

**Exh. JES-5
Dockets UE-170033/UG-170034
Witness: Jennifer E. Snyder**

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

**DOCKETS UE-170033 and
UG-170034 (*Consolidated*)**

**EXHIBIT TO
TESTIMONY OF**

Jennifer E. Snyder

**ON BEHALF OF STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

PSE Response to Staff Data Request No. 392

June 30, 2017

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

**Dockets UE-170033 and UG-170034
Puget Sound Energy
2017 General Rate Case**

WUTC STAFF DATA REQUEST NO. 392

WUTC STAFF DATA REQUEST NO. 392:

Please describe in detail PSE's current use of the Glacier battery system. Include the specific grid services the battery system has and/or is providing. Also, identify any services that the battery system has not yet provided but is available to provide, if the need were to arise.

Response:

Puget Sound Energy ("PSE") is currently working through use case testing with the Pacific Northwest National Laboratory ("PNNL") according to Department of Energy ("DOE") protocols. Use cases or grid benefits for battery storage are listed in Table 1 and are being deployed to all three Clean Energy Fund 1 ("CEF 1") grant recipients.

At PSE's Glacier Project, PNNL is studying energy shifting, grid flexibility, distribution deferral, and outage management. This aligns with PSE's expectations that capacity, flexibility, and outage mitigation would be the three value streams to realize at Glacier.

PSE has nearly completed the first round of use case testing. The use cases can be demonstrated in grid-tied mode. To fully evaluate the value of outage management, the capability to provide backup power in islanded mode is required. This has not yet been fully implemented.

Table 1. Use Case Testing for CEF 1 Grant Recipients

Use Case and application as described in PNNL Catalog	Avista	PSE	Sno – MESA1	Sno – MESA2	Sno - Controls Integration
UC1: Energy Shifting					
Energy shifting from peak to off-peak on a daily basis	Y	Y	Y	Y	
System capacity to meet adequacy requirements	Y	Y	Y	Y	
UC2: Provide Grid Flexibility					
Regulation services	Y	Y		Y*	
Load following services	Y	Y		Y*	
Real-world flexibility operation	Y	Y		Y*	
UC3: Improving Distribution Systems Efficiency					
Volt/Var control with local and/or remote information	Y		Y	Y	
Load-shaping service	Y	Y	Y	Y	
Deferment of distribution system upgrade	Y	Y			
UC4: Outage Management of Critical Loads		Y			
UC5: Enhanced Voltage Control					
Volt/Var control with local and/or remote information and during enhanced CVR events	Y				
UC6: Grid-connected and islanded micro-grid operations					
Black Start operation	Y				
Micro-grid operation while grid-connected	Y				
Micro-grid operation in islanded mode	Y				
UC7: Optimal Utilization of Energy Storage	Y	Y			Y