C&I Reliability, Resiliency, Storage, and Microgrids

Understanding the Business Customer’s Perspective

John Di Stasio
Bill LeBlanc
Tia Hensler Heath

Web Conference
Today’s Presenters

John Di Stasio
President, Large Public Power Council
Former GM and CEO, Sacramento Municipal Utility District

Bill LeBlanc
Senior Advisor, E Source

Tia Hensler Heath
Vice President, Research, E Source
What We’ll Cover

- Changing customer perspectives on reliability and resiliency
- Strategic importance to utilities
- Market research study overview
  - E Source market research experience
  - Value and topics covered
  - Study details and process
  - Deliverables and cost
  - Timing and next steps
Solar and Other DG Technologies Becoming Economically Viable

As Industry Scales, Prices Fall

Source: Solar Energy Industries Association
Storage Costs Projected to Drop Significantly

Source: Environment Guru
Many New Offerings Available

SolarCity Launches Microgrid Service, Available Worldwide

GridLogic™ combines distributed solar, batteries and controllable loads to give municipalities, remote communities, military bases and hospitals cleaner, more resilient, more affordable power.

HOW TESLA’S COMMERCIAL BATTERIES HAVE CHANGED THE FUTURE...FOR WINEMAKERS?

TESLA WON’T DELIVER BATTERIES UNTIL LATE THIS SUMMER, BUT JACKSON FAMILY WINES IS ALREADY USING THEM TO SLASH ITS PEAK-DEMAND ENERGY USE.

Stem Closes $27M Round for Behind-the-Meter Energy Storage

Constellation and Total see markets for energy storage as building and grid resources.

Jeff St. John
January 7, 2015
Outages Have Huge Financial Impacts for Customers

114

Number of weather-related outages since 1980 costing over $1 billion

$25–70 billion

DOE estimated annual cost of weather-related outages

$65 billion

Estimated cost of Superstorm Sandy

Source: US Department of Energy (PDF)
Increasing Costs of Weather-Related Outages

Source: US Department of Energy (PDF)
Increased Weather-Related Outages

Source: US Department of Energy (PDF)
Outages Have Huge Financial Impacts for Customers (cont.)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Average annual cost per business (US$)</th>
<th>Number of businesses in survey population</th>
<th>Estimated annual cost per sector (million US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare</td>
<td>17,800</td>
<td>24,086</td>
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<tr>
<td>Financial services</td>
<td>61,000</td>
<td>8,125</td>
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<tr>
<td>Retail</td>
<td>13,500</td>
<td>88,570</td>
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<td>Food stores</td>
<td>21,000</td>
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<td>Agriculture</td>
<td>75,000</td>
<td>11,488</td>
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<td>Continuous-process manufacturing</td>
<td>79,000</td>
<td>39,199</td>
<td>3,097</td>
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<tr>
<td>Finished-products manufacturing</td>
<td>17,000</td>
<td>34,448</td>
<td>586</td>
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<tr>
<td>Total</td>
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© E Source, “Reliability in the Emerging Electricity Marketplace: The End-User Perspective”
Public Policy Is Driving Increased Resiliency

New York awards microgrid grants to 83 communities

July 9, 2015 -- New York is giving 83 communities about $100,000 each to support microgrid projects, the office of Gov Andrew Cuomo told the press yesterday. The grants are from the NY Prize microgrid competition, which NYSERDA manages, his office said. The communities will study the... (To read the remainder of this article, please log in below.)

Microgrid Grant and Loan Program
Customer Reliability Is Important for More than Just Economics

“The goal is to keep the stores open during blackouts. … Minimum level of lighting, refrigeration, and keeping the cash registers open.”

—David Ozment, Senior Director of Energy, Walmart

“We’re committed to the communities we serve, so when disasters occur, we partner with local organizations to help those in need and protect our team members and guests.”

—Target

“After seeing the devastation of the earlier facility, it was important to Mercy to do whatever we can to ensure we’re here [for the Joplin community].”

—John Farnen, Executive Director for Strategic Projects, Mercy Hospital (Missouri)
Approx. $8 Billion ARRA-Related Investment in the Grid

Digital Energy:
2009 ARRA Smart Grid Stimulus

![Bar chart showing Smart Grid Investment Grants ($bn)]

- Equipment Manufacturing: $0.1
- Customer Systems: $0.1
- Transmission Systems: $0.3
- Distribution Systems: $0.5
- AMI: $2.0
- Integrated / Cross-cutting: $5.2

![Pie chart showing Smart Grid Demo Projects: Power Storage Technologies]

- Battery: Sodium-ion: 3%
- Battery: Lead: 1%
- Battery: Unknown: 12%
- Flywheel: 15%
- Flow batteries: 17%
- Battery: Li-ion: 20%
- CAES: 32%

Total = $185m
Additional Grid Investments

- Edison Electric Institute projects that around $50 billion will be spent annually on transmission and distribution investments.

- The American Society of Civil Engineers rated the current grid infrastructure as a D+ and estimates that we need $673 billion in grid investments from 2012 to 2020.
Utilities Need to Understand What Customers Want and Value

“I don’t care if the power is out for 10 minutes, but after 4 hours it can cost me thousands of dollars.”

“I need immediate communication so I can plan to get my plant operational once the power comes back on.”

