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National Grid Demand Response Pilot Updates

ADS - National Town Meeting
Tim Roughan

Washington DC
May 28, 2015

What is a Non-Wires Alternative (NWA)?

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Customer-side resources (e.g. Energy Efficiency), Demand Response, Renewables)

Utility-side resources (e.g. Volt-var optimization, utility-scale solar)



Non-Wires Alternatives (NWAs)

Defer a planned transmission or distribution infrastructure investment

Why Does National Grid Pursue NWAs?

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- External Motivation
  - Regulators, Legislation
  - Advocacy Parties
  - Retiring Power Plants

- Internal Motivation
  - Modernizing the grid (e.g. Connect21)
  - Exploring better ways to serve customers
  - Operating more efficiently

National Grid's Internal Process

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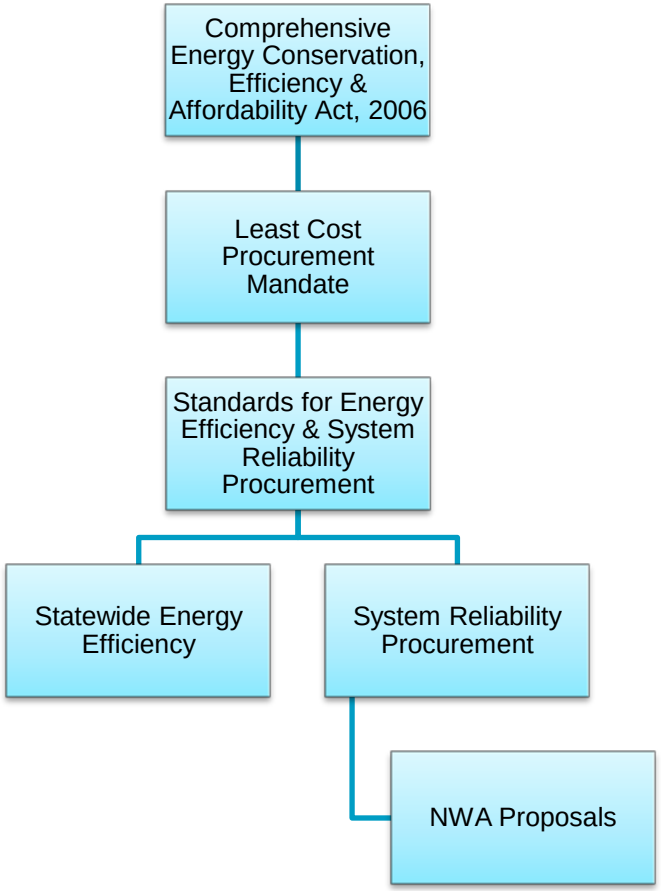
- Internal Principles Document
  - Multi-department agreement on NWA process within the company, approved in February 2011
  - 2 Review Cycles (below)
  - If NWA options are available, wires and NWAs are considered together
  - Challenge is the very localized nature of projects

Initial Review: Engineering	Secondary Review: Project Management

• Review capital project needs to determine potential for NWA
• Viable needs must:
  • Have >$1M wires option budget
  • Be unrelated to asset condition
  • Have >= 3 year lead time
  • Be <20% of total area's load
	• Review shortlist from Planning Group for quantitative NWA potential
	• Review should include assessment of:
	  • Customer base
	  • Load drivers
	  • Available technologies

