CLEAResult®



CPS and Austin Energy
Winning the C&I Demand Response Challenge

Leigh Holmes

Presentation Summary

- CLEAResult's work with CPS and AE
- CPS and AE C&I DR program details
- Examples of DR Measures (AE and CPS)
- How DR benefits the grid
- How DR is benefiting CPS and AE program participants
- How AE built a strong foundation for their DR programs
- AE: taking DR programs from good to great
- What next for DR Programs

© CLEAResult. All rights reserved.

CLEAResult's work with CPS Energy and Austin Energy

- Austin Energy C&I DR Program
  - Marketing
  - DR Site Assessments
  - DR System Design
  - DRMS implementation support
  - Manual Control Coaching
  - Reporting
  - Planning and Analysis

- CPS Energy C&I DR Program
  - The majority of CPS Energy's program is administered in-house
  - Free and personalized customer site assessments for Demand Response
  - Reporting on customer performance

© CLEAResult. All rights reserved.

CPS Energy C&I DR program details

- Between June 1 and September 30, email/text/phone notifications
  - Typically weekdays between 1 p.m. - 7 p.m.
  - 30 min, 1 or 2 hours notice depending on program
  - Events typically last 2.5 hours
  - Approximately 25 conservation events per season
- Capacity based incentive structure

PROGRAM DURATION	NOTICE TIMEFRAME	MAX EVENTS/YEAR	PER kW CAPACITY CREDIT
June 1 - Sept. 30	30 minutes	25	$73.00
June 1 - Sept. 30	2 hours	25	$70.00
June 1 - Sept. 30	1 hour	6	$31.00
July 1 - Aug. 31	2 hours	18	$47.00

© CLEAResult. All rights reserved.

Austin Energy C&I DR program details

- Between June 1 and September 30, both manual and AutoDR
  - Weekdays between 4 p.m. - 7 p.m.
  - 30 minute notice or 10 minutes notice (AutoDR) depending on program
  - Events typically last 2 hours
  - Approximately 15 conservation events per season (20 max)
- Energy payment type incentive structure
- Voluntary participation (no penalties)

Event Notice	Summer 4-7pm	Summer 1-7pm	Summer 1-7pm Energy Emergency Alert (EEA) - Anytime
30-Minute	$45	$50	$60
Automated	$55	$60	$70

CLEAResult®

© CLEAResult. All rights reserved.

Examples of DR Measures (AE and CPS)

HVAC

- Global Set Point Reset (Preferred)
- Fan Speed Limiting and chilled water temperature reset (not ideal)
- Pre-cooling (Limited application due to peak demand penalties)

Lighting

- Daylight harvesting
- 50% lighting reduction typical for “Big Box” retailers

Process equipment

- Pumps
- Crushers
- Conveyors
- Fans
- Filtration equipment

© CLEAResult. All rights reserved.

DR and Grid Reliability

Demand response capacity of all regional system operators is around 6% of peak demand

C&I accounts for 75% of total DR

Region	Customer Class			
	Residential	Commercial	Industrial	All Classes
AK	5.0	13.0	9.0	27.0
FRCC	1,477.6	1,344.3	276.0	3,097.9
HI	14.1	20.3	0.0	34.4
MRO	1,937.8	1,121.4	2,193.3	5,252.7
NPCC	143.6	498.5	416.6	1,058.7
ReliabilityFirst	1,776.4	730.9	3,391.8	5,899.0
SERC	1,206.0	1,305.1	5,941.9	8,452.9
SPP RE	234.9	368.9	1,083.0	1,686.8
Texas RE	277.1	405.5	231.5	914.0
WECC	1,420.2	1,213.1	1,749.7	4,382.6
Unspecified	46.5	0.0	42.4	89.0
Total	**8,539.2**	**7,021.0**	**15,335.2**	**30,895.0**

NERC: Potential Peak Demand Savings (MW) from Retail Demand Response Programs, by Region and Customer Class

© CLEAResult. All rights reserved.

DR and Grid Reliability

NERC's 2020 State of Reliability report states:

- Higher penetration of variable generation resources created a growing need for flexible resources like demand response to balance electricity supply and demand, ensure resource adequacy, and meet ramping needs

- ERCOT has operational tools available, including calling on demand response resources that can provide ancillary services, to maintain system reliability

© CLEAResult. All rights reserved.

