Northwest **Power** and **Conservation** Council

July 5, 2017

MEMORANDUM

TO: **Council members**

FROM: **Elizabeth Osborne**

SUBJECT: **Presentation by Jessica Matlock, Director, Government & External Affairs, Snohomish County Public Utility District**

BACKGROUND:

Presenter: Jessica Matlock, Director, Government & External Affairs

Summary: Jessica Matlock will present on Snohomish PUD's actions to advance innovative energy technology, including examining the potential of electric vehicles and hydropower run-of-the-river development, and research and development activities related to energy storage and microgrids, solar, and vehicles-to-grid technologies.

Relevance: Snohomish County PUD serves more than 340,000 customers over a 2,200 square mile service area. Its peak load is around 1400 MW.

Background: Jessica Matlock joined Snohomish County PUD in August 2006. She previously worked in energy and natural resources at the federal level and held a number of government relations positions with the Bonneville Power Administration.

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SNOHOMISH COUNTY PUD
PUBLIC UTILITY DISTRICT NO. 1

Opportunities and Advancing New Technologies

Jessica Matlock
Director, Government & External Affairs

July 12, 2017

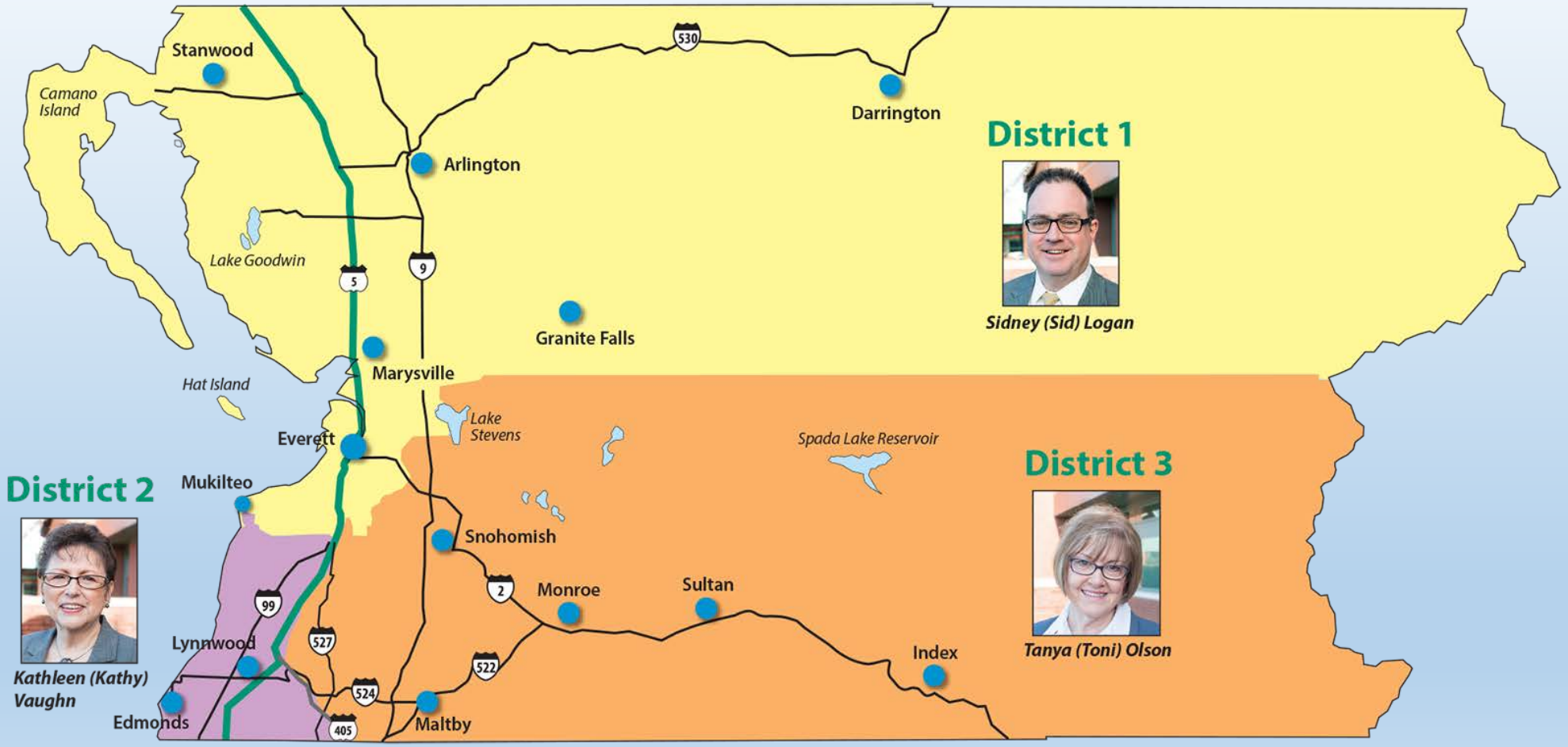
Who are we?

- Began operations in 1949 following a public vote
- Second largest public utility in the Northwest
- Twelfth largest public utility in the U.S.
- Bonneville Power Administration's largest power customer
- 341,000 customers & growing
- 2,200 square mile service territory
- 6,200 mile network of distribution lines

