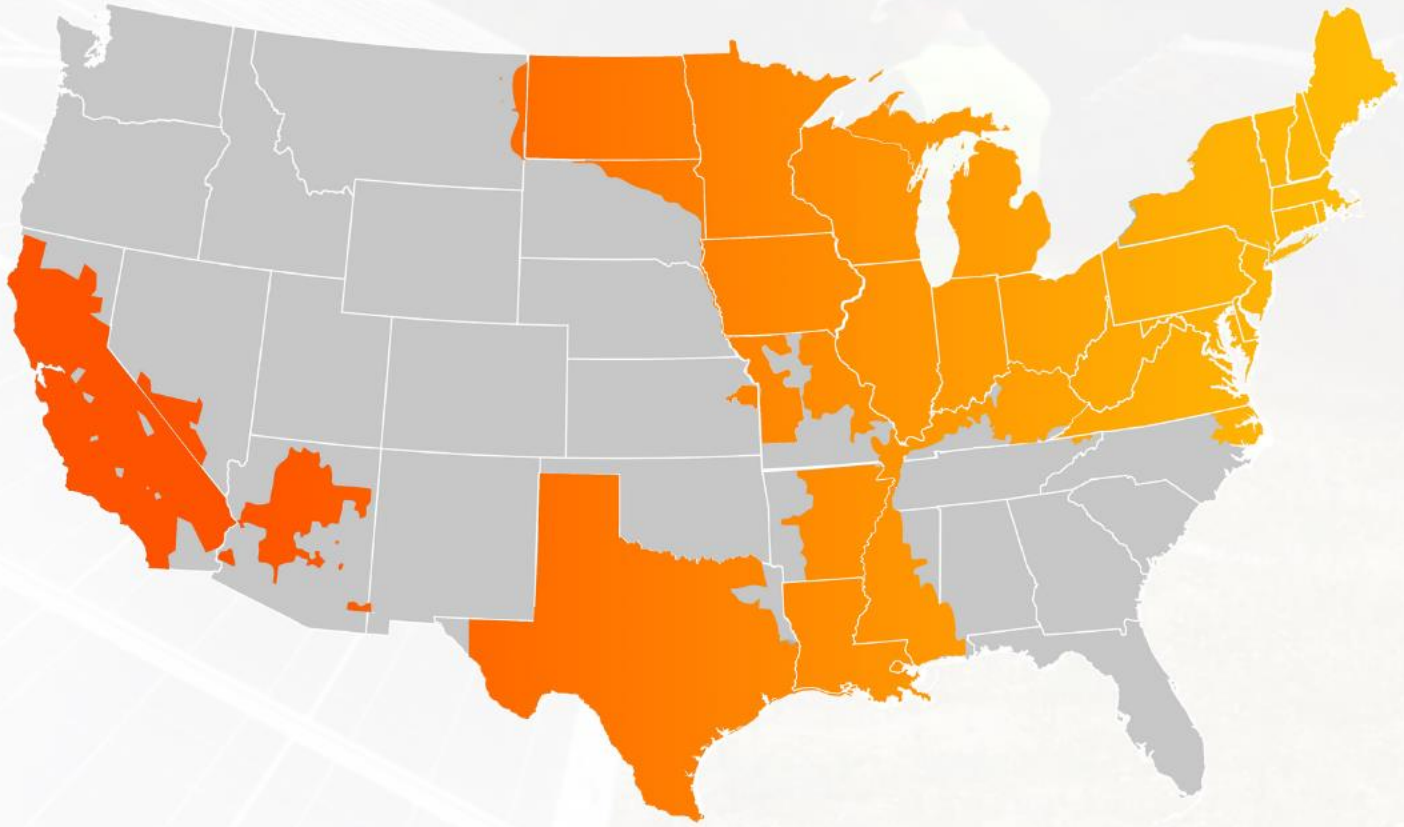
Active Demand Response (ADR) in New England