How DR is benefiting CPS and AE program participants

- LEED points for DR measure integration
- DR program allow customers to demonstrate their corporate responsibility
- DR programs increase customer engagement
- Participation helps lower costs for all customers and contributes to grid stability
- Financial incentives for participating

© CLEAResult. All rights reserved.

How AE built a strong foundation for their DR programs

- Market Potential Assessment Study
- Detailed understanding of participant potential via site assessments
- Recommend measures that are repeatable, flexible and code compliant
- Offer customer centric programs
  - Keep programs simple
  - Avoid penalties
  - Offer simple agreements rather than long complicated contracts

© CLEAResult. All rights reserved.

AE: Taking a DR program from good to great

- Using smart analytics to enable continuous improvement
  - Portfolio, sector and participant level performance analysis
  - Customer score cards
  - Demand Rebound Mitigation
  - Use program and participant insights to improve the program
- Automated Demand Response
- Dynamic Customer Centric Program Design

© CLEAResult. All rights reserved.

Taking a DR program from good to great using smart analytics

- Smart Analytics



- Improved program design
- Improved program performance
- Improved recruitment strategy
- Reduced demand rebound
- Improved customer engagement
- Opportunity to document customer load shed strategies
- Improved estimates for customer event performance

© CLEAResult. All rights reserved.

Portfolio Specific Analysis

- What analytics should be applied to the aggregated demand?

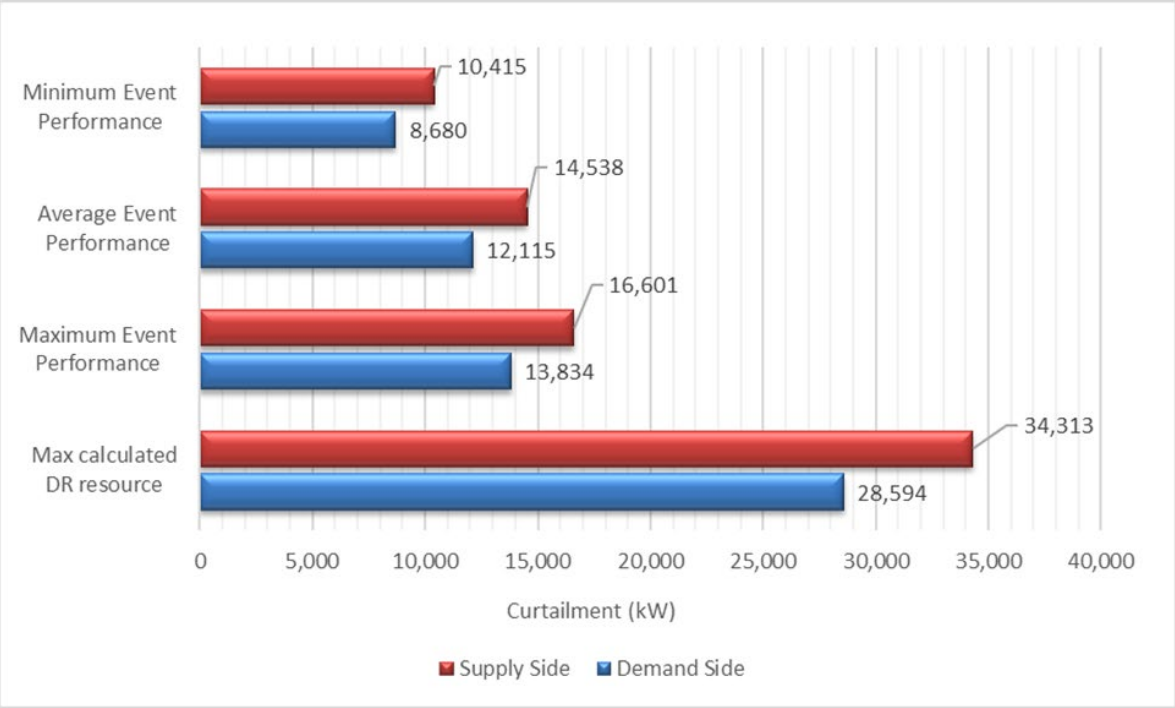
Total population	Average event performance	kW	% of max capability
	Minimum event performance	kW	% of max capability
	Max event performance	kW	% of max capability
	Average event participation	#	% of max participant
	Minimum event participation	#	% of max participant
	Max event participation	#	% of max participant
	Max calculated DR resource	kW	
	Total number of current participants	#	
	Total number of events called	#	
Total population	Trend showing event performance over season	kW	% of max capability
	Trend showing event participation over season	kW	% of max capability

