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EV Charging and Energy Storage

Energy Commission Merit Review Workshop
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greencharge networks

www.greencharge.net

greencharge networks

- Largest provider of commercial energy storage
  - 45+ MWh of contracted/operational projects
- Proven track record of savings

- Founded in 2009
- Non-recourse project financing for equipment & construction
- Headquartered in Santa Clara, CA with offices in New York & San Diego

ENVIRONMENTAL LEADER PRODUCT OF THE YEAR 2015

ENERGY STORAGE NORTH AMERICA GOLD AWARD 2014 & 2015

GREENTECH MEDIA'S GRID EDGE 20 2015

STEVIE'S AMERICAN BUSINESS AWARDS FINALIST 2015

PLATTS GLOBAL ENERGY AWARDS FINALIST 2015

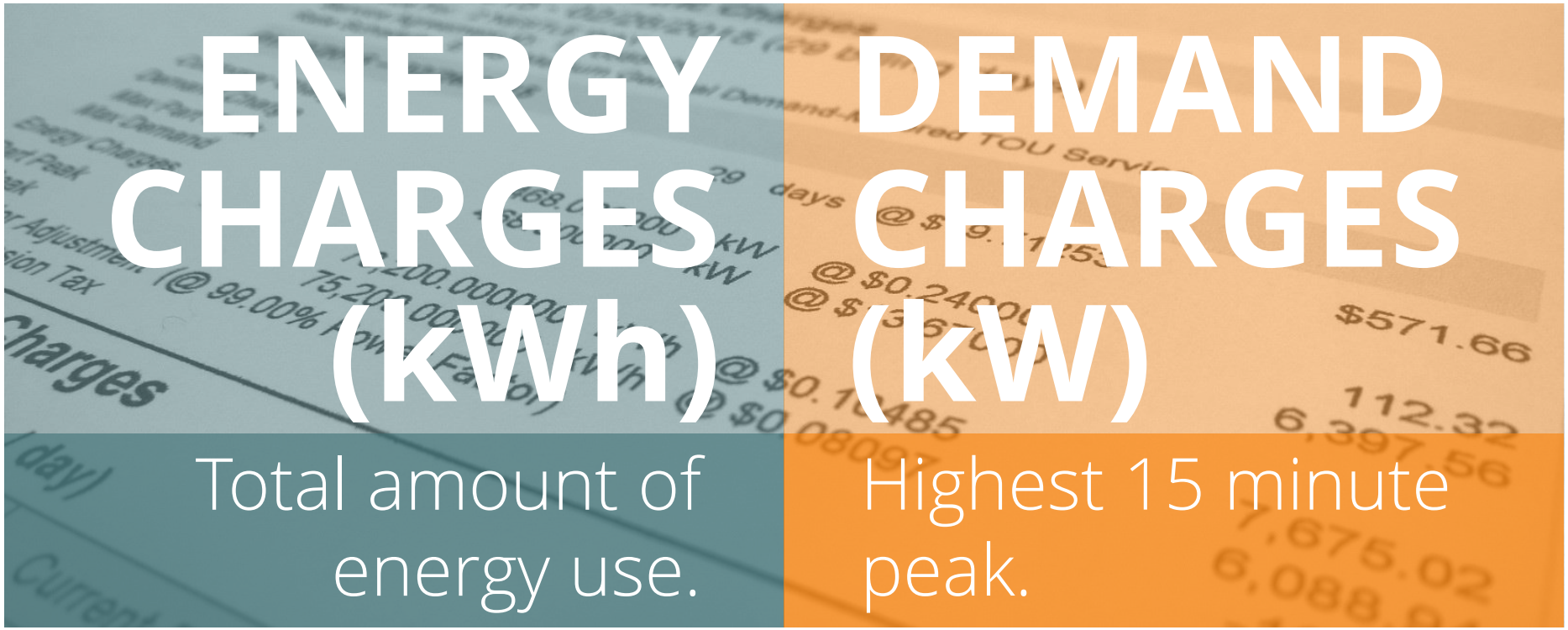
FIERCE INNOVATION AWARD WINNER 2015

SMART GRID NEWS TOP 15 COMPANIES FINALIST 2015

GLOBAL CLEANTECH TOP 100 COMPANY 2015

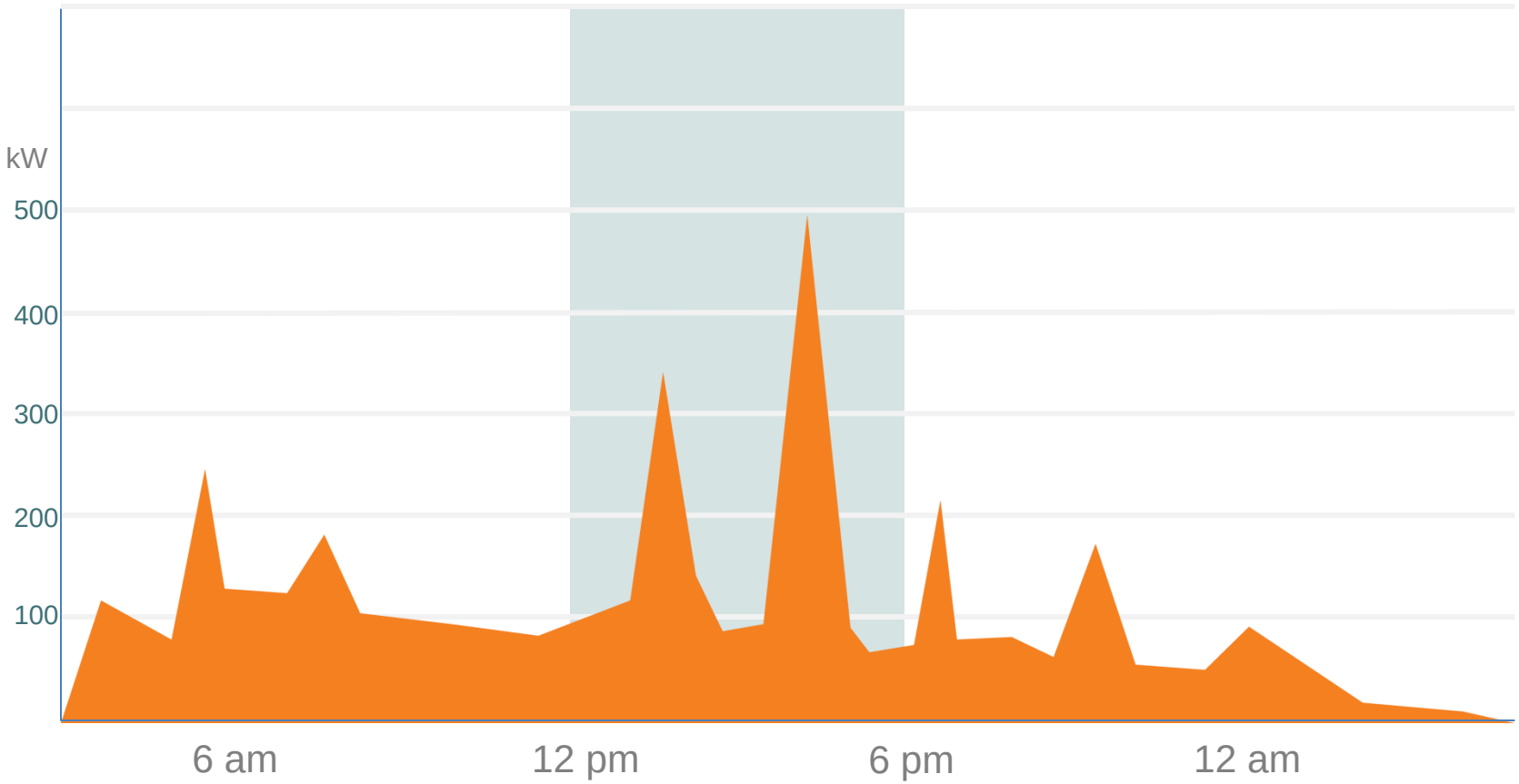
Sample Customers & Partners

Two Components of Commercial Utility Bills

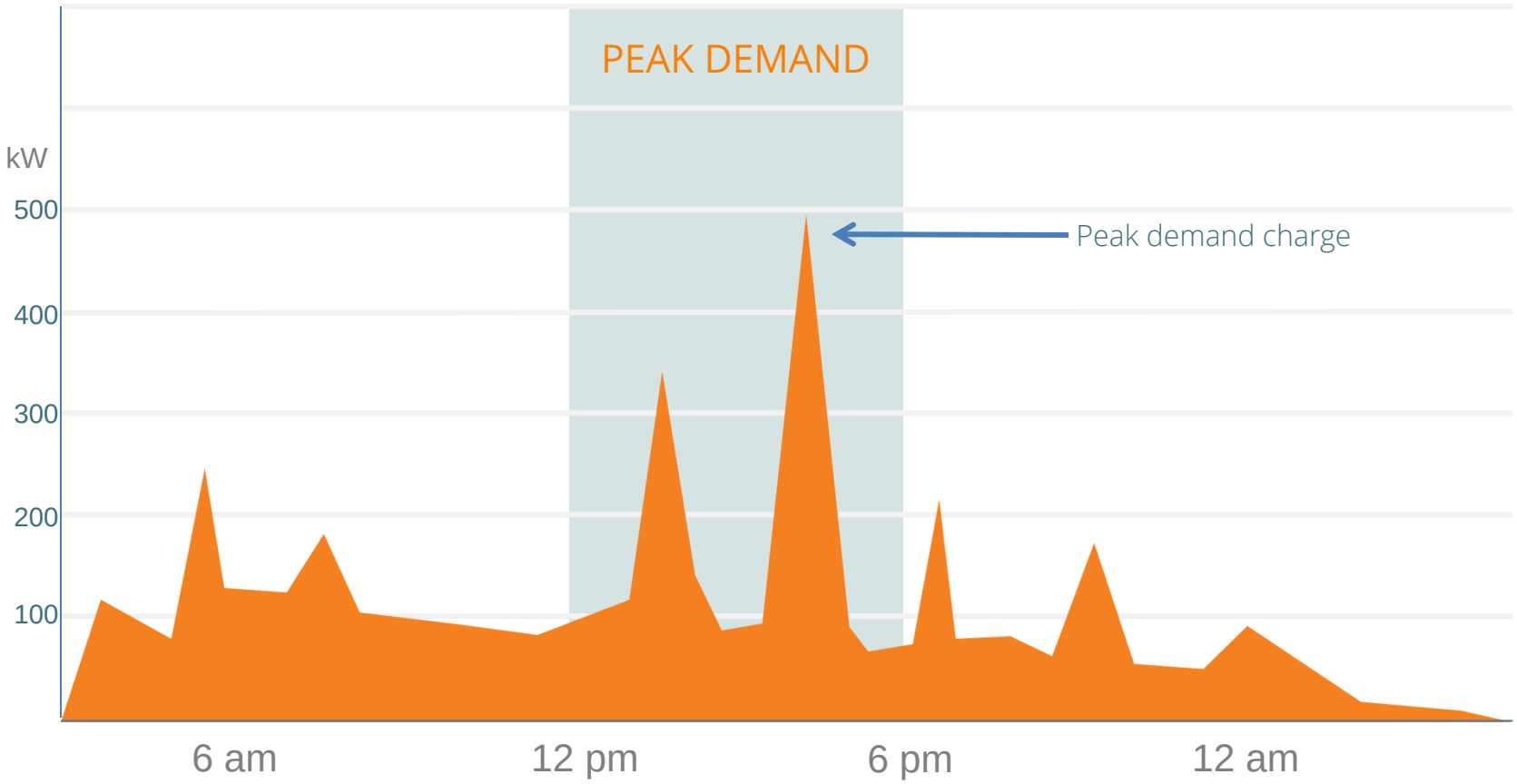


Demand Charges can account for over 50% of an electric bill.

