
AABC Commissioning Group

AIA Provider Number 50111116



Demand Response. Best Practices for Multi-Division, Multi-site Program Implementation

Course Number: CXENERGY1832

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NuEnergien



April 25, 2018

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Course Description

Years of research have focused on the benefits and challenges demand response implementation has on single buildings and building owners. But little attention has been given to the benefits and best practices for multi-site, large-scale government agencies to participate in demand response programs. Fortunately, more multisite operators with large-scale demand response implementation have emerged. They showcase that the benefits of demand response programs now extended to larger, more specialized infrastructure. This presentation cites the demand response program administered by New York City which provided up to 75MW of grid relief annually and earned revenue over \$22 Million.

Learning Objectives

At the end of the this course, participants will be able to:

1. Understand how to successfully implement demand response programs for new and existing participating sites.
2. Understand the enormous value demand response creates for society and the economy by reducing peak demand and thus reducing energy costs, helping municipalities comply with Clean Air Act requirements (and the concurrent public health benefits associated with that), and enabling utilities to defer costs associated with expanding capacity thus passing along the savings to rate payers and maintain the structural integrity of the electric grid.
3. Explain how to introduce demand response to a non-participating customer. Learn message points such as how building systems can be less stressed by spreading production away from peak periods, how environmental concerns can be abated by reducing peak emissions, and how grid sustainability is enhanced thus facility-level health and safety systems (e.g. critical in health care, food processing, etc.) are hardened.
4. Understand that demand response contributes to civic stability by lessening the chances of black-outs that could create large scale public safety hazards and deprive critical facilities of power to provide life-sustaining services.

A satellite night view of North America, showing the United States and parts of Canada and Mexico. The landmasses are dark, while the cities and urban areas are illuminated with bright yellow and orange lights, creating a dense network of glowing points and lines across the continent. The background is a deep black, representing the night sky.

DEMAND RESPONSE

Best Practices For Multi-Division,
Multi-Site Program Implementation



DEMAND RESPONSE | Complex Government Agencies

Discuss best practices for multi-site, large-scale government agencies to better understand demand response program implementation.

You can make it:

- More successful for existing participating sites
- Easier to introduce to an Agency not participating
- Encourage facility engineering departments' understanding of program options
- More meaningful for employees at every management level (Boots to Suits)

NUENERGEN | Overview

ENERGY CONSULTING + SOLUTIONS

NuEnergen is a leading Energy Management firm headquartered in White Plains, NY.

SERVICES

Demand Response | Energy Sourcing |
Invoice Auditing | Sustainability Programs

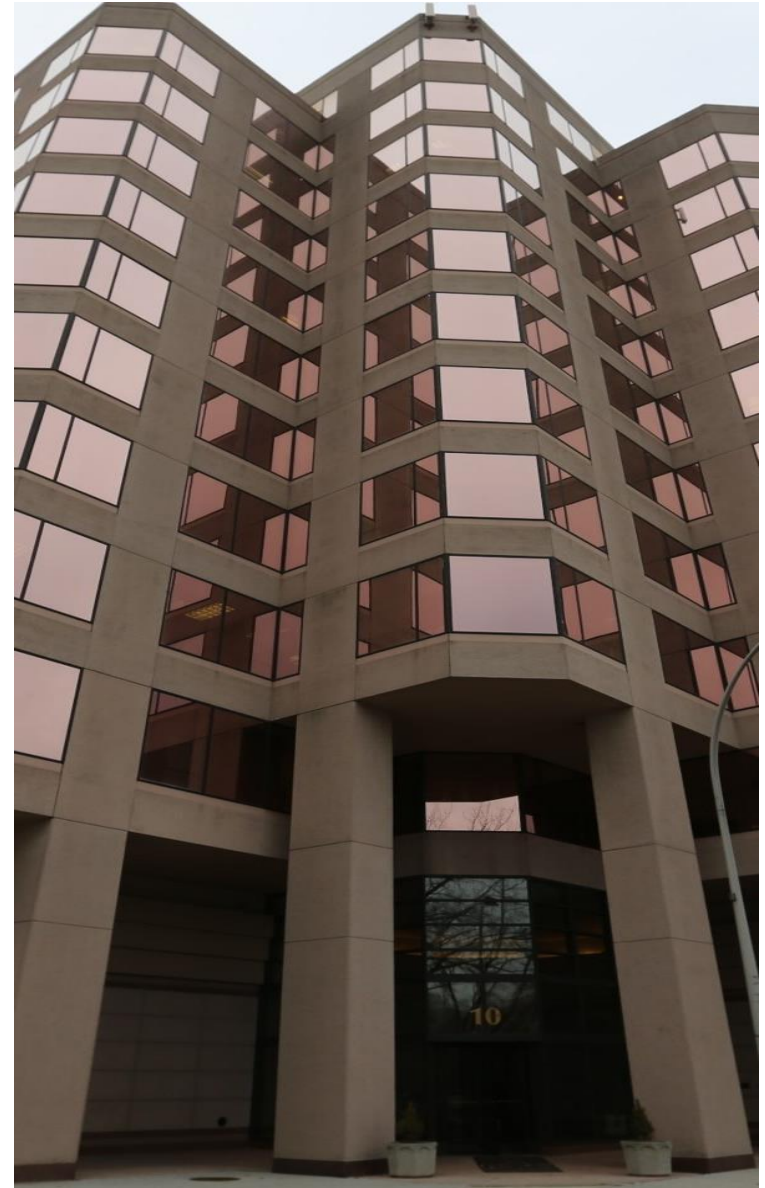
INSTITUTIONAL DR CLIENTS INCLUDE:

