NEEP EM&V FORUM ANNUAL MEETING

USING GEOGRAPHICALLY TARGETED ENERGY EFFICIENCY TO DEFER T&D INVESTMENTS

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Presentation Overview

1. The concept of geo-targeting efficiency
2. NEEP geo-targeting meta-study overview
   - Case studies examined
   - Lessons learned
   - Policy considerations
The Concept of Geo-Targeting
Efficiency as a T&D Resource

- Only affects growth-related T&D investment
  - Not all T&D investment is growth-related
- Can happen both “passively” and “actively”
  - Passive: by-product of system-wide efficiency programs
  - Active: by design, through geo-targeted programs

NOTE: This presentation focuses on the role efficiency can play in deferring T&D investments. However, efficiency can and should be considered in tandem with other demand resources (e.g. Demand Response & Distributed Generation)
Average Hourly CFL Usage Patterns

# Hypothetical Annual Savings from Different Efficiency Programs (MW)

<table>
<thead>
<tr>
<th></th>
<th>Peak Season</th>
<th>Peak Time</th>
<th>Res. CFLs</th>
<th>Res. A/C Retrofits</th>
<th>Com. HPT8 Retrofits</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Substation A</td>
<td>Summer</td>
<td>3:00 PM</td>
<td>0.4</td>
<td>0.9</td>
<td>0.7</td>
<td>2.0</td>
</tr>
<tr>
<td>Substation B</td>
<td>Summer</td>
<td>7:00 PM</td>
<td>0.4</td>
<td>1.4</td>
<td>0.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Substation C</td>
<td>Winter</td>
<td>7:00 PM</td>
<td>0.9</td>
<td>0.0</td>
<td>0.4</td>
<td>1.3</td>
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Note: savings values are illustrative only.
Hypothetical scenario:
• existing substation load = 90 MW
• max capacity = 100 MW
• baseline peak load growth = 3% per year

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</thead>
<tbody>
<tr>
<td>No EE programs</td>
<td>3.0%</td>
<td>90</td>
<td>93</td>
<td>95</td>
<td>98</td>
<td>101</td>
<td>104</td>
<td>107</td>
<td>111</td>
<td>114</td>
<td>117</td>
<td>121</td>
<td>125</td>
<td>128</td>
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<tr>
<td>0.5% savings/year</td>
<td>2.5%</td>
<td>90</td>
<td>92</td>
<td>95</td>
<td>97</td>
<td>99</td>
<td>102</td>
<td>104</td>
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<td>110</td>
<td>112</td>
<td>115</td>
<td>118</td>
<td>121</td>
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<tr>
<td>1.0% savings/year</td>
<td>2.0%</td>
<td>90</td>
<td>92</td>
<td>94</td>
<td>96</td>
<td>97</td>
<td>99</td>
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<td>105</td>
<td>108</td>
<td>110</td>
<td>112</td>
<td>114</td>
</tr>
<tr>
<td>1.5% savings/year</td>
<td>1.5%</td>
<td>90</td>
<td>91</td>
<td>93</td>
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<td>96</td>
<td>97</td>
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<td>103</td>
<td>104</td>
<td>106</td>
<td>108</td>
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<tr>
<td>2.0% savings/year</td>
<td>1.0%</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
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<td>97</td>
<td>98</td>
<td>99</td>
<td>100</td>
<td>101</td>
</tr>
</tbody>
</table>
Different Geo-Targeting Approaches

- Accelerate uptake of existing programs in target areas
  - More intensive marketing in those areas
  - Higher financial incentives in those areas
- New measures/programs
- RFPs / Performance contracts
- Combinations (2 or more of the above)

Remember: Efficiency does not have to be 100% of the answer. It can be married with demand response, distributed generation and/or other options as part of a multi-faceted strategy.
NEEP Geo-Targeting Study
Case Studies

- Bonneville Power Authority (2014 status)
- California: PG&E (early 1990s, new 2014 efforts)
- Maine (2012 to present)
- Nevada: NV Energy (late 2000s)
- New York: Con Ed (2003 to present)
- New York: LIPA (2014 proposal)
- Oregon: PGE (early 1990s)
- Rhode Island: (2012 to present)
- Vermont (mid-1990s pilot, statewide 2007 to present)

Note: deeper dive case studies shown in green
Conclusions (1)

The Big Picture

- Growing number of electric examples
- Growing sophistication of leaders
- Initial results are very promising
  - Deferrals have been successful
  - NWAs often considerably less expensive
  - EE usually cheapest of NWAs...
  - ...but often needs to be paired w/DR, DG, others
- Legislation/regulation was catalyst in almost all cases
Conclusions (2)

Implementation

- Senior Management buy-in is invaluable
- Cross-disciplinary communications & trust is critical
  - EE planners
  - T&D system planners
- Smaller is easier
- Distribution is easier; transmission is harder
- New analytical tools, big data offer great promise
- Modularity has great value
  - Buys time
  - Allows for calibration of forecasted need
Conclusions (3)

Evaluation

- Results mostly measured at substation (or equiv.)
  - So far, evaluation has primarily been a determination of whether construction could be deferred, or not....
  - Traditional EM&V still has value...but more for informing better planning and implementation in the future
Policy Considerations for States

1. Least cost solutions for T&D
   - Consider adopting explicit requirements, or…
   - Consider financial incentives for minimizing T&D costs
2. Long-term forecasts of T&D needs (to address lead times)
   - Consider requiring such forecasts (10 years? 20 years?)
3. “First cut” screening criteria
   - Consider establishing triggers for detailed assessment of NWAs
4. Equitable allocation of non-transmission costs
   - Consider assessing what comparable treatment of Transmission & NTA options might be
   - Consider advocating for comparable treatment in key venues
## Current Screening Criteria for Detailed Assessment of NWAs

<table>
<thead>
<tr>
<th>Transmission</th>
<th>Must Be Load Related</th>
<th>Minimum Years Before Need</th>
<th>Maximum Load Reduction Required</th>
<th>Minimum T&amp;D Project Cost</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>Yes</td>
<td>1 to 3</td>
<td>15%</td>
<td>$2.5 Million</td>
<td>Regulatory policy</td>
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<tr>
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<td>4 to 5</td>
<td>20%</td>
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<td></td>
<td></td>
<td>6 to 10</td>
<td>25%</td>
<td></td>
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<tr>
<td>Maine</td>
<td>Yes</td>
<td></td>
<td>&gt;69 kV or &gt;$20 Million</td>
<td></td>
<td>Legislative standard</td>
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<tr>
<td>Rhode Island</td>
<td>Yes</td>
<td>3</td>
<td>20%</td>
<td>$1 Million</td>
<td>Regulatory policy</td>
</tr>
<tr>
<td>Pacific Northwest (BPA)</td>
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<td>5</td>
<td></td>
<td>$3 Million</td>
<td>Internal planning criteria</td>
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</table>

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Must Be Load Related</th>
<th>Minimum Years Before Need</th>
<th>Maximum Load Reduction Required</th>
<th>Minimum T&amp;D Project Cost</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>PG&amp;E (California)</td>
<td>Yes</td>
<td>3</td>
<td>2 MW</td>
<td></td>
<td>Internal planning criteria</td>
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<tr>
<td>Rhode Island</td>
<td>Yes</td>
<td>3</td>
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<td>$1 Million</td>
<td>Regulatory policy</td>
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<tr>
<td>Vermont</td>
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<td>$0.3 Million</td>
<td>Regulatory policy</td>
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</table>
Q&A

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