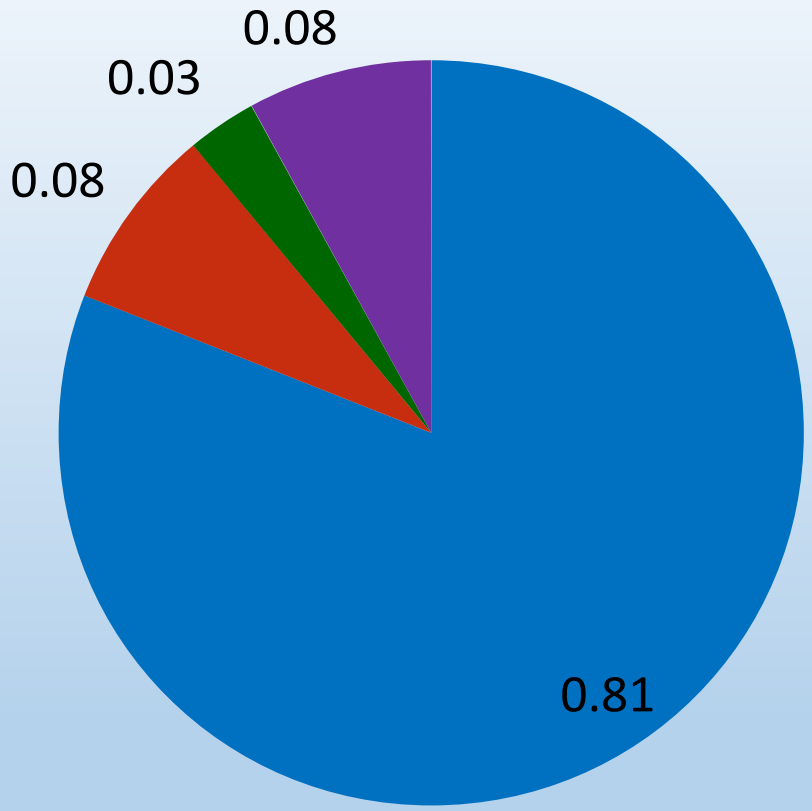
Where are we?


Stanwood Office
Arlington Office
PUD Everett Headquarters
Water Operations Facility
Woods Creek Project
Jackson Hydroelectric Project
Snohomish Office
Operations Center
Monroe Office
Lynnwood Office
Youngs Creek Project
Seattle
Washington

Locally elected Board of Commissioners



Our power supply is ~90% Hydro



BPA Hydro

PUD Hydro

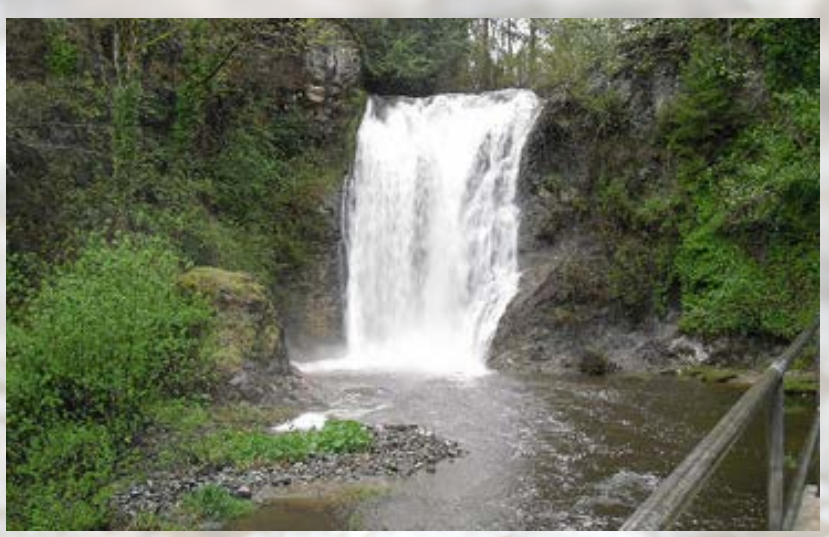
Wind

Landfill Gas, Biomass,
Solar, Market Purchases

A portion of the PUD's renewable energy attributes may be sold to fund other renewable energy research and development.

Hydropower

Henry M. Jackson Hydroelectric Project (112 MW)



Woods Creek Hydroelectric Project (nameplate capacity of 0.65 MW)

Youngs Creek Hydroelectric Project (7.5 MW)

Calligan Creek & Hancock Creek Hydroelectric Projects (6 MW each, under construction)

What do customers want?

- Major companies and many small businesses are shifting to renewables for corporate branding
- Large energy buyers want to work constructively with their utilities to reduce greenhouse gases (GHGs) through cost-effective renewable energy sources
- Want more control over their energy source
- Looking for ways to address carbon in their own lifestyles but with the help of their energy provider

Forbes

“Corporate demand for renewable energy could rock the grid” – June 21, 2016

“Facebook and Microsoft are among 60 companies and over 50 leading project developers and service providers participating in a new network, the Renewable Energy Buyers Alliance, known as REBA, that aims to break down barriers to lower-carbon energy. The alliance aims to see *60 gigawatts* – the same amount of total generating capacity of *Turkey* — of renewable energy deployed in the U.S. by 2025. That’s a huge jump from the *3 gigawatts* of renewable power purchases companies signed in 2015, which was about *triple* the amount from the previous year.”

Global Commitments to 100% Renewable Energy by 65 Firms

The Opportunity

- Redesign solar program
- Create electric vehicle program
- R& D Energy Storage
- Create demand response program

Goal For New Solar Program

Allow all of our customers to participate in a solar program

Maintain the relationship between our solar facility and the customer

Provide options for customers to support renewable energy

Solar Energy Program

People that still build their own solar get to sell back their power via schedule 90 which includes a premium for RECs, but aligns our rate with when we need it