MTA | NY/NJ Port Authority | U.S. General
Services Administration (GSA) | U.S. Navy

DEMAND RESPONSE VITALS

- NYISO, PJM, Con Ed, O&R, CenHud
- Over 1000 sites/accounts enrolled today
- C&I, Municipalities, Universities, Hospitals

www.nuenergen.com



DEMAND RESPONSE | Overview

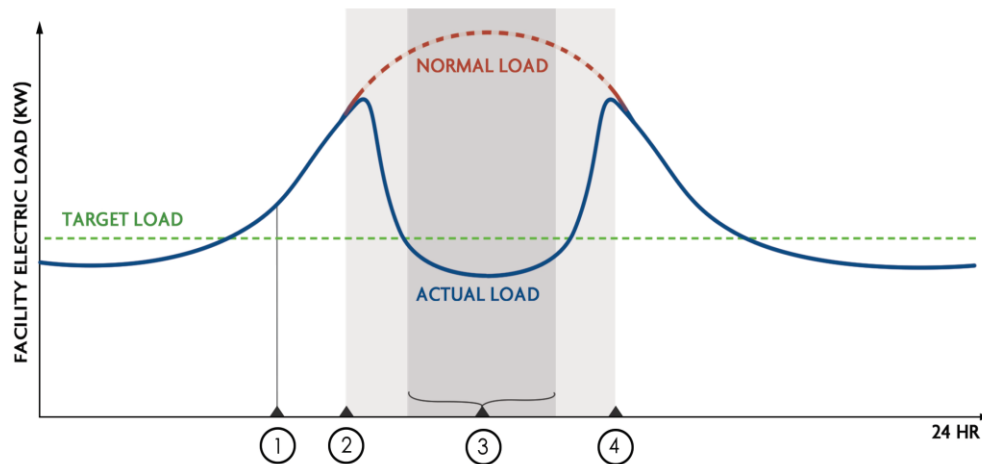
TYPES OF ENROLLMENT

Onsite Curtailment

Onsite Generation

HOW DOES IT WORK?

1. Alert sent for demand response event
2. Electrical load curtailed/reduced
3. Demand response event
4. Return to normal operations



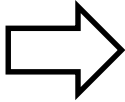
DEMAND RESPONSE | Curtailment Strategies

- HVAC – Lowering set point temps by 1-2 degrees F : virtually un-noticeable on hot days.
- HVAC – Reducing fan speeds, turning off/reducing package units, HVAC circulation pumps.
- Lighting – Reduce lighting in areas that are over lit on peak days (near windows, lobby areas, etc.)
- Elevators – Turn off one or two.
- Plug loads- Turn off appliances/non-critical PCs and other energy consuming devices not in use.
- Energy efficiency projects- which lower peak by at least 100kW (represent a one-time/year benefit).
- Onsite generation – Long-term retrofit/replacement of generators to satisfy resiliency/DR needs.
- Building Management Systems (BMS)- Centralize process to minimize labor/time.



DEMAND RESPONSE | Financial Details

for every
1000kW
pledged



\$10K to \$250
per year

PLUS

LOWERS the risk of **POWER**

LOSS in the region



THE CHALLENGE

- Buy-in of various stakeholders to understand and appreciate the value of demand response.
- Deployment of the program to encourage participation without burdening anyone with much additional day-to-day work.

Assess → Document → Educate → Dispatch →
Update → Appreciate



LARGE GOVERNMENT | Example

- City of New York: 4,000 Facilities.
- Heat, Light and Power budget of \$750MM/year.
- Facilities: Courts, Maintenance, Police/Fire, Wastewater/Water Supply, Universities, Hospitals, Transportation, Sanitation, Schools and other building types.
- Previous DR Participation – Lackluster/Not Structured, Multiple Providers, Confusing, No Cross-agency Coordination.
- Access to Data/Performance – Very Slow w/Spreadsheets, Emails.