Examining metrics for the aggregated demand highlights factors that are impacting participants as a whole, such as back-to-back events and events triggered late on Friday evening, etc.

© CLEAResult. All rights reserved.

Portfolio Specific Analysis Example

- Demand Side Performance Variation
- Avg: 12.1 MW (vs. 15.7 MW in 2019)
- Min: 8.7 MW (72% of Avg)
- Max: 13.8 MW (114% of Avg)



CLEAResult®

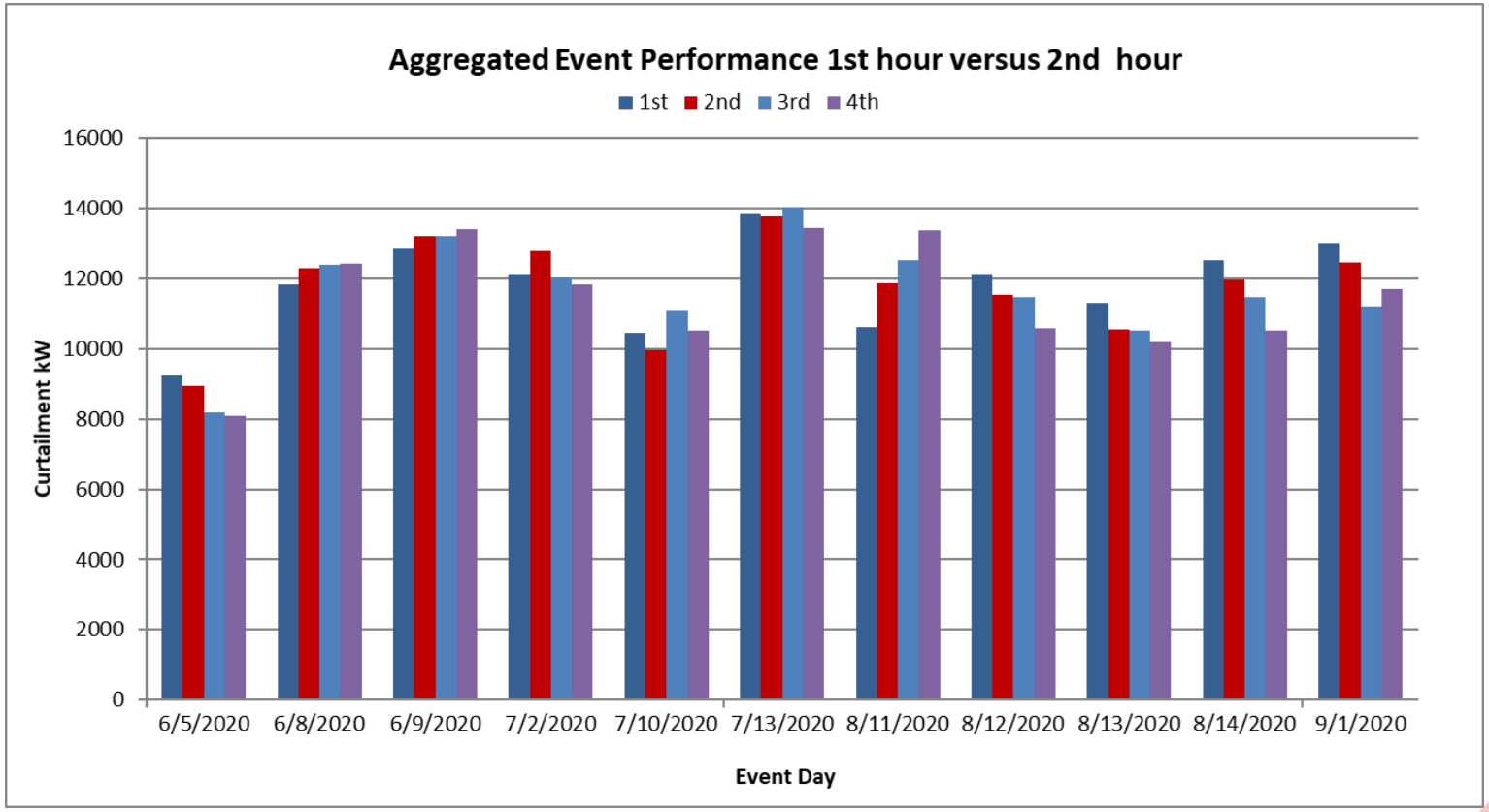
© CLEAResult. All rights reserved.

