Cities and the Transformation of the Utility Industry

August 2, 2016

Moderator:
James Irwin, Center on Wisconsin Strategy (COWS)
Fast Forward: An Early 20th Century Industry Confronts 21st Century Changes

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The American Council for an Energy-Efficient Economy (ACEEE)

- ACEEE is a nonprofit 501(c)(3) founded in 1980. We act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors.
- 50 staff; headquarters in Washington, D.C.
- Focus on energy efficiency in industry, buildings, & transportation sectors.
- Research in economic analysis & financing, behavior, energy efficiency programs, national policy, utilities, state, & local policy, and some international work.
- Diverse funding sources, including foundation grants, contracts and government grants, and conferences & publications.
City sustainability and transformation of the electric utility industry

- Why does this matter?
- Why should I talk to my utility?
- What goals do we share?
- What benefits are possible through partnerships?
Why does this matter? Benefits of energy efficiency for cities:

- Meet goals for sustainability and climate change
- Reduce energy costs for households and businesses
- Reduce energy burdens for customers most in need
- Keep more energy dollars in local economy
- Create local jobs
- Increase community resilience

*Transformations in utility industry will affect the ability of cities to achieve EE goals (both + and -)*
Utility transformations underway

Business models
  • Traditional model decaying, new business/regulatory models emerging – still very uncertain

Technologies
  • Existing technologies antiquated, aging
  • New smart technologies and grid emerging

Resources
  • Distributed resources growing rapidly
  • Costs of renewables at parity in some cases
  • Energy efficiency: large, growing, invisible resource
Industry in upheaval: “death spiral?”

- High cost infrastructure in place
- Competitive alternatives, e.g. customer-owned PV
- Customers generate own power—buy less from utility
- Customers also become more efficient—buy less
- Same high cost system in place
- Costs distributed across fewer customers/kWh sold
- Rates increase⇒ alternatives more competitive
  ⇒ more customers generate own power ⇒ more conservation ⇒ cycle repeats
- Threat is real, but ACEEE research shows that it is overstated – still marginal impacts
Energy efficiency: a low-cost utility resource

*Source:* Energy efficiency data represent the results from Molina 2014 for utility program costs (range of four-year averages for 2009-2012); supply costs are from Lazard 2015.
U.S. energy use since 1980 – all sources

2014 EE savings ~$2500/capita

Source: ACEEE, EE in US, 2015
Economy has grown without runaway electricity use – sales are now flat
One defensive response utilities are making to their concern about lower sales: switch to rates with high fixed charges

- Made in the name of equity and fairness: solar customers still impose system costs that aren’t recovered under existing rate structures (basic argument)
- Reality is these structures work against customer RE and EE
- Biggest impacts on smallest users
- Other rate designs could better address problem: e.g. time-varying rates that maintain volumetric price signal to encourage EE
Example: Madison Gas & Electric

- Proposed ~5X increase
- Approved ~2X

All four other IOUs in Wisconsin all have received similar increases

- Led to creation of advocacy group: RePower Madison
- MGE developed community plan with greener goals: 30% renewables by 2030
- City of Madison adopted aggressive climate action plan:
  - 80% reduction in GHG by 2050
  - 50% reduction in energy use in city
  - 25% total energy (incl. transportation) from clean sources

Source: [RePower Madison](https://www.repowermadison.com)
Changes have been slow in utility business/regulatory model

- Traditional utility regulation based on growth model---massive investment built the system we have today
- Goals have been electrification, sales growth, high reliability, “fair and reasonable rates”
- Other objectives generally have been lower priorities
  - Environmental protection
  - Customer choice
  - Customer service
  - Innovation
Policy status: energy efficiency resource standards (EERS)

EERS policy approaches by state (as of January 2016)

*Potential EE expansions in next few years

Source: American Council for an Energy-Efficient Economy
Changing the business model for electric utilities: making EE equitable, even profitable, as investments

Decoupling of utility revenues from energy (kWh) sales

Utility financial incentive for energy efficiency

LRAM (lost revenue adjustment mechanism)

Note that states are marked as having a regulatory mechanism in place if at least one large utility has that mechanism enabled. Some states have enacted a mix of LRAM and decoupling policies for various utilities. These states are marked as decoupled.
Policy impacts: rapid growth of EE programs

Source: ACEEE, 2015 State EE Scorecard

Total EE program spending ($billion)

- Electricity programs
- Natural gas programs

Source: ACEEE, 2015 State EE Scorecard
Completely re-thinking the utility business/regulatory models