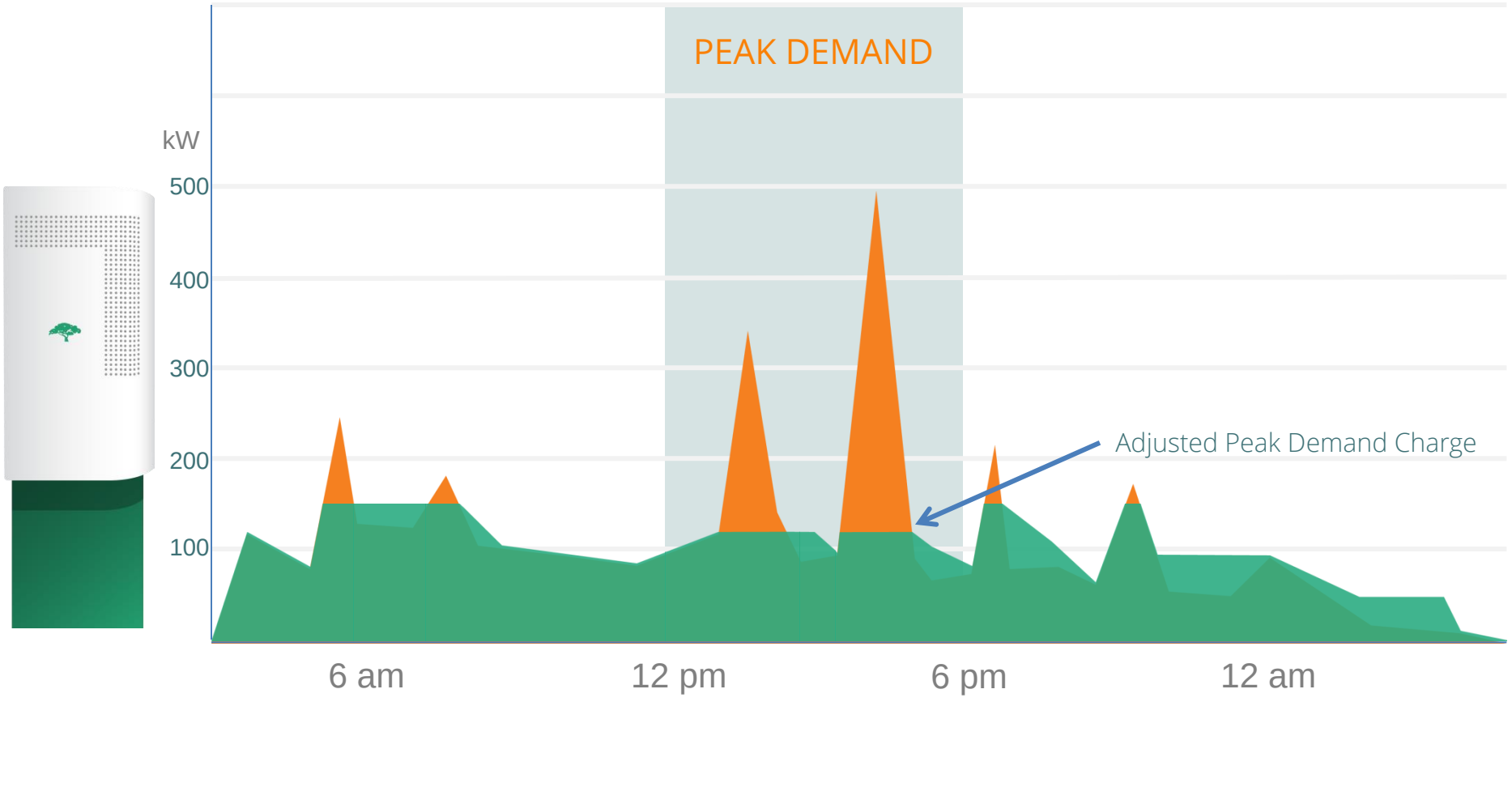
Energy – Measured in KWh



Peak Demand Charges - KW



Save On Demand Charges

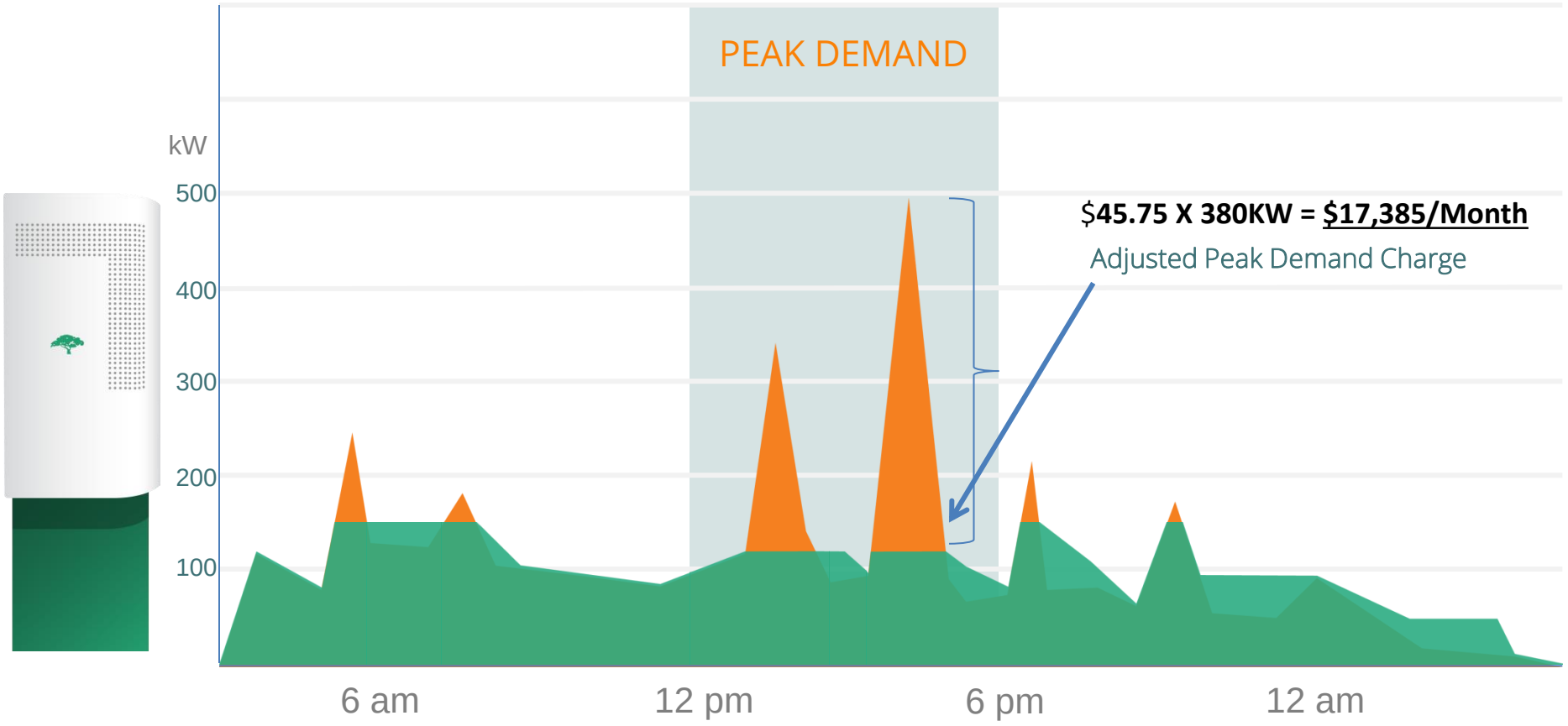


California Demand Charges

Year	Southern California Edison	PG&E	SDG&E	
2005	$23.30	$16.10	$16.19	Cost Per kW
2006	$26.62	$22.07	$18.65	
2007	$25.43	$22.13	$15.42	
2008	$26.11	$18.28	$21.31	
2009	$28.16	$21.13	$25.38	
2010	$29.22	$21.43	$24.75	
2011	$27.40	$21.31	$28.02	
2012	$28.10	$26.19	$30.68	
2013	$33.14	$28.40	$35.68	
2014	$38.14	$30.96	$41.87	
2015	$43.14	$36.46	$45.75	
Avg. Year Over Year Increase '05 – '15	7.7%	11.5%	16.6%	

SDG&E demand charges have gone up 180% over the past decade and 49% over just the last three years!