CPower

Leading Virtual Power Plant Provider

7.2 GW at
~28,000 sites

$1 BILLION
in revenue paid
to customers
since 2015



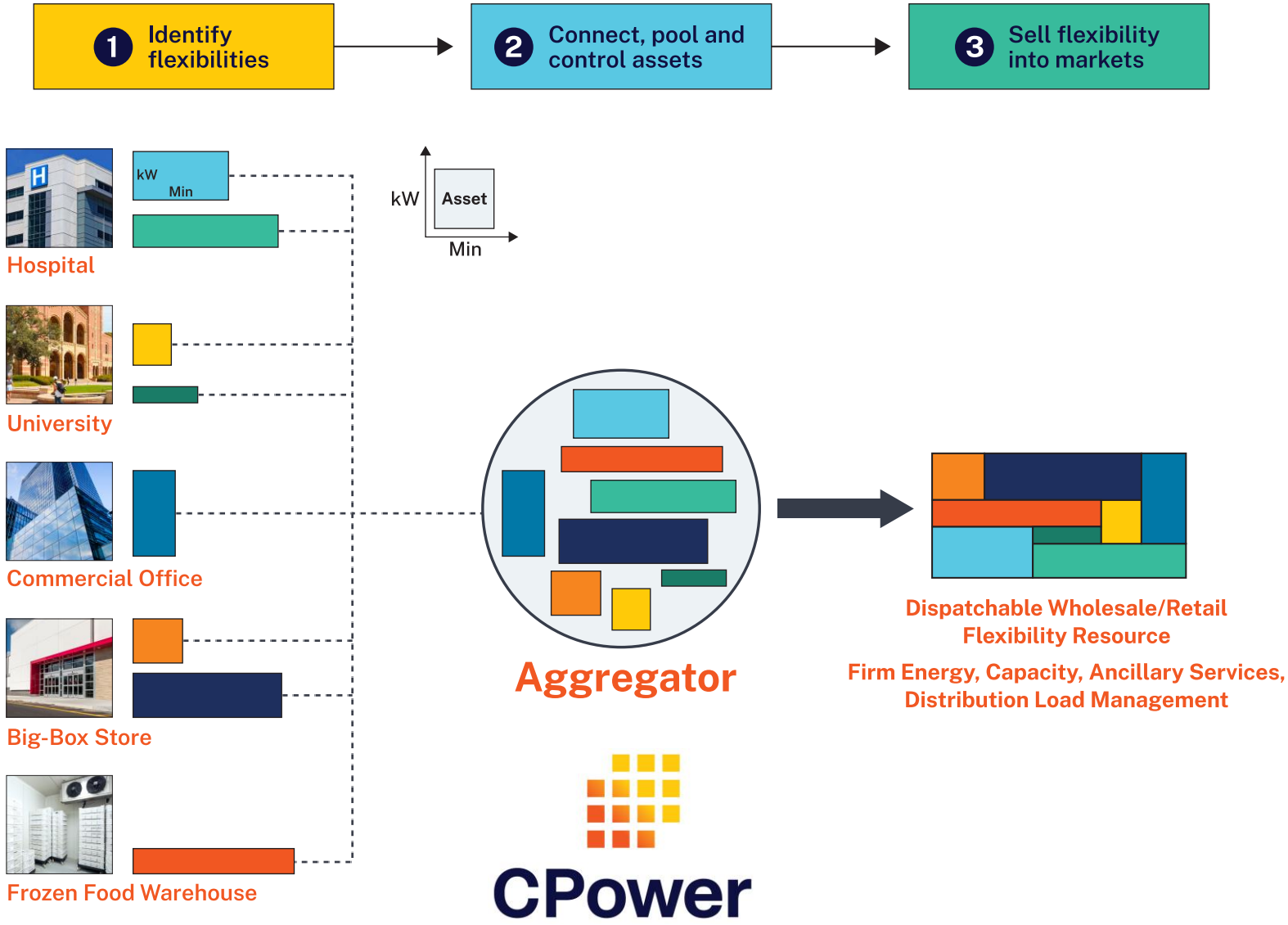
CPower

Virtual Power Plants

An aggregation of DERs that provides grid services via a coordinated dispatch.

Can include:

1) commercial and/or residential DERs
2) single type or heterogeneous mix of DERs
3) multiple control and communication methods between grid operator, VPP operator and DER.

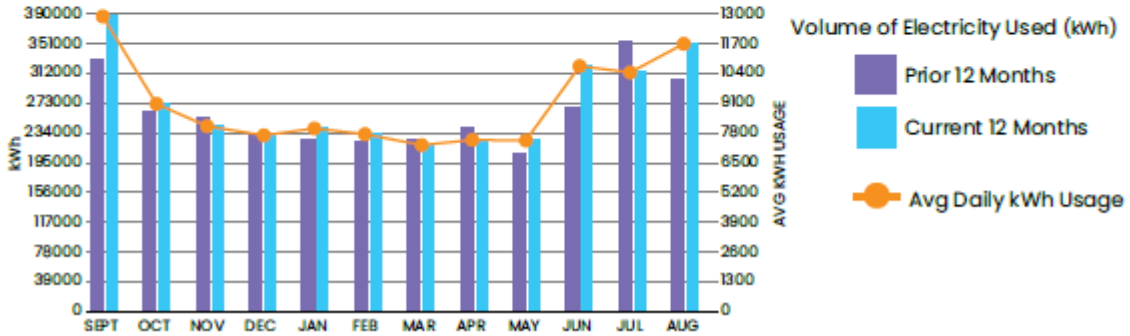


Lay of the Land – High School

857 KW Original – 350 KW Reduction

What do I owe?	How much did I use?	When is it due?
$57,988.37	351,000 kWh	Sep 12, 2024

Your Monthly Electricity Use At a Glance



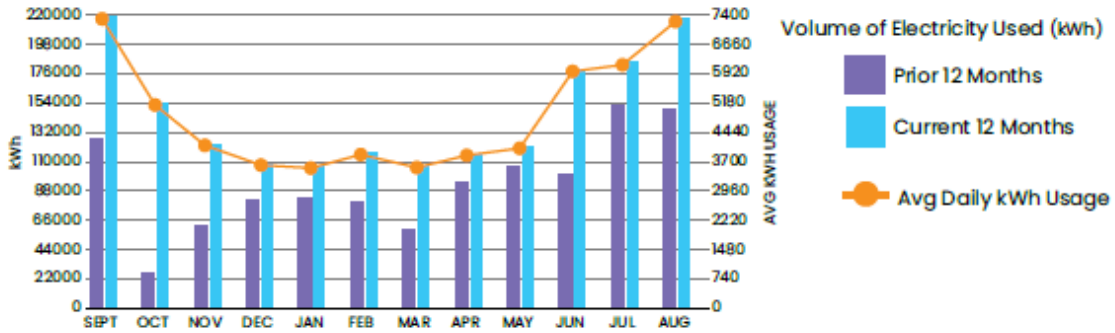
TOTAL DELIVERY CHARGES				**$ 14,199.89**
ELECTRICITY CHARGES	**QUANTITY USED**	**COST PER UNIT**		
Electricity Supply - Off Peak	165,750.00 KWH	$ 0.09950	$	16,492.13
Electricity Supply - On Peak	185,250.00 KWH	$ 0.09950	$	18,432.38
Demand Charge	857.25 KW	$ 10.34000	$	8,863.97
TOTAL ELECTRICITY CHARGES				**$ 43,788.48**
TOTAL CURRENT CHARGES				**$ 57,988.37**

Lay of the Land – Middle School

620 KW Original – 300 KW Reduction

What do I owe?	How much did I use?	When is it due?
$37,148.27	217,200 kWh	Sep 12, 2024

Your Monthly Electricity Use At a Glance



TOTAL DELIVERY CHARGES				**$ 9,126.07**
ELECTRICITY CHARGES	**QUANTITY USED**	**COST PER UNIT**		
Electricity Supply - Off Peak	69,800.00 KWH	$ 0.09950	$	6,945.10
Electricity Supply - On Peak	147,400.00 KWH	$ 0.09950	$	14,666.30
Demand Charge	620.00 KW	$ 10.34000	$	6,410.80
TOTAL ELECTRICITY CHARGES			**$**	**28,022.20**
TOTAL CURRENT CHARGES			**$**	**37,148.27**

