



## Innovative DER Projects / Use Cases

December 13, 2019 | NE Electricity Roundtable

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# Creating a Planet Run by the Sun.

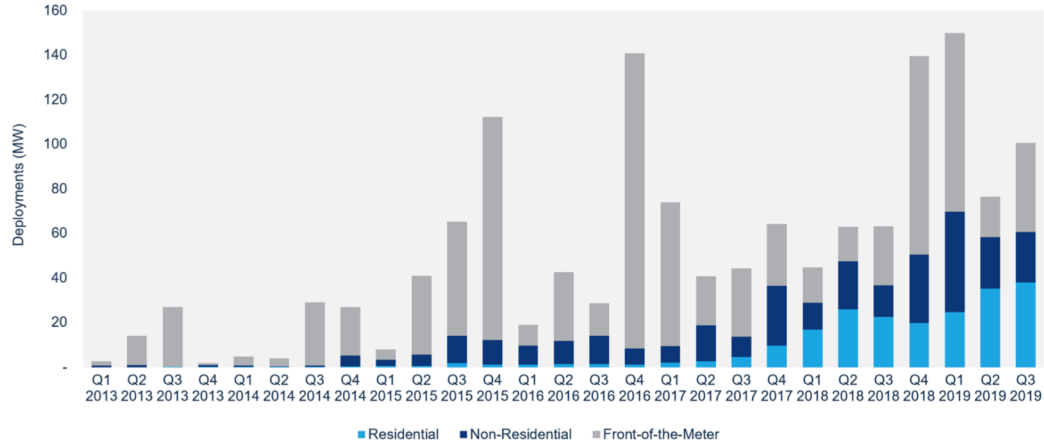
## SUNRUN

The nation's largest residential solar, battery and energy services company.

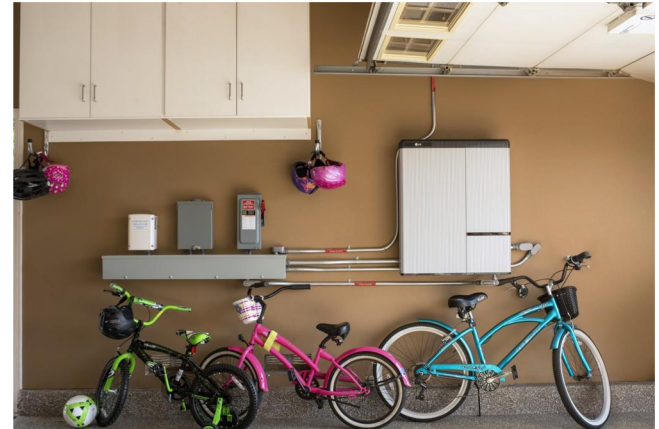
- Led the industry since 2007 with our no upfront cost, solar-as-a-service model.
- Sunrun designs, installs, finances, insures, monitors and maintains the systems.
- 22 States + Washington, DC + Puerto Rico
- 270,000+ customers; 8,000+ battery installs
- 15% battery attachment, 30% in CA



