Demand Response Pilot

Scott Cooper, Business Customer Energy Solutions Mgr.

Connor Tompkins, Power & Transmission Contracts and BPA Policy Analyst

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Agenda

- Value of Demand Response (DR) to Tacoma Power
- DR Overview
- Customer Overview
- DR Valuation
- Pilot Agreement

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Value of Demand Response to Tacoma Power

CES Strategy

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Commercial & Industrial

- Event Based Shut-Off Demand Response
- Industrial or Commercial Curtailment Program
- Retrocommissioning with Demand Response



Residential

- Direct Load Control Electric Resistance Water Heating
- Connected Residential Thermostats
- Direct Load Control Customer Batteries

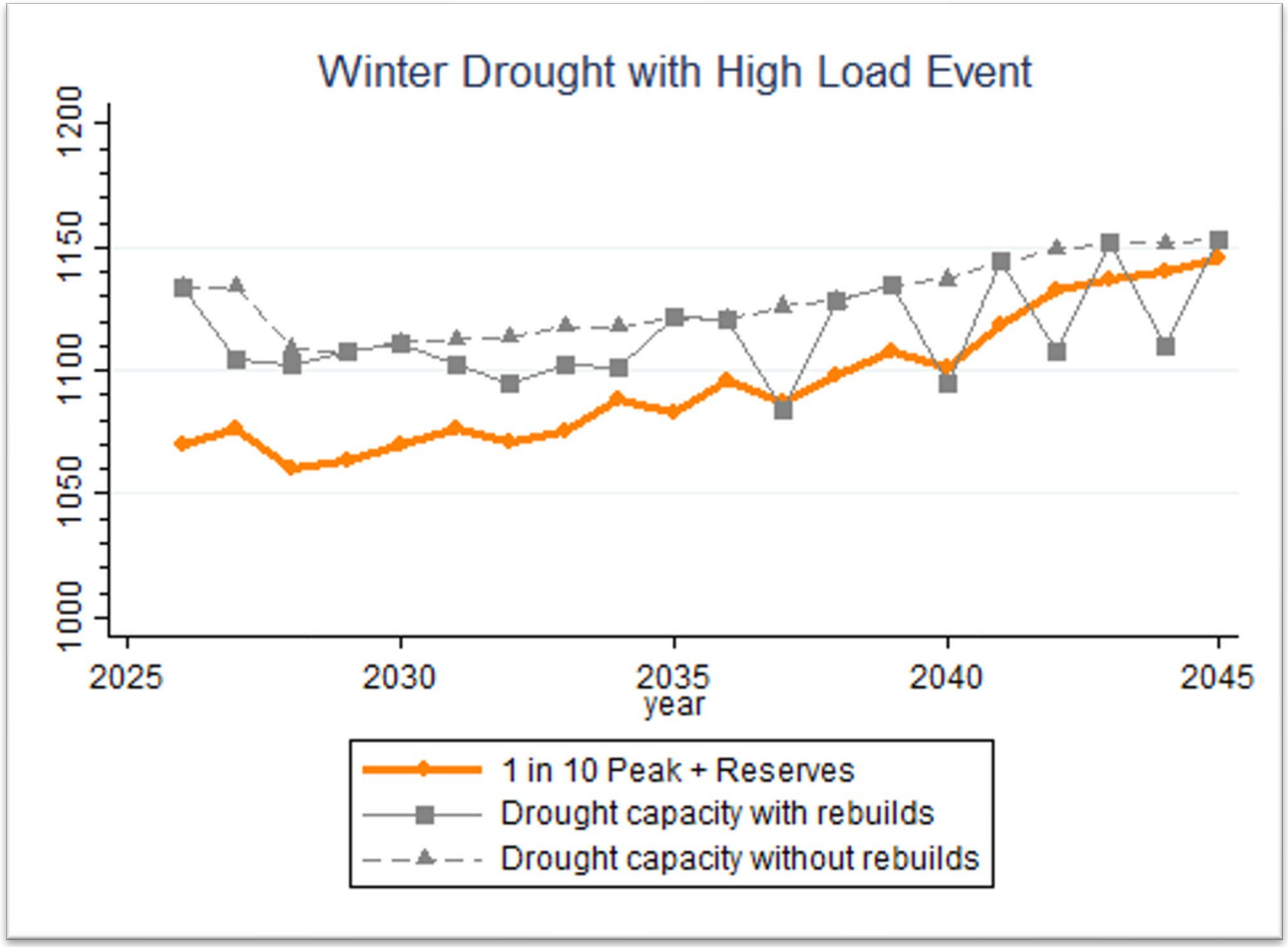


Transportation

- Fleet Direct Load Control Incentives
- Residential Charge Off Peak Synthetic Time-of-Use
- Fleet Charge Off Peak Synthetic Time-of-Use