Portfolio Specific Analysis Example

Min Performance: 6/5/2020 (8,680 kW)

Max Performance: 7/13/2020 (13,834 kW)

Average Performance: 12,115 kW



CLEAResult®

© CLEAResult. All rights reserved.

Sector Specific Analysis

What analytics should be applied to each sector?

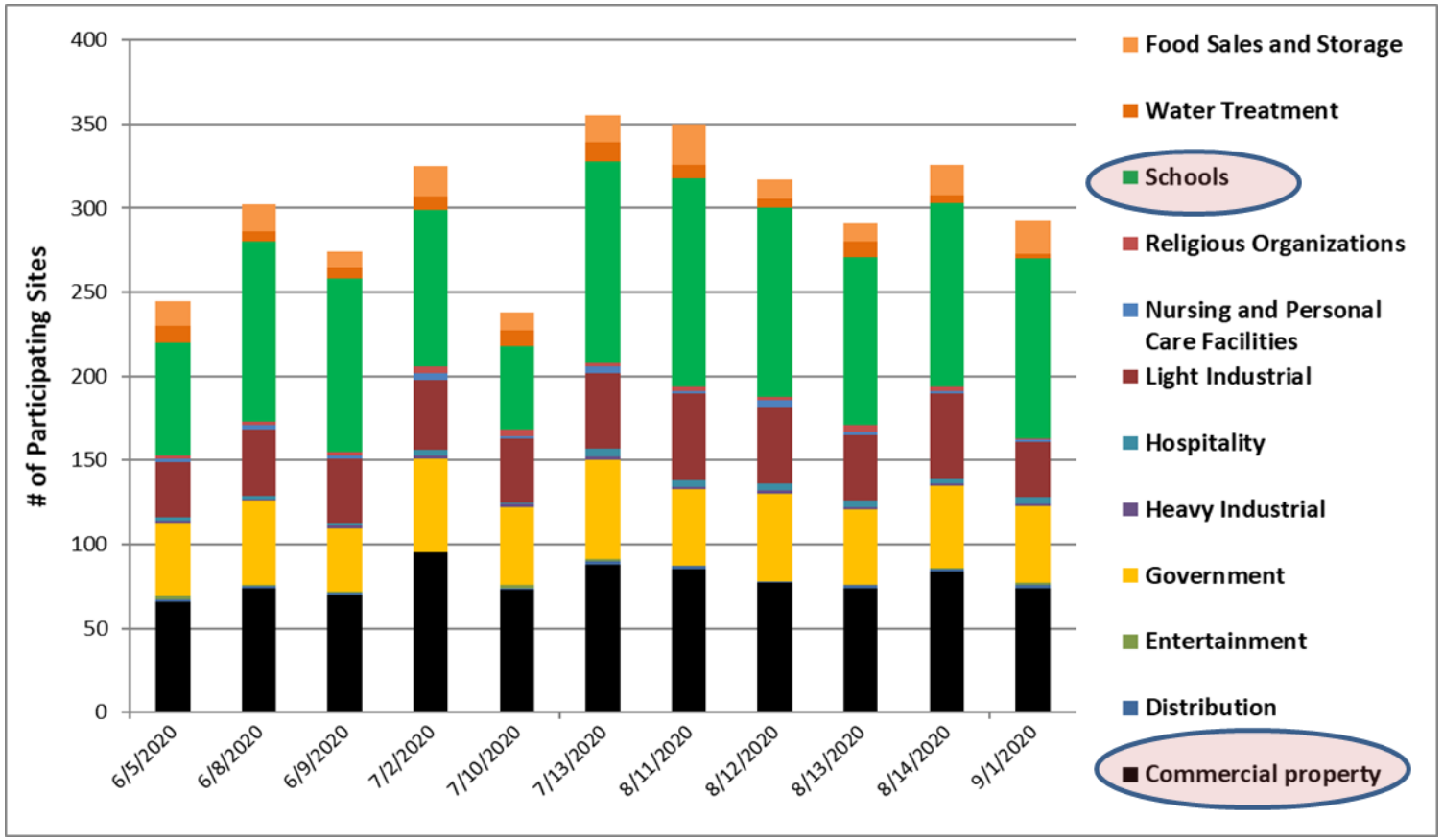
Sector	Average event performance	kW	% of max capability
	Minimum event performance	kW	% of max capability
	Max event performance	kW	% of max capability
	Average event participation	#	% of max participant
	Minimum event participation	#	% of max participant
	Max event participation	#	% of max participant
Sector	Trend showing event performance over season	kW	% of max capability
	Trend showing event participation over season	kW	% of max capability
	Chart that ranks sector performance		

