Non-Wires Alternatives

INTRO TO THE CONCEPT AND MIDWEST INITIATIVES

Chris Neme
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U.S. Electric Utility Plant in Service Capital Additions (billions $)

Source: Enerlytics (2017) analysis of data from “all 193 U.S. operating companies required to report financial and operating statistics between 2013 and 2016.” (FERC Form-1 filings)
The Concept of Non-Wires Alternatives (NWAs)

• Some T&D investments are driven by localized peak load growth
• Geo-targeted DERs can slow/eliminate load growth
  ▪ Energy efficiency...
  ▪ ...but also DR, DG, storage, etc.
• Slower load growth can defer T&D capital investment
  ▪ Or even reduce or eliminate investment
• Deferral has economic value
• If deferral benefits outweigh costs, consumers win
Energy Efficiency as an NWA

• Most EE programs/measures save energy at every hour
  ▪ Not true for every participant...
  ▪ ...but true for large groups of participants as a whole
  ▪ Limited exceptions
    – Street lighting programs (night only)
    – Programs addressing only cooling or heating (though still often valuable for T&D)
• Thus, most EE programs provide some T&D deferral
• System-wide programs provide “passive deferral”
• EE as NWA is about “active deferral”
  ▪ Intentionally getting additional savings in a specific geographic area
Residential Lighting Load Shape

### Peak Time & Savings Mix Matter

#### Hypothetical DSM Program Impacts

<table>
<thead>
<tr>
<th>Substation</th>
<th>Customer Mix</th>
<th>Peak Season</th>
<th>Peak Hour</th>
<th>Residential LEDS</th>
<th>Residential A/C</th>
<th>Commercial Lighting Retrofits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Primarily Business</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>B</td>
<td>Primarily Residential</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>C</td>
<td>Primarily Residential w/Electric Heat</td>
<td>Winter</td>
<td>7:00 PM</td>
<td>1.0</td>
<td>0.0</td>
<td>0.4</td>
<td>1.4</td>
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</tbody>
</table>

Note: savings values are illustrative only.
Depth of Savings Matters Too

<table>
<thead>
<tr>
<th>Level of Savings</th>
<th>Rate</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>2031</th>
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</thead>
<tbody>
<tr>
<td>No EE programs</td>
<td>3.0%</td>
<td>47</td>
<td>48</td>
<td><strong>50</strong></td>
<td>51</td>
<td>53</td>
<td>54</td>
<td>56</td>
<td>58</td>
<td>60</td>
<td>61</td>
<td>63</td>
<td>65</td>
<td>67</td>
</tr>
<tr>
<td>0.5% savings/year</td>
<td>2.5%</td>
<td>47</td>
<td>48</td>
<td>49</td>
<td><strong>51</strong></td>
<td>52</td>
<td>53</td>
<td>55</td>
<td>56</td>
<td>57</td>
<td>59</td>
<td>60</td>
<td>62</td>
<td>63</td>
</tr>
<tr>
<td>1.0% savings/year</td>
<td>2.0%</td>
<td>47</td>
<td>48</td>
<td>49</td>
<td><strong>50</strong></td>
<td>51</td>
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<td>57</td>
<td>58</td>
<td>60</td>
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<td>1.5% savings/year</td>
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<td>48</td>
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<td>55</td>
<td>55</td>
<td>56</td>
</tr>
<tr>
<td>2.0% savings/year</td>
<td>1.0%</td>
<td>47</td>
<td>48</td>
<td>48</td>
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<td>50</td>
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Hypothetical scenario:
- Existing substation load = 47 MW
- Max capacity = 50 MW
- Initial upgrade increases capacity to 65 MW
- Second upgrade increases capacity to 80 MW
Different Approaches to Geotargeting Efficiency

• 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 DR, DG, other options*
NRDC-Midwest Utility Collaboration on NWAs

• Consumers Energy Pilot (MI)
  ▪ Initially conceived 2015
  ▪ Field test late 2017 thru 2018 – Swartz Creek Substation
    – Test of planning and program delivery concepts
  ▪ Full scale NWA project on 2nd substation to begin later in 2019

• DTE (MI)
  ▪ Phase 1: Spring 2018 thru Summer 2019 – Hancock Substation
    – Develop frameworks/systems – cost-effectiveness, evaluation approach, potential assessment
    – Field test select program concepts
  ▪ Phase 2: Full scale NWA project on 2nd substation
    – Substation selection by June 2019
    – Launch programs in field late 2019 or early 2020

• First Energy (OH)
  ▪ Feasibility assessment (2017-2018)
  ▪ Several potential projects passed initial screen and may be candidates for future pilot program
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