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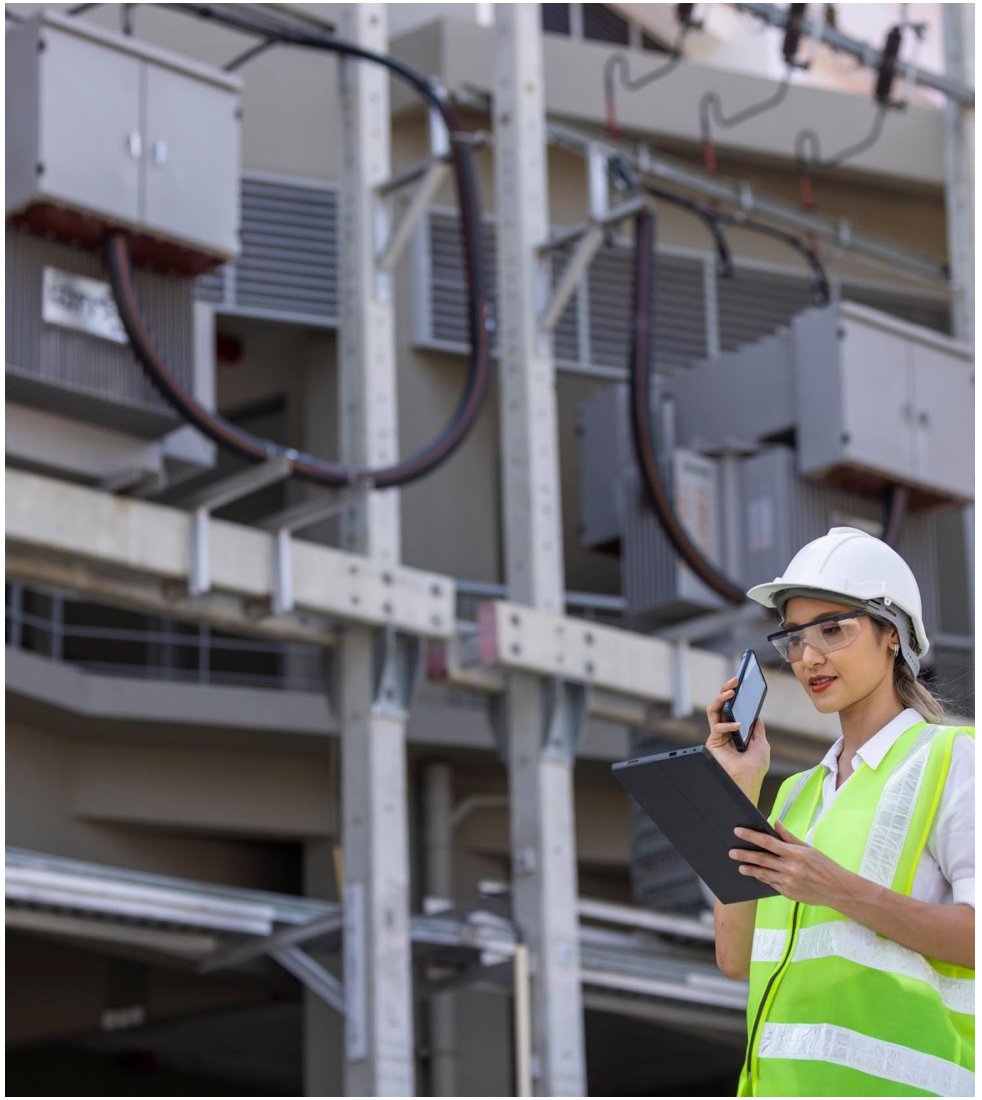
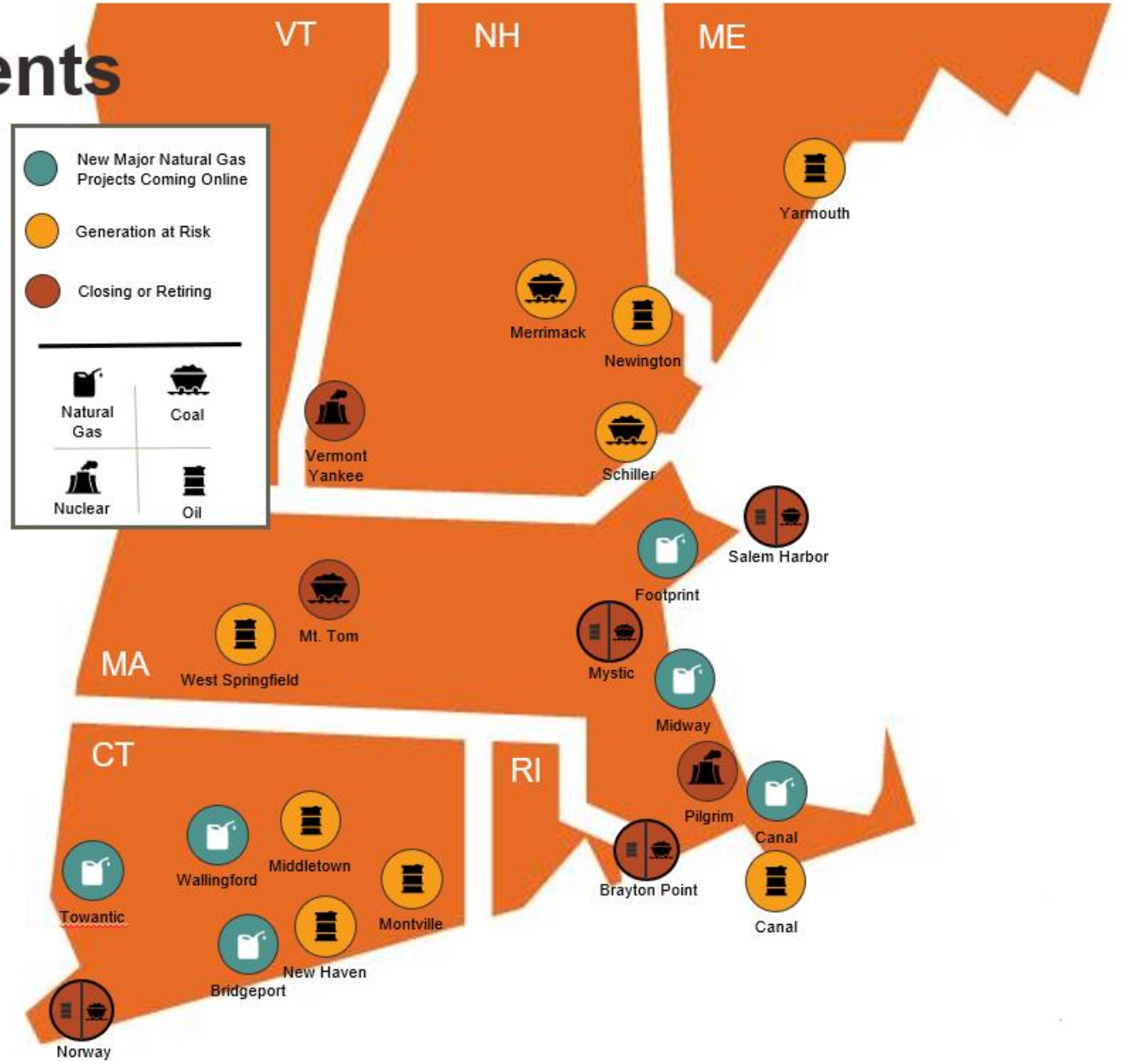
The Problem You Are Helping To Solve