Examining metrics for each sector highlights factors that impact participant subsets, such as back-to-school shopping periods.

© CLEAResult. All rights reserved.

Sector Specific Analysis Example

Top Two Sectors:
Schools and
Commercial Property



© CLEAResult. All rights reserved.

Individual Customer Analysis

What analytics should be applied to individual customer demand?

Individual customer analysis identifies:

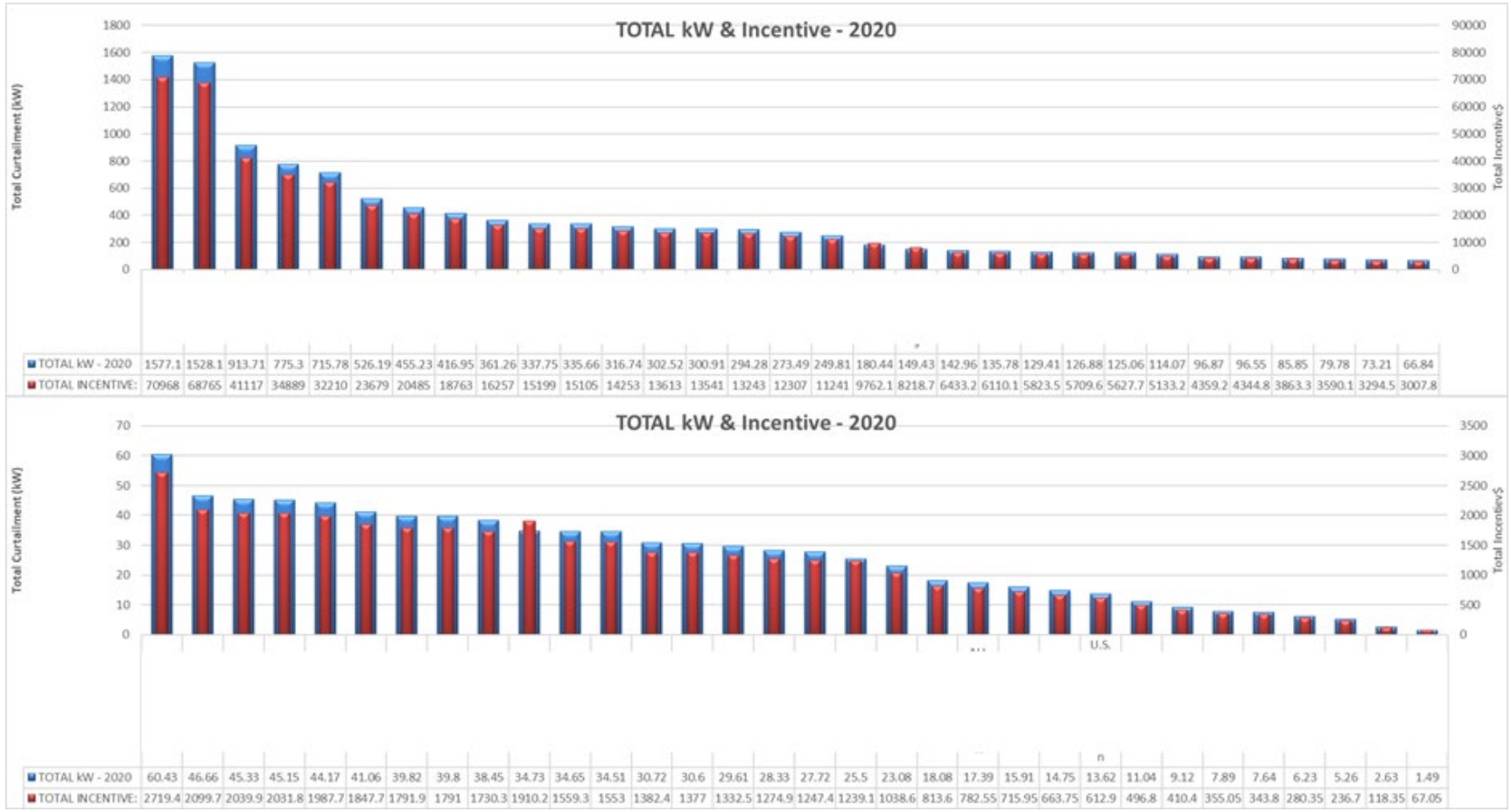
- rebound occurrence
- consistency and level of performance
- level of participation