NWA in Rhode Island - Legislation

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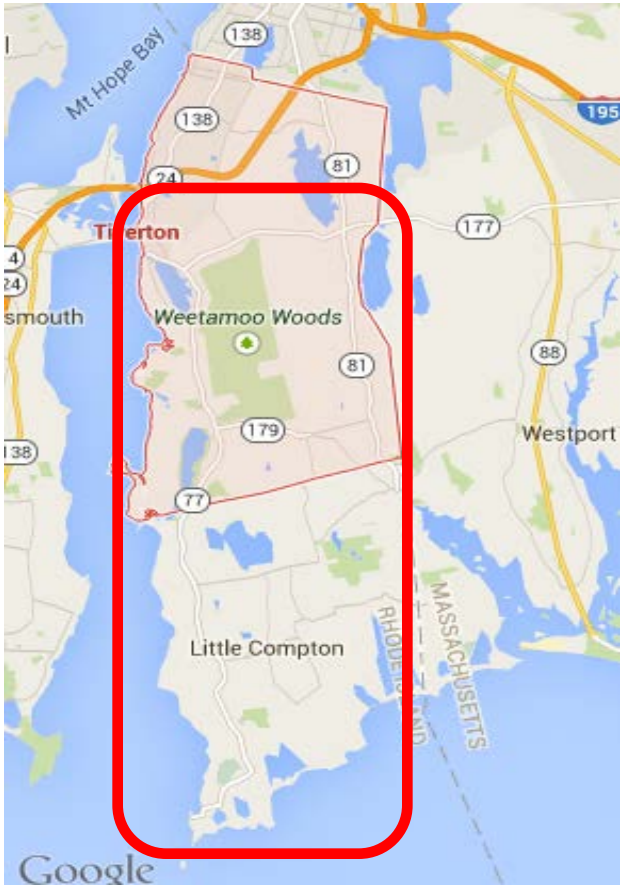


- Least Cost Procurement mandate intended to:
  - Increase stability through resource diversification
  - Integrate renewables
  - Reduce cost of energy
  - Increase accountability in planning and administration
- Standards for Energy Efficiency (EE) and System Reliability Procurement (SRP)
  - Basis for 3-year EE plans and SRP Reports
  - NWA proposals included in the SRP Reports
- First, fully-funded NWA Proposal was approved in the 2012 SRP Report

NWA in Rhode Island - DemandLink

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- Two Feeders serve 5200 customers in southern Tiverton and Little Compton
- Originally forecasted to be overloaded starting in 2014
- Wires Solution
  - Construction of a 3rd feeder at the Tiverton Substation to serve area
  - $2.9 million in 2014
- DemandLink NWA 2012-2017:
  - Defer upgrade by 4 years
  - EE and demand response (DR) tactics focused on reducing air conditioning (AC) and water heating load
  - Provide load relief starting with 150kW in 2014, up to 1MW by 2018
  - 2015 Collaboration with RI Office of Energy Resources (OER) Solarize & Solar Load Relief Projects



DemandLink Timeline

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Fall 2011
- NWA Development
- File Proposal with RI PUC

2012 2013
- Ramp-Up Years
- Recruit Participation

2014 - 2018
- Deferral Years
- Maintain Participation
- Realize Load Reductions

Year	2014	2015	2016	2017	2018
kW Reduction Needed	150	390	630	860	1000

Pilot Area Characteristics

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- Electric demand peaks:
  - Summer months
  - Late afternoon/evening hours

- Customer Base
  - 80% Residential
  - 20% Small Commercial
  - Town demographics differ: income, home types, etc.

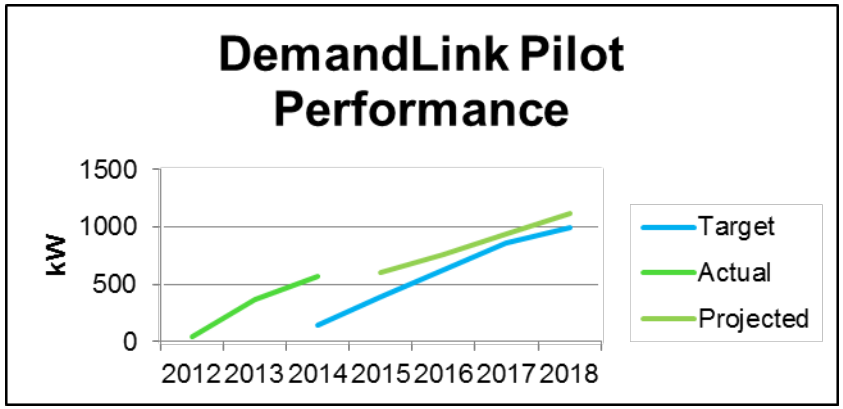
- What motivates customers to participate?
- What technologies will provide the most peak load reduction?

