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Aggregated Distributed Energy Resource (ADER)
Task Force

Year 1 Recap Meeting, August 24, 2023

ADER Participation Update – Tesla, Inc.

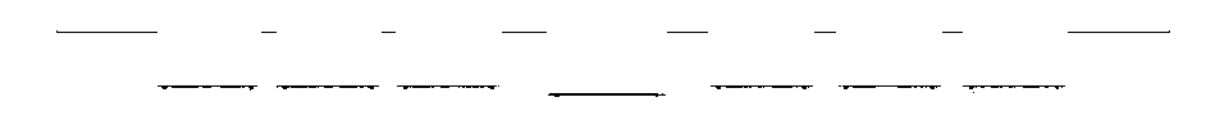
Kevin Joyce, Tesla Global Aggregation and Grid Services Lead
Filed in Public Utility Commission of Texas Project No. 53911

RTO/Market-integrated VPPs will unlock the most grid reliability value

Integration is the most sophisticated level of service from a Virtual Power Plant

3) RTO/Market Integration (Available in ERCOT Pilot Today; Objective of FERC Order 2222)

- Market Integrated VPPs (like ADERs) communicate their behavior and intentions to the ISO/RTO (market operator) in response to an ISO/RTO instruction
- This unlocks additional services and value (awards for availability in capacity and reserve products; dispatchable in real-time via ISO/RTO economic generation dispatch)
- Makes the VPP more useful and reliable in grid operations – allows DERs to participate directly in wholesale price formation

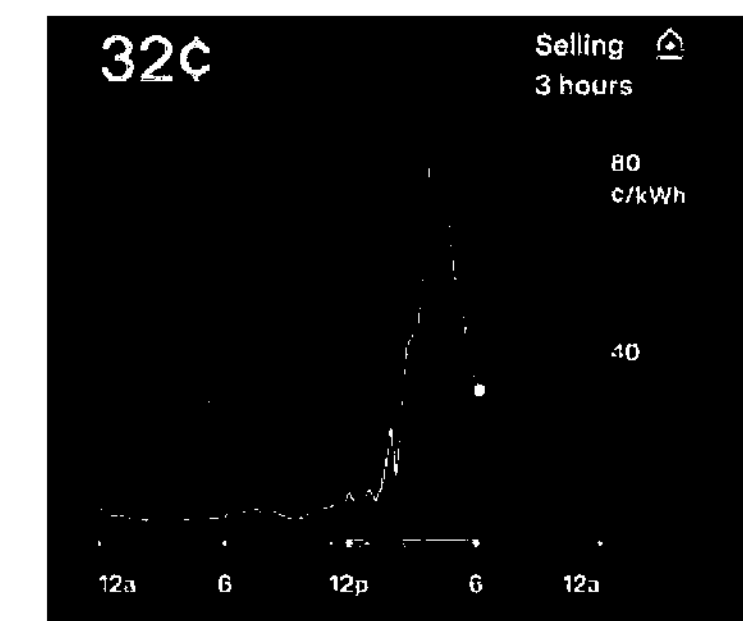


Participation in the Tesla Electric VPP will earn you \$10 per Powerwall, per month, as a credit on your monthly electric bill. You will still earn your monthly Sellback Credits for any energy sent back to the grid.

Tesla Electric: VPP participation in ancillary service included in customer bill credits

2) Response to Scarcity Signals from the Grid Operator

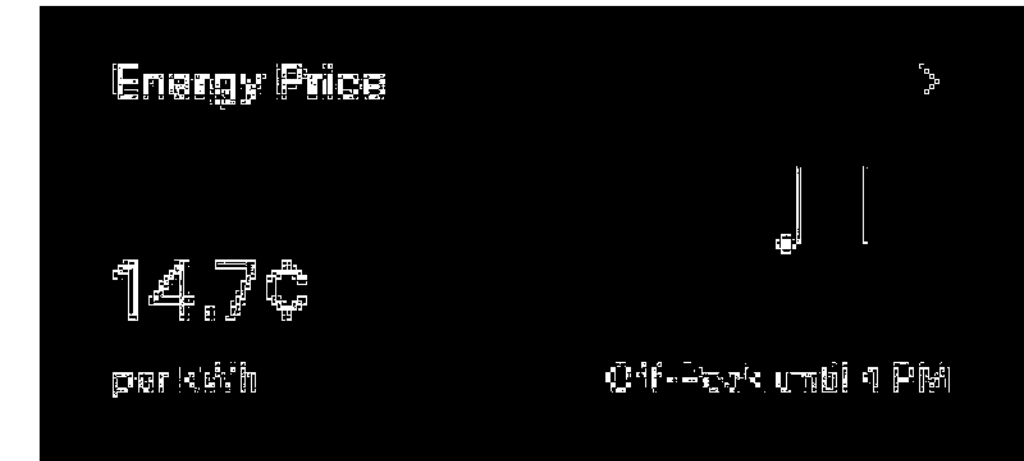
- Aggregated DERs provide additional support by exporting more during grid needs
- Motivates the DERs to provide additional capacity when most valuable to wholesale market
- Examples include peak energy prices or 4CP (demand response)