Power Plant Retirements

Capacity Prices are decreasing

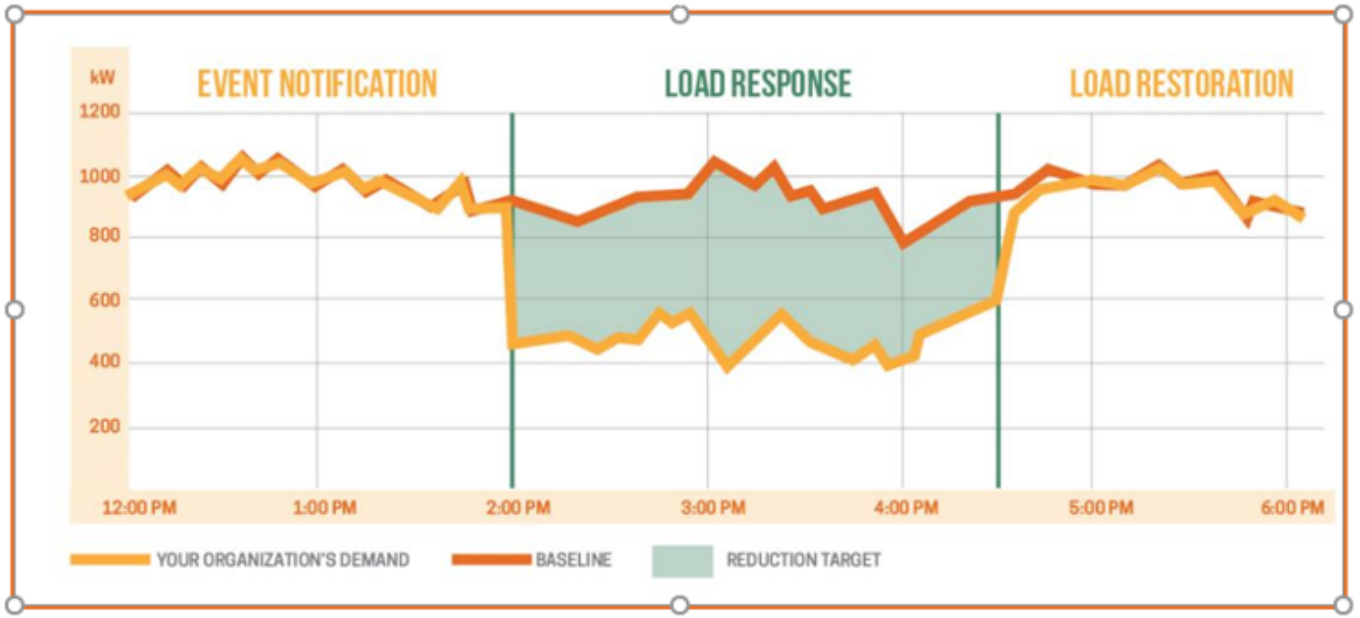
- Drivers:
  - Wind & Solar Penetration increasing capacity
- 30% of generation at risk for decommissioning
- More to close or retire
  - Will constrain capacity and potentially offset new capacity and drive up pricing



What Is Demand Response?

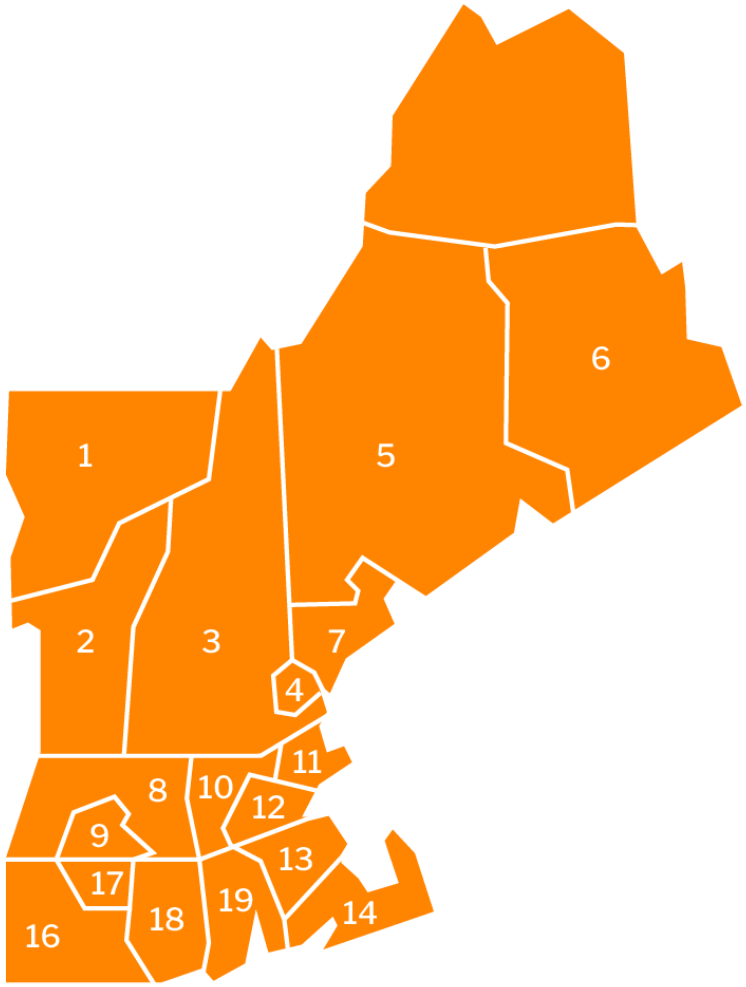
Programs that pay organizations to reduce energy load during times of grid stress or high energy prices.

