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# Community Storage:
## SMUD's Energy StorageShares Program

July 17, 2025

# Webinar Logistics

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# Clean Energy Group

## Affordable, reliable, clean energy for all.

**Climate Resilience and Community Health**

**Distributed Energy Access and Equity**

**Energy Storage and Flexible Demand**

**Fossil Fuel Replacement**

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# Resilient Power Project

Building the foundation for energy resilient communities.

USDN urban sustainability directors network

footprintproject.org™

AMERICAN MICROGRID SOLUTIONS

ELEVATE

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*Rooftop solar installation in Dorchester, MA. Credit: Resonant Energy*

www.resilient-power.org

CELEBRATING 10 YEARS TECHNICAL ASSISTANCE FUND

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# TECHNICAL ASSISTANCE FUND

*Providing Support to Build Local Resilience*



# Webinar Speakers


**Olivia Tym**
*Clean Energy Group (Moderator)*

**Marriele Mango**
*Clean Energy Group*

**Chris Brown**
*Sacramento Municipal Utility District*

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# Upcoming Webinars

Load Growth: What States Are Doing to Accommodate Increasing Electric Demand (July 21)

Geothermal Networks: An Opportunity for States (August 11)

Assessing Hydrogen for Long Duration Energy Storage: Use Cases, Costs, and Equity Concerns (August 13)

Read more and register at www.cleanegroup.org/webinars

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Inclusive Prosperity Capital, Community Power Coalition:

# Development Support for Community Solar Paired with Storage

July 17, 2025

# Clean Energy Group is a proud member of the Community Power Coalition, selected to receive $249.3 million through EPA's Solar for All program

**Building a movement of community-based solar developers who deliver significant benefits to low-income and disadvantaged communities**

INCLUSIVE PROSPERITY CAPITAL™

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## Community-owned solar

To build wealth in low-income and disadvantaged communities

## Affordable multifamily housing solar

Solutions in regions where community solar is not currently an option

## Resident-owned community solar

For cooperatively owned manufactured home developments

## Models for rural solar programs

For rural landowners and rural electric cooperative ownerships

## Community solar plus storage

Encouraged to enhance grid resiliency and reliability, while maximizing potential savings

## Equitable workforce development programs

To share the benefits of jobs in the solar industry

Credit: IPC, https://inclusiveprosperitycapital.org/sfa/

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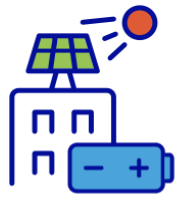

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# What is Community Solar and Storage?

Community Solar allows multiple individuals or entities to subscribe to and benefit from a single, shared solar energy facility.

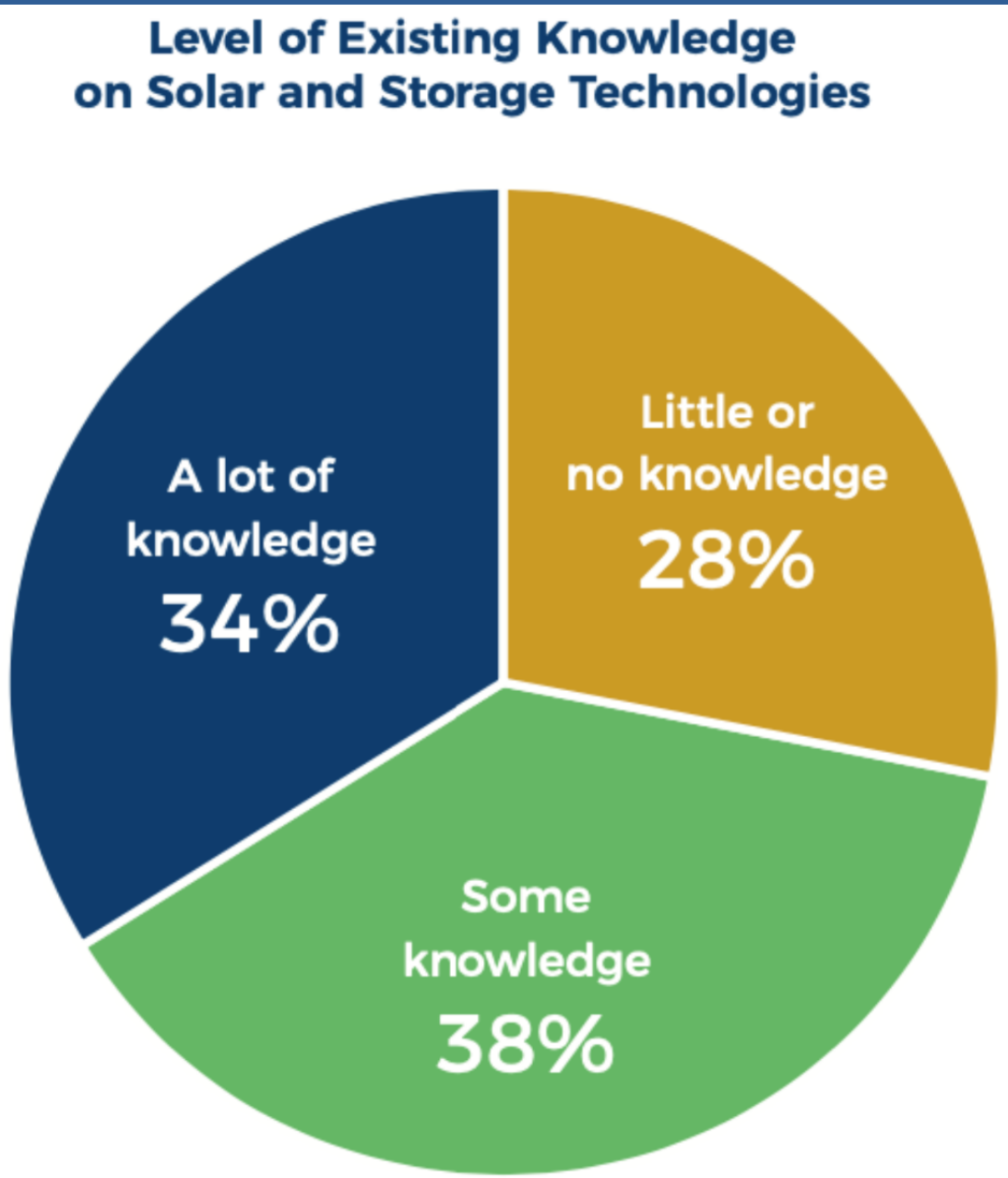
# Incorporating Battery Storage can....

