The Utility World Is Radically Transforming: Are Evaluators Up for the Challenge?

Bill LeBlanc
Chief Instigation Agent, E Source

IEPEC Denver 2019

August 2019
Who Is E Source?

- Research and advisory firm with 30 years utility experience
- Focused on utility-customer connections
- Membership-based with 80+% of N. American Utilities
Today’s roadmap

- What is the **larger context** of our world of DSM?
- How does it fit into the **utility of the future**?
- How do we **design** for our customers so they care?
- How do we **define Electrification**?
- Key challenges for **Evaluators**.
Key challenges facing utilities

- Stagnant load growth
- Revenues being squeezed
- Increasing percentage of clean energy
- Brand strength and consumer preferences
- Expanding distributed energy resources (DERs)
We will only green the world when we change the very nature of the electricity grid—moving it away from dirty coal ... to ... renewables. And that is a huge industrial project—much bigger than anyone has told you.

Finally, like the New Deal, if we undertake the green version, it has the potential to create a whole new clean power industry to spur our economy into the 21st century.

—Thomas Friedman (2007)
Rapid decrease in costs of wind and solar

Levelized Cost of Electricity By Source

- WIND: Now only 33% of the cost compared to 2010
- SOLAR: Now only 17% of the cost compared to 2010
- NATURAL GAS: Now 63% of costs compared to 2010
- COAL: Now 97% of costs compared to 2010

Source: US Energy Information Administration
U.S. electric capacity additions and retirements, 2019
gigawatts (GW)

- solar PV
- natural gas
- wind
- coal
- nuclear

planned additions
(24 GW)
- solar PV, 18%
- wind, 46%
- natural gas, 34%
- other, 2%

planned retirements
(8 GW)
- nuclear, 18%
- natural gas, 27%
- coal, 53%
- other, 2%

Source: US Energy Information Administration

Double this with consumer solar
How does EM&V change when the objective is carbon reduction of 80% to 100% in 20 years?

Note: EM&V = evaluation, measurement, and verification
Growth in plug loads

All images source: iStock
Smart speakers are the most quickly adopted electronic devices in US history

Source: Consumer Adoption, XAPPmedia
Customers actually want to engage with you on this channel

60% of smart speaker owners said they are “probably” or “definitely” interested in a utility app that utilizes voice-activated skills

Data from the E Source Residential Utility Customer Survey
There’s much more that could be done

Help customers understand time-variant rates

Walk customers through a home energy audit

Help customers control smart devices

Expand educational campaigns

Promote trade allies
Number of gadgets by age of consumer

Note: Electronic devices include cellphones, smartphones, TVs, game consoles, DVRs, laptops, etc.
The old utility success paradigm

- Increase sales
- Build and spend
- Enhance reliability

20th-century model

Source: www.industcards.com/st-other-usa-oth.htm
Why did the utility’s position erode?

- The core product used to be the most amazing technological feat in history; now it’s taken for granted.
- Utilities have been rewarded for being reliable and safe, not for being innovative or customer-centric.
- The rest of the world’s leading companies have set a high bar for innovation and speed.
- *Monopoly* has become a negative word in a world of competition; people love *choice*.
The new utility success paradigm

20th-century model

- Increase sales
- Build and spend
- Enhance reliability

21st-century model

- Increase value
- Products and services
- Greening the grid
- Transforming transportation
How might the evaluation community assist in the transformation from the old utility world to the new paradigm of DERs, electrification, and carbon reduction?
Quiz time! Name that year*

How fast have we evolved?

*Thanks to Scott Dimetrosky, Apex Analytics
1997 or 2017?

- *Titanic, The Lost World: Jurassic Park,* and *Men in Black* were the three biggest films of the year
- Princess Diana was killed in a car crash
- Steve Jobs started back at Apple
- The first iPhone was still 10 years in the future
- The Dow Jones average was soaring to over 7000
- *Harry Potter* was published
1997 or 2017?

Practice one first:
Therm Impacts and Cost-Effectiveness of the 1992 Oregon Residential Building Code

1997
1997 or 2017?

Market Transformation: Measuring the Immeasurable

- Hossein Haeri, Sami Khawaja, and Jennifer Stout, Barakat & Chamberlin, Inc.
- Jamshid Hosseini, Marquette University

1997
1997 or 2017?