LARGE GOVERNMENT | Example





Enrollments - Winter 2013

Division	Enrollments	Enrolled kW
CUNY	7	1,580
DEP	1	1,200
DOC	4	3,825
DPR	1	400
HHC	2	1,600
NYPD	2	550
	17	9,155



DEMAND RESPONSE | Assess

- Meetings with Energy Managers – Little DR knowledge.
- NuEnergen performed over 400 onsite visits.
- Collected energy data/accounts/facility notes/engineering documents.
- Every site visited and assessed for demand response capability.
- Facility engineers educated on what DR is (many had never heard of it).

Demand Response - Site Inspection Form

Client			
Location/Address			
Utility Account numbers at the site?			
Commission History Information			
Was the building occupied last year(s)?		YES	NO
Client contact information			
First Name	Last Name	Email	Primary Phone / Cell / Off Phone
Please describe the operations being taken:			
Building Information			
Where are there elevators using these cases?		YES	NO
Building controls as requested			
Are there elevators with speed using these cases?			
		YES	NO
Building systems as requested			
Are there emergency generators in the facility?			
		YES	NO
Customer's Size of operations			
Demand response being requested and load that can be carried by the generators including the A/C's service:			
Are the permits in place for generator?		YES	NO

Water describe major equipment		
Cooling and Heating Systems:		
How many chillers are in the plant?		
What are the sizes of the chillers?	YES	NO
Are the chillers air cooled generators?	YES	NO
What are the chiller set points (i.e., deg F)?		
Are there VFDs on the Cooling Towers?	YES	NO
Air Handling:		
Are there VFDs on the AHUs?		
How many AHUs are in the building	YES	NO
What are the CF ratings of the Supp. & Fan Fans?		
Is there a Split AC unit?	YES	NO
Lighting/Misc:		
Does the facility have a BMS system?		
	YES	NO
Does the BMS have a Carthamium Function?		
	YES	NO
Building Information		
What is the building area (SqFt)?		
How many total floors are there?		
How many elevators are there?		
How many escalators are there?		
What is the summer temperature Set Point?		
What is the winter temperature Set Point?		
What is the peak pressure Set Point?		
Temperature Controller via Thermostat or BMS?		
Is the Discharge Air Temperature Controlled?		
Is the FRESH, managed or unmanaged?		
What are the set points on and		
How many electrical meters are in the building?		
Is there a SCADA how are data stored?		
Other Notes:		
Master Numbers		
Master Numbers		
Master Numbers		



ENERTRAC

Demand Response Portal

NUENERGEN

ENERGY MANAGEMENT + CONSULTING

Enrollments

Resource Monitor

Portfolio Monitor

Summary

Reports

Search...

Period: Summer '17

Program: NYISO SCR

Network: All

Method: All

RTM: All

Show All

Export

Division	Resource	Account #	Program	Network	Period	Enrolled	Baseline	Target	Method	CBL	Last Event	Perf.	RTM	Actions
BPL	Brooklyn Public Library - Central	690118205310001	NYISO SCR	J	May'17 - Oct'17	100	929	829	C	W	2017-02-23	100%	✓	<div><div></div><div></div></div>
CUNY	Baruch College	490118080000000...	NYISO SCR	J	May'17 - Oct'17	700	4,548	3,848	C	W	2016-08-25	100%	✓	<div><div></div><div></div></div>
CUNY	Borough of Manhattan CC	490118080200006	NYISO SCR	J	May'17 - Oct'17	100	2,437	2,337	C	W	2017-02-23	100%	✓	<div><div></div><div></div></div>
CUNY	Bronx CC	390118074517002...	NYISO SCR	J	May'17 - Oct'17	300	2,453	2,153	C	W	2016-08-25	52%	—	<div><div></div><div></div></div>
CUNY	Brooklyn College	690118075000005	NYISO SCR	J	May'17 - Oct'17	1,200	7,248	6,048	C	W	2017-02-23	100%	✓	<div><div></div><div></div></div>
CUNY	City College of New York	490118085800016...	NYISO SCR	J	May'17 - Oct'17	510	8,834	8,324	C	W	2017-02-23	100%	✓	<div><div></div><div></div></div>
CUNY	College of Staten Island	790118036000002	NYISO SCR	J	May'17 - Oct'17	700	5,616	4,916	C	W	2017-02-23	100%	✓	<div><div></div><div></div></div>


DEMAND RESPONSE | Document

Protocols mutually agreed upon

- NuEnergy Analysis performed and reported back to Energy Managers
- Realistic protocol guidelines (no compromising of facility's primary mission)
- Proper notification hierarchy (Engineering, Facilities, Executive Management, Energy Managers) Memorialize and enter all data into a centralized portal

DEMAND RESPONSE | Document

- Internal Championing of the programs is critical.
- Key Element- Direct contact information for internal and vendor administrators.

