National Grid System Reliability Procurement DemandLink Pilot Update

Docket No. 4545

What is a Non-Wires Alternative (NWA)?

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)

Specific geographical location

Defer a planned transmission or distribution infrastructure investment
Why Does National Grid Pursue NWAs?

- **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

- **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

- **Initial Review: Engineering**
  - 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

- **Secondary Review: Project Management**
  - Review shortlist from Planning Group for quantitative NWA potential
  - Review should include assessment of:
    - Customer base
    - Load drivers
    - Available technologies
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 - Legislation

➤ Standards for System Reliability Procurement

- Approved by the RI Public Utilities Commission in 2008
- Major update in 2011
- Minor update in 2014

- Four Aspects
  - Definition of NWAs
  - Criteria for determining suitability for NWAs
  - Basis for comparing NWAs to traditional alternatives
  - Financial analysis

- Established reporting requirements
  - 3 year, high-level plans
  - Annual, detailed SRP Reports
Annual SRP Reports and Funding

- **Annual SRP Reports are filed in November each year**
  - Updates on projects in progress
  - Summarizes projects reviewed for NWA potential
  - Proposes new projects when feasible
  - Requests funding for all projects proposed for coming year

- **SRP Reports have their own docket and funding requests**
  - SRP charges are added the EE charge on customer bills to simplify collection
  - SRP project budgets leverage EE funds by promoting existing incentives in the affected areas
    - Intended to focus already allocated funds into areas of need
    - Increases the cost effectiveness of the SRP efforts
NWA in Rhode Island - DemandLink

- 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

- **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

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<tbody>
<tr>
<td>kW Reduction Needed</td>
<td>150</td>
<td>390</td>
<td>630</td>
<td>860</td>
<td>1000</td>
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</table>
Pilot Area Characteristics

- 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

- **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

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>2012</td>
<td>1.24</td>
</tr>
<tr>
<td>2013</td>
<td>1.95</td>
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<tr>
<td>2014</td>
<td>1.63</td>
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<tr>
<td>2015</td>
<td>1.44</td>
</tr>
<tr>
<td>2016</td>
<td>1.53</td>
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<tr>
<td>2017</td>
<td>1.58</td>
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<tr>
<td>Overall</td>
<td>1.60</td>
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**DemandLink Pilot Performance**

- **Target**
- **Actual**
- **Projected**

![Graph showing DemandLink Pilot Performance with 2012 to 2018 kW data points]
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

<table>
<thead>
<tr>
<th>Gross Capacity (kW)</th>
<th>Grid Support Solar Field(s)</th>
<th>Solarize Residential</th>
<th>Small Commercial</th>
<th>Total</th>
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<tbody>
<tr>
<td>1</td>
<td>280</td>
<td>160</td>
<td>80</td>
<td>520</td>
</tr>
<tr>
<td>2</td>
<td>50%</td>
<td>45%</td>
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<td>3</td>
<td>142</td>
<td>72</td>
<td>36</td>
<td>250</td>
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<tr>
<td>4</td>
<td>57%</td>
<td>29%</td>
<td>14%</td>
<td>100%</td>
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NWA Implementation Lessons Learned

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

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