



Bring Your Own Device  
Opportunities with Dynamic Rates  
*Creating a Planet Run by the Sun*

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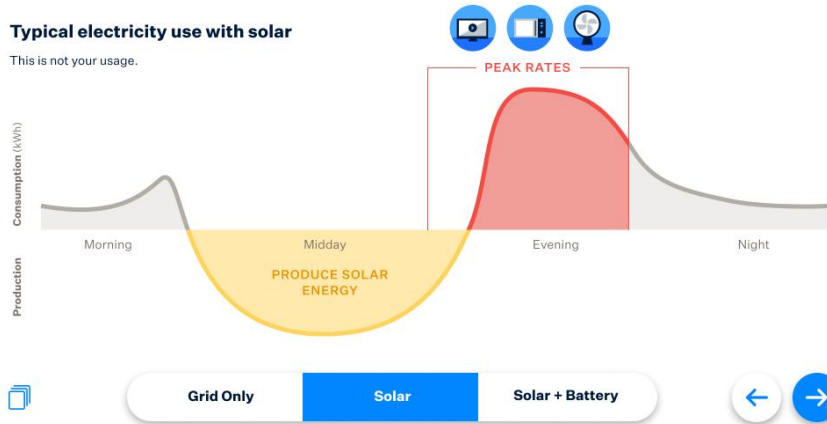
# NEM 2.0: Customer experience with time of use rates

sunrun

Don't change your habits to avoid evening price spikes.

## Typical electricity use with solar

This is not your usage.

