

Potential PUD Remedies for Westend Resiliency

2/13/2023



Potential Westend Resiliency Projects

- Current contract constraints preclude large generation projects until post 2028
- Single utility and customer projects up to 200 KW are feasible
- District practice is to collaborate with customers to facilitate and support all customer resilience projects
- With respect to District resilience grants, current strategy is to identify projects most likely to be successful that might align with grant opportunities and windows
 - Sequim Microgrid
 - Diamond Point Overhead to Underground Project
 - Sequim Distribution Scale Battery



Potential Westend Resiliency Projects

- IRA and Resilience Infrastructure Grants may be available to fund 50-70% of design and construction
- Project solutions are very large scale and cost, and will be a challenge to complete during the window of Federal grant availability for such large resiliency projects
 1. New PUD 115KV transmission line between Joyce and Sappho
 2. 20 MW/160 MWh Lithium battery based microgrid
 3. 20 MW of emergency diesel generators
- Westend Loads (2022)
 - Peak Winter load = 31 MW
 - Annual average load = 13.7 aMW
 - Light Summer 24 hour average load = 9.1 aMW



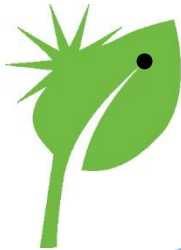
New Transmission Line Planning Estimate

- New 25 mile PUD 115KV transmission line from Joyce to Sappho
- Tie into all existing 115KV lines, from Discovery Bay to Sappho
- Manually or automatically switch on BPA loss of power to either Joyce or Westend
- >95% Capacity Factor
- Design & construction cost estimate \$27 million
- Additional annual O&M \$610,000 per year
- Project life 60 years
- Ancillary benefits might reduce fiber expansion costs to west end on the order of \$2 million for a fiber route under exclusive control of PUD. The line could also be available to facilitate post 2028 generation projects, perhaps bypassing some local BPA lines



Battery Microgrid Planning Estimate

- Centrally located substation with 20 MW 160 MWh battery microgrid to serve west end during BPA outages
- Manually or automatically switch on BPA loss of power
- >90% Capacity Factor. Would not serve all Westend under very cold conditions, nor for some very long outage durations, typically those over 16 hours
- Design & construction cost estimate \$51 million
- Additional annual O&M \$1,000,000 per year
- Project life 30 years (very low utilization)



Battery Microgrid Planning Estimate

- Ancillary benefits might include load shaping to reduce demand charges by up to \$1.4 million per year, with additional implementation cost
- A potential to add a 10 MW utility scale solar post 2028
 - If collocated with the batteries and 50 Acres of land available
 - 1.9 aMW or 2.4% of PUD load
 - \$11 million capital and \$200,000 per year (NREL)
- Could conceivably be used in conjunction with a customer post 2028 projects, including Wind.
- May restrict or limit development of customer net meter systems as summer generation could exceed load



Emergency Generators Planning Estimate

- Centrally located substation and standby diesel generators totaling 20 MW capacity
- Automatically switch on and sectionalize upon loss of BPA loss of power
- >90% Capacity Factor. Would not serve all Westend under very cold conditions
- Design & construction cost estimate \$15.3 million
- Additional annual O&M \$830,000 per year
- Project life 30 years (low utilization)
- A more flexible distributed system is feasible but would substantially increase costs



Financial analysis at 4% cost of capital

	Transmission Line	Battery Microgrid	Standby Generators
NPV	\$39,200,000	\$65,700,000	28,500,000
Life	60 Years	30 Years	30 Years
Annualized Cost	\$1,734,000	\$3,797,000	\$1,649,000
Annualized +30 Year Recapitalization	\$0	\$1,121,000	\$485,000
Rate impact with no grants	2.48%	7.03%	3.03%
Rate impact 70% grants	1.33%	3.35%	1.94%
Chance of success	???	???	???



Questions?