- Provide resilience benefits
- Reduce subscription costs

Maycroft Apartments artist rendering of the fully renovated 64-unit apartment building for low-income residents.
Photo Credit: Jubilee Housing

**Resilient-power.org**

# Barriers to Solar and Battery Storage Development



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# Technical Assistance Fund

Providing technical support to build local resilience.

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Clean Coalition

USDN urban sustainability directors network

*Solar installation in Puerto Rico. Credit: Solar Responders*

**www.cleanegroup.org/initiatives/technical-assistance-fund**

# Clean Energy Groups: Technical Assistance Fund

- Supports the development of clean energy projects aimed at decreasing energy burdens and increasing resiliency.
- Funds preliminary technical and financial feasibility analyses.
- Pre-development feasibility analysis links organization to trusted allies who can provide independent background on solar+storage
- Vendor agnostic, no “sales pitch”
- Builds resilient power awareness and capacity in historically underserved communities.

Has awarded over **$2 million in funding** for communities to evaluate solar+storage at essential community-serving facilities.

*Community Resiliency Hub opening. Credit: Queen Shabazz, UPAL*

# What are the steps to develop solar+storage?


To successfully seek funding and move towards project development, project teams need to know:

- System size,
- **Cost** of installation and maintenance,
- Estimated lifetime **savings**,
- Benefits from the system: community resilience and environmental sustainability

The Technical Assistance Fund provides project teams with a clear picture of costs, ownership structures, and financial incentives to help with decision making and fundraising.

# Overcoming Economic Barriers

**IPC Finance Support Could Include:**

- Pre-development, including recoverable grants
- Developer Lines of Credit
- Acquisition & construction financing
- Investment Tax Credit and interconnection bridge financing
- Enabling transmission and distribution upgrades sited in low-income and disadvantaged communities
- Credit enhancements
- Co-investment with community lenders
- Grants, at the project and subscriber level

# Interested in Participating?
# Eligible Projects…

- Serve Low-Income and Disadvantaged Communities
- Deliver at least 50% of the electricity generated from the system to multiple residential customers within the same utility territory as the facility
- Deliver at least 50% of the benefits (e.g., financial savings, renewable energy credits) derived from the power generated by the community solar system to multiple residential customers in the same utility territory as the facility
- Provide LIDAC households min. 20% household savings on cost of electricity
- Projects must not exceed 5MW

# Affordable Housing:

# Maycroft Apartments, DC

## 62kW Solar, 56kWh Battery

**Led by:** Jubilee Housing

**Backup Power:** Three days

**Critical Loads:** Hallway and stairwell lighting, and a resiliency center that provides lighting, exhaust and floor fans, charging for phones and medical devices, refrigeration for food and medication, and a microwave

**Costs:** $130,000 batteries and installation, $197,000 solar

**Funding:** $65,000 grant from PEPCO (utility)

**Economic Benefits:** Community solar for 100 residents - $40 monthly utility savings

# Awareness Building

## Environmental Hazards

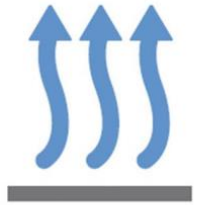
Battery storage safety begins with proper siting to ensure the battery system is insulated from potential environmental hazards, such as extreme weather and flooding.

## Temperature Controls

Some storage systems may require dedicated heating and/or cooling systems to regulate temperatures and operate properly.

## Codes and Standards

Follow the most up-to-date codes and standards and implement safety best practices when installing a storage system.



## Venting

Battery systems contained in enclosed areas may require venting to avoid the buildup of explosive gases during a system failure.

## Awareness

Areas containing battery storage systems should be clearly marked and onsite staff should be made aware of any potential safety hazards. Warning systems should immediately alert staff and first responders of system failures.

## Fire Suppression

Effective fire suppression equipment should be installed in case a fire does occur. Local and regional first responders should be informed of potential hazards and receive relevant training.

# Thank You!

**Marriele Mango**
Senior Project Director
Clean Energy Group
Marriele@cleanegroup.org

**Learn more:**
https://inclusiveprosperitycapital.org/sfa/

**Apply for Clean Energy Group's Technical Assistance Fund today:**
www.cleanegroup.org/initiatives/technical-assistance-fund

# SMUD StorageShares®

Christopher Brown

July 17, 2025

Powering forward.
Together.

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# Agenda

- Background
- SMUD StorageShares pilot program
  - Customer Participants
  - Utility Battery System
- Challenges, lessons learned, and the future

# Background

# What's StorageShares?

A unique solution that aggregates customer investment into energy storage to procure a larger distribution sited utility battery instead of individual customer sited batteries.

- Economies of scale
- Reduced maintenance cost
- Strategic siting of battery systems

This program combines energy storage and demand charge reduction to provide participants the benefits of energy storage without the burden of battery ownership.