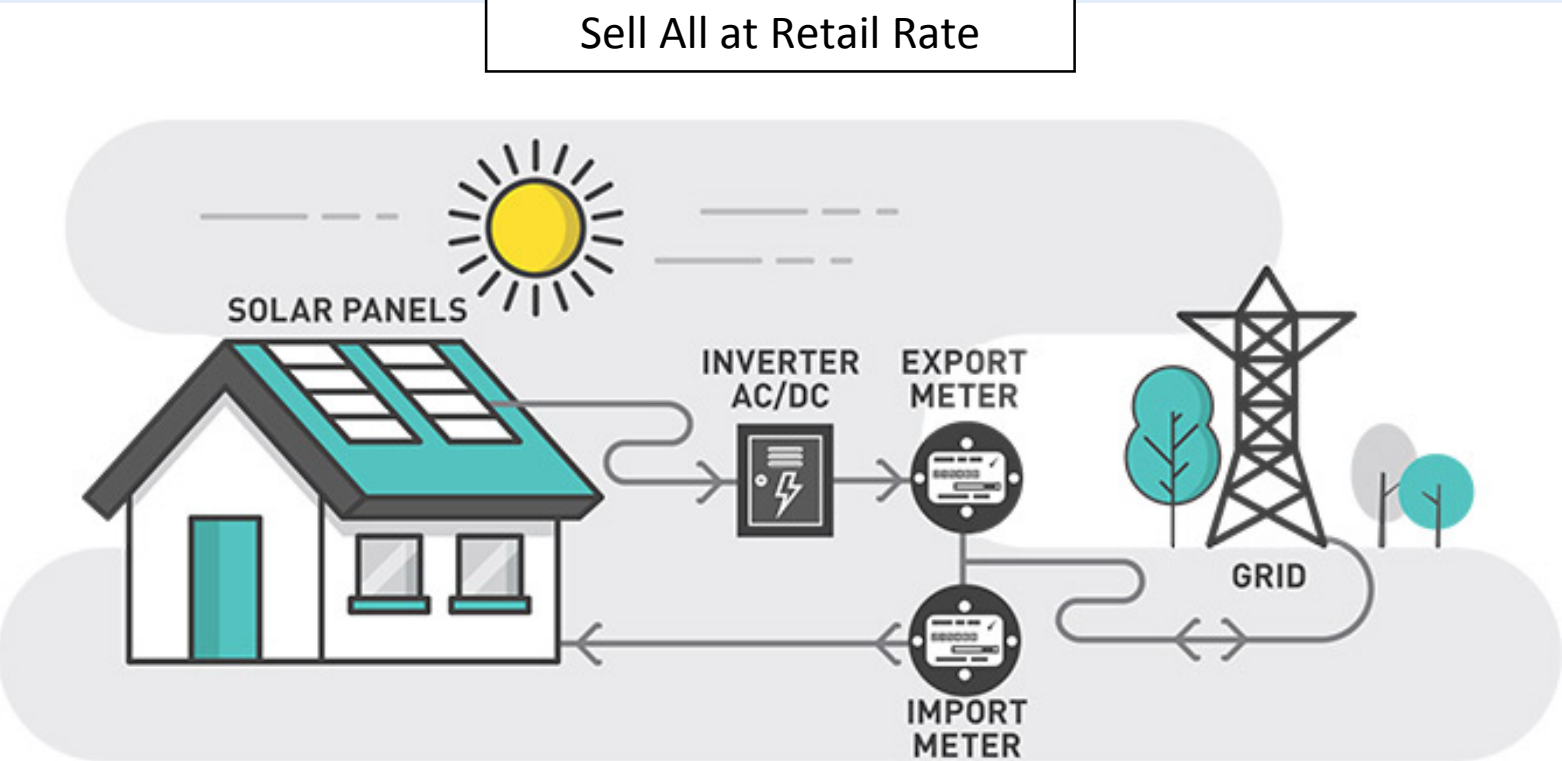
Renewable Blocks – allows customers to buy into “renewable energy” on a monthly/yearly basis

Solar shares – pay to rent a share of a solar panel for the life of that panel

- $160/share to rent the share for the life of the panel (approx. 25 years)
- Purpose of program is to offer participation into a solar program for all customers, it is not to reduce energy bills

Proposed Schedule 90 Construct

Buy All at Sch. 90
Sell All at Retail Rate



Goal For Electric Vehicle Program

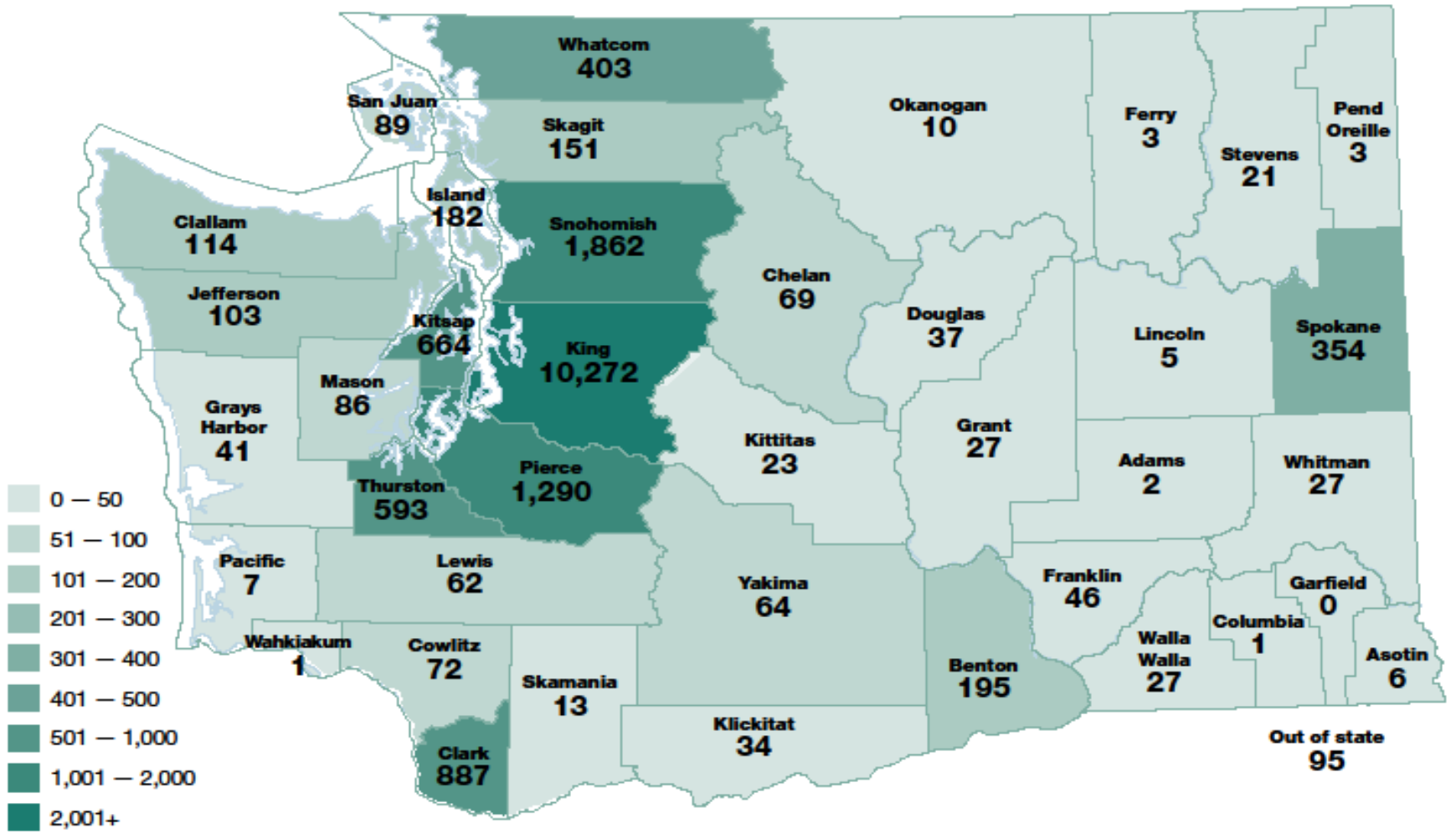
Find most effective way to encourage adoption of EV's that provide value for all customers

