Some Issues and Challenges in Doing DSM in India

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Prayas Experience in DSM

- Independent NGO of professionals doing research based advocacy in public interest
- Involved in DSM since early 1990s and did an IRP for Maharashtra in 1994
- Report on need for regulatory action and utility driven DSM programs in 2005
- Review of Nashik Pilot CFL Program by MSEDCL
- Collaborative effort to promote DSM in Maharashtra between Lawrence Berkeley National Lab (LBNL), MERC, Maharashtra Utilities.
Overview

- Highlights of Review of Nashik pilot CFL program
  - What the pilot program was about
  - What we did in our review
  - What we found in our review

- Lessons for future DSM programs in India
Highlights of Review of Nashik Pilot CFL Project
Description of Program

- Only residential and commercial consumers having no arrears eligible
- Two choices – (1) direct purchase or (2) installments
- Limit of 5 CFLs per consumer
- Several delivery mechanisms
  - At ‘Bill Collection Centers’
  - Door to door sales by ‘Bachat Gut’ women
  - Retailers’ shops
  - MSEDCL meetings to publicize CFL program
- Large promotion also by the suppliers
Overview of Prayas’s Review Process

Components of Review
- Impact Evaluation
- Failures and Replacement of CFLs
- Tracking and Monitoring System
- Price Comparison
- Process Evaluation

Process
- Survey - ~ 200 urban & 50 rural participants
- In-depth interviews with participants, non-participants, MSEDCL staff, retailers, manufacturers, *Bachat Gut* women
## Cost Effectiveness of Appropriately Used CFLs

<table>
<thead>
<tr>
<th>Consumer Perspective</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings per CFL (kWh/month)</td>
<td>4.5</td>
<td>5.9</td>
</tr>
<tr>
<td>Applicable Tariff (Rs/kWh)</td>
<td>2.50</td>
<td>2.50</td>
</tr>
<tr>
<td>Consumer Savings (Rs./month)</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Pay Back Period (months)</td>
<td>10-11</td>
<td>7-9</td>
</tr>
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<table>
<thead>
<tr>
<th>Utility Perspective</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings per CFL (kWh/month)</td>
<td>4.5</td>
<td>5.9</td>
</tr>
<tr>
<td>Energy Savings per CFL including 10% losses (kWh/month)</td>
<td>5.0</td>
<td>6.6</td>
</tr>
<tr>
<td>Applicable Tariff (Rs/kWh)</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Utility Savings (Rs./month)</td>
<td>10</td>
<td>13</td>
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## Variety of Uses of CFLs by Sample Consumers

<table>
<thead>
<tr>
<th></th>
<th>Replaced Tube</th>
<th>Replaced &quot;Zero Watt&quot; Bulb</th>
<th>Used in Bathroom</th>
<th>Not Used Yet</th>
<th>Replaced Incand. Bulb in Other Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urban</strong></td>
<td>59%</td>
<td>4%</td>
<td>9%</td>
<td>4%</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Rural</strong></td>
<td>52%</td>
<td>2%</td>
<td>2%</td>
<td>3%</td>
<td>41%</td>
</tr>
</tbody>
</table>
Percentage of Failed CFLs by Days of Usage

Rural

Urban

Days

% Failed

0% 10% 20% 30% 40% 50% 60%

1-10 21-30 41-50 61-70 81-90 101-110 121-130 141-150 161-170
### Six Month Failure Rates of CFLs Used by Survey Respondents

<table>
<thead>
<tr>
<th></th>
<th>Consumers Who Experienced At Least One Failure of CFLs</th>
<th>Failure Rate of Initial Set of CFLs Purchased</th>
<th>Failure Rate Including Replacements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>69%</td>
<td>41%</td>
<td>35%</td>
</tr>
<tr>
<td>Rural</td>
<td>96%</td>
<td>74%</td>
<td>55%</td>
</tr>
</tbody>
</table>
Problems with Replacement of Failed CFLs

- 14% of urban consumers and 29% of rural consumers who tried to get replacements faced problems.
- Replacement in rural areas particularly difficult:
  - long distance and expenses (up to Rs. 50 per trip).
- Distributors did make significant efforts to replace failed CFLs but high failure rate compounded the problem.
Lessons for Future DSM Programs
Utilities Can Play a Key Role

- Facilitate penetration of efficient technologies:
  - Increasing awareness
  - Reducing high cost through bulk purchases and installment schemes

- Enhance programs through innovative delivery mechanisms such as *Bachat Gut* women in Nashik
Consumers Keen to Participate

- Penetration of CFLs through Nashik program impressive
- Almost all purchases occurred in poor neighborhoods
  - Poor eager to participate provided program affordable through innovative financial schemes - installation plans
  - Poor adopt new technologies if aware of benefits
Evaluation, Monitoring & Validation (EM&V) extremely important

- EM&V - important information for decision makers regarding actual savings
- Feedback to improve on-going and future programs
- Data requirements for evaluation should be incorporated into design of program
- Baseline data should be collected - accurate estimation of program impacts
- EM&V should be done preferably by independent agency
Process Evaluation Crucial Component of EM&V in Indian Context

- Process evaluation assesses program design, procedures, systems to see if can be improved.
- Many utilities do not have effective MIS and process evaluation will identify areas for improvement.
- Quality of equipment often issue in Indian context.
- A good on-going process evaluation would have identified problems with quality of CFLs and replacement early in the Nashik pilot.
Capacity Building Would be Useful

- DSM new area in India; lack of understanding and expertise.
- Proper program design, on-going oversight and EM&V essential for success
- BEE should institute technical assistance and training programs including EM&V for utilities’ and regulatory staff
Load Research Necessary for Large Scale DSM Programs

- Very little knowledge about components of peak demand.
- Load research helps answer questions such as:
  - How much do domestic consumers contribute to system peak?
  - How many incandescent bulbs are used by households and small commercial consumers?
  - What is fastest growing end-use?
  - How much does commercial air-conditioning contribute to system peak?
Example of Load Research

Source: Presentation by Grayson Heffner, DSM Workshop, Mumbai, March 10-14, 2008
Summing Up

- Utilities can play an important role in increasing awareness and lowering high initial cost barrier.
- Consumers are keen to participate. Communication and innovative financial schemes very helpful.
- EM&V critical for success. On-going process evaluation particularly relevant in India to allow mid-course correction. Also addresses concerns about quality of equipment and information systems.
- Capacity building in program design and EM&V necessary. BEE could play role in training programs.
- Load research required to effectively target DSM programs and estimate potential savings.
Thank you for your attention!