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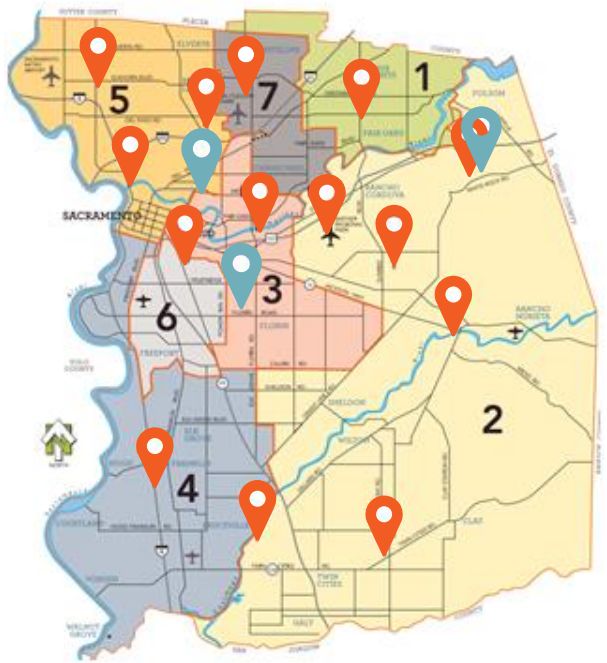
# Customer benefit aligned with grid needs

Customer Battery Need → Value spread across territory

Utility Battery Need → Highly locational value




*Conceptual Representation. Not based on actual location needs.



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# Why StorageShares?

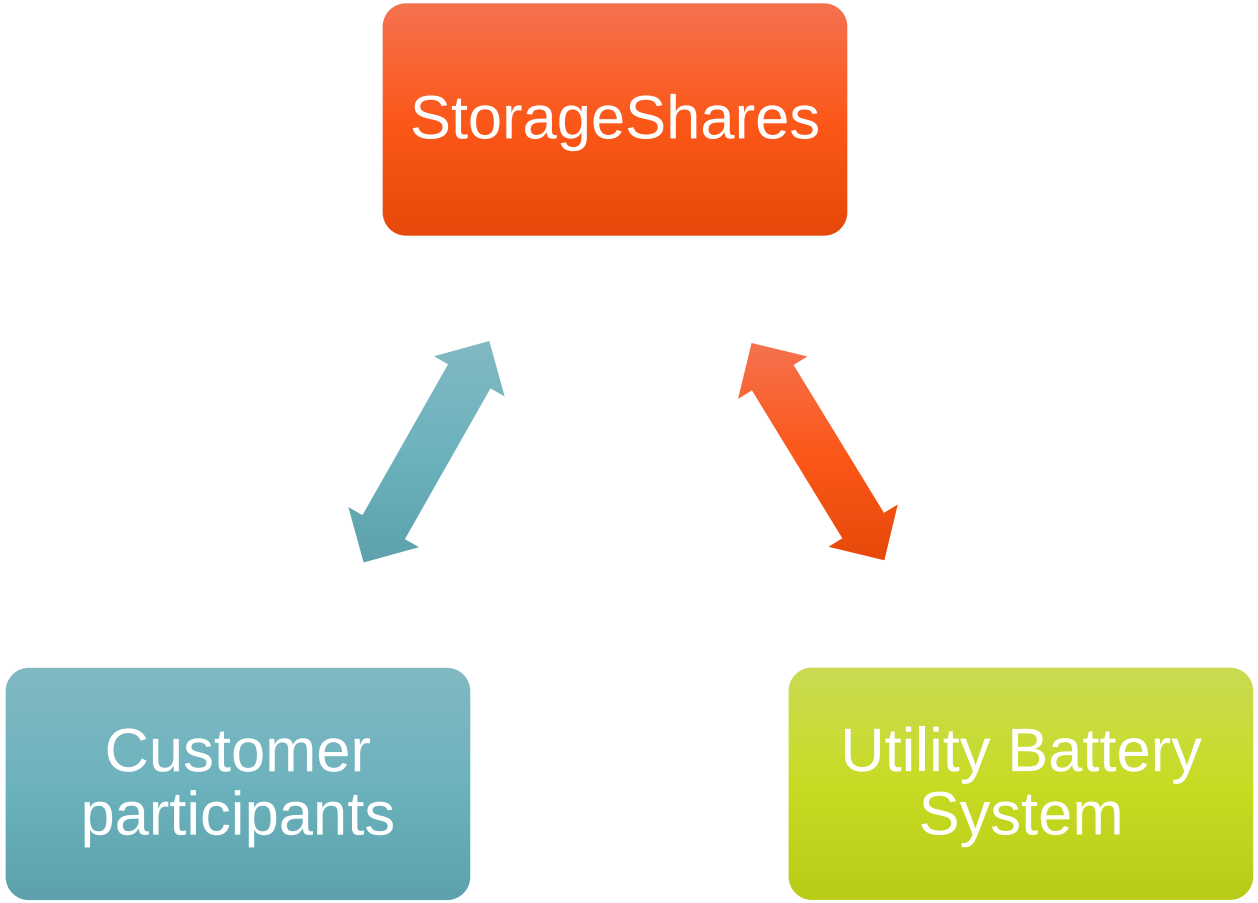
- StorageShares enables a pathway that aligns customer investment with grid needs in a way that delivers those objectives for participants and nonparticipants alike.
- Our customers want to invest in technology that supports their decarbonization, affordability and reliability goals.
  - Aligns with our priorities

# StorageShares pilot program goals

- Support and accelerate our decarbonization plans.
- Enabling electrification by maximizing infrastructure utilization.
  - Infrastructure designed and built to support peak load
  - Supports electrical vehicle (EV) adoption managing impact on grid infrastructure, location and time-based impact these resources have
  - Global supply chain challenges
    - Transformer lead times
    - Time it takes a customer to start service

# SMUD StorageShares

# What makes up StorageShares?



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# Customer participants

# StorageShares pilot details

- Customer buys shares at an upfront cost and receives a benefit over 10 years.
- We provide the customer benefit on their bill.
- We limit the number of shares offered to match the potential benefit that an actual battery could provide.
- Participant won’t install a battery for demand charge reduction (no double dipping).
- We install the physical battery at a beneficial location on the grid.