**CITYWIDE DEMAND RESPONSE PROGRAM OVERVIEW**

WHAT IS DEMAND RESPONSE (DR)?

- **Demand Response** is an electricity grid- and utility-run series of programs that offer financial incentives to facilities that can reduce electric load during periods of high stress on the electric grid. DR contributes to maintaining the reliability of New York's power infrastructure.

HOW CAN CITY AGENCIES PARTICIPATE IN DR?

- DCAS has developed a citywide DR contract with vendor NuEnergy (see below).
- Agencies should contact DCAS to arrange a NuEnergy audit to assess any City facility that it believes is likely to be able to temporary curtail a portion of its electric load when called on.

HOW AGENCIES BENEFIT

- Each agency receives revenue earned by its participating facilities, paid out twice a year. Amounts depend on load reduced and rates set by the NY state electricity grid manager (NYISO) and local utility (Con Edison). The more load enrolled, the higher the potential earnings.
- Program participation makes facilities eligible for installation of electric load monitoring equipment that allows for around the clock daily load monitoring in near real-time via a web based portal (ENERTRAC).
- Load reduction contributes to the City's carbon emission reduction goals, and to NYC avoiding brownouts or blackouts caused by extreme weather or supply disruptions.

HOW DO PAYMENTS WORK?

- DCAS receives the revenue on behalf of all participating agencies, and makes an FMS revenue transfer to each agency (agency earnings less vendor and DCAS administration fees) using budget codes established for this purpose. This happens twice a year (following summer and winter enrollment periods where applicable).
- Agencies receive all DR revenue earned by its facilities (less vendor and DCAS administration fees). NuEnergy and DCAS provide detailed facility level performance and earning reports.
- DR funds do not expire and may be transferred to next fiscal year by notifying your agency's OMB task force.

WHICH CITY FACILITIES ALREADY PARTICIPATE?

- Hospitals, college campuses, courthouses, sanitation garages, wastewater treatments plants, office buildings, schools, ferry terminals, museums, recreation centers, libraries, labs and more.

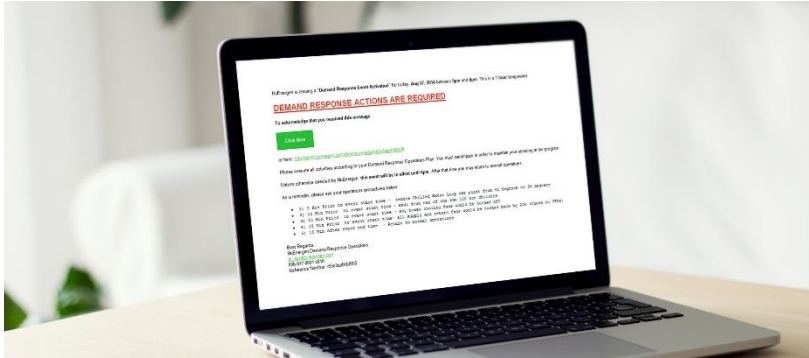
CONTACT INFORMATION

- DCAS DEM - Leonid Zolotarev, Billing Programs Administrator;
email: lzolotarev@dcas.nyc.gov, office: 212-386-6327
- NuEnergy - Anton Nica, Senior Client Services Manager;
email: anica@nuenergy.com, office: 866-977-0901 x 817, cell: 914-258-0784

DEMAND RESPONSE | Educate

- Program Summaries Created –
Programs Available, Rules,
Pricing, Call Times, Etc.
- Central Repository for Programs.
- Demonstrates that the programs
are structured and not designed
to be called often.
- Presented in open forums for
questions on programs.

	NYISO SCR (Special Case Resources)	Con Edison CSRP (Commercial System Relief Program)	Con Edison DLRP (Distribution Load Relief Program)
Type	Mandatory	Mandatory	Mandatory
Notice	21-hour Advisory and 2-hour Activation	21-hour Advisory and 2-hour Activation	2-hour Activation ONLY
Reason for deployment	System wide load relief	System wide load relief	Location and contingency based load relief
Relief Type	Curtailment & Generator	Curtailment & Generator	Curtailment & Generator
Commitment Periods	Summer: May – October Winter: November - April	Summer: May - September	Summer: May – September
Pre-Planned Commitment	Yes	Yes	Yes
Minimum Hours Called/Season	1 hour Test	1 hour Test	1 hour Test
Typical Event Call Times	M – F, 4 to 6 hours call window during normal business hours	M – F, 11am – 11pm (4 hour call window depends on location)	Any Day from 6am – 12am
Reservation Payment	Market based capacity payment Up to \$100/KW/period	Most Boroughs: \$18 - \$23/KW/Month St. Island, Westchester: \$6 - \$11/KW/Month	Tier 1 Network: \$18 - \$23/KW/Month Tier 2 Network: \$25 - \$30/KW/Month
Revenue earned	Prorated based on performance & reliability	Prorated based on performance & reliability	Prorated based on performance & reliability
Penalty	None	None	None



NuEnergy is issuing a "Demand Response Event Activation" for today, Aug 07, 2014 between 5pm and 6pm. This is a 1 hour long event.