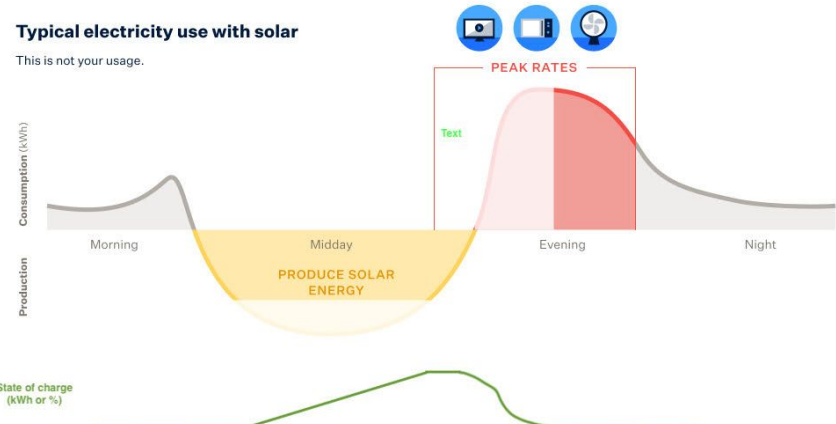


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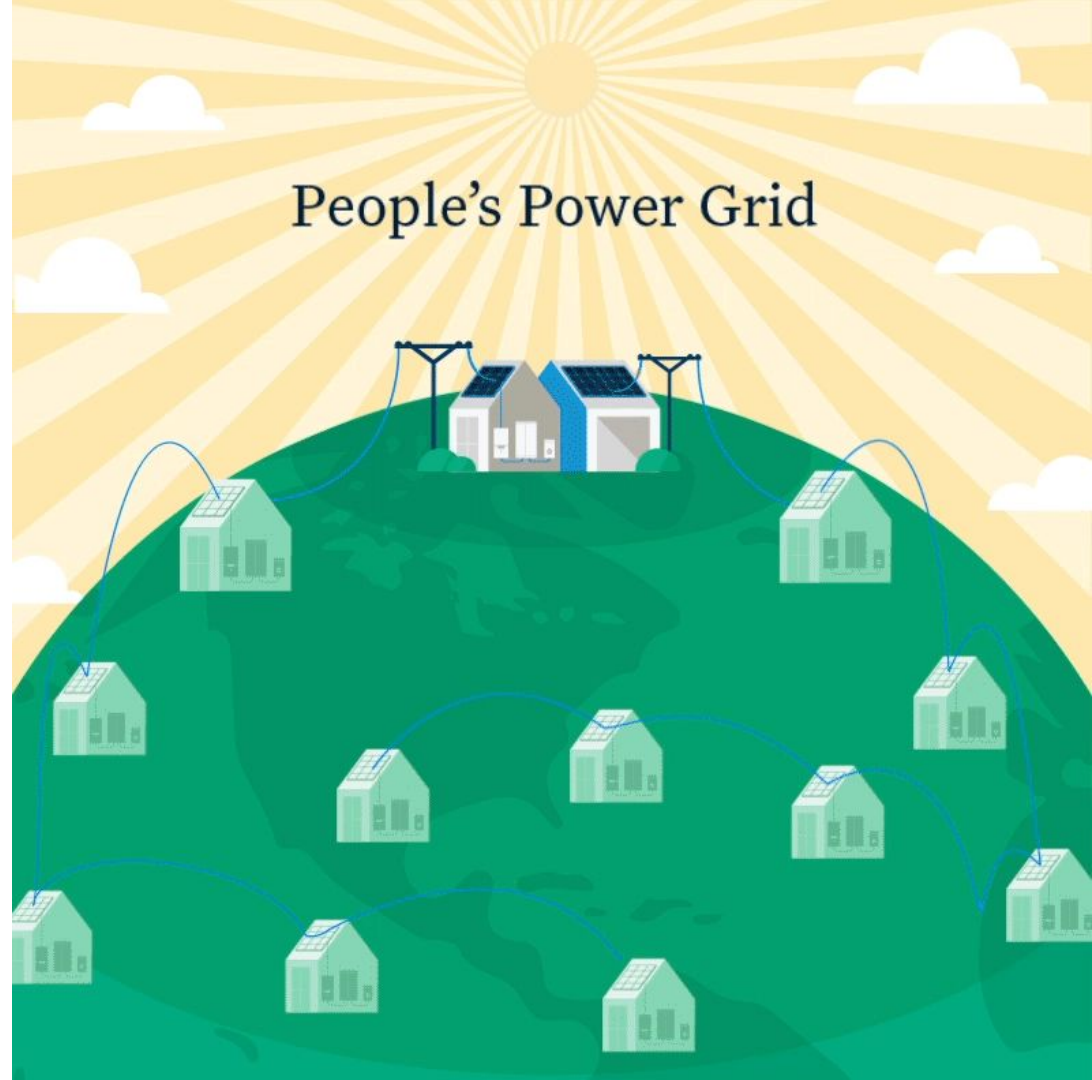


# Bring Your Own Device (BYOD) Programs

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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



# Massachusetts National Grid BYOD Program

## BYO Thermostat



Simple  
 ~1 kW/home  
 20 events/yr  
 Customer fatigue  
 \$20 upfront, \$25/yr

## BYO Device



Flexible  
 ~2.5-4.5 kW/home  
 Daily events  
 Recharge constraints

## 2018 BYOD

Pay for performance  
 \$70/kW-year  
 Summer only  
 2-5 pm  
 Exports not counted



## 2019 BYOD

Exports valued  
 2-7pm  
 3 hour/event  
 Summer (June-Sept):  
 \$225/kW-yr  
 ≤ 60 events  
 Winter (Dec-Mar):  
 \$50/kW-yr  
 ≤ 5 events