Individual participants	Average event performance	kW	% of max capability
	Minimum event performance	kW	% of max capability
	Max event performance	kW	% of max capability
	Event participation	#	% of max participant
Participant	Trend showing event performance over season	kW	% of max capability
	Trend showing event participation over season		
	Chart that ranks participants in order of performance		
	Chart that ranks participants in order of unutilized potential		
	Charts highlighting any rebound occurrence		

© CLEAResult. All rights reserved.

Individual Customer Analysis

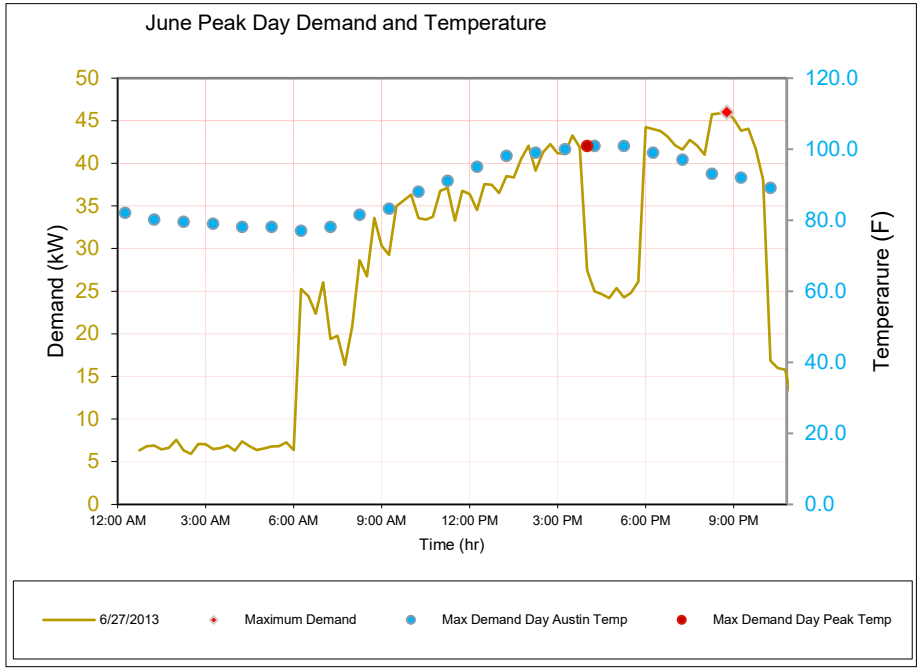
Ranking individual participants in order of load shed potential helps to prioritize outreach