Value of DR to Tacoma Power

- Strategic alignment
  - 2026 IRP and CEIP
  - Resource Stewardship and Sustainability
- Demand side resource
  - Investing in flexible, deployable, cost-effective resources
- Risk mitigation
  - Cold snaps, unexpected outages, hydropower unit rebuilds, etc.
- Pilot = Practice
  - Real world operations with workable resource, with ability to reevaluate after 2 years



"CEIP" – Clean Energy Implementation Plan, as required by CETA (Clean Energy Transformation Act)

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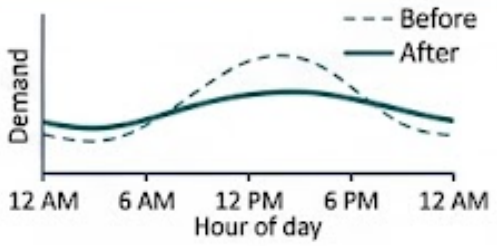
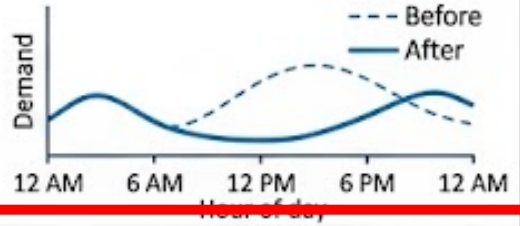
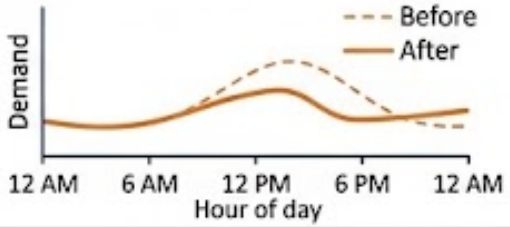
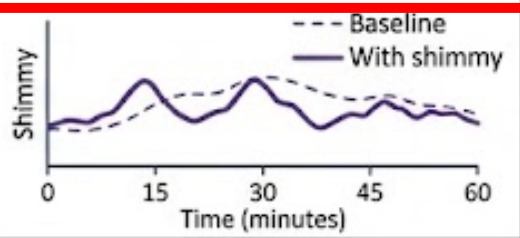
Demand Response Introduction

Demand Response Concept

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	Demand	Capacity	Result
Airline Example	**80 people** show up for a flight	**70 people**	The airline pays **10 travelers** **to not fly**
Utility Example	**80 MW**	**70 MW**	The utility pays **consumers** **to not use 10 MW**

Peak Load Management Profiles

Profile	Target Demand Graph	Power Utility Example	Airline Example
Shape Long-term load profile changes		Time varying rates (Time-of-use, Critical Peak Pricing)	Use of peak pricing to encourage off-peak travel
Shift Move load to another time		Utility directly controls devices to reduce load for a limited time	Moves passengers from one flight to the next
Shed Reduce load when needed		Non-critical curtailment (mostly industrial, fuel switching)	Offers cash, hotel and meal credits to not fly
Shimmy Rapid, dynamic adjustments		Utility can use direct control to provide ancillary services (voltage support, frequency response, etc.)	Don't want shimmy on an airplane ☺

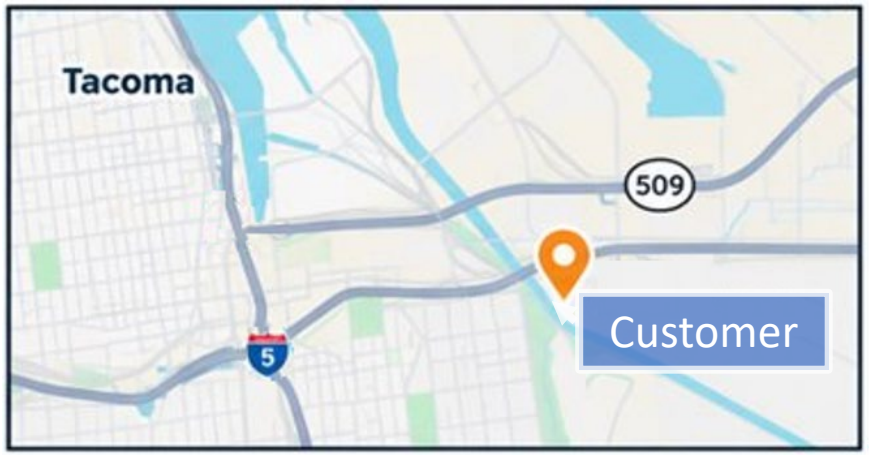
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Customer Overview