A few states are exploring and establishing new models, including:

• New York: Reforming the Energy Vision (REV)
• Minnesota: e21 Initiative
• California

While different in origins and processes, share:

• Multiple, key stakeholders
• Collaborative
• Willingness to innovate, experiment
• Recognition of transformation underway

Good source of info: Rocky Mountain Institute E-Lab
http://www.rmi.org/elab
Rapid emergence of “smart grid”---no standard definition, but characterized by technologies that are:

- Connected
- Communicating
- Integrated
- Responsive
- Data-rich

- Real-time
- Diagnostic
- Analytical
- Predictive
- Learning
Intelligent systems and networks ➔ intelligent efficiency

- Smart grid
- Smart meter
- Occupants
- Sensors & controls
- Building automation system
- Display
- Facilities management

Smart appliances, equipment, and energy systems
Rapid increase in distributed resources

- Costs of renewable generation have declined rapidly; increasingly competitive
- Greening of the grid: customer demand for RE increasing rapidly
- Reliability, resilience increasing attraction of on-site generation, including fossil-fuel CHP
- Energy efficiency: key role in distributed resources
- Other emerging technologies—e.g., electric vehicles, energy storage
Production from distributed generation (R, C & I sectors)

Source: ACEEE analysis of data in EIA Monthly Energy Review
Load shapes are changing
Volatile, dynamic energy markets

Henry Hub Natural Gas Spot Price

Dollars per million Btu

Policies in flux

- Clean Power Plan (CPP)?
- Some push-back or stagnation of energy efficiency resource standards (EERS)
- New rate designs (esp. time varying)
- Concerns over rate impacts from EE
- Industrial EE opt-outs
- Misperception that EE potential has been largely tapped out
EE opportunity under CPP in select states

For 1%/yr EERS, building code upgrades and medium level of CHP. From ACEEE SUPR2 model.
CPP: many states moving ahead with plans

http://www.eenews.net/interactive/clean_power_plan

Supreme Court Stay Response

- Continuing Planning: 20 states
- Assessing Planning: 8 states
- Suspending Planning: 19 states
- Exempt: 4 states

E&E's POWER PLAN HUB
Reaching more customers with EE and relieving energy burdens

• Expanding reach of EE programs to serve multifamily, affordable housing markets

• Expanding programs
  Small businesses and other traditionally “hard-to-reach” customers
What are utilities doing?

• Many are looking to new ways to cover costs – solar charges, fixed costs, demand charges
• A few may be cutting back on EE
• Some are/will expand EE but looking at new measures and ways to manage costs
• A few recognize the need to offer new services – EE, community solar, CHP, batteries; EV charging
• Most are holding steady for now
What are cities doing? A sampling

- Boston and selected CA cities: work together with utilities for EE program development
- Minneapolis: developed formal partnership with utilities for EE and RE goals
- Madison: developed energy plan after utility enacted rate structure with high monthly fixed charges
- Boulder: proposed ending franchise agreement and establishing municipal utility (outcome not yet decided)
The way ahead: against these dynamics, what can cities do?

- Track and engage in regulatory and policy proceedings affecting:
  - Utility planning and operations
  - Resource choices
  - Customer programs
  - Rate structures
  - Infrastructure improvement

- Dialogue with utilities to see how they can help with economic and sustainability goals (e.g., reduced energy dollar drain and GHG emissions reductions)
Cities responses: scoring and tracking progress toward EE goals

- Given this dynamic backdrop of transformations and upheavals, becomes even more important to measure and track key metrics
The City Scorecard: A Tool for Tracking Energy Efficiency Leadership

Efficient Cities Network Webinar
August 2, 2016

Dave Ribeiro (dribeiro@aceee.org)
Presentation topics

• *City Scorecard* overview and results from 2015 edition

• *City Scorecard*’s role in tracking local governments’ efforts to encourage utility energy efficiency

• Examples from cities leading the way
City Scorecard project goals

1. Compare large US cities exclusively on efficiency – creating friendly competition among cities to become more efficient

2. Focus on policies to highlight important actions cities can take – offering a roadmap for cities
2015 City Energy Efficiency Scorecard Results

http://aceee.org/local-policy/city-scorecard
City Scorecard policy areas

- Transportation policies: 28 points
- Local government operations: 15 points
- Community-wide initiatives: 10 points
- Energy and water utilities: 18 points
- Buildings policies: 29 points
## Energy utility metrics