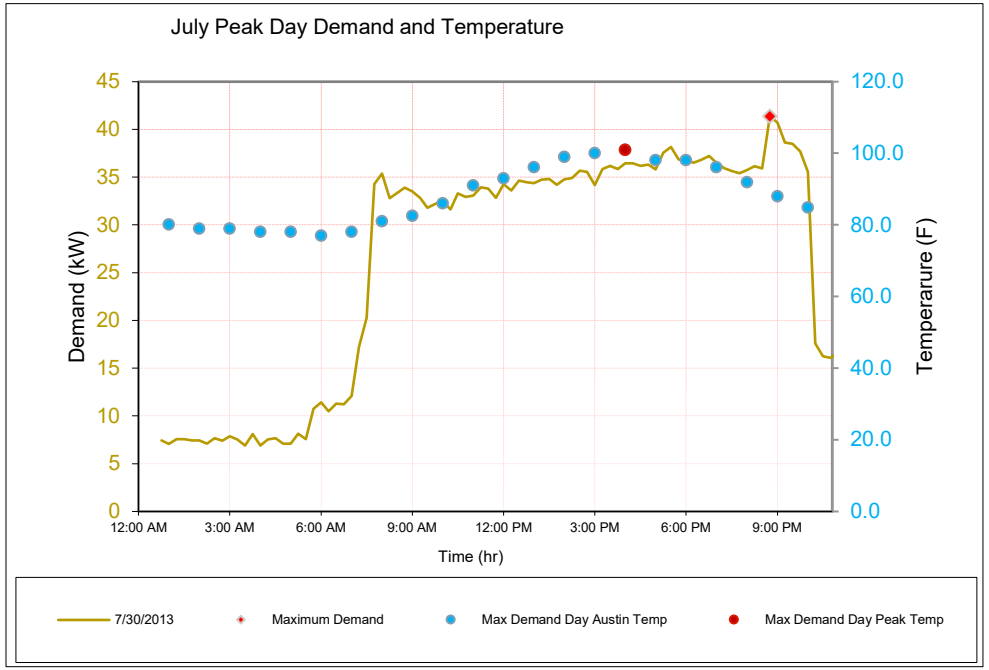


© CLEAResult. All rights reserved.

Individual Customer Analysis

Analyzing event performance data for demand rebound can help customers avoid costly peak demand charges.





© CLEAResult. All rights reserved.

Individual Customer Analysis

Customer Average Performance (kWh)

Customer Maximum Demand (kW)

Customer Average Performance %

Industry Best Performance %

Customer Best Performance

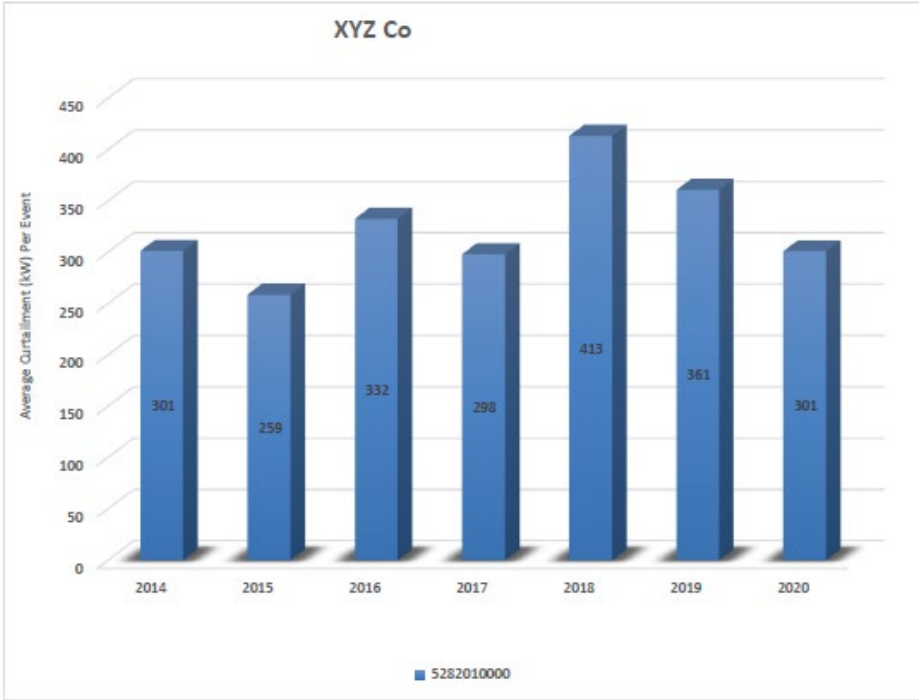
Additional Incentive Customer Could have Earned