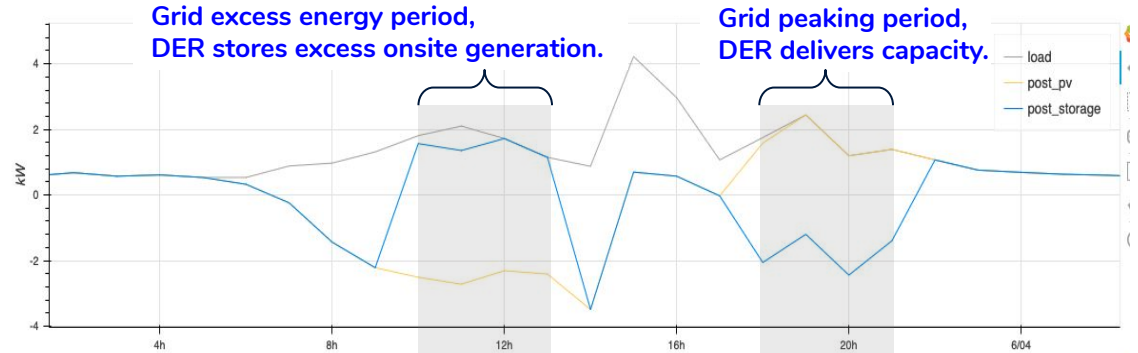


# Load shift working group proposals from Sunrun

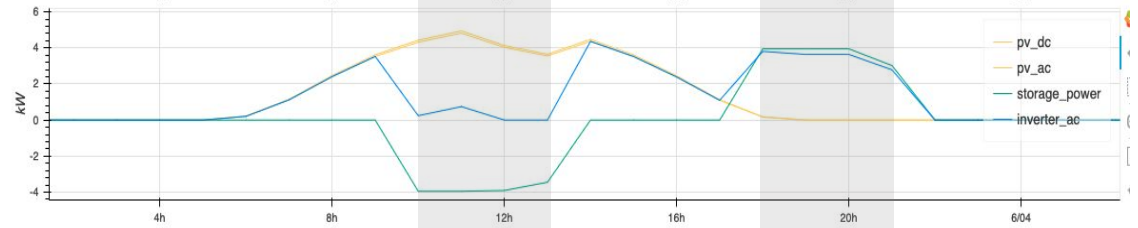
1. Distribution Load Shift (DLS) Product
  - $\approx$  Pay for Load Shape (P4LS)
  - + Distribution Services
2. Market Integrated Distribution Service (MINTDS) Product
  - $\approx$  Load Shift Resource 2.0 (LSR 2.0)
  - + Distribution Services
  - Utility as Distribution System Operator
  - Utility-offered tariff via aggregators

# Distribution Load Shape (DLS) Product: Illustration

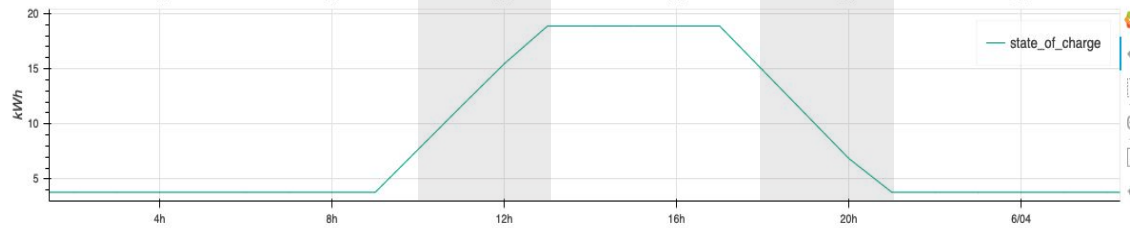
Utility meter reading or net load  
at residential customer site,  
hourly intervals