Product Identification, Partnership Formation, and Pricing Strategy: Methods and Results for Building Energy Performance Software

- Peter Benenson, Peter Benenson Consulting
- Tom L. Webster, Webster Consulting

1997
1997 or 2017?

Evaluating Programs of the Cities for Climate Protection Campaign

- Moderator: Fred Sissine, Congressional Research Service
- Panelists:
  - Ralph Torrie, Cities for Climate Protection Campaign
  - Phil Welker, City of Portland Oregon Energy Office
  - Doug Yoder, Department of Environmental Resources Management, Dade County, Florida
  - Barbara Bamberger, City of Chula Vista, California
1997 or 2017?

Not All Spillover Is the Same—So Don’t Treat It That Way!

- Ryan Bliss, Research Into Action

2017
1997 or 2017?

Generating a Statewide Baseline Market Characterization for Commercial and Industrial Customers

- James Leahy, DNV GL Energy

2017
Powerwalking = RCT

- Pick **random** people off the street
- Try to **control** my laughter when they say something funny
- **Trial**-and-error process to get the right mix of people
How do we portray ourselves?
What are non-energy benefits?

- “When you don’t use energy in your house, you benefit from saving money.”
- “Like when a lazy person gets out of doing hard work?”
- “Sounds like ‘friends with benefits.’”
What’s *net to gross* refer to?

- “That’s how much the government takes out of your paycheck each month, right?”
- “I have no idea. It sounds disgusting.”
What drives satisfaction and brand value?

Percentage rating electric provider’s overall performance as “very good” or better

Number of programs participated in

- 0 programs: 39%
- 1 program: 42%
- 2 programs: 45%
- 3 programs: 48%
- 4 programs: 50%
- 5 programs: 52%
- 6 programs: 64%

© E Source; data from E Source Residential Energy-Use Study
## The utility DSM budget of 2020

<table>
<thead>
<tr>
<th>Budget category</th>
<th>Percentage of budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer incentives</td>
<td>60.8</td>
</tr>
<tr>
<td>Admin</td>
<td>24.4</td>
</tr>
<tr>
<td>Delivery</td>
<td>12.0</td>
</tr>
<tr>
<td>Evaluation</td>
<td>1.0</td>
</tr>
<tr>
<td>Marketing</td>
<td>0.9</td>
</tr>
<tr>
<td>Design</td>
<td>0.2</td>
</tr>
<tr>
<td>Utility performance incentives</td>
<td>0.2</td>
</tr>
<tr>
<td>Other</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Note:** Percentages may not equal 100 due to rounding.
What becomes “contagious” in the marketplace?

| Social currency | Triggers | Emotion | Public / norms | Practical value |

Adapted from *Contagious: Why Things Catch On* by Johan Berger (2013)
What becomes “contagious” in the marketplace?

| Social currency | Triggers | Emotion | Public / norms | Practical value |

Adapted from *Contagious: Why Things Catch On* by Johan Berger (2013)
What is social currency?

- Knowing something others don’t know
- Sharing something remarkable, different
- Being special, “in” crowd, “in” clubs, exclusivity
- Getting something in short supply, being first

https://www.trustedreviews.com/best/best-iphone-3501342
Why did the Prius win the battle?

Honda Civic Hybrid


Toyota Prius

https://www.motortrend.com/cars/toyota/prius/2006/
Prius and Tesla owners in California

Trendy bohemians

People who care about the environment

Adapted from The Onion
The power of social norms

Visible, demonstrate your actions

Subconscious desire to fit in

Milieu acceptance, avoid conflict


LeBlanc personal HER
## Products meeting “stickiness” factors

<table>
<thead>
<tr>
<th>Product or service</th>
<th>Social currency</th>
<th>Trigger</th>
<th>Emotion</th>
<th>Social norms/public</th>
<th>Practical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermostat control via smartphone</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Electric vehicle programs and support</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Photovoltaic panel sales, leasing, and support</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>?</td>
</tr>
</tbody>
</table>
Design thinking

Empathy
https://travel.stackexchange.com/questions/3041/how-to-use-sinks-with-separate-hot-cold-taps
https://brightside.me/wonder-curiosities/3-reasons-why-people-in-the-uk-have-2-taps-326760/
Safety moment

Innovation moment
“If I had an hour to solve a problem, I’d spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.”

—Albert Einstein
Current program design and customer experience strategy: Typical method

1. Cost-cutting goal or behavioral goal
2. Target customers
3. Sell and bribe
Fundamental shift in program design and marketing strategy: Customer-first method

1. Target customers
2. Incorporate attractive attributes
3. Blend in utility goals
Change the vocabulary ...

“How might we ...”