DEMAND RESPONSE ACTIONS ARE REQUIRED

To acknowledge that you received this message

[Click Here](#)

or visit: <http://emd.nuenergy.com/dr/acknowledge/r53e3aabfb8f55#>

Participants must execute all activities according to your Demand Response Operations Plan. You must participate in order to maintain your standing in the program. If you are otherwise directed by NuEnergy, **this event will be in effect until 6pm**. After that time you may return to normal operations.

For more information, please see your operations procedures below:

- 1) 3 Hrs Prior to event start time - reduce Chilled Water Loop set point from 42 degrees to 36 degrees
- 2) 15 Min Prior to event start time - shut down one of the two 150 ton chillers
- 3) 15 Min Prior to event start time - sky boxes cooling fans would be turned off
- 4) 15 Min Prior to event start time - all supply and return fans would be turned back by 20% (those on VFD)
- 5) 15 Min After event end time - Return to normal operations

Regards,
NuEnergy Demand Response Operations
dr@nuenergy.com
7-0901 x810
Reference Number: r53e3aabfb8f55

DEMAND RESPONSE | Dispatch

Rapid response necessary (as little as 2-hour notice)

Dispatch notices sent via email, text

Protocols inserted in all emails (easy reference)

NuEnergy Network Operations Center (NOC)

- On call for help 24x7.
- Monitors acknowledgement responses from emails/texts.
- Calls/follows up with non-responding sites.
- Monitors real-time energy use and calls non-performers.
- Reconciles and creates reporting of event performance.

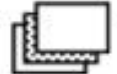


IT'S HOT TODAY!

TODAY'S HIGH TEMPERATURE IS PLACING A STRAIN ON OUR ELECTRIC GRID. FOR THIS REASON, TODAY IS AN ELECTRIC DEMAND RESPONSE DAY. OUR BUILDING IS PARTICIPATING IN NEW YORK'S DEMAND RESPONSE PROGRAM.



TO CONSERVE ELECTRICITY AND HELP AVOID BLACKOUTS, OUR BUILDING STAFF MAY BE:

-  Turning off unnecessary overhead lighting
-  Reducing elevator service
-  Increasing space temperature

-  Lower shades to block the heat of the sun
-  Turn off computer monitors & other equipment when not in use
-  Unplug personal electronics, such as coffee makers or cell phone chargers

ACTIONS YOU CAN TAKE TO KEEP THE BUILDING COMFORTABLE FOR EVERYBODY

DEMAND RESPONSE | Dispatch

WHO
RESPONDS

Two Responders:

No response from a
Primary= Facility Not
Responsive



PRIMARY

Onsite Facility
Personnel/Engineering



SECONDARY

Facilities Management/
Executive Management

DEMAND RESPONSE | Dispatch (Cont'd.)

Wed 8/2/2017 9:13 AM

LZ Leonid Zolotarev (DCAS) <lzolotarev@dcas.nyc.gov>
Demand Response Con Edison CSRP - Activation - 08/02/2017

To: Cyril Toussaint; Ruby Cruz; Marcus Lewis; Diana Eusse; Louis Igihaut
Cc: Sergey Shabalin (DCAS); Susan Cohen (DCAS); Anton Nica
This message was sent with High importance.

DR Poster - IT'S HOT TODAY.PDF
157 KB

Action Items + Get more add-ins

Attention Health+Hospitals team!

NuEnergy is issuing a "DEMAND RESPONSE EVENT ACTIVATION NOTICE" for Con Edison CSRP Program participating facilities for **TODAY, AUGUST 2, 2017**. This is a **1 hour long event/test with test times varying for each facility**. Below please see specific **test/event** times for your agency participating facilities.

Division	Resource	Account #	Program	Network
HHC	Bellevue Hospital	490118132000016	ConEd CSRP	W2 2pm-3pm
HHC	Harlem Hospital	490118131000009 490118131100007 490118136020002	ConEd CSRP	W3 4pm-5pm

Please make sure all enrolled facilities execute all activities according to their respective Demand Response Operations Plans. **THIS IS A MANDATORY EVENT**. Enrolled facilities must participate in order to maintain standing in the program. A list of your agency's enrolled facilities can be found in 'DEMAND RESPONSE' section of **ENERTRAC** Portal - <https://emd.nuenergy.com/et>.