Tesla Electric: Consumer devices sell energy to grid on-peak

1) Permanent Load Shift From Static information In Rates

- The most basic grid support from DERs comes from responding to time varying rates
- This modifies the premise consumption profile every day to reduce impact during peak times

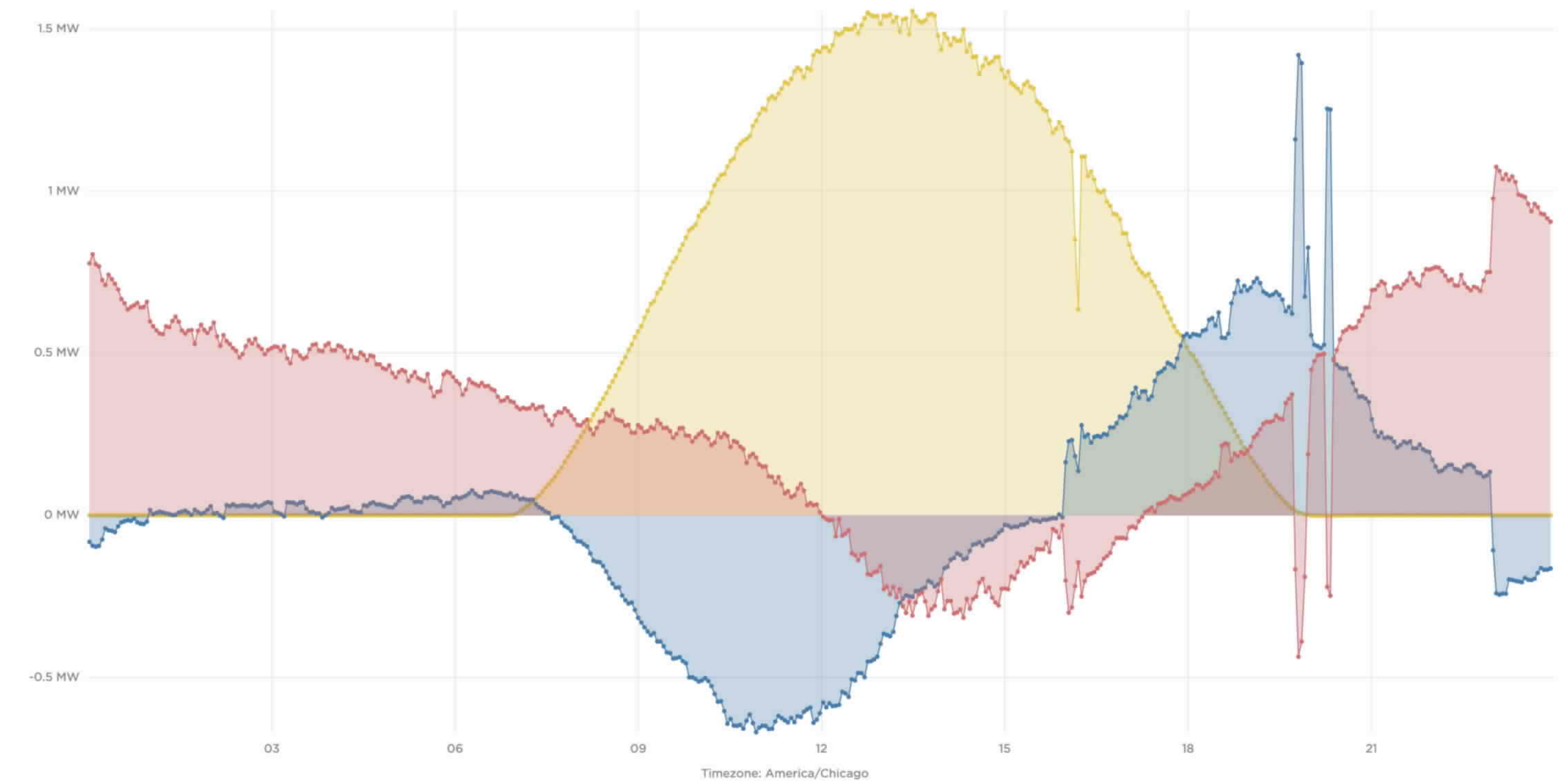


Tesla Electric: Consumer devices programmed to charge off-peak

Tesla ADER Participation is Live

Two Tesla ADERs have participated in ERCOT reserves and Non-Spin and have been dispatched by SCED

- Two ADERs:
 - Oncor customers in the North Load Zone
 - Centerpoint customers in the Houston Load Zone
- Behavior shown on the right is from 8/23/23 showing dispatches in the evening
 - Correspond to times of energy scarcity
- Regular non-spin participation starting this week.