Provides energy users the ability to earn revenue and lower net energy costs.



Program Education

ISO-NE Dispatch Zones



1 • Northwest Vermont
2 • Vermont
3 • New Hampshire
4 • Seacoast
5 • Maine
6 • Bangor Hydro
7 • Portland ME
8 • Western MA
9 • Springfield MA
10 • Central MA
11 • North Shore
12 • Boston
13 • SEMA
14 • Lower SEMA
15 • Norwalk-Stamford
16 • Western CT
17 • Northern CT
18 • Eastern CT
19 • Rhode Island

New England Demand Response Options

Program Name	Program Type	Customer Obligation Hours	Notification Lead Time	Performance Season	Typical Event Length	Typical Curtailment Frequency	Administrator
Active Demand Capacity Resource	Capacity	24/7/365	30 minutes	Summer (June-Aug) & Winter (Dec-Jan)	3.5 Hours	2 x 1 Hour Mandatory Tests	ISO-NE
Connected Solutions	Targeted Dispatch	June-September 3pm – 6pm 4pm – 7pm 5pm – 8pm	Day Ahead	Summer Only (June-Sept)	3 hours	4-6 calls per season	Utility
Peak Demand Management (Cap Tag)	Energy Bill Cost Avoidance	Voluntary	Day Ahead & Day Of	Summer	3 hours	4-6 calls per year	CPower

Events/ Audits ISO-NE

Active Demand Capacity Resource (ISO)

Utility Program

- In each season, tests ***will*** occur and events ***may*** occur.
- Test: 1 hour minimum
- Actual event: Duration based on need

ISO-NE Event History
2010- 2024

Year	# of Events	Hours
2010	1	2:45
2011	2	6:45
2012	0	0
2013	3	13:10
2014	0	0
2015	0	0
2016	1	3:30
2017	0	0
2018	1	3:45
2019	0	0
2020	0	0
2021	0	0
2022	1	2:00
2023	3	8:30
2024	2	4:00
AVG	1	3:00

Summer: June-September

- Typically, between 3 pm to 8 pm curtailment call on a weekday

Connected Solutions Summer Events

Summer Events	Number of Events – Targeted Dispatch			
Year	Eversource	CapeLight	NGrid	Unitil
2018	-	-	2	-
2019	3	3	1	1
2020	3	3	3	3
2021	5	4	6	5
2022	6	6	6	6
2023	6	6	6	6
2024	4	4	4	4

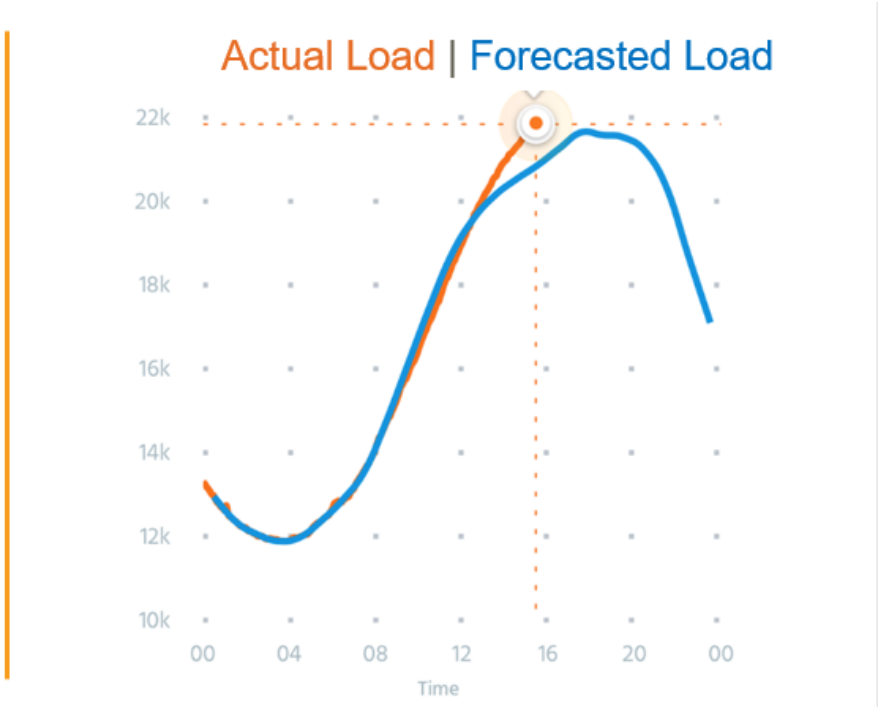
Summer Event: September 3, 2018

Summer Strain on the grid is generally caused by hot and humid conditions resulting in transmission lines inability to carry the required power.