Austin Energy Load Co-op Program - Customer Report

2020 Event Summary

Customer:	XYZ			
		Your Avg. Performance:	37%	<--On average you achieved this % load drop (based on varying levels and frequency of performance)
Avg. Performance:	301 kW	**Top Performers in Your Industry:**	40%	<--Your industry's top performers achieved this % load drop
Maximum Demand:	805 kW	**Your Best Performance:**	41%	<--The best % load drop achieved
Final Incentive:	$13,540.95	**Addt'l Potential Incentive:**	$1,175	<--Additional incentive you could have received by consistently performing at your best load drop

Historical Performance Comparison



2020 Event Performance

Site	Account #*	Event Performance (kW) 6/5/2020	6/8/2020	6/9/2020	7/2/2020	7/10/2020	7/13/2020	8/11/2020	8/12/2020	8/13/2020	8/14/2020	9/1/2020	EV** (%)	Avg (kW)	Rate ($ /kW)	Estimated Incentive ($)
XYZ Co	*	300	285	310	327	314	317	279	296	290	303	284	100%	301	$ 45	$13,540.95
													Total:	301		$13,540.95

Best Performance of the season
75-100% of the best performance
20-75% of the best performance
<20% of the best performance

Note:
Avg. Performance: Sum of all sites average performance if multiple sites are present
Maximum Demand: Sum of individual site's average summer peak demand if multiple sites are present
Your Avg. Performance: Sum of individual site's average performance compared to sum of the site maximum demand
Top Performers in Your Industry: Your industry's top performers achieved this % load drop
Your Best Performance: Sum of individual site's best performance compared to sum of the site maximum demand
Average Curtailment Per Event: Average curtailment of all events with higher than zero curtailment
Adjustment: Account # with "" indicates 8/11/20 curtailment is ignored in Avg (kW) calc because of late notification on 8/11/20
**Event Participation (EV): Excludes any events where you achieved less than 20% of the best performance

© CLEAResult. All rights reserved.

Customer Interaction

Inputs to customer meetings:

- Prepare questions based on customers underperformance in advance
- Customer Scorecard
- Rebound Analysis

Outputs of customer meetings:

- Recommendations to the customer to improve event performance
- Recommendations to customer to reduce demand rebound
- Recommended modifications to the utility recruitment plan
- Recommended modifications to the DR program
- Documentation of customer load shed strategies
- Revision of the customer load shed estimates

© CLEAResult. All rights reserved.

AE: taking DR programs from good to great

- Smart Analytics



- Improved program design
- Improved program performance
- Improved recruitment strategy
- Reduced demand rebound
- Improved customer engagement
- Opportunity to document customer load shed strategies
- Improved estimates for customer event performance

© CLEAResult. All rights reserved.

What next for DR Programs

- Expanding DR inclusion in building codes
- Home automation via alarm systems and low-cost smart plugs and devices
- Smart thermostats
- Proliferation of low-cost voice assistants that integrate with home automation
- Variable generation resources creating a growing need for flexible resources
- Climate events that test grid reliability
- Widespread adoption of EVs with Bidirectional Charging
- Has Covid permanently impacted C&I DR potential

© CLEAResult. All rights reserved.

Electric Vehicles with Bidirectional Charging

- F-150 Lightning can feed 9.6 kilowatts of power back into a home's power panel
- Able to supply a home for up to three days
- Ford Intelligent Power will use the Lightning's stored energy during high-cost and peak energy hours.
- When there's less strain on the grid during overnight hours and costs are lower, the vehicle will recharge



CLEAResult®

© CLEAResult. All rights reserved.

Leigh Holmes
CLEAResult
Manager of Utility Programs
310-994-4076
leigh.holmes@clearesult.com



© CLEAResult. All rights reserved.