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# StorageShares pilot details

- No maintenance or operating costs.
- No interconnection costs.
- Guaranteed performance.
- StorageShares moves with you if your business relocates.
- Doesn’t require installation of battery system at your business location.
- Doesn’t require perfect operation.
- Continue to receive only one bill.



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# Target customer

- Commercial customers with a low load factor and high demand charges.
- Customers in locations with low grid needs.
- Customers open to an alternative solution to a behind-the-meter battery system.
- Not for customers seeking back-up power.

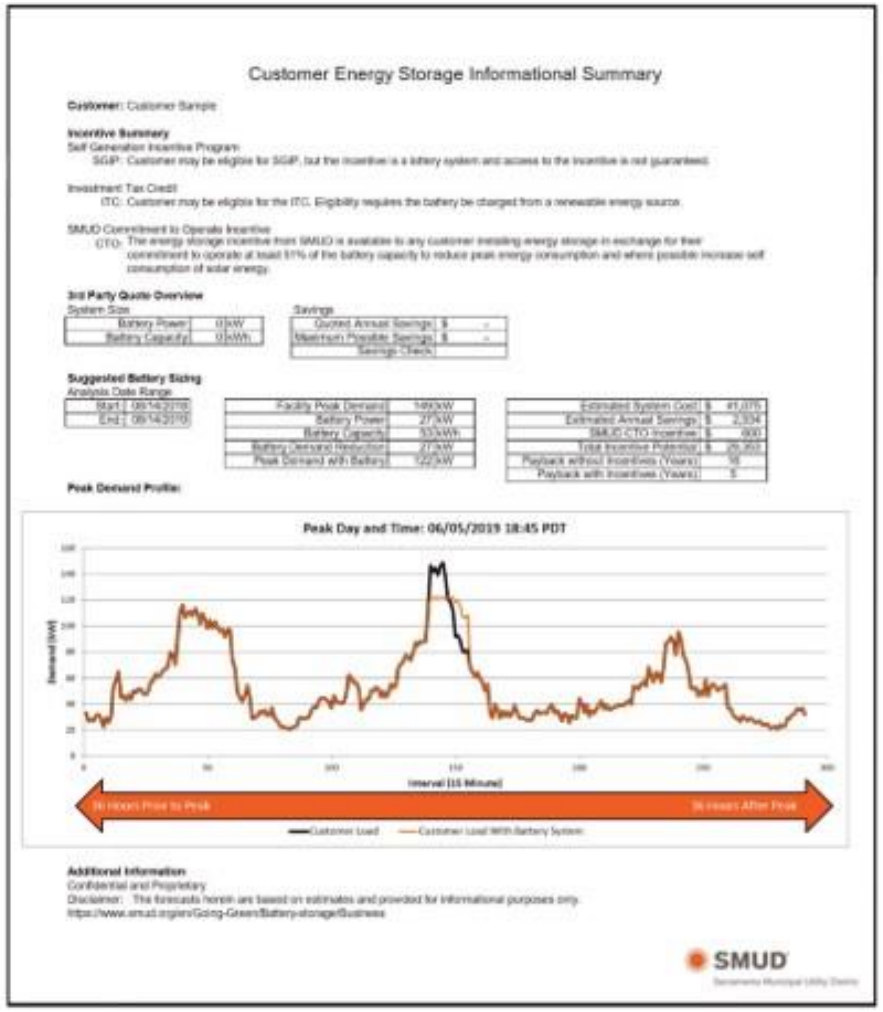
# Customer education

- Identify customer's motivation for battery storage.
- Provide education as appropriate.
- Present the benefits and costs of battery storage.
- Assess how the program aligns with customer's desire or need for a battery.

# Customer evaluation process

- Conduct analysis with battery sizing tool for interested customer.
  - Determines if the customer load shape is ideal for a battery.
  - Determines the number of shares a customer is eligible for.
- Provide a summary report.

# Example Summary Report



Customer Energy Storage Informational Summary

**Customer:** Customer Sample

**Incentive Summary**

Self Generation Incentive Program

SGIP: Customer may be eligible for SGIP, but the incentive is a battery system and access to the incentive is not guaranteed.

Investment Tax Credit

ITC: Customer may be eligible for the ITC. Eligibility requires the battery be charged from a renewable energy source.

SMUD Commitment to Operate Incentive

CTO: The energy storage incentive from SMUD is available to any customer installing energy storage in exchange for their commitment to operate at least 51% of the battery capacity to reduce peak energy consumption and where possible increase self consumption of solar energy.

**3rd Party Quote Overview**

System Size

| | |
|---|---|
| Battery Power | 0 kW |
| Battery Capacity | 0 kWh |

Savings

| | |
|---|---|
| Quoted Annual Savings | $ - |
| Maximum Possible Savings | $ - |
| Savings Check | |

**Suggested Battery Sizing**

Analysis Date Range

| | |
|---|---|
| Start | 08/14/2018 |
| End | 08/14/2019 |

| | |
|---|---|
| Facility Peak Demand | 149 kW |
| Battery Power | 27 kW |
| Battery Capacity | 53 kWh |
| Battery Demand Reduction | 27 kW |
| Peak Demand with Battery | 122 kW |

| | |
|---|---|
| Estimated System Cost | $ 41,075 |
| Estimated Annual Savings | $ 2,334 |
| SMUD CTO Incentive | $ 600 |
| Total Incentive Potential | $ 26,950 |
| Payback without Incentives (Years) | 18 |
| Payback with Incentives (Years) | 5 |

**Peak Demand Profile:**

Peak Day and Time: 06/05/2019 18:45 PDT

Interval (kW)

Interval (15 Minute)

24 Hours Prior to Peak

24 Hours After Peak

Customer Load

Customer Load With Battery System

**Additional Information**

Confidential and Proprietary

Disclaimer: The forecasts herein are based on estimates and provided for informational purposes only.

https://www.smud.org/en/Going-Green/Battery-storage/Business

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- Shows peak kW demand reduction a battery system could deliver.
- Provides the number of shares the customer is eligible for.
- Offers estimated cost information for comparing 3rd party battery project proposals.
- Lists possible incentives and tax credits available for battery system installation.