Save On Demand Charges



ENERGY STORAGE SOLUTION

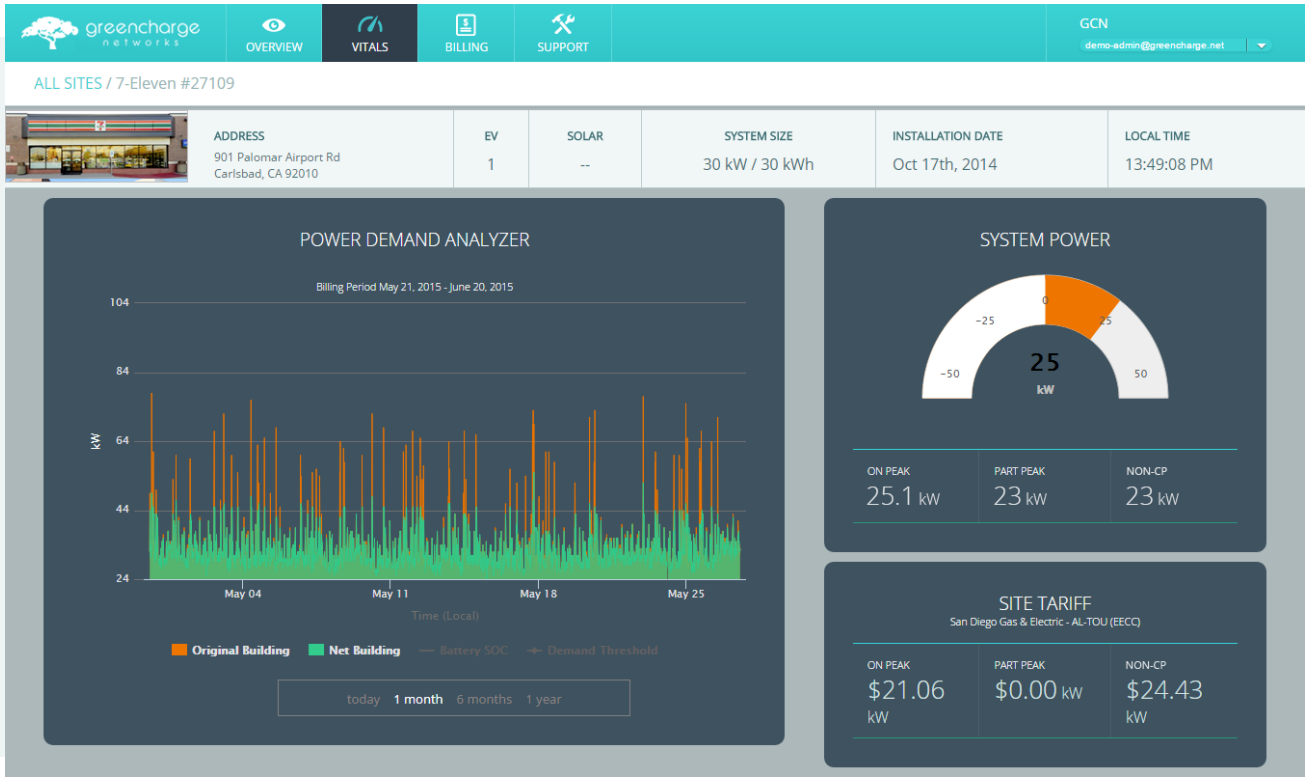
- Intelligent Cloud-Based Software
- Lithium-ion Energy Storage
- Integrated Risk Free Financing

"They install it, they pay for it, and over 10 years we split the savings. How could you possibly say no to that?"

- Rex Parris, Mayor, City of Lancaster

Energy Storage Solution - Software

Intelligent software automatically responds to peaks in demand by learning a facility's energy use patterns.



- 200,000+ operational hours
- 5 years of proven savings
- Scalable software platform
- Easily measure and communicate energy performance and savings

- Leverage data to identify additional energy savings
  - Transit schedules, usage patterns
- Additional Utility service revenue
  - Demand response
  - Utility services

Energy Storage Solution – Hardware

Flexible and proven hardware options designed to perform optimally in various environments.

- Industry leading lithium-ion batteries
- Modular and expandable
- 10-year warranty
- Indoor/outdoor
- HVAC cooling
- Perfect Safety Record
- 30kW/30kWh
  - 2′ x 2.5′ footprint
- 250kW/500kWh & Up

A no cost financing option with equipment, installation, warranty and maintenance all included.

POWER EFFICIENCY AGREEMENT

No cost. No risk. Just savings.

- No cost or risk
  - Green Charge owns and operates the system absorbing all risk
  - No operational impact to customers
  - 10 year warranty
- Just savings
  - Savings are shared between customer and Green Charge
  - Aligned incentives to increase savings

Purpose

- Demonstrate the feasibility of publicly accessible DC fast chargers in 16 private and public sector establishments
- Reduce in greenhouse gas emissions through electrification of the transportation sector

Goals

- Install the DC fast chargers and energy storage systems
- Curtail the peak demand charges caused by the fast charger to reduce greenhouse gas emissions.
- Increase frequency of long distance EV travel by increasing prevalence of DC fast chargers.

Facts

- $4.3M matching grant (GCN 56%/CEC 44%)
- Awarded October, 2013
- First installation June, 2014
- Completed January, 2016
- DC fast chargers Nissan
- EV Network NRG (12) and ChargePoint (4)
- 30kW – 50kW in power
- Green Charge responsibilities: site sourcing, engineering design, equipment procurement, permitting, installation management, processing interconnection, commissioning for operation, system operations, and reporting data