Strategic type/placement of charging stations (home or commercial)

Manage EV charging to avoid PUD's energy peaks

17,941 Plug In Electric Vehicles Registered in Washington

As of June 30, 2016



Map includes Electric Vehicles (EVs) produced by major automakers since about 2011. It does not include cars that were converted to EVs by their owners, neighborhood Evs or EV models from the 1990's that are still registered in Washington, or motorcycles. WSDOT created this map based on data provided by the Washington State Department of Licensing.

16-09-0506

Gathering the data…

Joined the Pacific Northwest Utility Electrification Collaborative

- Snohomish PUD, Seattle City Light, Tacoma Power, Chelan PUD and Puget Sound Energy

Hired Energy and Environmental Economics (E3) Study to evaluate the economic impacts of transportation electrification in the Pacific Northwest

*Utility customer costs and benefits

*Regional costs and benefits (across transportation and electric systems)

*Electric system impacts

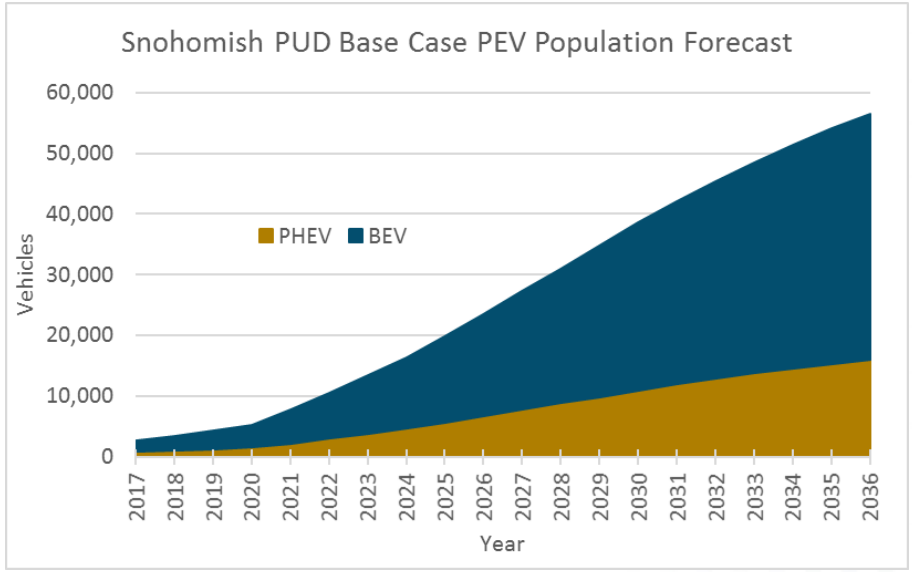
*Numerous scenarios re: EV adoption rates, gas prices, carbon values, energy prices, EV costs, etc.

Case Studies: Snohomish PUC, Seattle, Tacoma, Chelan and Puget Sound Energy

Final report provided on March 15, 2017

Snohomish County PEV Population

- **Population forecast methodology:**
  - Base WA forecast
  - Current service territory sales as share of WA
  - Adjust share according to county population growth rates
- **57k PEVs by 2036**
- **PEV sales reach 8% of Snohomish County LDV sales by 2030**



Conclusions

- ✓ **Study shows significant benefits of electric vehicle adoption**
  - Each passenger vehicle added provides $1,070 in value to our customer base
  - If the vehicle's charging is managed (taken off peak), that value increases to $2,676 per vehicle
  - EV adoptions in our service area is projected to reduce CO2 emissions by 900,000 tons