A long-established industrial customer in Tacoma



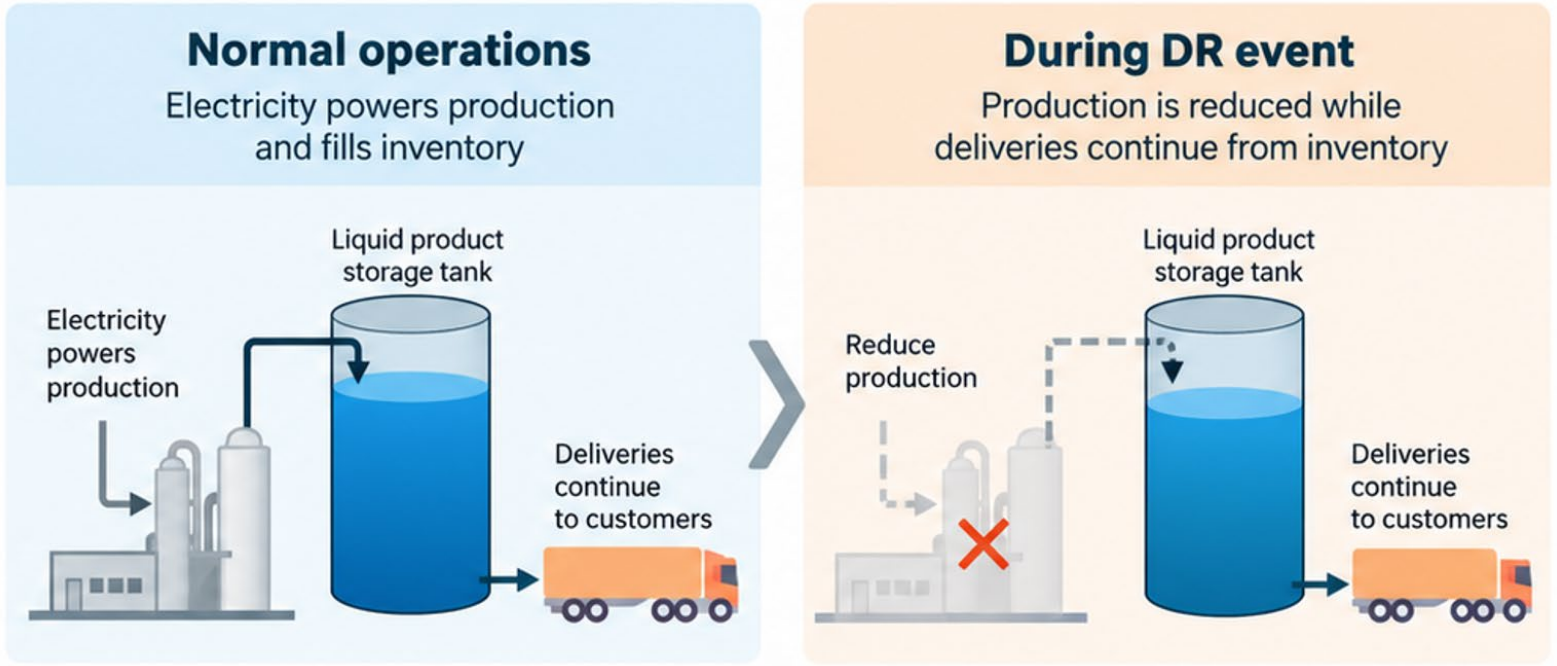
- **What they do**
  - Produce liquid nitrogen, oxygen and argon
  - Electricity-intensive industrial process
  - Operates continuously, 24/7
- **Tacoma relationship**
  - Tacoma Power customer since 1978
  - Facility expansion in 2009