Installations

Case Study: Redwood City

Municipality: Redwood City

Size: 84,000 Residents

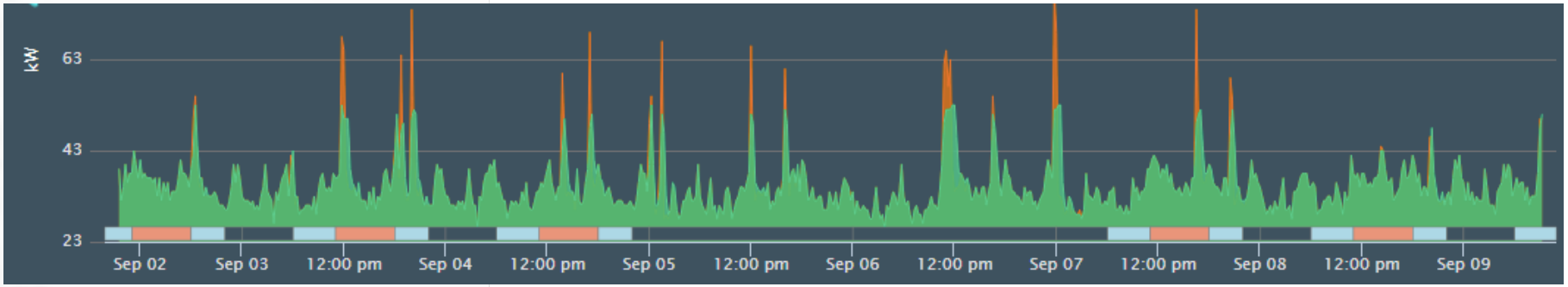
Locations: 2

- High-traffic downtown parking garage
- Redwood City Public Library

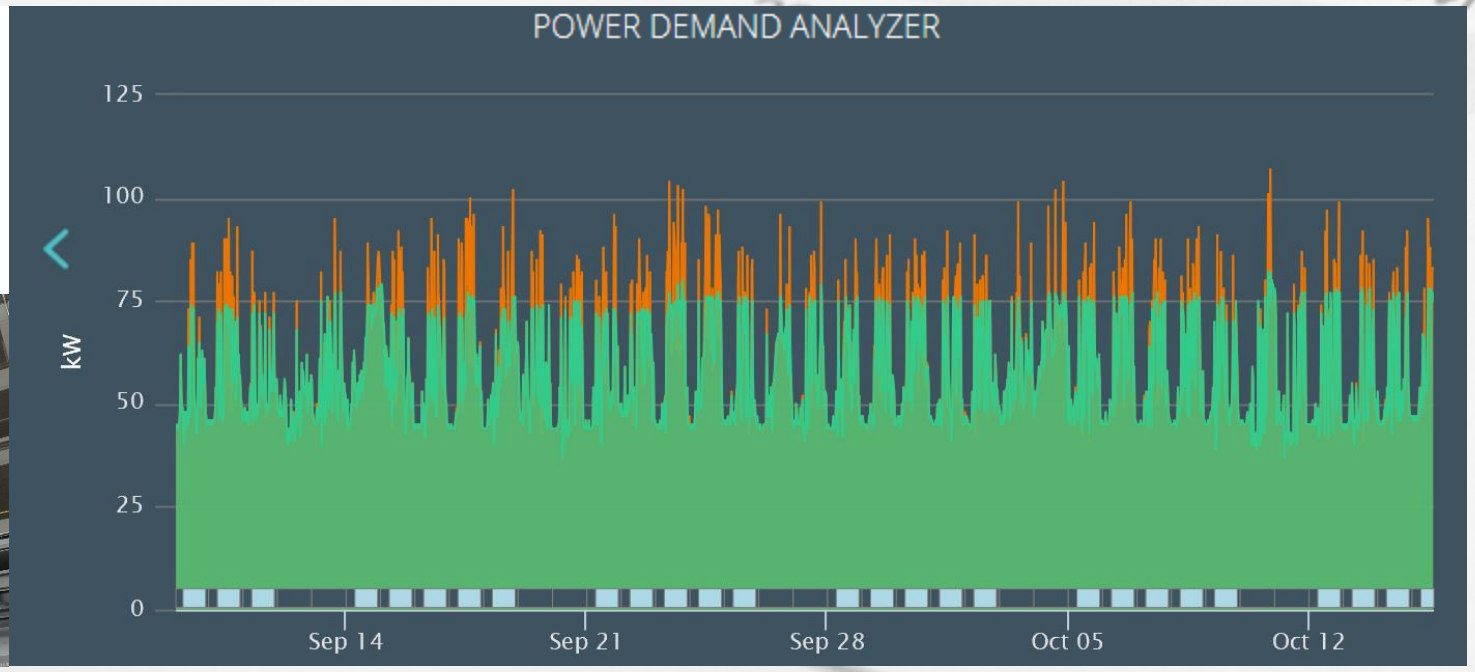
Annual Savings: $7,000 per site in demand charges