ADCR Event

Triggers:

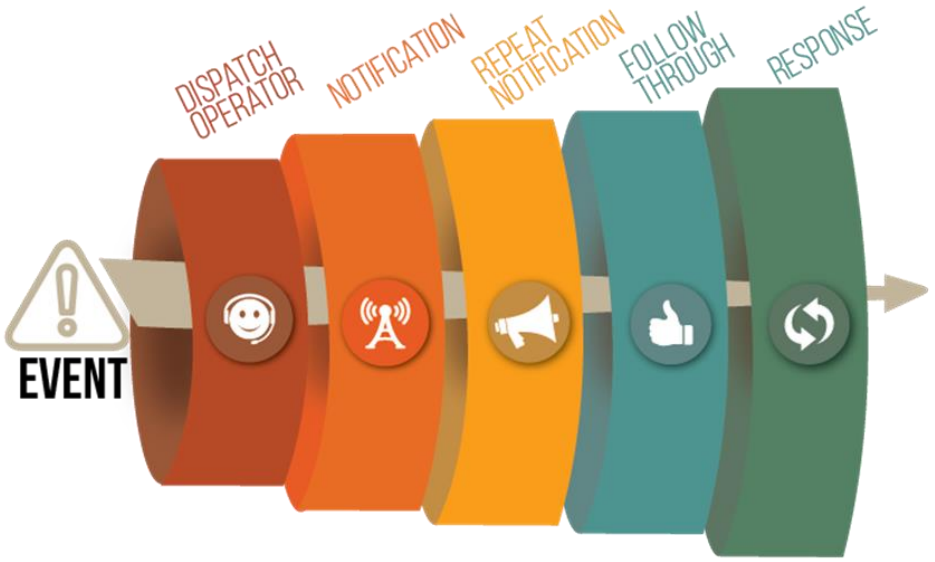
- Load was running significantly higher than forecast by over 2500 MW
- Several generation resources had significant outages and reductions totaling approximately 1,600 MW
- The peak temperature and dew point for the daytime hours in Boston were 94 and 73 with a forecast of 89 and 70
- ISONE declared an Emergency Alert at 3:15p, just before the DR dispatch took effect at 3:41 pm



Notifications

All Call System Functionality

- **The All Call System Utilizes:**
  - Phone
  - Email
  - Text Message
  - The System notifies all relevant contacts based on the program notification requirements
- **The System will:**
  - Be activated by CPower Dispatch Operators
    - For both test and real events
  - Send important preparation, start and completion notifications by utility, zone, or ISO.

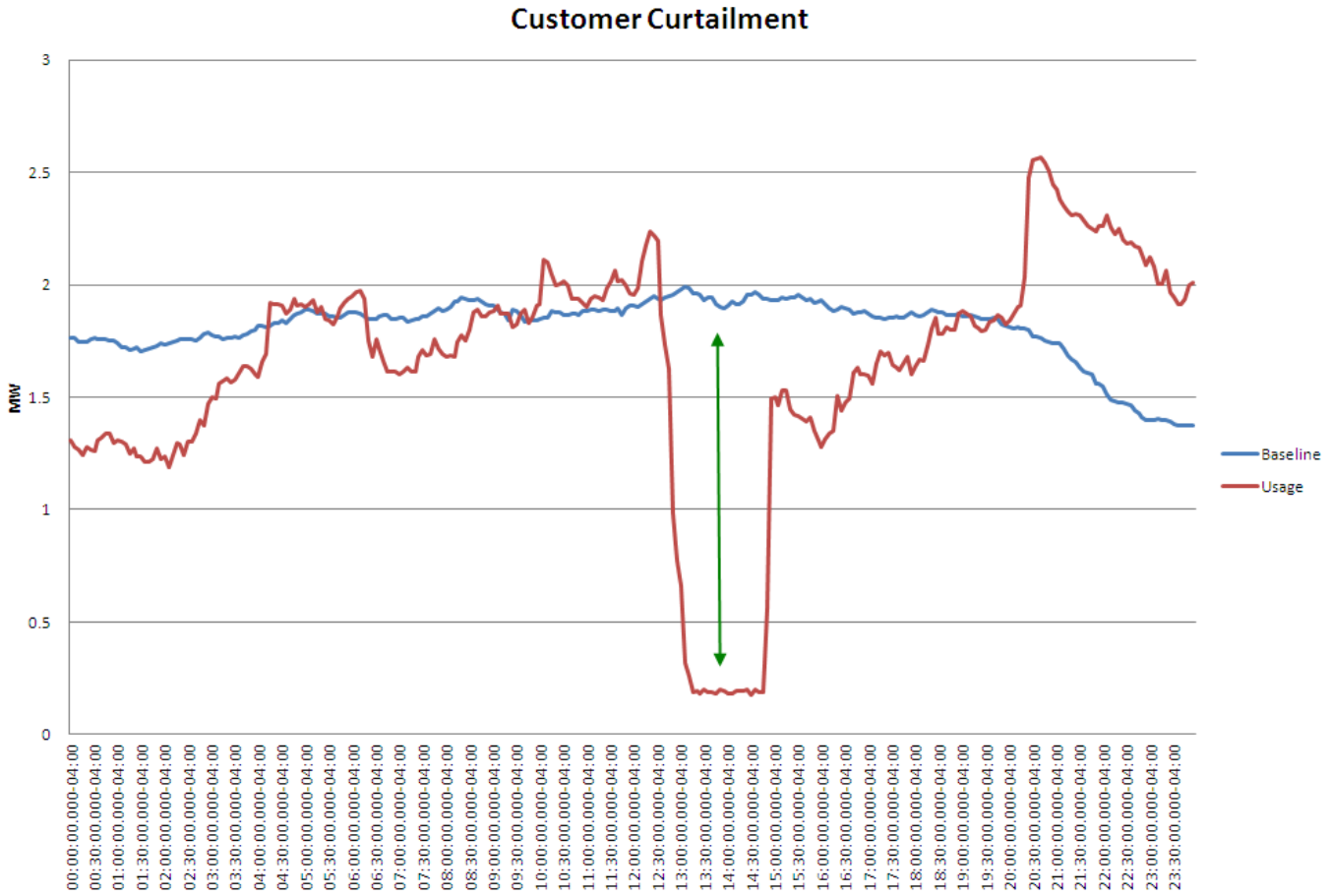


- Dispatch notifications will come from:
  - Phone – (410) 346-5907
  - Email – cpowerdispatch@mg.cpowerenergymanagement.com