Why this customer is a strong DR pilot partner

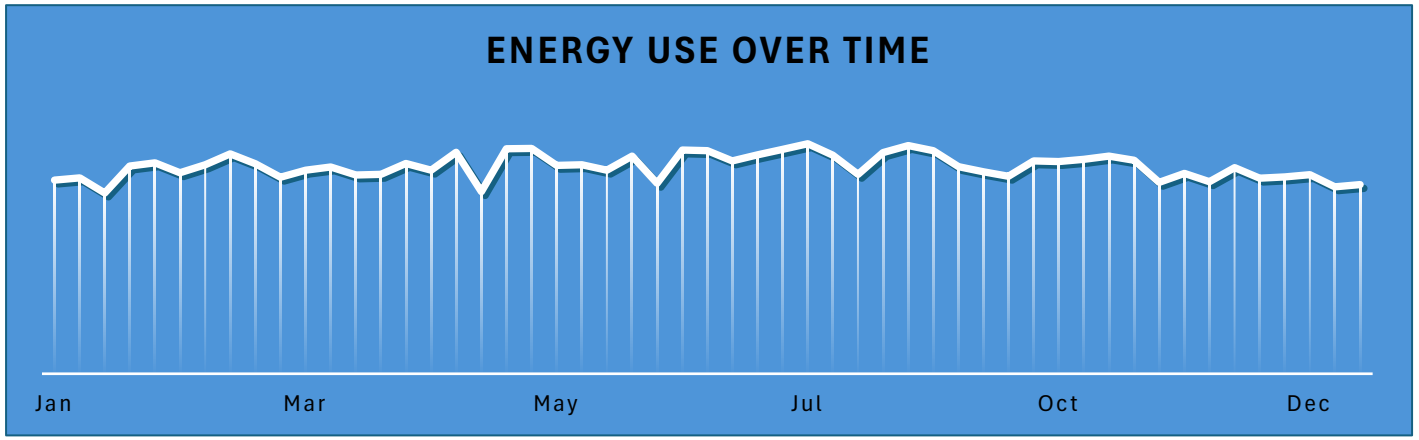
Existing storage creates flexibility

- Liquid products stored on-site
- Storage tank acts as a battery
- During a DR event, production can be reduced
- Customer deliveries can continue from inventory



Large and Predictable load

- Facility operates 24/7/365
- Consistent electricity use improves dispatch confidence
- Pilot helps Tacoma test reliable industrial DR at scale



What 10+ MW of demand response means for Tacoma

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Illustrative scale

10+ MW
Demand reduction capability

~360+ MWh
Equivalent load shifted across a 36 hour event

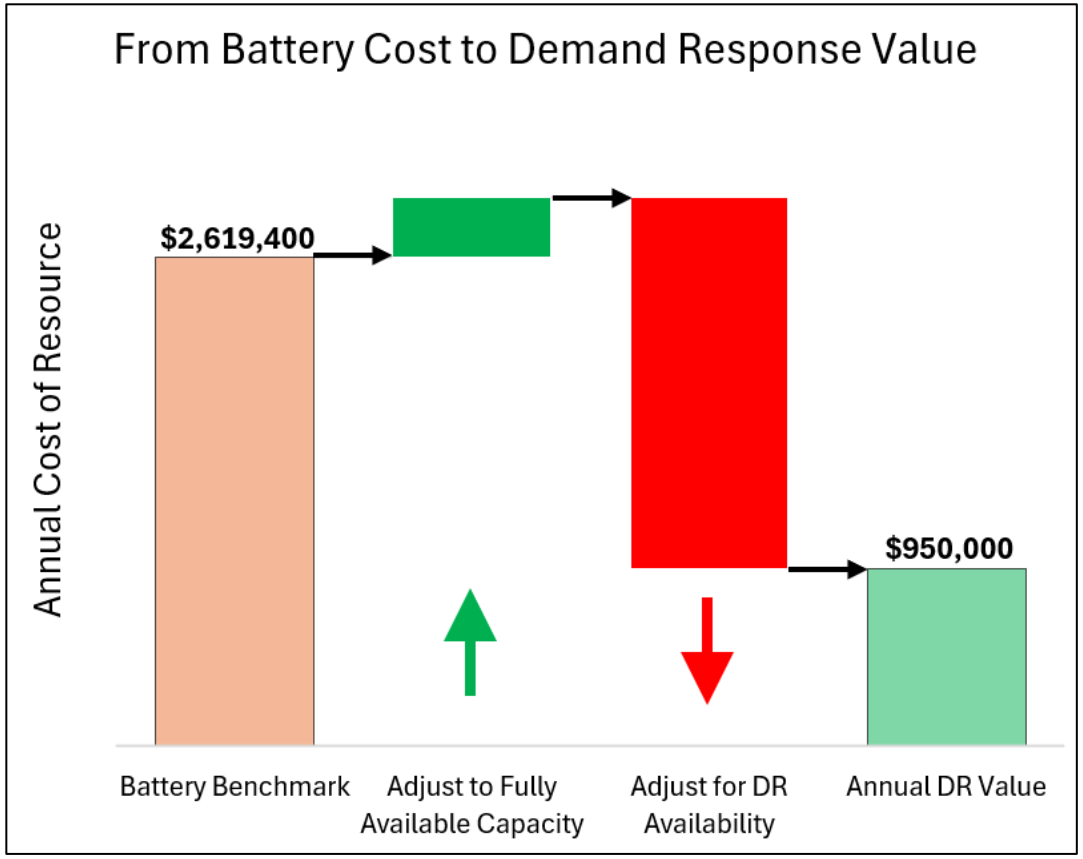
~8,000+ homes
Approximate average household electricity use for 36 hours