Financing Model: Green Charge PEA Shared Savings

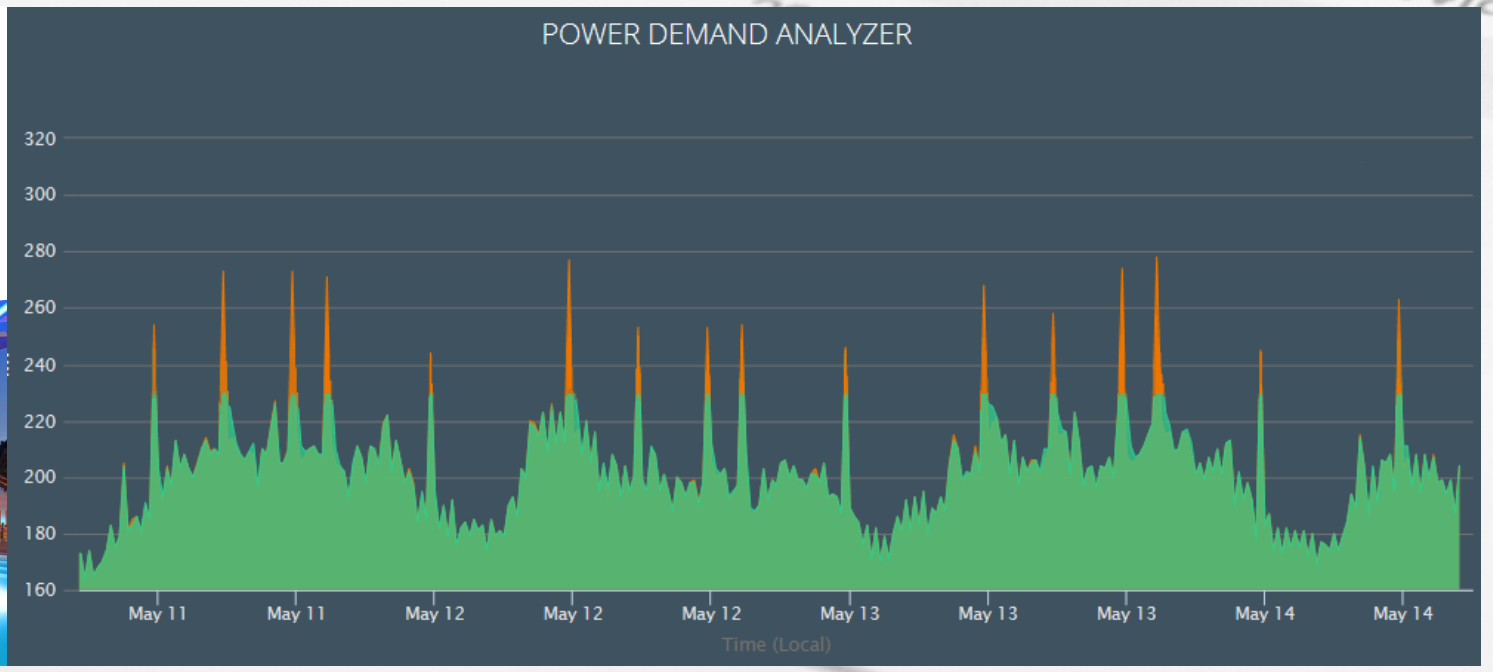
Sample GridSynergy Control Software View



Santa Clara Tasman Garage – Levi's Stadium



SHORE HOTEL
SANTA MONICA CA



Findings/Lessons Learned

- High demand for DC fast chargers
- Energy storage not well understood
- Market saturation still required
- ESS size limitations prevented savings potential
- All 16 sites reduced demand charges
- Groundwork for Green Charge Networks success

Results

- Successful installation 16 DC fast chargers + energy storage
- Energy storage offset the demand spikes created by EV's
- Prevented 106,000 kWh of energy produced by non-renewable resources equivalent of 73 metric tons of CO2 emissions
- Opened traveling corridors for EV drivers more highway and major street accessible charging stations
- Host customers saved money from DC fast chargers and other demand creating systems

Award-Winning

June, 2016

The California Higher Education Sustainability Conference

12th annual Energy Efficiency and Sustainability Best Practice Awards

Winner for Sustainable Transportation

CSU Fullerton
Battery Storage &
EV Charging System

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Thank you

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