LED Pilot Projects
A Utility Perspective
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# Outdoor Lighting Statistics

## Summary of Service Classifications

<table>
<thead>
<tr>
<th>Service Classifications</th>
<th>Revenue ($M)</th>
<th>Accounts</th>
<th>Locations</th>
<th>Components</th>
<th>Net Book Value ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Niagara Mohawk</strong></td>
<td>~$60.40</td>
<td>12,714</td>
<td>268,339</td>
<td>789,340</td>
<td>~$82.41</td>
</tr>
<tr>
<td><strong>Granite State</strong></td>
<td>~$0.92</td>
<td>~742</td>
<td>~6,450</td>
<td>~20,007</td>
<td>~$1.78</td>
</tr>
<tr>
<td><strong>Massachusetts Electric</strong></td>
<td>~$28.84</td>
<td>~13,658</td>
<td>~214,959</td>
<td>~652,985</td>
<td>~$47.61</td>
</tr>
<tr>
<td><strong>Nantucket Electric</strong></td>
<td>~$10.09</td>
<td>~3,287</td>
<td>~105,116</td>
<td>~316,641</td>
<td>~$20.93</td>
</tr>
<tr>
<td><strong>US Service Territory</strong></td>
<td>~$100</td>
<td>30,420</td>
<td>~600,000</td>
<td>~1.8M</td>
<td>~$153</td>
</tr>
<tr>
<td><strong>Narragansett Electric</strong></td>
<td>~$10.09</td>
<td>~3,287</td>
<td>~105,116</td>
<td>~316,641</td>
<td>~$20.93</td>
</tr>
</tbody>
</table>
## A Utility Perspective on SSL

### SSL Benefits
- Energy Efficient - (Supports efficiency metrics and carbon reduction targets)
- Environmentally friendly – no hazardous waste, recyclable components
- Operational Life – reduced maintenance, parts stock and customer complaints

### SSL Concerns
- Component product quality – LED’s, Drivers
- Lack of standardization – performance variability, analytical life
- Manufacturer integrity – engineering, fabrication and photometric quality, warranty

### Industry Changes
- Legislative Initiatives – Mandated equipment performance changes and operational criteria
- Societal Issues – Sky glow and light trespass reduction, vehicle/pedestrian safety and property security
Utility Issues
SSL Adoption/Implementation Obstacles

- Utility business models, tariffs and rates –
  - Long term perspective
  - Extensive and lengthy regulatory process
  - Based on data, experienced performance and costs

- Product variability –
  - Operating performance, quality and cost cause difficulty in developing rates based on longevity with no experience.
  - Lack of industry standardization.

- Inconsistent Energy Rate Development –
  - Industry standard unmetered model (fixed criteria) vs. Variable consumption/operating time/dimming/overdrive condition model (Potential solution is SMART controls)
LED Pilot Projects

- **Utility Objective –**
  - Participate in LED Pilots through collaboration with municipal customers and other interested constituencies to obtain the data and experience to support a defensible business model, tariff structure and rate design. (Paradigm shift?)
The Challenges

<table>
<thead>
<tr>
<th>Financing –</th>
<th>Project Objectives –</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Federal Stimulus Funds,</td>
<td>• Lighting Design,</td>
</tr>
<tr>
<td>• Energy Efficiency Programs</td>
<td>• Cost Savings,</td>
</tr>
<tr>
<td></td>
<td>• Environmental</td>
</tr>
</tbody>
</table>

Objective Situation Evaluation –

• Finance Application –
  • Realistic Goals & Objectives or Marketing Rhetoric

• Customer Knowledge and Awareness –
  • Lighting Knowledge,
  • Project Scope Diversity & Costs,
  • Ownership and Maintenance Responsibilities,
  • Utility Tariff Compliance

• Schedule –
  • Funding Deadlines vs. Realistic Implementation Plan
The Foundation

Customer Education –

- Outdoor Lighting Technologies –
  - HID vs. LED, Illumination basics, measurements, costs, performance

- Utility Tariff Options –
  - Applicability or Special Agreement

- Objectives –
  - Definition and Understanding of Realistic Goals and Objectives

- Project Concept Evaluation –
  - Site selection, quantity and type of lighting changes, assessment plan, term, cost and function responsibilities, billing, electrical sourcing, energy measurements.
Memorandum of Understanding

- To provide a high level framework, establishing mutual intent and guidelines to support the various tasks, functions and objectives associated with the project, and promote the recognition of roles and responsibilities of all involved parties.
The Agreement

▪ Key MOU Elements:
  ▪ Project intent, scope and clear objectives
  ▪ Define funding sources, compliance criteria, and schedule
  ▪ Identification and functional description of all active parties
  ▪ Relationship agreement of the parties to mutually conduct the pilot; partnership, cooperative, alliance.
  ▪ Identification and description of geographic/demographic locations, specific light locations and existing and proposed equipment.
  ▪ Roles and responsibilities of each party regarding existing and planned lighting: installation, removal, maintenance, operation, monitoring, billing, planned metering/control applications and measurements.
  ▪ Project term period and post pilot conditions
  ▪ Rights and ownership of pilot information
  ▪ Responsibilities and approval rights of all forms of communication and media coverage
  ▪ Liability and indemnification
The Plan

Pilot Project Scope Document

- To provide a functional structure with clear roles and responsibilities of all participants to achieve the designated objectives, defined component infrastructure and location details, requirements and specifications for planning, engineering, installation, operation, maintenance and removal, established criteria for materials and procurement, and duties to perform unbiased measurement, testing, analysis and documentation.

- Project Description
- Goals and Objectives
- Responsible Parties
- Project Location
- Existing Conditions
- Proposed Conditions
- Material Criteria, Specifications, Validation and Warranty
- Manufacturer/Vendor Requirements
- Procurement/Stocking/Staging
The Plan

- Implementation Plan
  - Installation
  - Operation
  - Maintenance
  - Removal
  - Restoration

- Measurement & Testing Plan
  - Photometric
  - Cognitive Perception (Human Conditions)
  - Energy Consumption
    - Metered, Adaptive Controls, Un-metered
  - Testing Schedule
    - Baseline, Initial, Progression, Final

- Results - Compilation, Analysis and Comparative Assessment

- Documentation and Communication Plan
  - Pre-project, Project Application, Post-project
  - Reporting and Presentation
Implementation & Conclusion

- **Plan Implementation** –
  - Dedicated and committed resources focused on the objectives will achieve a better result.

- **Conclusion** –
  - The pilot must be a collaboration of knowledgeable parties, equally supporting the project, and having the appropriate commitment to achieve the established objectives.
Commentary

- **Consortium participation:**
  - Involvement in the strategic development of this changing industry
  - Share and learn from successes and experiences of others
  - Influence on legislative and regulatory policies

- **LED adoption status:**
  - Continued investigation, research
  - Select pilot applications

- **Implementation Issues:**
  - Variable Consumption Energy Measurement (Rate/Tariff)
  - Industry standardization
  - Stabilization of technology / costs