compliance with NERC planning standards
Transformed DSP and Bainbridge

Grid Analysis
- Consider wire and non-wire option for each identified delivery need
- Evaluate cost vs. benefit identifying best options by location

For non-wires options, model characteristics available to meet supply needs; include as input in next IRP cycle

Grid requirements/local needs
Forecasts & assumptions
Non-wire & wire options

Value of system services
($/unit of service location and time specific as needed)

IRP Analysis
IRP Inputs
Bainbridge Island growth (2018-2027)

Expected **peak** load growth

- 1.8% per year with conservation
- Winter peaking, primarily from heat loading

Drivers include:

- Local growth
- Transportation electrification *(e.g., ferry, cars)*
Bainbridge Island Substation Loading and Capacity

Normal winter customer load forecast

Normal winter customer load forecast (outside needs assessment period)

85% planning threshold
Reliability and grid modernization

- **Resiliency**
  - Rebuild aging Winslow Tap line

- **Reliability**
  - Build “missing link” transmission line

Example 115 kV transmission line

Battery adds capacity and improves system flexibility

Smart, flexible conservation and demand response tools
Working together for a better energy future

Stay informed and involved:

- Learn more and subscribe to email updates: pse.com/bainbridge
- Email us at info@psebainbridge.com
- Leave a message at 1-888-878-8632
Questions
Targeted Conservation and Demand Response Tools

Mark Lenssen
Supervisor, Energy Management Engineering
At a crossroads: solving the Island’s capacity needs

- Local growth & ferry electrification driving substation capacity need
- Capacity need is during winter peaks
At a crossroads: solving the Island’s capacity needs

PSE and national experts considered:

Traditional wires: new substation to increase capacity

Non-wires: tools to reduce demand / temporarily add capacity

PSE selected hybrid approach to address capacity need

If successful, they postpone need for new substation for 10 years
Tools: Conservation and demand response

Specific tools in our toolbox

- **Conservation** lowers energy use year-round
- **Demand response** reduces demand specifically during peak periods

Example Home - Morning warm-up Profile
Our programs will support you to...

**Conserve** by lowering energy use year-round

Source: Energy.gov

Reduce demand during peak periods with **Demand Response**

Source: Energy.gov

Sources: hotwater.com, rheem.com, sandenwaterheater.com
Hitting the road: what’s next

Request for Proposals for program implementers:

• Contractor network
• Bulk pricing benefits (equipment)

• Demand response software/hardware provider using the following potential areas:
  ✓ Heating systems (via smart thermostats)
  ✓ Water heaters
  ✓ Behavior

Programs to launch: mid-2020 based on RFP responses, demand response may take a bit longer (IT and software take longer to deploy)
What you can do now

Visit pse.com/rebates to:

• Sign up for a Home Energy Assessment if you haven’t had one

• Learn about current rebates and offerings

• Call an Energy Advisor to tips and ideas: 1-800-562-1482
Questions
Voluntary Renewables

Heather Mulligan
Manager Customer Energy Renewable Programs
Providing Customers with Renewable Energy Options

## Retail Renewable Energy

### GREEN POWER
- SCH 135, 136
- PNW REC purchases
- 60,000 customers
- Residential, commercial, municipal

### SOLAR CHOICE
- SCH 135
- Solar RECs WA and ID
- 7,900 customers
- Residential and small commercial

### BULK REC PURCHASES
- Excess PSE wind RECs
- 10,000,000 kWh
- 1-2 Large business Participants

### GREEN DIRECT
- SCH 139
- Long-term partnership with PSE for dedicated energy resources
- Launched 2017
- Large commercial, municipal
- 287 MW of Wind and Solar

## Customer Generation

### NET METERING
- SCH 150, 152
- Up to 100 kW
- Full retail compensation
- ~9,300 customers; 78 MW
- Residential, commercial, municipal, community solar

### SMALL POWER PRODUCERS
- SCH 91, 152
- 100 kW – 5 MW
- 15 year pricing based on avoided cost
- Small developers

### GREEN DIRECT
- SCH 139
- Long-term partnership with PSE for dedicated energy resources
- Launched 2017
- Large commercial, municipal
- 287 MW of Wind and Solar

### SOLAR CHOICE
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- Solar RECs WA and ID
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### BULK REC PURCHASES
- Excess PSE wind RECs
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### GREEN POWER
- SCH 135, 136
- PNW REC purchases
- 60,000 customers
- Residential, commercial, municipal
Green Power Program

+ Allows customers to match a portion or all of their electricity with renewable energy.