To achieve maximum event performance, site specific Event Protocols (Operation Plans) **MUST BE FOLLOWED**. Protocols are embedded in NuEnergy notices to each facility and can also be found on the Portal. Please have facility managers review DR protocols and verify contact information prior to the event.

Facilities with **real-time metering** capabilities should take every opportunity to monitor event performance 'LIVE' in 'DEMAND RESPONSE' section of **ENERTRAC**. Use 'Portfolio Monitor' to monitor performance of entire agency portfolio; use 'Resource Monitor' to monitor performance of individual resources. Real-time data is an invaluable tool during DR events to help you meet 100% performance goals.

In order to contribute to a system wide grid relief, it is also recommended to implement agency wide temporary load reduction measures by advising staff to turnoff or unplug unnecessary equipment, appliances and electronics; reduce lighting to minimal levels; increase space temperatures; close blinds and window coverings. Please distribute the attached Demand Response flyer throughout your facilities.

Should you have any questions, please do not hesitate to contact me or NuEnergy (Anton Nica), anica@nuenergy.com, office: 866-977-0901 x817, mobile: 914-258-0784; Demand Response hotline: 866-977-0901 x810).

Thank you,

Leonid Zolotarev | Billing Programs Administrator; Energy Budget, Supply and Reporting
P: (212) 386-6327 | F: (212) 669-3160 | lzolotarev@dcas.nyc.gov

NYC Citywide Administrative Services Energy Management

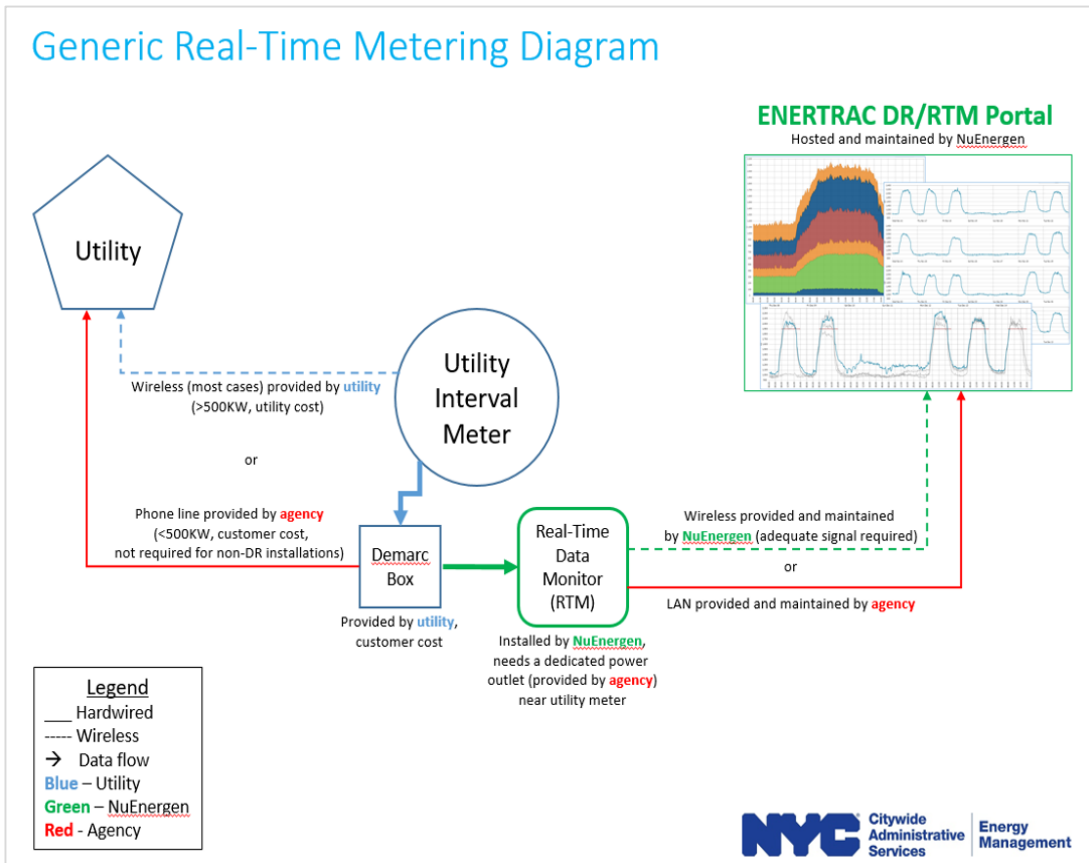
Like us on Facebook

Energy Managers get involved
Gives proper guidance and ensures the programs are
still fresh/relevant when facilities are dispatched.