“Reliability is critical. If the utility can’t provide it, I’ll work with a third party to find a solution.”

“Several vendors have approached me with solutions, but I’d rather work with the utility.”
Study Overview

- E Source market research experience
- Value and topics covered
- Study details and process
- Deliverables and cost
- Timing and next steps
E Source Market Research

- Deep experience in studying and working with the business sector
  - Satisfaction surveys
  - Key account and midsize customer surveys
  - Sector studies
  - Studies on technologies, marketing, and customer needs and behaviors
E Source Market Research (cont.)

- Long history of business market research studies
  - Reliability and outage costs
  - Pricing and load management
  - Energy-efficiency potential
  - Interest in and actions related to solar and distributed generation
Utility Value of Study

- Strategic intelligence and road map for reliability-related investment and customer engagement

- Data and insights to inform:
  - Grid and reliability infrastructure investment decisions
  - Customer reliability and dynamic pricing offerings
  - Account management tactics
  - Customer messaging and communications plans
  - Microgrid strategies and implementation efforts
Topical Focus

- In-depth interviews to gain insights into large and midsize business customers’ attitudes, desires, barriers, and anticipated actions related to:
  - Reliability and resiliency
  - Backup generation
  - Battery storage
  - Microgrids

- Robust, quantitative value-of-service reliability survey to assess outage costs under a wide range of scenarios
Customer Segments

- US and Canada
- Large and midsize businesses (number of employees at site)
  - 20–50
  - 50–100
  - 101–250
  - 250+
- Key segments such as:
  - Manufacturing (continuous process)
  - Manufacturing (non-continuous process)
  - Healthcare and hospitals
  - Grocery
  - Offices
  - Government and education
  - Retail
  - Financial/digital economy (such as data centers)

Source: iStock
# Key Topics Covered

1. Perceived utility service level and costs associated with different types of reliability events

2. Desire for and willingness to pay for reliability-related products and services

3. Understanding of the benefits of and interest in battery storage, microgrids, dynamic pricing, and demand response

4. Current barriers, future preferences, and likelihood of action through a third party versus the utility

5. How reliability-related investment decisions are made
Study Design

- North American study
  - In-depth qualitative interviews to gain attitudinal and behavioral insights
  - Quantitative survey to assess outage costs under a wide range of scenarios, explore existing backup generation, assess buying preferences, etc.

- Utility-specific service territory oversampling is available for early partners
Study Respondents

- Respondents will be energy decision-makers at their organization
- Random sample with quotas for each segment
Qualitative In-Depth Interviews

Process

- In-depth interviews (IDIs) are informal, guided discussions that help tease out important *attitudinal* and *behavioral* insights
- We’ll conduct 40 IDIs across the spectrum of selected customer segments and business sizes
- We’ll create a report highlighting strategic findings

Insights

- Barriers and future desires
- Decision-making processes
- Understanding of the benefits of and interest in reliability-related investments
- Likelihood of third party versus utility action
Quantitative Value-of-Service Survey

**Process**
- Random sample of large and midsize businesses
- Quotas by segment
- 20-minute online survey
- 800 completed interviews
- Strategic results and detailed data report

**Insights**
- Perceived level of outage events and cost of various outage scenarios
- Existence of existing on-site reliability infrastructure
- Interest in and willingness to pay for increased reliability
North American Study Deliverables

- An intelligence report based on in-depth interviews
- A strategic outcome report, highlighting the outlook for the future and illustrating how utilities can work with customers on resiliency, reliability, storage, and microgrids
- A detailed results presentation report with key data in meaningful formats that you can use at your utility to help make strategic decisions
- A findings web conference with a discussion of our results and time for questions
- Full datasets
Oversampling Add-On Option

- Available to members who join by **September 15** for an additional $9,500
- We’ll collect additional quantitative survey data (oversample) for your service territory (not IDIs)
- We’ll provide the full dataset and a report comparing the results from your territory to the North American results
Oversampling Add-On Option (cont.)

- Participating utilities are required to provide customer lists and email addresses (we recommend at least 1,000)
- We’ll use a $50 incentive to increase the response rate with a goal of 100 completes per oversample region
- We strongly recommend allowing us to use the utility’s name during email recruitment to increase the response rate
Study Schedule

- Schedule is dependent on having 10 members join the study by September 15.
- Utilities that join by August 24 will have an opportunity to provide input on the quantitative survey instrument and IDI guide.
- Those joining by September 15 will have the opportunity to provide input on the IDI guide only.
- Service territory oversampling is available to utilities that join by September 15.
### Study Costs

<table>
<thead>
<tr>
<th></th>
<th>By September 15</th>
<th>After September 15</th>
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<tbody>
<tr>
<td>E Source utility members</td>
<td>$24,500</td>
<td>$29,500</td>
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<tr>
<td>Non-members</td>
<td>$39,500</td>
<td>$39,500</td>
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<tr>
<td>Oversampling</td>
<td>Additional $9,500*</td>
<td>Not available</td>
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</tbody>
</table>

*Customization of the oversampling questionnaire and process will be accompanied by additional fees*
For More Information

Bill LeBlanc
Senior Advisor, E Source
303-345-9142 bill_leblanc@esource.com

Mike Smith
Vice President, Marketing & Sales, E Source
303-345-9207 mike_smith@esource.com

Locate the study prospectus at
www.esource.com/market-research/reliability