Performance

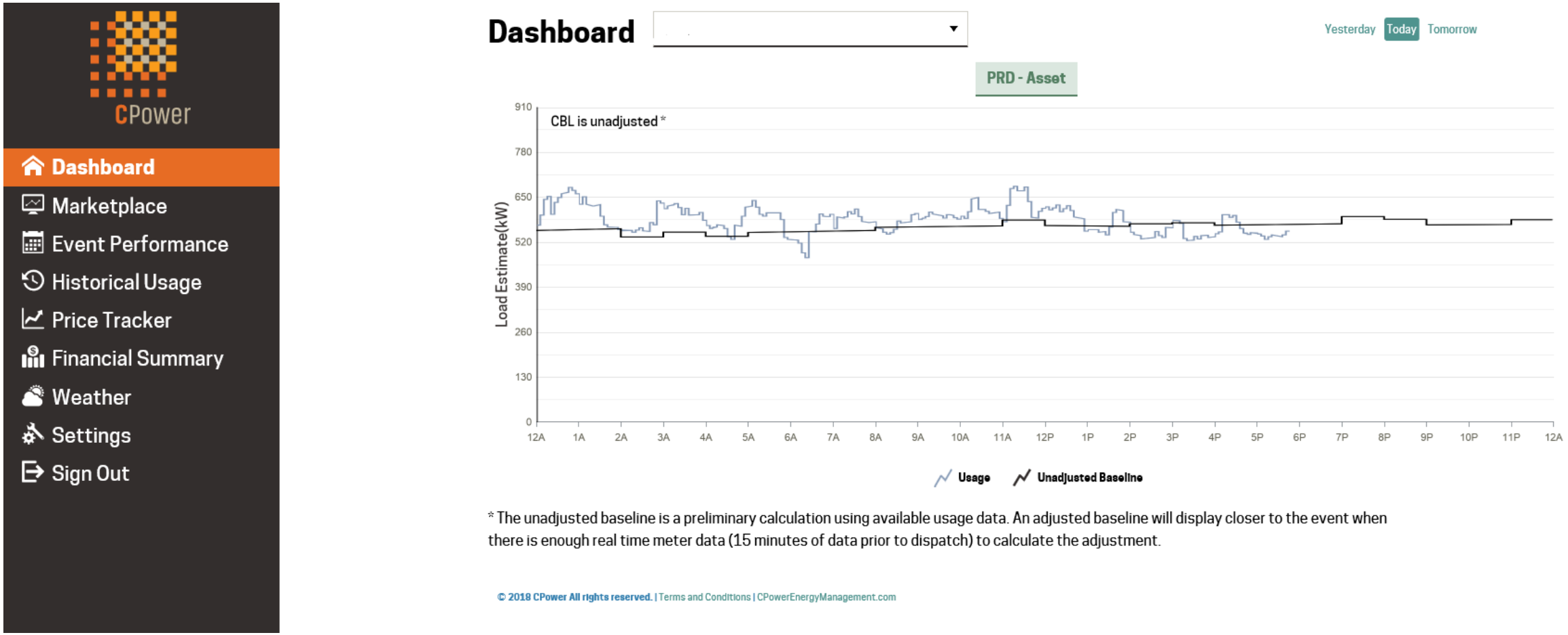
Performance on Utility Meter

Performance is determined as the average hourly difference between baseline and actual load.