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# Utility Battery System

# Test scenarios

## Scenario 1: Natural adoption demand charge reduction

- 9 Systems Installed - Each sized at 60kW // 120kWh
- Total Batteries installed – 540kW // 1080kWh

**Electricity Charges**

| Item | Usage | Type | Rate | Amount |
|---|---|---|---|---|
| Power Factor | 0.9944 | | | |
| Electricity Usage | 1,346 | Summer Off Peak kWh @ | 0.104400 | 140.52 |
| Electricity Usage | 321 | Summer On Peak kWh @ | 0.135600 | 43.53 |
| Electricity Usage | 268 | Summer Super Peak kWh @ | 0.196900 | 52.77 |
| Electricity Usage | 8,363 | Winter Off Peak kWh @ | 0.082200 | 687.44 |
| Electricity Usage | 5,593 | Winter On Peak kWh @ | 0.103900 | 581.11 |
| Site Infrastructure Charge | 170 | Maximum kW @ | 2.880000 | 489.60 |
| Demand Charge | 87 | Summer Super Peak kW @ | 7.050000 | 76.67 |
| System Infrastructure Fixed Charge* | | | | 109.05 |
| Sacramento City Tax* | | | | 163.55 |
| State Surcharge* | | | | 4.77 |
| A) TOTAL ELECTRIC SERVICE CHARGES/CREDITS | | | | $2,349.01 |