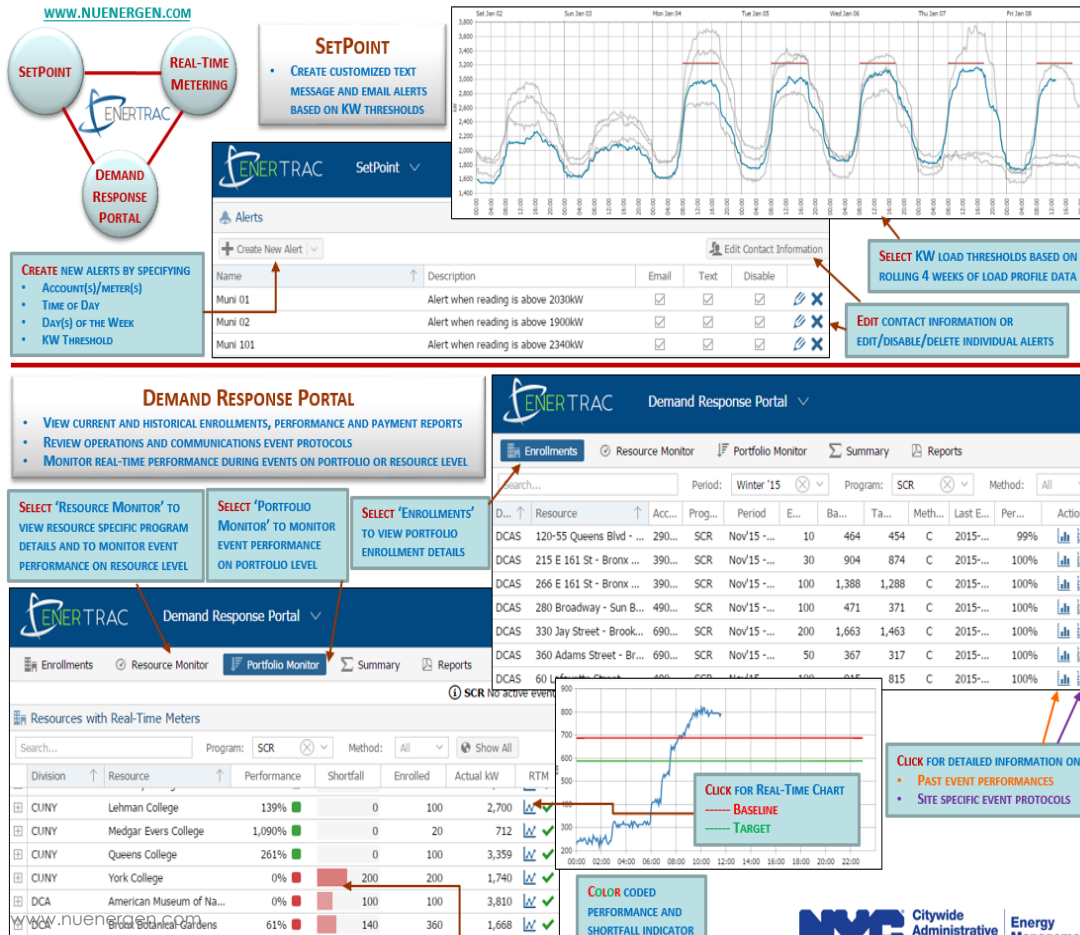
DEMAND RESPONSE | Update



- Portal- Seasonal Reporting of Enrollments
- Real-Time Metering
- Performance Reporting
- Transparency



DEMAND RESPONSE | Update

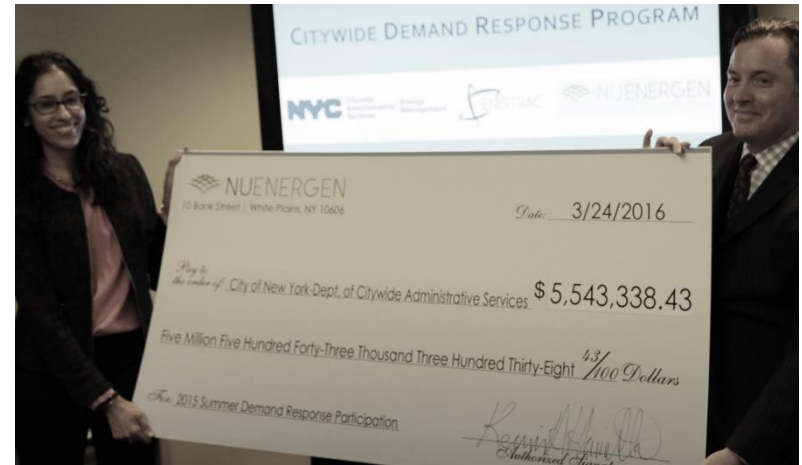


All relevant data in one portal

- Encourages logging in
- One-stop shop
- Email address is login
- Instant password resets
- RTM data updates every 5 mins