- ✓ **If spread <u>evenly</u>, distribution system impacts appear manageable**

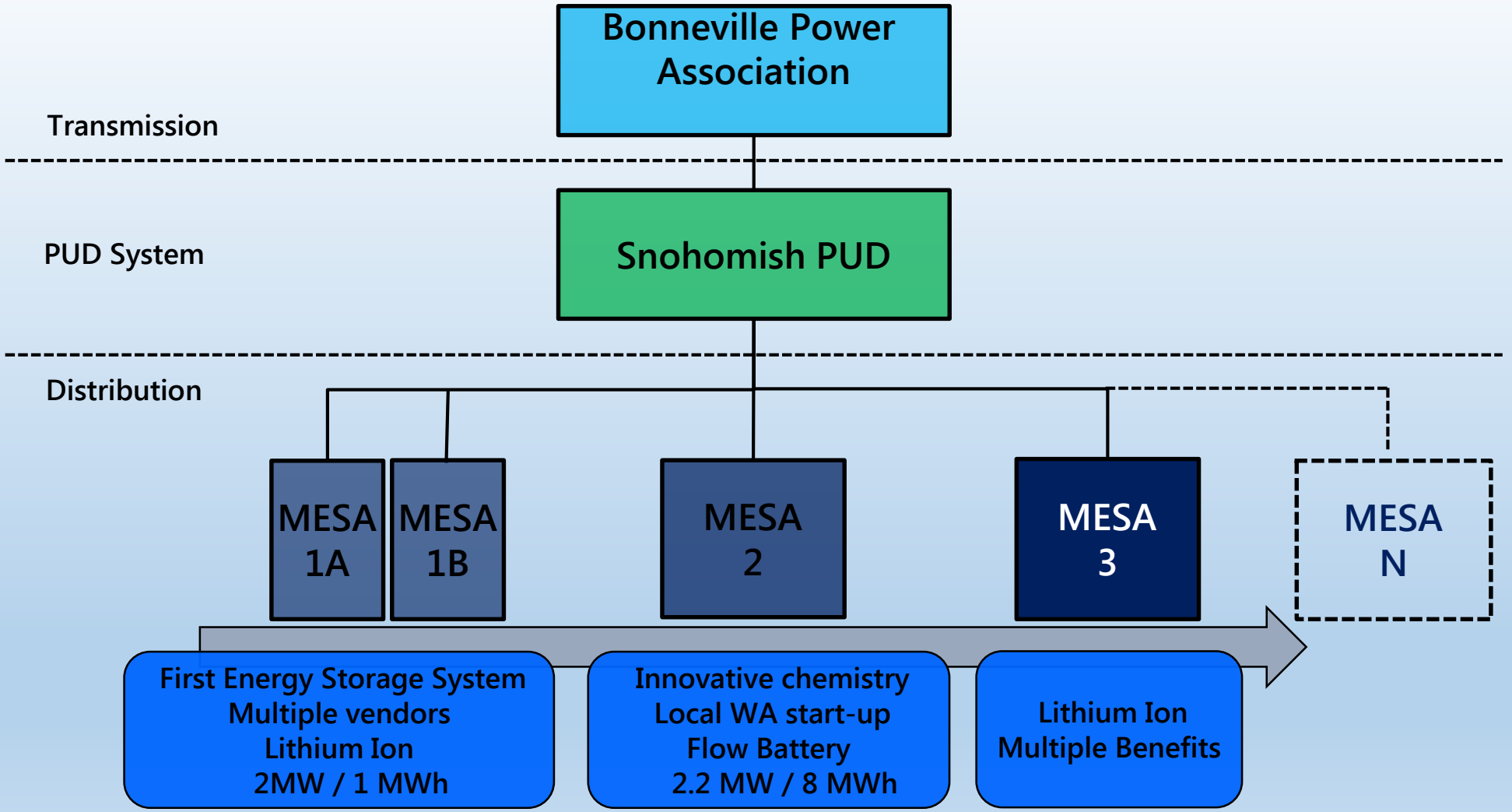
Next Steps on Electric Vehicle Program

- Begin consideration of program opportunities (e.g., public charging, home charging, smart charging, busses, forklifts, make-ready stations, etc.)
- Stay closely engaged with PNW Collaborative
  - Policy issues
  - Program design considerations
  - Complimentary approaches
- Develop better understanding of potential local distribution impacts
- Learn through pilot programs and regional collaboration
- Continue to engage our customers to understand their interests

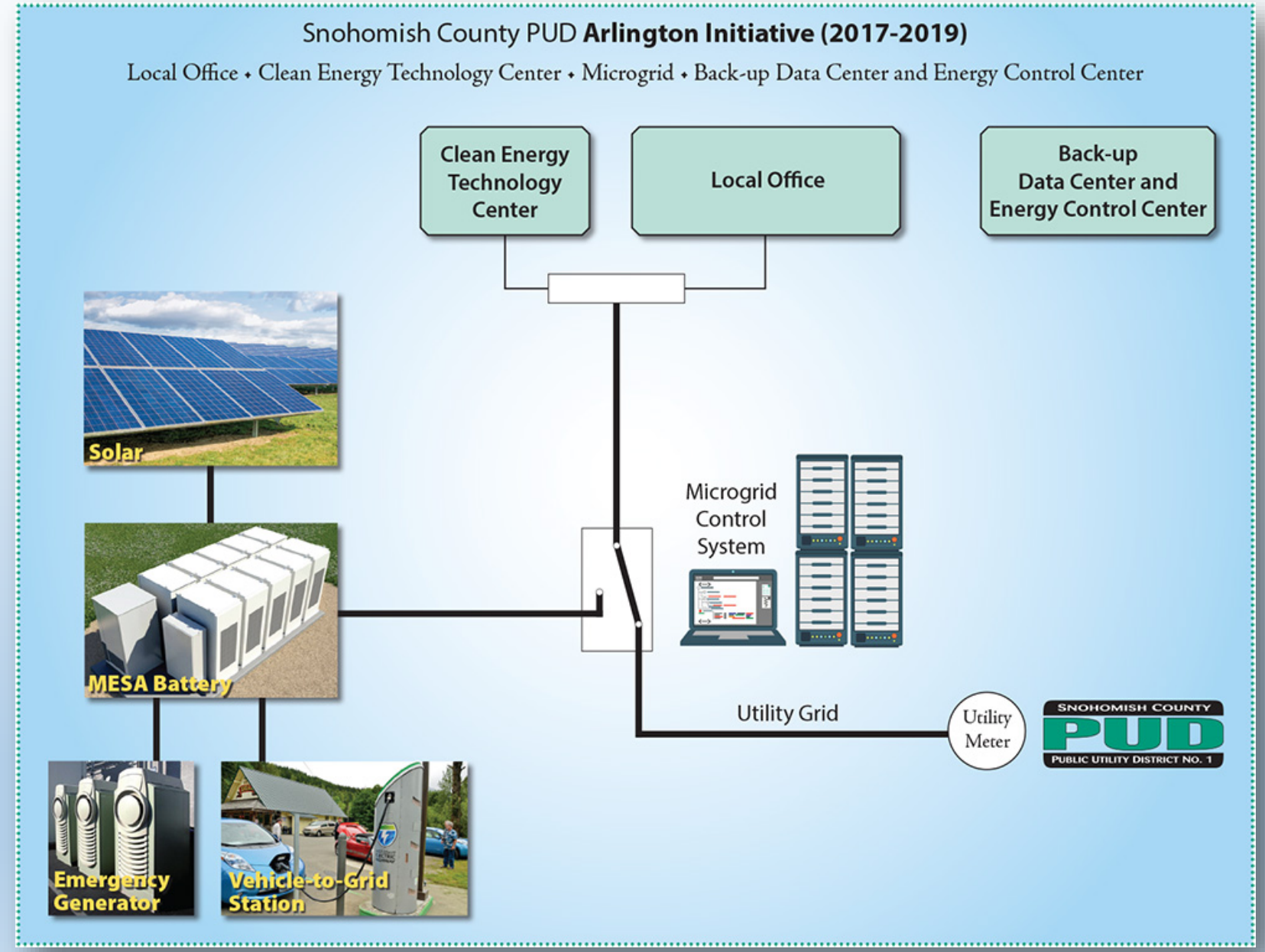
Goal For Energy Storage Program

- Provide Grid Support & Ancillary Services
- Renewable Energy Integration
- Microgrid Grid Resiliency
- Test Modular Energy Storage Architecture (MESA)