## Scenario 2: Utility driven adoption

- 1 System Installed – 200kW // 400kWh



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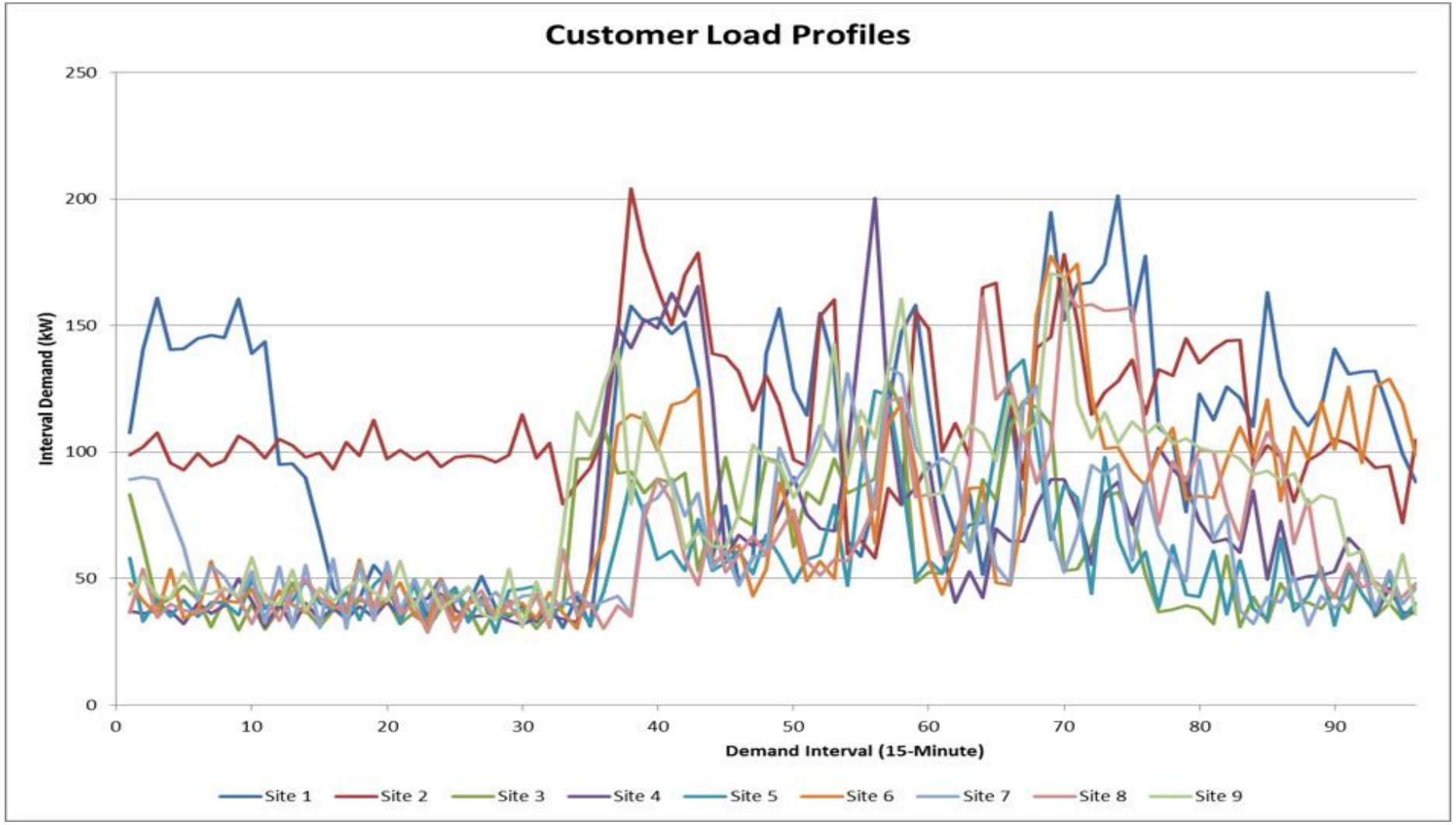
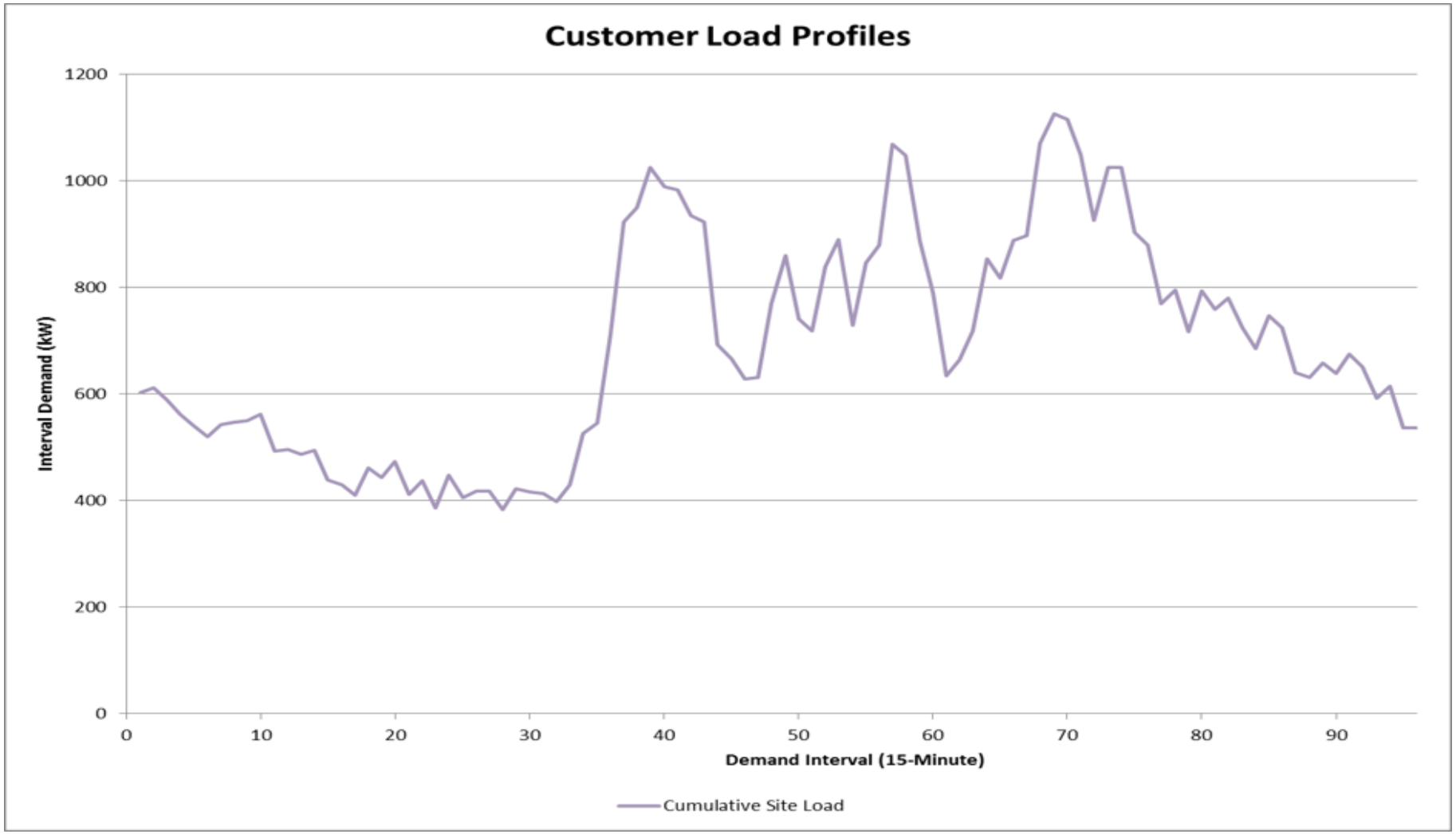
# Individual customer loads