+ Open to residential and commercial customers.

+ Costs an additional 1 cent per kWh.

+ Supports independent, renewable energy producers.

+ Focused primarily in the pacific northwest.
Green Power Supply

+ Wind – 50%
+ Solar – 34%
+ Livestock methane – 8%
+ Landfill Gas – 2%
+ Low Impact Hydro – 5%
+ Geothermal – 1%

+ **Washington State Definition:** Electricit y generated from sources that replenish themselves naturally with little, if any, pollution or negative environmental impacts.
Solar Choice

+ Allows customers to match a portion of their electricity with solar energy.

+ Open to residential and commercial customers.

+ Costs an additional $5 per 150kWh.
Solar Grants for Low-Income Housing and Community Services

+ Awarded $815K in 2018 & 2019 for 8 agencies and 10 sites
Eligible Customers are commercial customers with aggregate load of 10M kWh, annually; or municipal, county, state or federal institutions.
Green Direct Participants

Phase 1 Participants

City of Kirkland

Phase 2 Participants

PSE

"PSE's Green Direct project is entirely consistent with our climate goals: to take bold steps that will cut our climate footprint and benefit generations to come."
—Dow Constantine, King County Executive

"PSE’s Green Direct tariff directly benefits Washington, is a pioneering model for utilities nationwide, and supports REI’s success in continuing to operate 100 percent on renewable electricity."
—John Salmen, REI Divisional Vice President of Sustainability

"Signing on to use renewable energy through the Green Direct program is an all-around Win for T-Mobile."
—Mike Sievert, President and COO of T-Mobile
Questions
Community Solar
Product Overview

Therese Mirana-Blackney
Manager New Products and Services
Community Solar in Washington

• Under current Washington law, PSE already facilitates the administration of third-party-led Community Solar projects that take two pathways:
  o A PSE customer acts as site host, interconnecting solar behind the meter
  o A Community Solar Project Developer interconnects solar in front of the meter on the PSE distribution system
• This presentation focuses on the opportunity to develop a PSE-led Community Solar program, where PSE is the program administrator and operator
Renewable products portfolio goals

- Provide **clean energy options** for customers
- Improve **customer experience** by meeting customer needs now and in the future
- Partner with **communities** in PSE’s territory
- Support **carbon reduction and clean electricity strategy** by adding voluntary and portfolio renewable resources
- Enable **low-income customers to share in the benefits** of renewables
Community Solar overview

**Challenge**
PSE customers want to support solar development, but many face barriers to rooftop solar – including lack of home ownership, high up-front cost, and rooftop suitability. There is a gap in offerings for these customers to support new, local projects and allow them to receive in the benefits.

**Solution**
Community Solar allows customers to share in the costs and benefits of new solar capacity in PSE’s territory. Customers pay a monthly subscription to cover the costs of a local solar array. They see financial benefits in the form of avoided energy credits (and state incentives where applicable).

**Target customers**
1) Customer who face barriers to rooftop solar, yet want to support solar development in WA
2) Low-income customers who have been unable to share in the benefits of the clean energy transition

**Key benefits**
- **Customer choice** - Provide clean products options for customers, meet demand for a program that support new, local solar
- **Community benefit** – Provide a financial and administrative pathway for communities to see solar developed locally
- **Equity** – Allow low-income customers to share in solar benefits
- **Carbon reduction** – Provide clean energy to PSE customers
Preliminary product design

- New, local solar capacity in PSE’s electric service territory
- Subscription model (rather than up-front payment model)
- Customer can purchase multiple blocks
- Customers sign year-long commitment
- 8-year program length
- Portion of discounted subscriptions dedicated for low-income customers
- Available to commercial and residential customers
Low-income option

- Community Solar expands access to solar beyond customers who are able to invest in rooftop solar by removing barriers:
  - up-front cost
  - roof suitability
  - home ownership
- Subscription fee could still be a barrier for low-income customers.
- Reducing the subscription fee to provide bill savings for low-income customers requires an additional source of funding.
- This will expand bill savings benefits to customers with a high energy burden.
Launching a community solar program is best supported through a proactive approach to bringing distributed resources online.