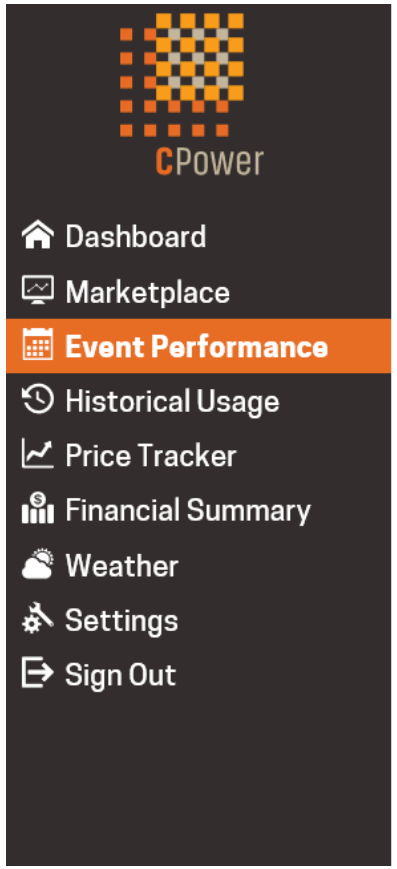


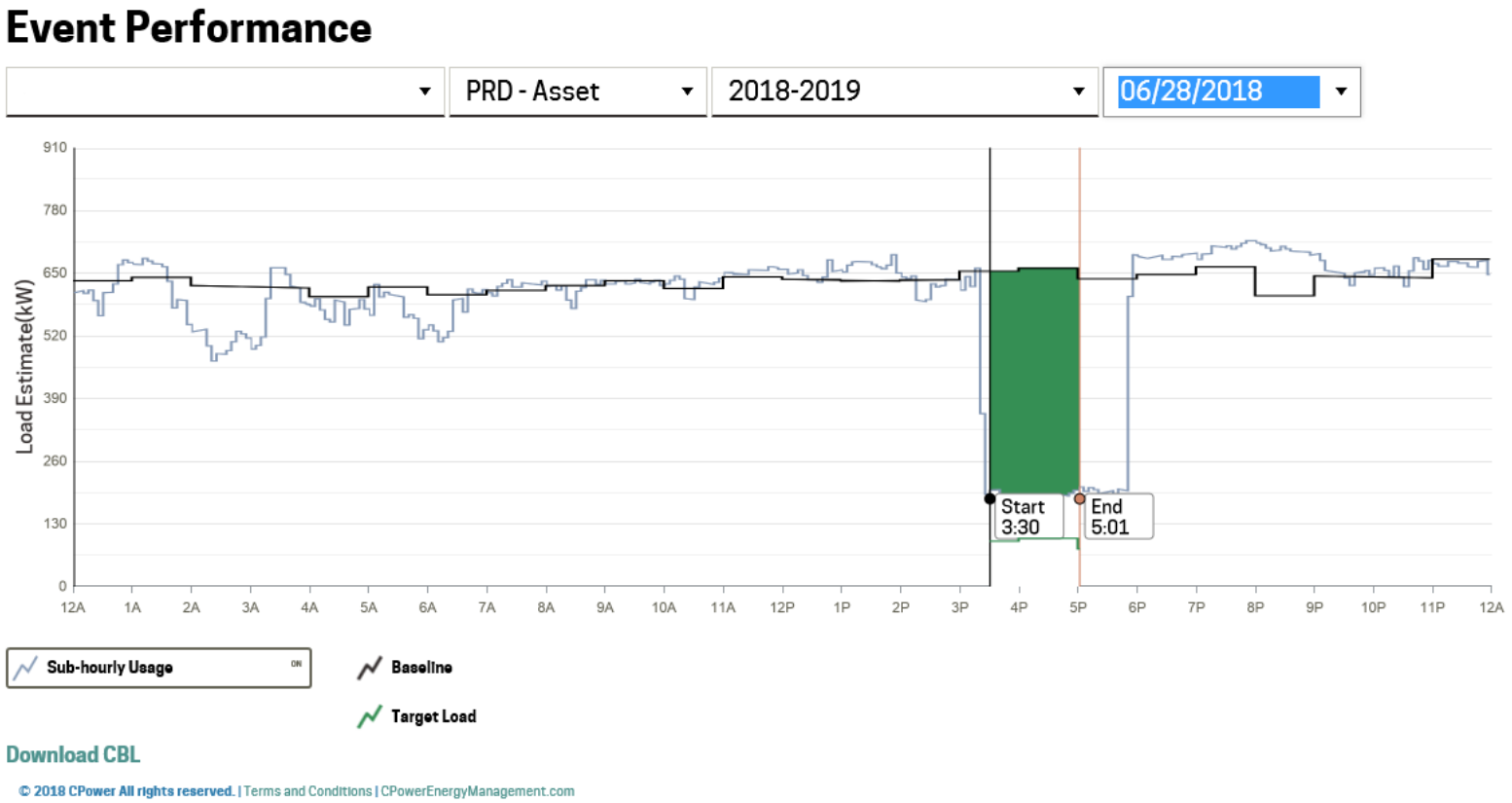
CPower Portal

Real-Time Usage



Performance Tracking





Stacking Benefits

ADCR Value (ISO-NE 30-minute)

CPower

Projected Program Revenues For
ISO-NE Active Demand Capacity Resource

	ISO-NE kW Reduction		ISO-NE Payments		Customer Share	
Commitment Period	Summer (8 months)	Winter (4 months)	$/kW-mth	Annual Gross	Rate	Annual Revenue
June 1, 2025 - May 31, 2026	650	300	$2.53	$ 16,192	70.0%	$ 11,334
June 1, 2026 - May 31, 2027	650	300	$2.59	$ 16,576	70.0%	$ 11,603
June 1, 2027 - May 31, 2028	650	300	$3.58	$ 22,912	70.0%	$ 16,038
June 1, 2028 - May 31, 2029	650	300	$3.50	$ 22,400	70.0%	$ 15,680
June 1, 2029 - May 31, 2030	650	300	$3.50	$ 22,400	70.0%	$ 15,680
			Total Customer Benefit			$ 70,336

EARN WITH DEMAND RESPONSE

Connected Solutions Value (Utility Day-Ahead ADR)

- **650 KW (performance) x $25 (ADR capacity/performance) x 70% (share)=**

  - **Summer 2025- $11,375**
  - **Summer 2026- $11,375**
  - **Summer 2027- $11,375**
  - **Summer 2028- $11,375**
  - **Summer 2029- $11,375**

EARN With Connected Solutions

Total = $56,875

Capacity Tag Management (Savings)

SAVE WITH PEAK DEMAND MANAGEMENT

Cap-Tag is set summer of this year	ISO-NE Zone	Cap Tag Power Year	Cap-tag Value $/kW Year
2025	NH	2026-2027	$31.08
2026	NH	2027-2028	$42.96
2027	NH	2028-2029	$42.00 (expected)
2028	NH	2029-2030	$42.00 (expected)

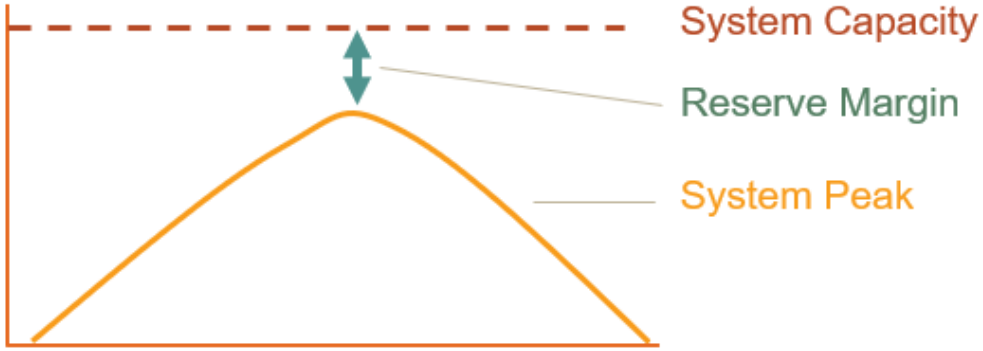
Cap Tag value drops by 650 KW in summer 2025

Value is realized from June 2026 through May 2027*:

- **650 KW x $31.08 x RM = $28,283 *over 12 months***
- **27-28= $39,094**
- **28-29= $38,220**
- **29-30= $38,220**

Total = $143,816

assuming capacity is passed through on your power contract



Stacking Benefits

EARN With ADCR

+

EARN With Connected Solutions

+

SAVE With Cap Tag Management

June 2025-May 2030:

ADCR (ISO) –

- Year 1 - $11,334
- Year 2 - $11,603
- Year 3 - $16,038
- Year 4 - $15,680
- Year 5 - $15,680

Connected Solutions ADR (Utility) –

- Year 1 - $11,375
- Year 2 - $11,375
- Year 3 - $11,375
- Year 4 - $11,375
- Year 5- $11,375

Peak Demand Management (Cap tag) –

- Year 2 savings - $28,283
- Year 3 savings - $39,094
- Year 4 savings - $38,220
- Year 5 savings - $38,220

Offset Revenues [$127,211] + Capacity Savings [$143,816] =

Year 5 Total Energy Benefit = $271,027

CPower + YOU =

TRUSTED ENERGY SOLUTIONS

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