# Aggregated customer loads



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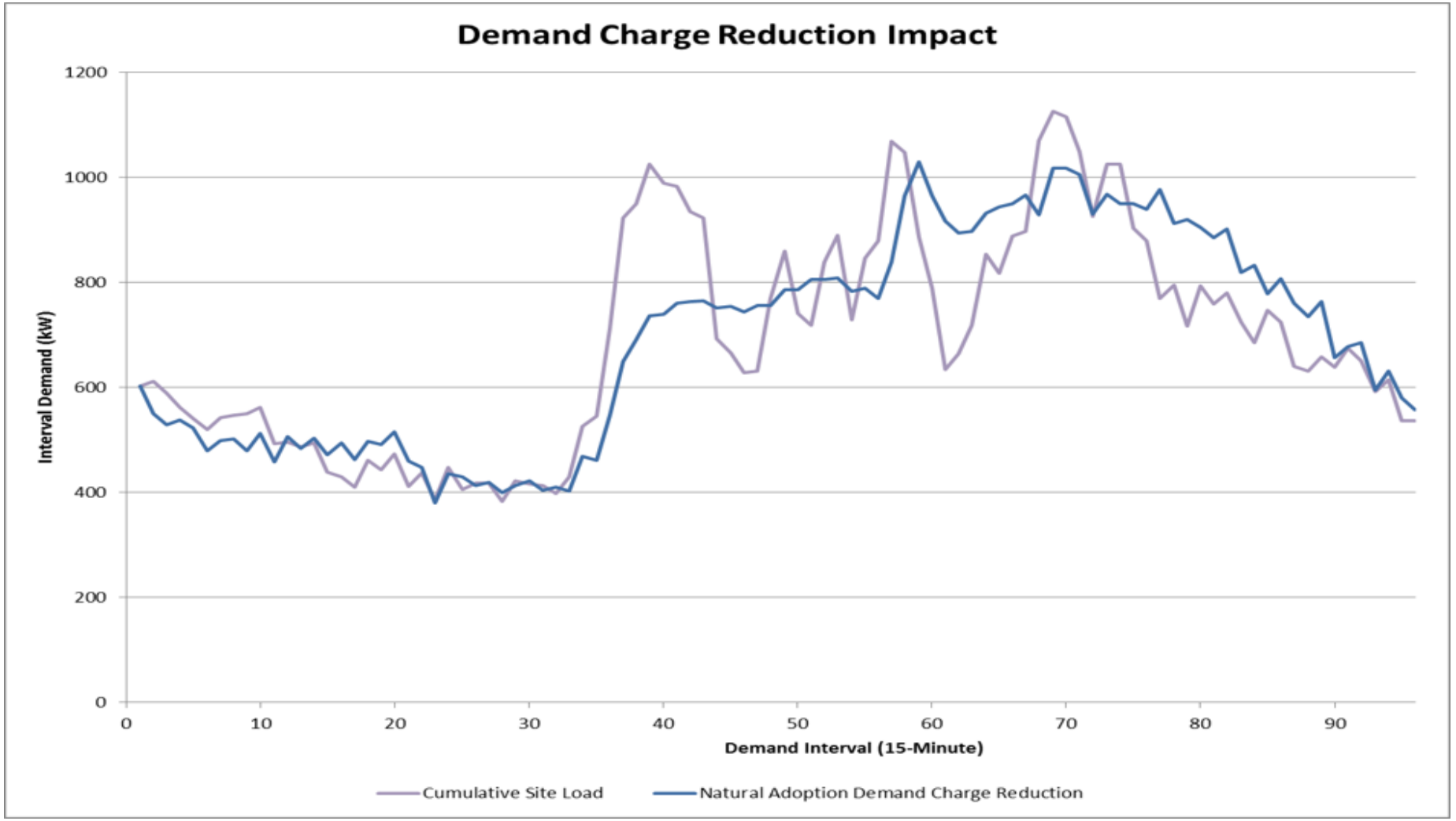
# Impact of demand charge reduction (540kW)



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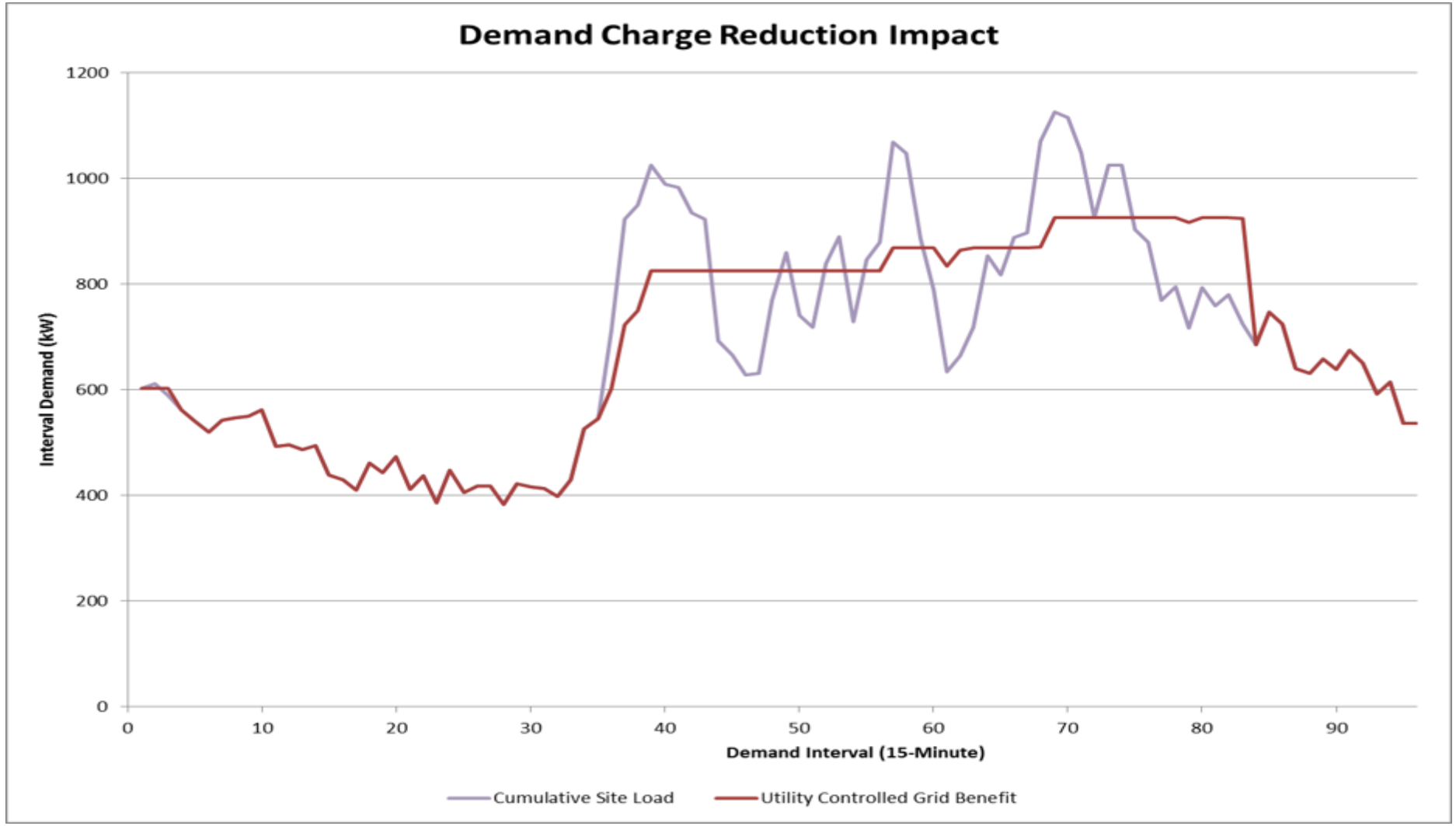
# Impact of utility control (200kW)



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# Scenario impact summary

## Scenario 1 impact:

- Individually customers reduce a total of 441kW of retail demand charges.
- Poor alignment of 15-minute interval loads means often customer batteries are charging and discharging at the same time.
- The coincident demand reduction on the feeder is only 95kW.