**Community-located sites** –
Release RFI for municipal or tribal rooftops/land, bundle and release RFP for development
* RFI sites could have PPA or be PSE-owned

**Larger distributed sites** –
Leverage project(s) in development in Kittitas County (5MW)
* Larger sites could be Schedule 91 (PURPA small generators) or PSE-owned
Community-located projects

PSE has taken a proactive approach to finding optimal solar sites in communities across its service territory, with a goal of having communities help identify potential sites.

- Release an RFI to public entities in PSE’s service territory to find community-located solar sites
- Evaluate RFI sites received for system cost / benefit, community value, solar viability, and more
- Select a package of solar sites for development, work closely with communities to build a path to development
- When the community-sited projects come online, use the energy to feed the Community Solar product

Timeline:
- Oct 2019: Release an RFI
- Early 2020: Evaluate RFI sites
- Mid 2020: Select a package of solar sites
- Late 2020: When the projects come online
Questions
Joint Meeting PSE, CCAC and UAC

February 3rd 2020
Climate Change Advisory Committee (CCAC)

Established 2017 (9 members)

Advises City Council on actions to:
- Reduce greenhouse gas emissions
- Prepare residents, businesses and community for climate impacts
- Increase community awareness of climate impacts and individual actions

Tasked with developing Climate Action Plan
Climate Action Plan Development Process

1. Complete Climate Assessment
2. Complete Greenhouse Gas Inventory
3. Develop Climate Action Plan
4. Implement Climate Action Plan
5. Monitor Progress

Leadership Commitment
Sea Level Rise on Bainbridge Island
A Preliminary Assessment

https://www.bainbridgewa.gov/922/Climate-Change-Advisory-Committee

Prepared by
James Rufo-Hill
Electricity, 53%

Transportation, 34%

Waste, 5%

Propane, 2%

HFCs, 5%

Source: Cascadia Consulting Group Inc
Three Community Workshops/Survey
Concern about all impacts, especially water & wildfires (450 Respondents)

- Increase in Temperatures
- Sea Level Rise
- Water quantity/water quality
- Wildfire and Smoke

- High
- Medium
- Low
Two Type of Actions

Mitigation
Reducing greenhouse gas emissions and atmospheric greenhouse gas concentrations
(Addressing the root cause to stop it from becoming worse)

Adaptation
Preparing for, responding to or recovering from the effects of increased greenhouse gas concentrations in the atmosphere
(Addressing current the effects and future effects based on past emissions)
Mitigation Goal

By 2040, reduce Bainbridge Island’s GHG emissions by 90% compared to 2014 levels

Interim targets:
Reduce emissions by 25% by 2023 (compared to 2014)
Reduce emissions by 60% by 2033 (compared to 2014)
Reductions Needed to Meet Targets

Metric Tons of CO₂ Equivalents

- 214,000 (baseline) in 2014
- 234,000 in 2018
- 161,000 in 2023
- 86,000 in 2033
- 21,000 in 2040
Adaptation Goal
Bainbridge Island is climate savvy, and can withstand the impacts of climate change.

Community Engagement Goal
COBI inspires action across the community and partners with local/regional organizations to take meaningful climate change mitigation/adaptation actions.
Climate Action Plan: Six Focus Areas

1. Energy
2. Buildings
3. Transportation
4. Waste
5. Natural Environment
6. Community Engagement
Purpose of Meeting Tonight

Study session to discuss issues that are important for the Climate Change Advisory Committee (CCAC) to understand as they develop the Climate Action Plan (CAP) and for the Utilities Advisory Committee (UAC) as do their work.