“Yes ... and ...”

“Let’s figure out how to make that work.”

These are all “How we can succeed” statements.
What were Airbnb’s design challenges?

Design for Trust
Dave and Deb communication was perfect from the beginning. They are very attentive and helpful hosts. The place is absolutely nice and well equipped! It is so clean and so bright, I recommend it to anyone who visits Edmonton. Plus the location is really convenient! My friend and I will stay here again for sure ^_^
Real-life design thinking example: Nest

“Instead of saying: ‘let’s just make it easier to program,’ we believed there should be a better way.”

—Tony Fadell, former senior vice president, Apple

Source: http://innodigest.com/design-thinking-to-sustainable-energy/

“Instead of saying: ‘let’s just make it easier to program,’ we believed there should be a better way.”

Source: http://innodigest.com/design-thinking-to-sustainable-energy/
This is our only regular communication with 90% of our customers.
Typical assumption on bill redesign

Assumption: Customers want to be able to read their bill more easily

Utility goals: Reduce calls, complaints, and late payments, and increase satisfaction

Customer goals: Core fears and desires are often not well known

Source: Georgia Power
HOW MIGHT WE deliver the bill as a communications tool about the value they have received instead of the money that they owe?

HOW MIGHT WE deliver the bill that reduces anxiety that many people feel in anticipation of receiving, opening, and paying their bill?
Bill redesign
Billing experience redesign
#1: Build evaluation into a truly integrated workflow for customer programs....
How many of you use this metric?

Return on evaluation investment (ROEI)
Potential ROEI metrics

- Lowering program acquisition costs
- Lowering costs of delivery
- Lowering costs of field problems, fixes, and complaints
- Increasing customer satisfaction
- Increasing behavioral actions
- Increasing Net Promoter Scores
#2: Consider the Objective of Carbon Reduction of 80-100% in 20 Years
#3: Move quickly to adopt EM&V techniques for Electrification

Nail down:
- Winners and losers
- Cost effectiveness tests
- Human factors
- Regulatory incentives/PBR
- Carbon measurement
NREL electrification model: EVs dominate

Vehicle electrification dominates incremental growth in annual consumption

2050 U.S. electricity consumption increases
- Medium +932 TWh (20%)
- High +1,782 TWh (38%)

Source: National Renewable Energy Laboratory
Defining beneficial electrification

- Environmentally beneficial electrification
  - Less carbon and lower rates for nonparticipants

- Grid-efficient electrification
  - Carbon, rates, and bills are all reduced
  - Lower rates and lower bills

- Economically efficient electrification
  - Less carbon and lower bills
## Revamping cost-effectiveness tests

<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Included in Total Resource Cost Test and Electrification Test</strong></td>
<td><strong>Included only in the Electrification Test</strong></td>
</tr>
<tr>
<td>Incremental cost of a new air source heat pump over a gas furnace and/or central air-conditioning unit</td>
<td>Increased CO$_2$e emissions from increased electric generation</td>
</tr>
<tr>
<td>Avoided cost of fossil fuels (oil or gas not used because of switch to electricity)</td>
<td>Decreased CO$_2$e emissions from reduction in oil- or gas-fired heating</td>
</tr>
<tr>
<td>Increased cost of electricity</td>
<td>Air quality improvements from displaced fuel and related public health savings</td>
</tr>
<tr>
<td>Lower customer operations and maintenance costs</td>
<td></td>
</tr>
<tr>
<td>Increased cost of generation capacity (if applicable)</td>
<td></td>
</tr>
<tr>
<td>Increased transmission and distribution (if applicable)</td>
<td></td>
</tr>
</tbody>
</table>
Is it time for Electrification regulatory profit incentives for investor-owned utilities?

- Cost recovery of program costs
- Incentive to drive rates lower by electrification programs
- Incentive for net efficiency gains (reducing overall Btus for same “work”)
- Incentive for accelerating adoption of new technologies adopted (e.g., EVs)
- Incentive for meeting environmental goals
- These all can include sliding-scale bonuses
#4: Focus on customer value

Imagine what your job would be in the absence of regulation, then …
For more information

Bill LeBlanc
Chief Instigation Agent, Strategy & New Products, E Source
303-345-9142  bill_leblanc@esource.com