## Scenario 2 impact:

- The utility-controlled battery is less than half the size of the customer natural adoption batteries.
- The utility-controlled system can reduce the peak demand by 198kW.
- More predictable load with ability to dispatch energy based on bulk or feeder demand events.



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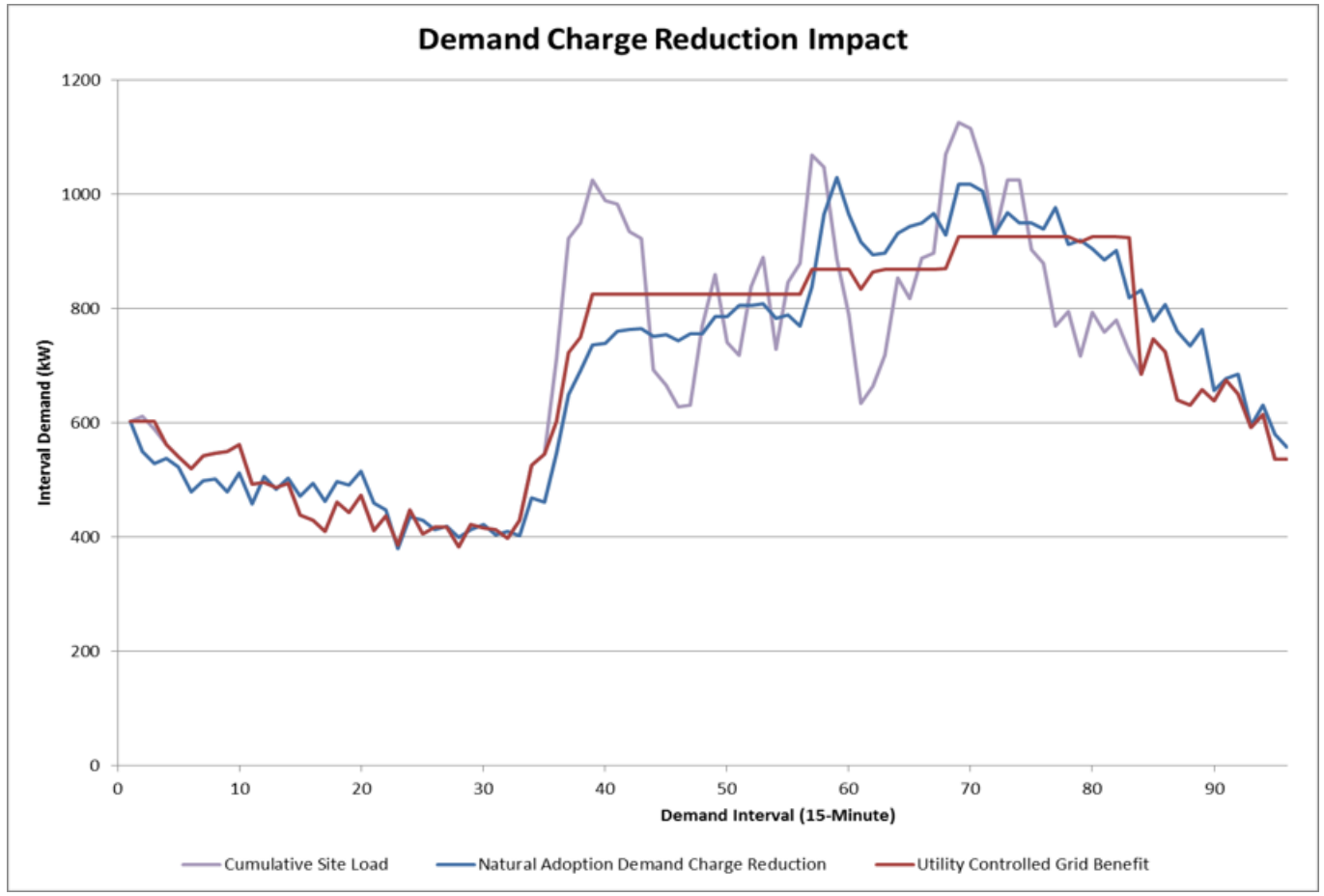
# Utility control matters

Utility control of the battery can create twice the benefit with less than half of the battery capacity.



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# Utility benefit

- We deploy and manage a battery based on locational grid needs.
- Battery operation is independent of StorageShares offering to customer.
- Procurement benefits from economies of scale.

# Utility Battery Storage installation

- 4MW battery deployed and operational.
  - 4MW creates 4,000 shares for the pilot offering.
- Location selected based on potential reconductor and line upgrade needed with 5 years of evaluation.
- Battery provides a diverse set of benefits.
  - Infrastructure support
  - Grid services
  - DERMS integration
  - Market Participation (CAISO, EIM)
  - Job training and education



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# Challenges, lessons learned, and the future

# Challenges and lessons learned

- Pandemic changed the way companies utilized buildings and infrastructure.
  - Remote work limited investment in facilities.
  - Changed prioritization of cash investments (StorageShares in cash up front).
- C&I customers largely driven on financial benefit.
  - Battery payback remains longer than most commercial investment requirements

# Future plans for the program

- StorageShares program on standby.
  - Need active battery storage adoption and utility-scale need
  - Program is designed to scale with customer demand
- The program continues to operate as a catch not fish position.
- Component of a larger behind-the-meter battery storage program portfolio.



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# Thank you!

Email:
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