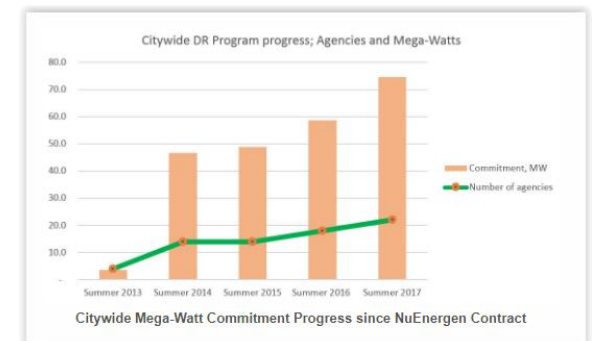
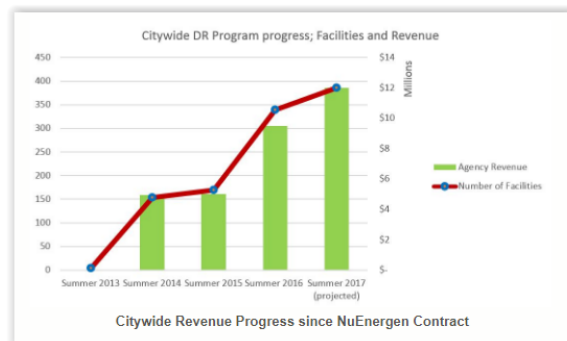
DEMAND RESPONSE | Appreciate

- Recognition Ceremonies.
- Additional capital funds provided to good performers.
- Check presentations.
- NuEnergy Semi-Annual updates (state of DR and the City participation).
- Ongoing training and encouragement.



DEMAND RESPONSE PROGRAM | Results

- Over 400 facilities participating (up from 17 in 2013).
- Over 75 MW in Summer 2017 (up from <10MW in 2013).
- 22 Agencies and Orgs participating (up from 6).
- 300 facilities with Real-Time DR Meters deployed (up from 0 in 2013).
- Won Program Pacesetter 2017 Award given by Peak Load Management Association.



DEMAND RESPONSE PROGRAM | Results

<http://www.utilitydive.com/news/how-new-york-city-expects-to-save-75-mw-this-summer-through-demand-response/446063>



FEATURE

How New York City expects to save 75 MW this summer through demand response

The city's complex demand management program just registered its 400th facility and is looking to expand further

AUTHOR

Robert Walton
@TeamWeDog

Sergey Shabalin, the director of billing programs and analytics for New York City's Department of Citywide Administrative Services (DCAS), has a message for utilities upstate: "Come talk to us about demand response."

PUBLISHED

June 28, 2017

New York City has been developing its demand response program for years — just last summer it achieved 58 MW of reduced municipal load, bringing in about \$10 million in revenue. While the bulk of the city's operations are in Consolidated Edison's territory, it has some demand in the territories of Orange & Rockland, Central Hudson and NYSEG in the north of the state that it would like harness.

DEMAND RESPONSE PROGRAM | Results

City of New York's Municipal Demand Response Program. City of New York's Municipal Demand Response Program. The City's program encompasses over 340 facilities across 20 city agencies and organizations. For summer 2016 period, the program reduced over 58 MW, over 10% of load of the locations engaged, which comprise 40% of the City's municipal peak load. Recent achievements include consistent 100% portfolio performance and over \$9.5M in summer 2016 revenue.

<http://blog.nuenergen.com/plma-pressrelease>

www.nuenergen.com

energy
NYC energyNYC
@energy_NYC

Follow

NYC DEM's #DemandResponse Program is proud to be recognized in the 14th PLMA Awards in Nashville, TN! What a way to kick off #EarthMonth



11:29 AM - 5 Apr 2017

DEMAND RESPONSE PROGRAM

| Key Takeaways

- No organization is too complex for implementation.
- Align incentives (financial and otherwise) across the organization to encourage program participation.
- Communicate up, down & across management levels.
- Provide meaningful information easily understood by the lay person.
- Celebrate successes, foster more.



DEMAND RESPONSE
PROGRAM | Get
Started

- Energy Managers – Start with the basics before anyone else is involved.
- Gather basic data about each facility.
- Facility Use - ex. Office, Lab, Training, Living Quarters, Repair Depot, Etc.
- Basic Monthly kW/kWh data (12 months of bills/bill data sufficient).
- Prior DR participant – previous protocols if they exist.
- Onsite Generation – Generators onsite and loads (if known).
- Proper Contract Vehicle In Place – (Good news, existing DLA contract vehicle).



Choose the provider you are most comfortable with and has the expertise you seek
www.nuenergen.com

This concludes The American Institute of Architects
Continuing Education Systems Course



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