# Rapid residential growth; often, largest quarterly deployment



Source: Wood Mackenzie Power & Renewables



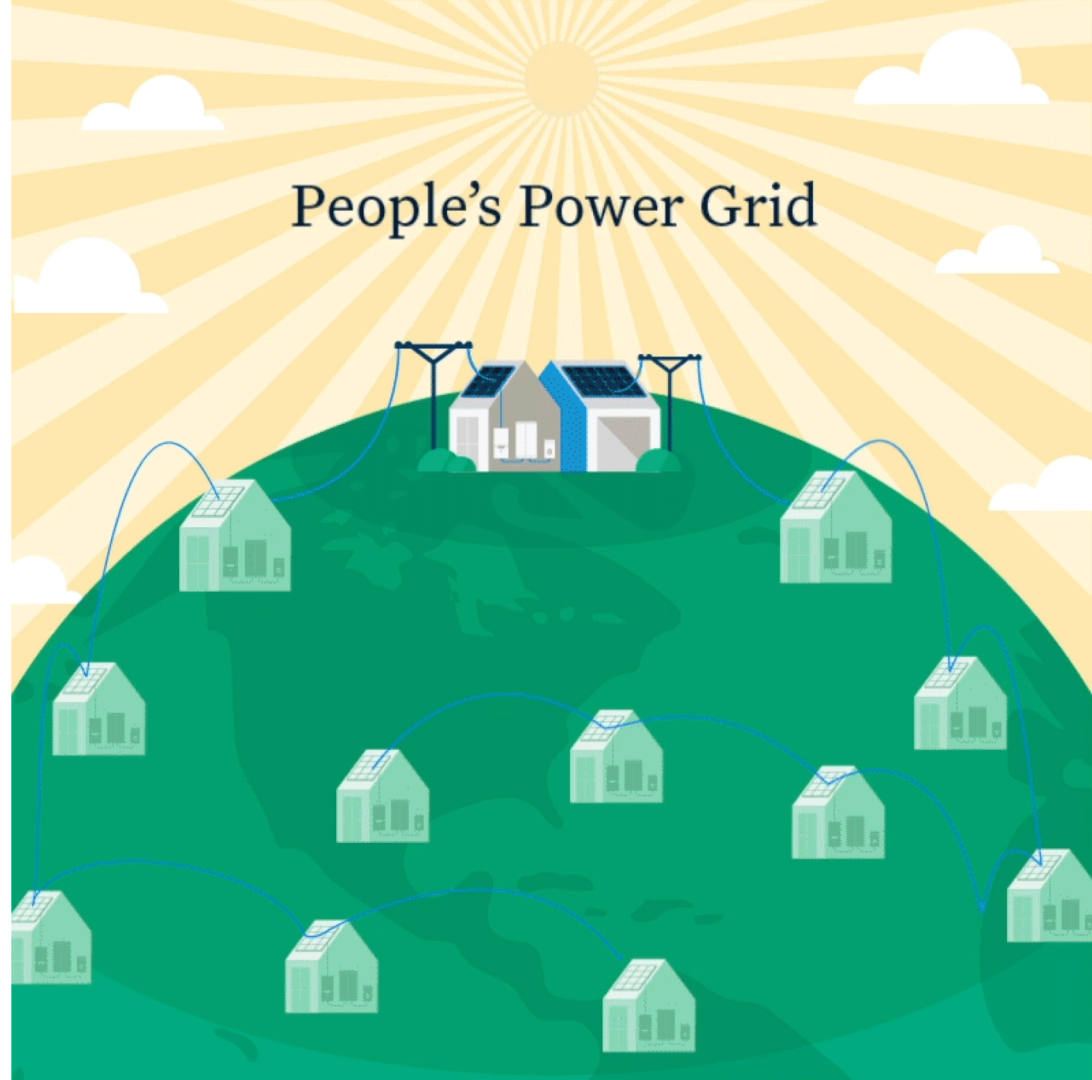


# Bring Your Own Device (BYOD) Programs

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## Utility + Competitive Partnership

- **Utility** identifies need, predicts peak/sends signal or sets discharge profile, does settlement.
- **Competitive companies** finance, manage, and assume all risk.
- **Participating customer** receives backup power and energy savings at lower cost, minimal complexity.
- **ALL ratepayers** receive savings without ratebase risk.
- VT, NH, MA, RI, NY; West Coast





# ISO-NE Capacity Auction

## Sunrun Won 20 MW

- Qualified for > 20MW (5000 homes) in **first-of-its-kind process**
- Bid and cleared 20 MW
- **Measured** on AC output of PV + Storage inverter
- First for **residential** and first for **aggregated PV + Storage**
- Low bid prices, paid same as all cleared resources, **\$3.80/kW-mo**
- **Passive Demand Resource:**
  - Summer (Jun-Aug) 1-5pm
  - Winter (Dec-Jan) 5-7pm