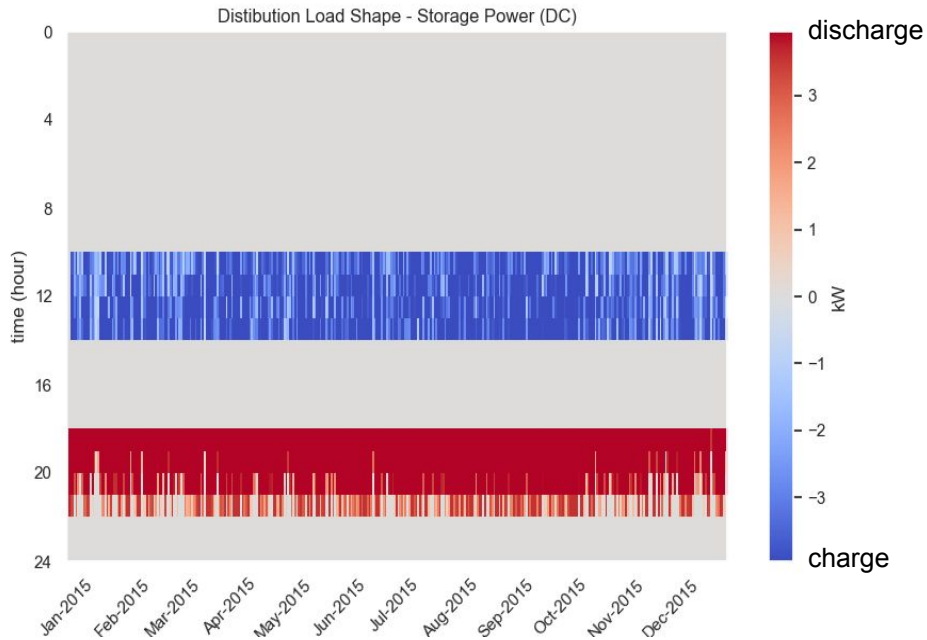
System power flow



Battery state of charge



# Distribution Load Shape (DLS) Product



## Approach Benefits

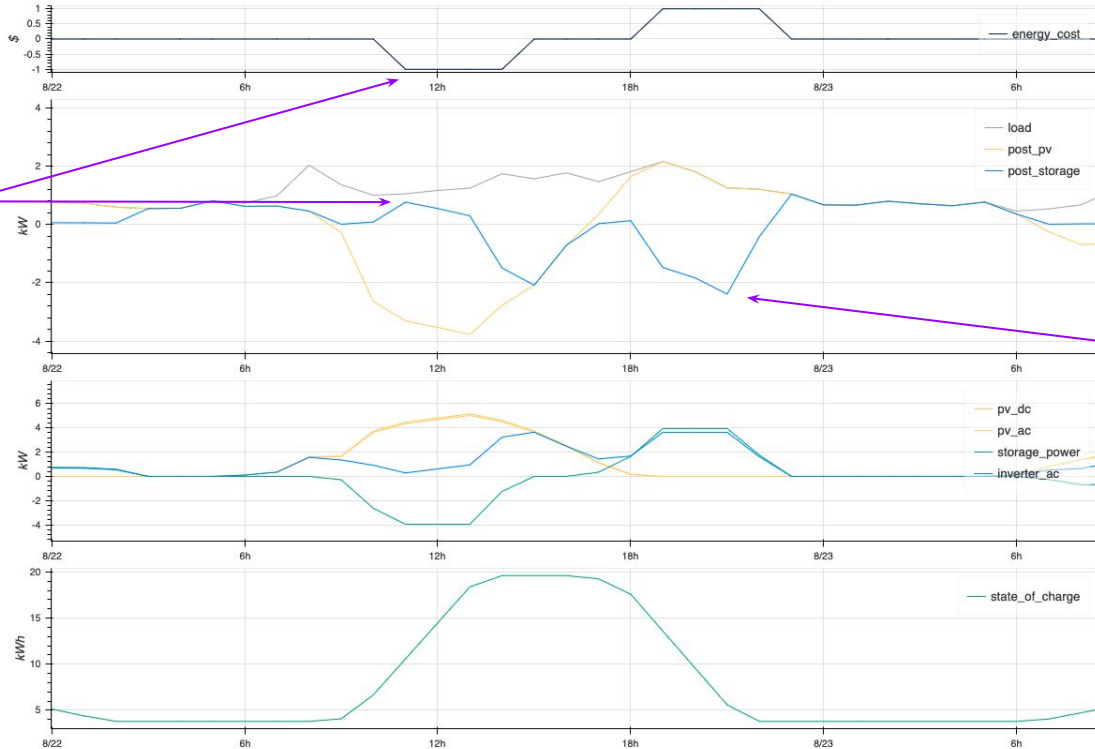
- Easy to program/schedule DER and account for within **interconnection** and **planning** processes.
- DSO/CCA **coordinated** response to align with excess energy and peaking capacity needs for the benefit of all regional customers.
- Optional rider tariff stackable with **NEM** and receives **capacity payment** for beneficial permanent load shape.
- **Hosting capacity** expansion/deferral benefits if coordinated holistically within interconnection processes.
- Available to **retrofit** existing (if needed) and future DER customers with capabilities to provide coordinated capacity services.