Energy Storage Portfolio



Arlington Microgrid



Arlington Microgrid Goals

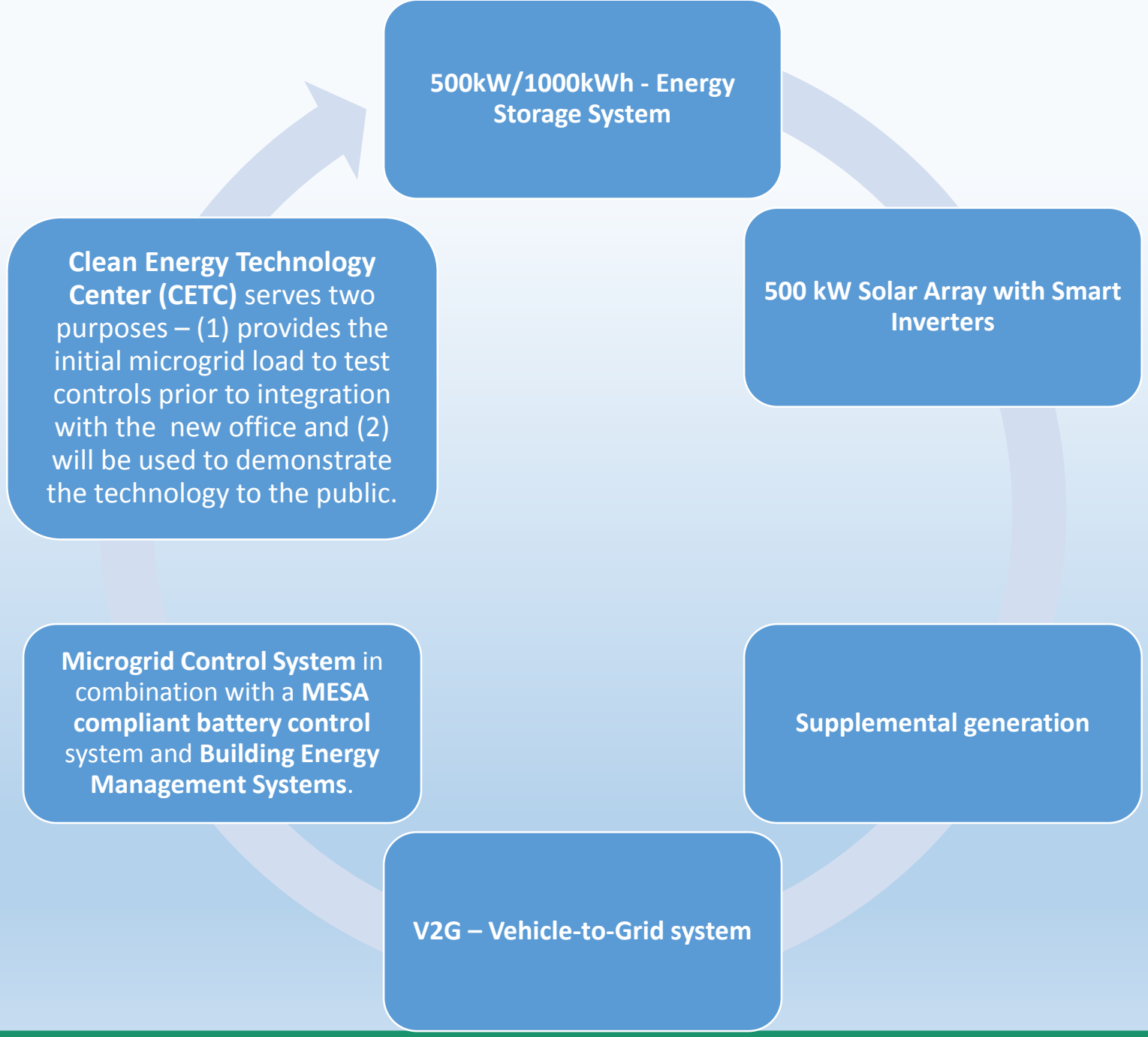
Grid Resiliency and Disaster recovery – Battery and Solar Array sized to provide back-up power to the Clean Energy Technology Center (CETC) and the new Arlington Local Office (not the Data Center).

Renewable Energy Integration - During normal operation – the battery will be used to demonstrate improved integration of an intermittent renewable energy resource with the PUD's distribution system.

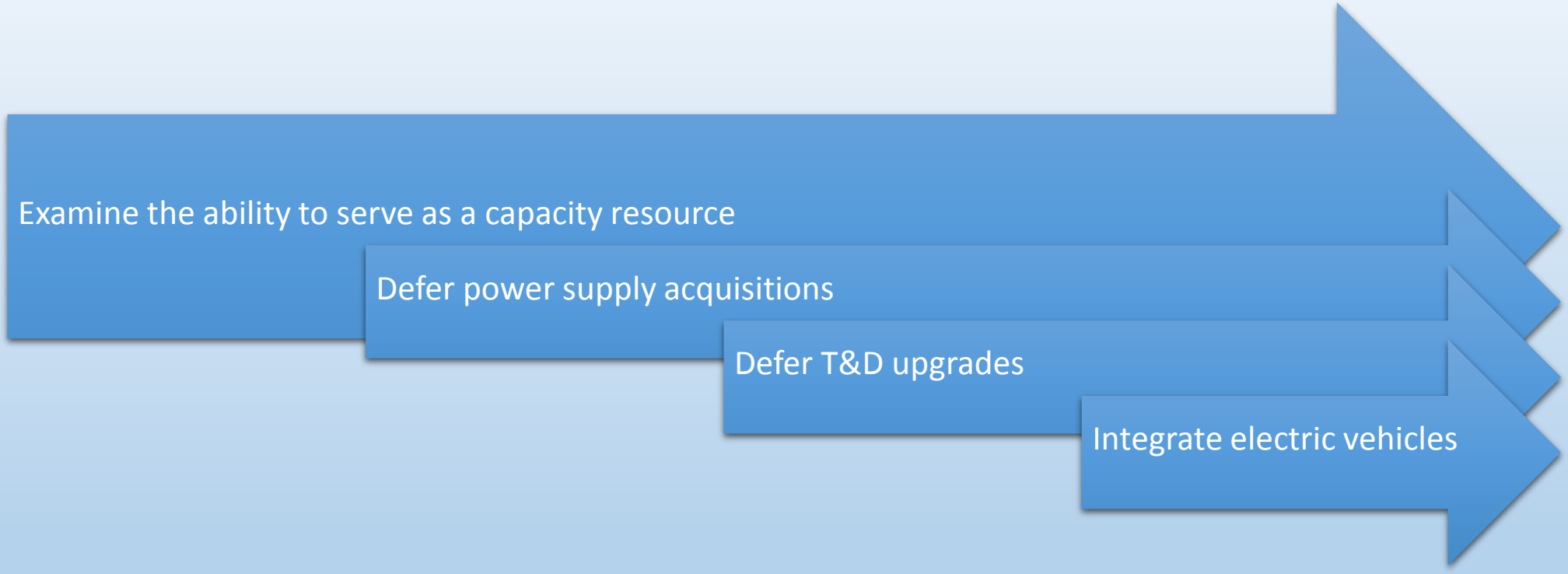
Grid Support and Ancillary Services – The system will be connected to the PUD's other two energy storage systems via the DERO (Distributed Energy Resource Optimizer). This will allow the battery to be called upon to provide grid support when it is not being used for either of the above two uses.