# HECO/OATI Grid Services Program: 1,000 Sunrun Brightboxes in a Virtual Power Plant

## Capacity Grid Services

Day-ahead notification

Up to 4 hour duration

Dispatched by HECO

Availability: 5 - 9 pm



## Fast Frequency Response

Autonomous, deployed in 10 cycles

Triggered locally at 59.7 Hz

30 min or until grid stabilized

24/7 availability



## Kukui Hele Pō

1,000 Sunrun Brightbox Customers

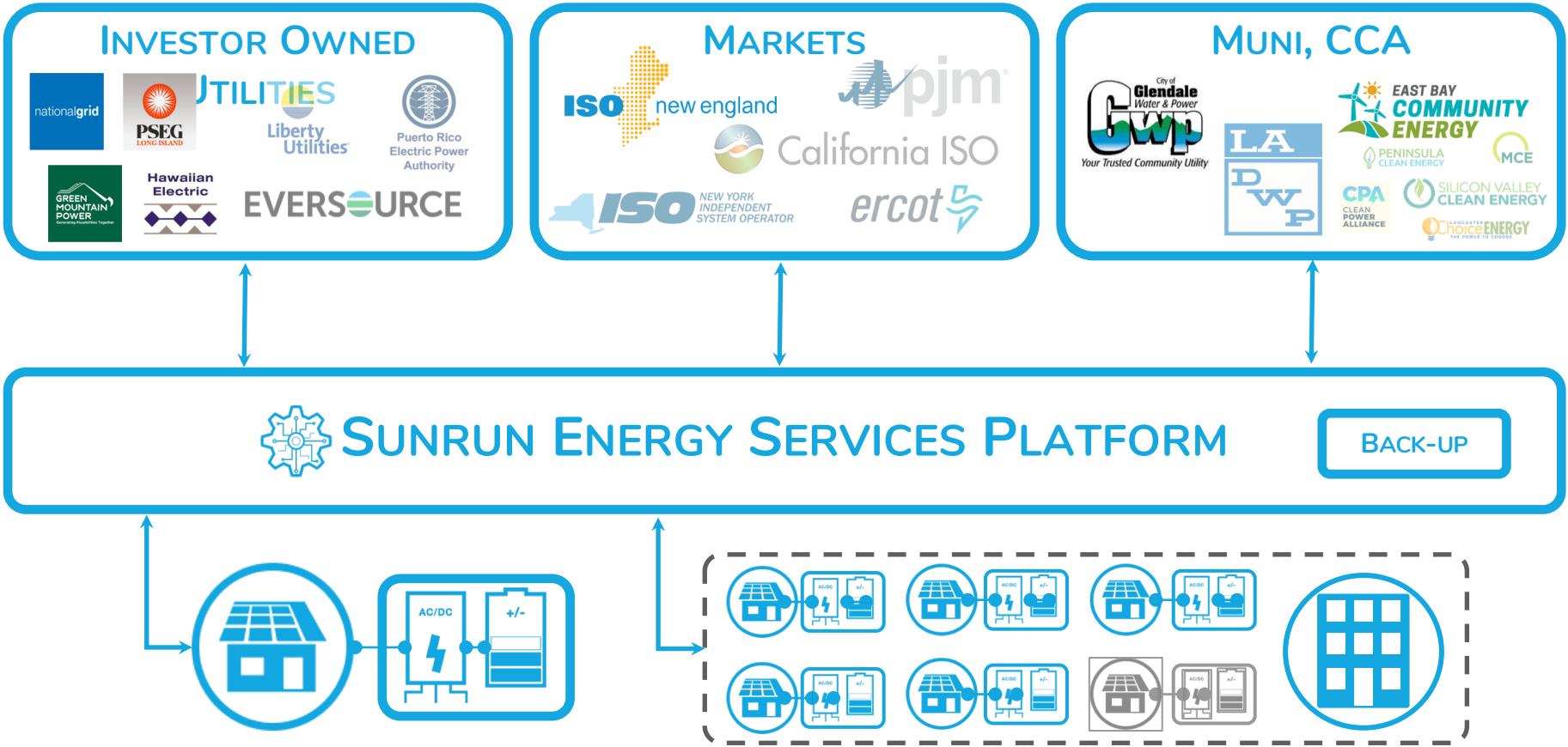
\$200 enrollment incentive

\$50 donation to 'Aha Punana Leo Charity

Customer bill credits



# Scale: Chasing Legacy Infrastructure





# Los Angeles Dept. of Water & Power

## Challenge: Gas Peakers

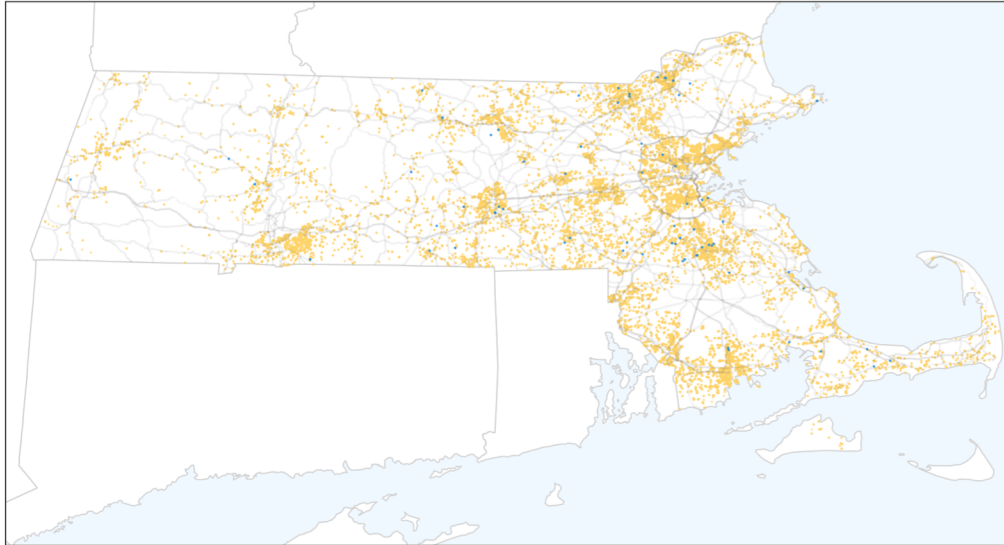
- LA has 80% renewable by 2036 goal
- To get there, must shut down 3 gas plants

## Proposal: Residential VPP to Replace Peaker

- By 2029, we estimate the potential for 950 MWh of storage paired with 760 MW of solar directly from LADWP's residential customers
- ~75,000 homes and apartment buildings
- 240 MW of 4-hour peak capacity, equivalent to a gas power plant
- Cheaper than alternatives for the utility and provides individual customer bill savings
- Resilient backup power



# Let's Harness the Distributed, Resilient Fleet in New England



Sunrun installs in MA

2019 summer peak would have been ~ 1,000 MW higher without BTM PV.

“As energy-efficiency measures and BTM PV resources proliferate, demand for electricity from the regional grid declines and records become more difficult to exceed; the all-time record peak of 28,130 MW was set thirteen years ago in August of 2006.”

- ISO Newswire 10/2/19

Thank You.