EXH. JM-8
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: JOHN MANNETTI

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-240004** **Docket UG-240005**

SEVENTH EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF

JOHN MANNETTI

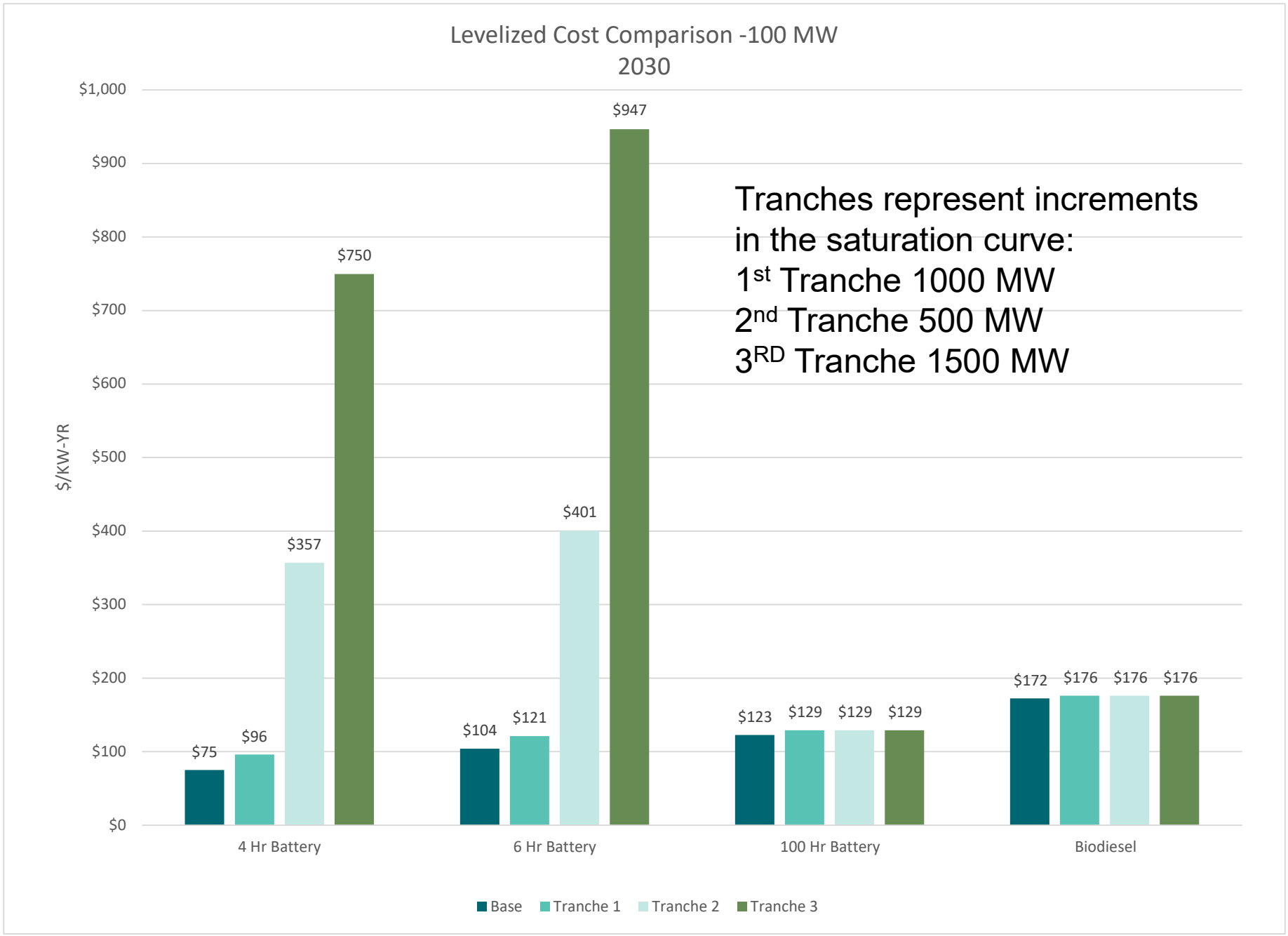
ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 15, 2024

Long Duration Battery

PUGET SOUND ENERGY

Bob Williams


Levelized Cost Comparison -100 MW
2030
$/KW-YR
$1,000
$900
$800
$700
$600
$500
$400
$300
$200
$100
$0
$75
$96
$357
$750
$104
$121
$401
$947
$123
$129
$129
$129
$172
$176
$176
$176
4 Hr Battery
6 Hr Battery
100 Hr Battery
Biodiesel
Base
Tranche 1
Tranche 2
Tranche 3
Tranches represent increments in the saturation curve:
1st Tranche 1000 MW
2nd Tranche 500 MW
3RD Tranche 1500 MW

Saturation Curves

- The effectiveness of batteries to meeting peak need decreases as more batteries decreases as more MW are added to the system represented by the Effective Load carrying Capability (ELCC)

- As an example a 4 hour battery can solve a 4 hour peak event. In this case the battery would have an ELCC of 100%

- The 4 hour battery has the impact of flattening the need but it will not solve those events longer than 4 hours. If it is an 8 hour event then is would require two 4 hour batteries to fill that need. This would have 50% ELCC.

Saturation Curve for Shorter Duration Batteries