Note: single schedule shown for simplicity, but other schedules possible.

# Market Integrated Distribution Service (MINTDS)

## Product: Illustration

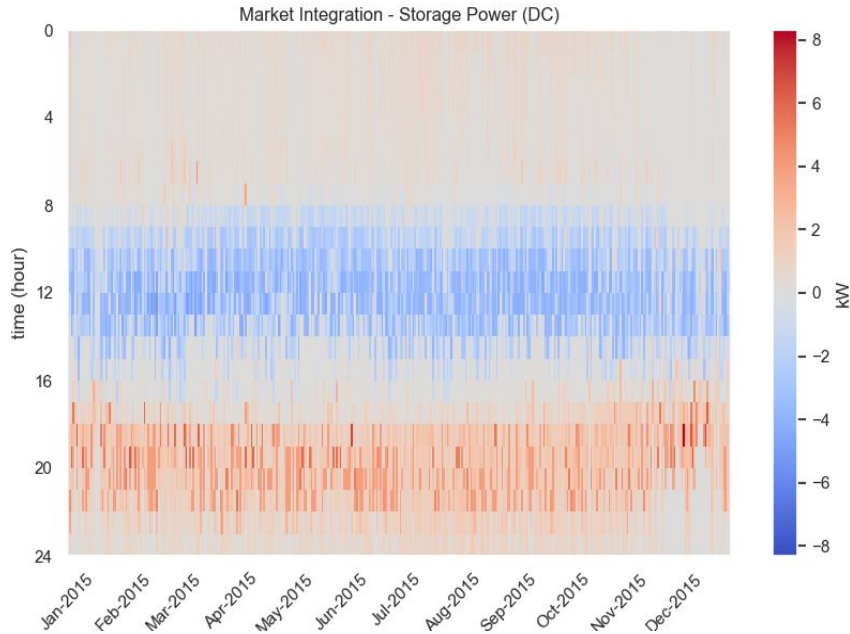
During negative price signal: Battery charges from rooftop solar eliminating exports and resulting in positive demand from the grid.



During positive price signal: Battery discharges at high power resulting in net export to grid.



# Market Integrated Distribution Service (MINTDS) Product



## Approach Benefits

- **Real time dispatchable** load shift product.
- DSO/CCA dispatches resources to align with excess energy and peaking capacity needs for the benefit of all regional customers.
- Unlike CAISO's PDR, customer resources are able to self consume during peaking period with alternative baseline allowing for DER Capacity **export**.
- Optional rider tariff stackable with **NEM** and receives performance based **capacity payments**.
- **Hosting capacity** expansion/deferral benefits if coordinated holistically within interconnection processes.
- Available to **retrofit** existing and future DER customers with capabilities to provide coordinated capacity services.

# Harness customer investments & Advance system planning

## To plan for the future and lower costs for all

- Utility and CCA **Bring Your Own Device (BYOD)**/rider tariff programs are designed for customers to respond to dispatch signals for coordinated aggregated response.
- Consider the impact/**inequity** of exposing customers to local/regional high pricing.
- Don't simply hope customers respond to high prices.
- Resources participating in BYOD programs are better suited for **coordinated real-time dispatching** than individual customers responding to real-time rates.
- BYOD programs encourage **technology adoption**.
- **Protect customers** unable to adopt new technology and exposed to real-time pricing.
- Don't forget about **distribution hosting capacity** coordination benefits as one of four Multiple Use Applications stacked within these BYOD programs.