Illustrative comparison based on 30.9 kWh/day 0.2 acres per household. This is an equivalence, not electricity generation.

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Demand Response Valuation

How We Determined the Value of Demand Response



Additional DR Benefit
Only pay for capacity when it's needed, not year-round.

Why We Use Batteries as a Benchmark

Established Cost Benchmark:
Our Integrated Resource Plan identifies utility-scale batteries as our least-cost capacity resource

Different Operating Capabilities:
Batteries can respond frequently for shorter periods. DR Customer can respond for longer periods, but less frequently

Value Based on Availability:
We adjust the battery benchmark to reflect how reliably the DR Customer can meet our critical capacity needs.

~$950,000 per year
Estimated annual demand response capacity value.

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Pilot Contract

Pilot vs. Program

Pilot program:
Test → Evaluate → Learn → Refine

What are we testing?

- Impact
  - Peak reduction, event mitigation, WRAP/market impacts, etc.
- Process
  - Tacoma Power
    - Event calls, operational implementation, M&V process, etc.
  - Customer
    - Event performance, communications, customer impacts, etc.

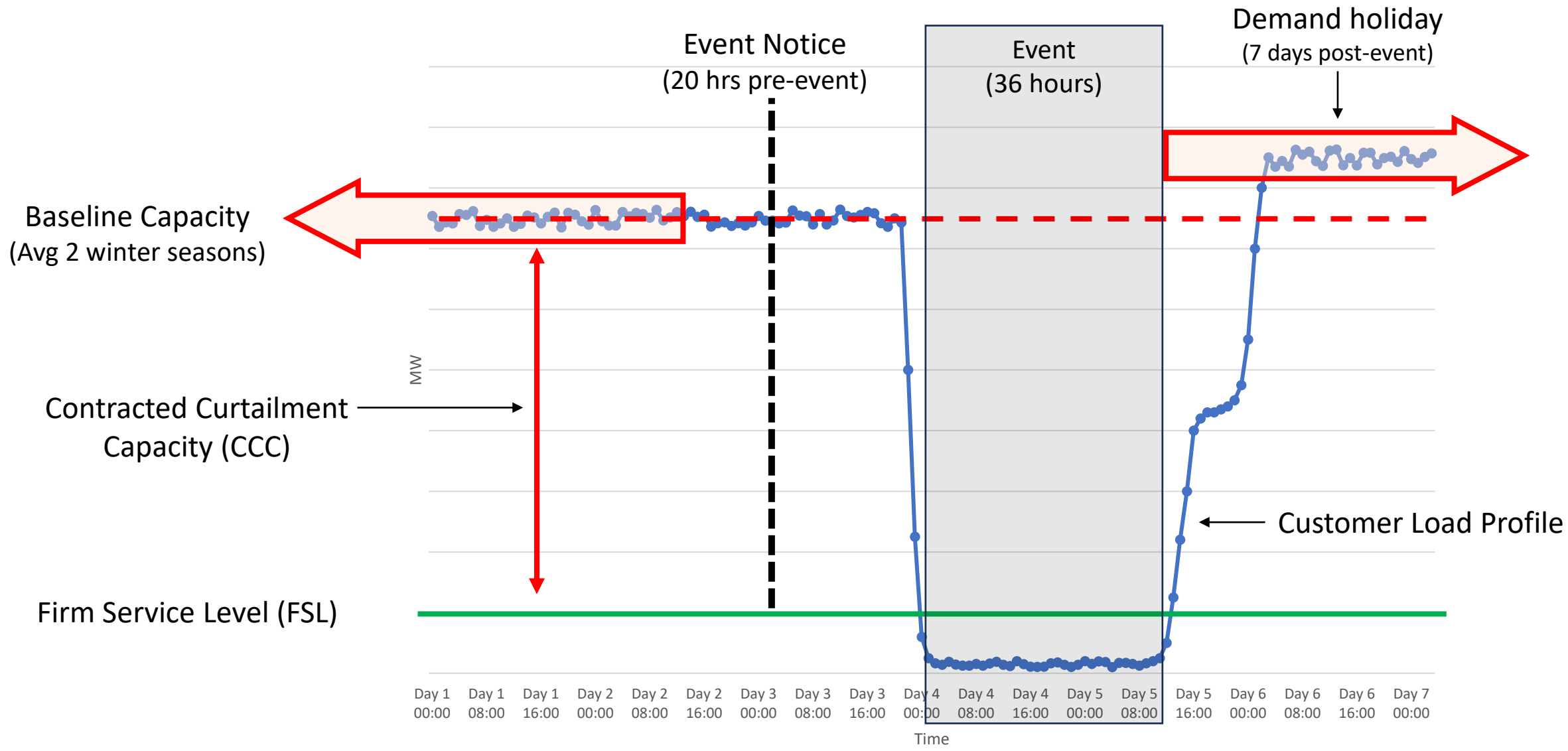
Incentive Agreement

DR Pilot: Availability + Performance

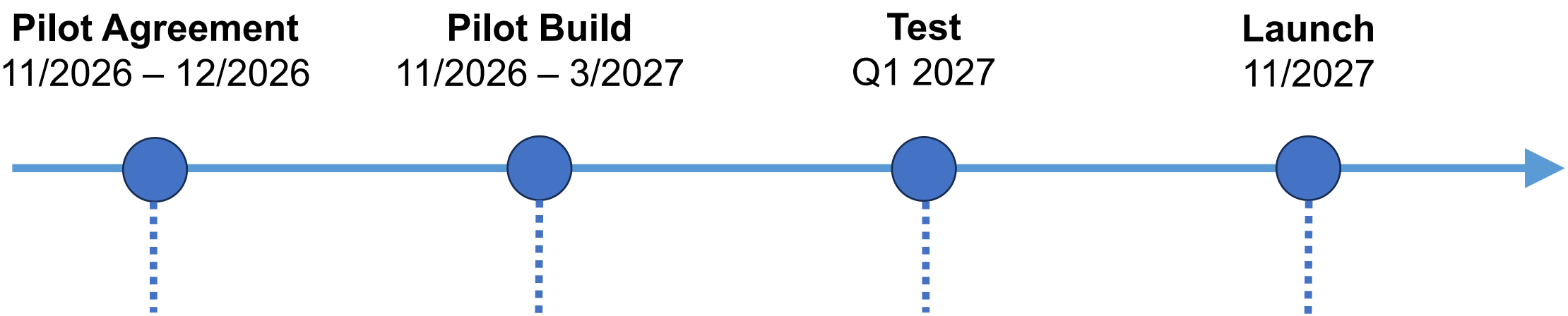
- Pilot contract – 2-year term
- Long-duration demand response events
  - 36-hour events, full-plant shutdown (~10+ MW)
- Seasonal events, limited frequency
  - 5-month season (Nov – Mar)
  - 5 events/season
  - Min. 4 days between events
- Event advance notice
  - Min. 20-hour notice
  - Called by TP Operations
- Demand holiday
  - 7 days post-DR event

~$950k incentive/season

Proposed Pilot Structure



Next Steps



- Finalize agreement, w/ customer
- Seek PUB approval
- Final signatures

- Finalize tool and process design
- Build tools, SOPs, protocols, etc. with internal stakeholders
- Test, with stakeholders and customer

- Potential test event

- Launch for winter 27/28
- Ongoing implementation, through winter 28/29



Thank you!

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APPENDIX

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Critical Capacity Hour Coverage

Critical Capacity Hours:
Periods when Tacoma Power is capacity scarce.

Batteries:
Can respond frequently, but for shorter periods before recharging.

Demand Response:
Can respond for longer periods, but less frequently.