The V2G (Vehicle-to-Grid) – This component will help to demonstrate the rapidly growing interest in electric vehicle battery storage systems to assist with actively contributing to the distribution system.

Microgrid Components



Goal for Demand Response Program



Team PUD

Customer Experience

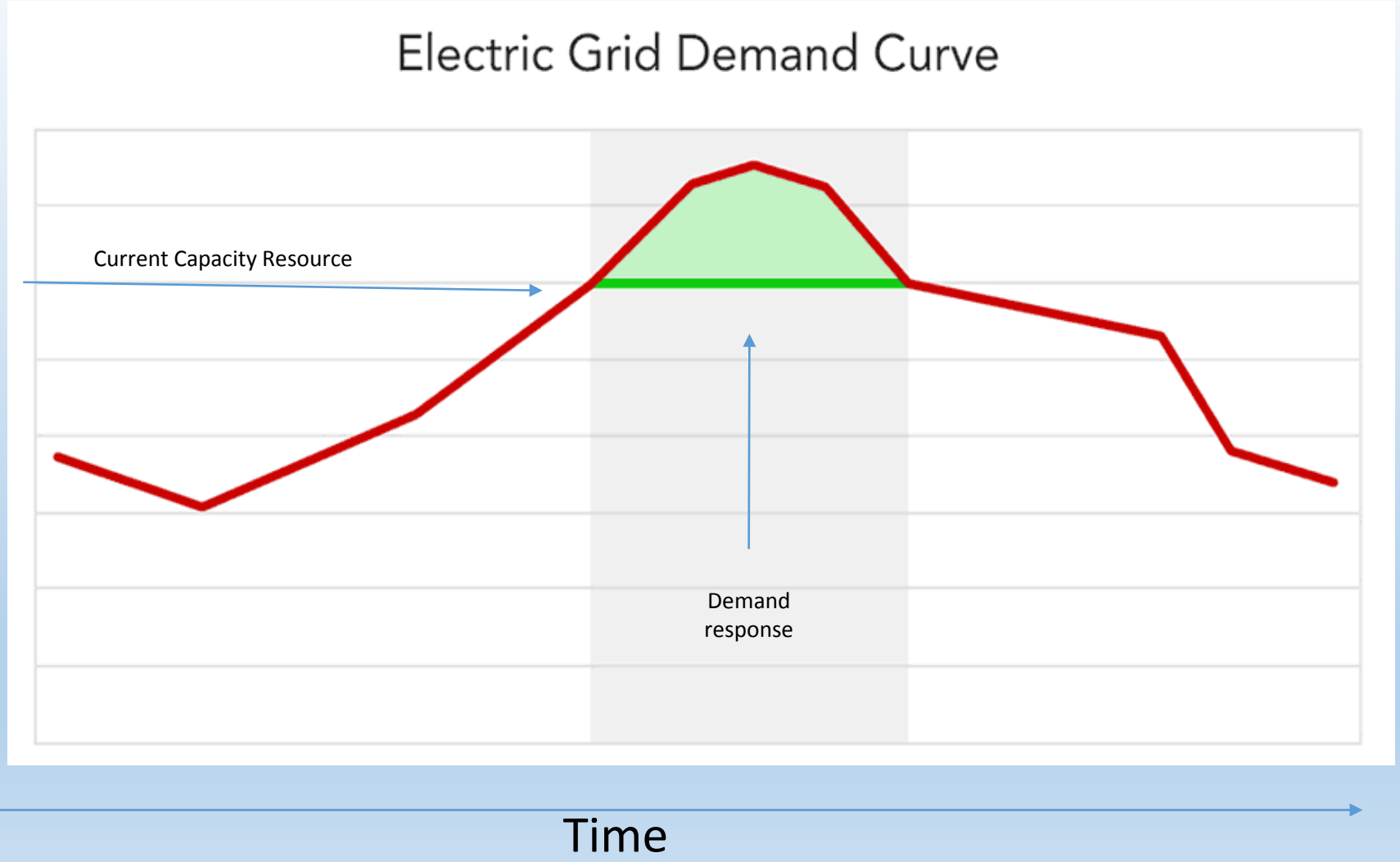
Delivering Now & For the Future

Responsible Cost & Fiscal Management

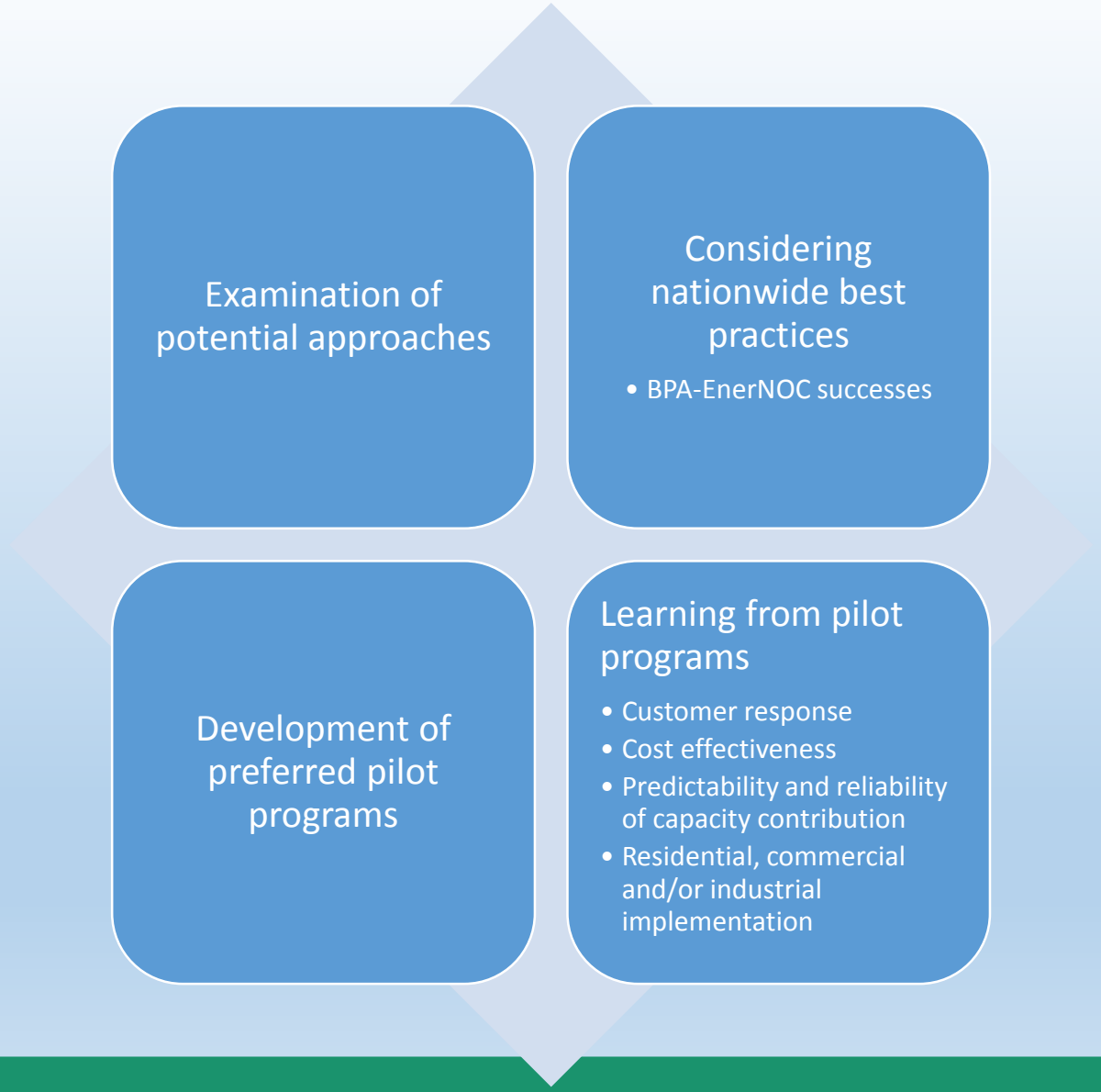
Continual Improvement