DemandLink Details

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- 2012-2014
  - EE & DR tactics focused on reducing AC load
    - E.g. wi-fi tstats, plug devices, window AC rebates
    - Intent is to achieve load reductions without affecting comfort
  - Most load reduction achieved has been through EE
    - Pilot has increased EE participation in area by more than 50%
  - First DR events conducted in 2014
    - Preliminary results show only 8% reduction in runtimes; approximately 80kW of average reduction overall
    - No 2014 DR events were need-based; cool summer
- 2015-2017
  - Introducing tactics aimed at reducing load drivers beyond AC (heat pump water heaters, dryers)
  - Continually recruiting/maintaining participation through marketing

Benefit/Cost Ratio	
2012	1.24
2013	1.95
2014	1.63
2015	1.44
2016	1.53
2017	1.58
Overall	**1.60**



DemandLink Details

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- RI OER Solarize and Solar Load Relief Projects
  - Peregrine Energy Study
    - Analyzed solar as a peak load reduction measure and identified associated costs & benefits
    - Recommendations from the study informed project implementation plans
  - Implementation in the DemandLink pilot area
    - Incentivizes systems facing west instead of south to maximize peak kW
    - May contribute to load relief in the area, potentially reducing future kW targets for DemandLink
    - Co-promotion of initiatives through marketing aimed at maximizing participation in both projects

		1 Grid Support Solar Field(s)	2 Solarize Residential	3 Small Commercial	4 Total
1	Gross Capacity (kW)	280	160	80	520
2	Average Distribution Contribution Percentage (DCP)	50%	45%	45%	
3	Distribution Contribution (kW)	142	72	36	250
4	Portfolio Allocation	57%	29%	14%	100%

NWA Implementation Lessons Learned

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Engagement Should be Direct, Local and Frequent

- Year-round activities required to promote and maintain awareness and education
- Telemarketing service has been most effective, emails and direct mail pieces also helpful
- Engagement with community events facilitates a local network

"Save Money, Save Energy" Pitch Is Not Always Effective

- Some are suspicious about the Company's motives for giving away free products
- Significant concerns about "Big Brother" aspect of remote activation of DR events
- Some customer segments are not motivated by bill savings, long or short term

Diversifying Incentives Increases Participation Potential

- With a limited population, participation rates need to be higher than typical for success
- More options increases breadth and depth of potential participation
- Solar can provide added load relief and participation benefits

NWA Implementation Lessons Learned, continued

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Minimize Customer Requirements

- Leveraging the same vendor/products as EE reduces cost and streamlines delivery process for customer (but can complicate internal setup)
- Minimizing the number of steps to get from interest to incentive increases the potential for customer follow-through
- Transparency minimizes confusion

Communication is Vital Even After Recruitment

- Frequently Asked Questions document handed out at every install
- Contact information for troubleshooting and questions should be clear
- Notifications for DR events helps to manage participant expectations

Run Test Demand Response Events Far in Advance

- Allows for time to troubleshoot issues
- Identifies communication gaps
- Gives a general idea of what to expect for participation

NY REV Demand Response

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- Programs for Summer 2015
  - Distribution Load Relief – for emergency loading conditions
    - Targeting larger customers – uses reservation demand construct, paid to reserve, then paid for performance
  - Residential Load Control
    - Control of central and window AC loads
  - Peak Load Shaving Program – day to day heavy loading
    - Targeting commercial customers

NY REV Demand Response

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- Kenmore, NY area (north of Buffalo)
  - Potential overloads on cables feeding substation
  - Serves 19,000 customers
    - 94% residential, 51% of load
    - 6% commercial, 49% of load, most are small commercial, only 1-2 larger customers
- Looking for 1 MW of load relief
- Filed with PSC 3/25/15, expecting something back by mid-June – program start July 1

NY REV

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- Looking for REV ‘demo’ projects
  - Projects that would incorporate REV-like aspects
    - Dispatching of distributed energy resources
    - Payment for such dispatch
    - Reserves needed to back-stop dispatch
    - Value of resources
    - And a whole lot more