ADER Pilot Journey

To create, register, and qualify a new type of resource, ERCOT, Utilities, Tesla, and others had to create new pathways.

New Coordination and Enrollment Processes

- New Processes Established for Coordination with TDSPs, Enrollment Screening, Interconnection Review
- Updating ERCOT's registration portal (RIOO) and completing new ERCOT and PUC Documentation

Technical Challenges related to Telemetry and Dispatch

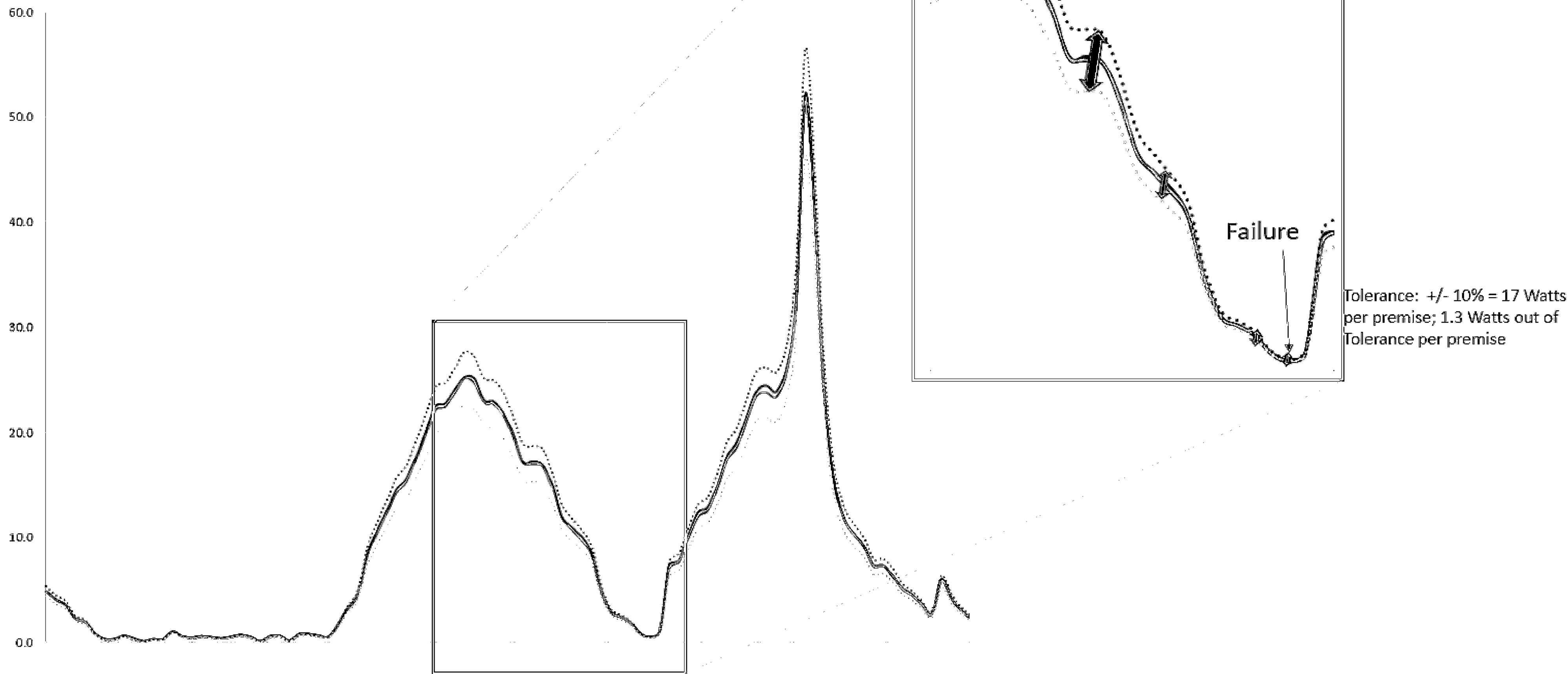
- Communicating with individual devices and creating pathways for aggregating and delivering the information
- Creating dynamic information about availability of the resource to accommodate customer's use
- Developing measurement and verification with the ERCOT ISO
- Refining dispatch control systems to perform with traditional resource accuracy (or better)
- Building toward a standard for 3rd party participation

Development of retail customer offers and experiences

- Customer engagement, marketing and value proposition. Including enabling customer control
- Creating and implementing customer incentives and compensation

Lessons Learned and Challenges

Pilot has been successful at identifying technical changes that will create clarity for future aggregations



Customer Experience of ADER

Focus on Transparency and Control

- Event participation is visible
- Provide customers with the information they need to understand
- Customer control through configuring settings like Backup Reserve
- Offers that integrate ADER will continue to evolve and improve