Commitment to EXCELLENCE

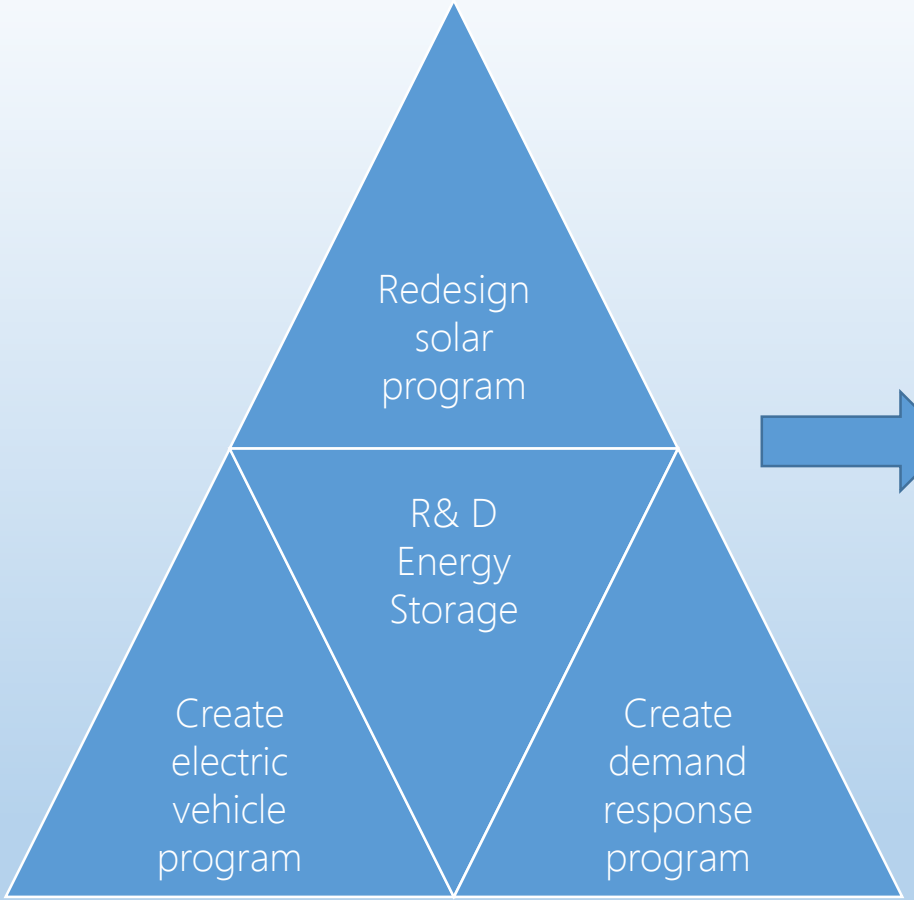
Demand Response Opportunity



Demand Response Strategy



The Opportunity




Research and develop new technologies


Build new partnerships with various industries


Test out equipment and software

Engage in these technologies to provide greater economic benefits to our customers

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Thank you

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