<table>
<thead>
<tr>
<th>Policy Area and Subcategory</th>
<th>Maximum Score</th>
<th>Percentage of total points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy Utility Policies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Efficiency Spending</td>
<td>4</td>
<td>4%</td>
</tr>
<tr>
<td>Natural Gas Efficiency Spending</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Electric Savings</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Natural Gas Savings</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Energy Efficiency Targets and Funding Agreements</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Energy Data Provision</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Customer data access</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Aggregated building data access</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Community-wide data access</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Advocacy efforts related to utility energy data</td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>
## Tops scores for energy utility efforts

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Electric efficiency spending (4 pts)</th>
<th>Electric savings (2 pts)</th>
<th>Gas efficiency spending (2 pts)</th>
<th>Gas savings (1 pt)</th>
<th>EE targets &amp; requirements (2 pts)</th>
<th>Data provision (2 pts)</th>
<th>Overall energy utility score (13 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>MA</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>MN</td>
<td>3.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1</td>
<td>2</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Portland</td>
<td>OR</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>0.5</td>
<td>1</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Chicago</td>
<td>IL</td>
<td>3.5</td>
<td>1</td>
<td>1.5</td>
<td>0.5</td>
<td>2</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>San Francisco</td>
<td>CA</td>
<td>3.5</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>Denver</td>
<td>CO</td>
<td>3</td>
<td>1</td>
<td>1.5</td>
<td>0.5</td>
<td>2</td>
<td>1.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Seattle</td>
<td>WA</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>San Jose</td>
<td>CA</td>
<td>3.5</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>0.5</td>
<td>1.5</td>
<td>9</td>
</tr>
<tr>
<td>Washington</td>
<td>DC</td>
<td>3</td>
<td>0.5</td>
<td>1</td>
<td>0.5</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>New York City</td>
<td>NY</td>
<td>3</td>
<td>0.5</td>
<td>1.5</td>
<td>0</td>
<td>1.5</td>
<td>2</td>
<td>8.5</td>
</tr>
<tr>
<td><strong>Median (overall)</strong></td>
<td></td>
<td><strong>2.5</strong></td>
<td><strong>0.5</strong></td>
<td><strong>0.5</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>
## Boston’s local leadership

<table>
<thead>
<tr>
<th>Metric</th>
<th>City effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>City promotion or joint implementation of utility program</td>
<td>Renew Boston program between city and energy utilities promotes efficiency actions and connects residents/businesses with efficiency services</td>
</tr>
<tr>
<td>City advocacy for efficiency</td>
<td>Seat on Energy Efficiency Advisory Council to advocate for efficiency</td>
</tr>
<tr>
<td>2013 electric utility spending on efficiency programs as % of revenue</td>
<td>7.54%</td>
</tr>
</tbody>
</table>
## Minneapolis’ local leadership

<table>
<thead>
<tr>
<th>Metric</th>
<th>City effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local utility funding agreements</td>
<td>Clean Energy Partnership between city and energy utilities lays out an active role for utilities in achieving city’s energy goals</td>
</tr>
<tr>
<td>City promotion or joint implementation of utility program</td>
<td>Minneapolis promotes and funds Xcel and CenterPoint program, Home Energy Squad</td>
</tr>
<tr>
<td>Provision of energy data</td>
<td>City participated in DOE’s Energy Data Accelerator, and has advocated to the PUC for policies to further improve data access</td>
</tr>
<tr>
<td>2013 gas utility spending on efficiency programs per residential customer</td>
<td>$30.49</td>
</tr>
</tbody>
</table>
## Portland’s local leadership

<table>
<thead>
<tr>
<th>Metric</th>
<th>City effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>City promotion or joint implementation of utility program</td>
<td>Partners with energy utilities through Sustainability at Work and Clean Energy Works Portland/Oregon</td>
</tr>
<tr>
<td>City advocacy for efficiency</td>
<td>Founding member of the Fair and Clean Energy Coalition</td>
</tr>
<tr>
<td>2013 electric utility spending on efficiency programs as % of revenue</td>
<td>5.02%</td>
</tr>
</tbody>
</table>
Takeaways

• Profound changes underway in utility industry; cities must be part of the conversation
• *City Scorecard* shows there are foundational energy efficiency initiatives cities can pursue; *Scorecard* also provides tool to track progress toward
• Based on our research, large cities can do more to encourage and become partners in utility energy efficiency initiatives for customers
Resources

- **Local Energy Efficiency Self-Scoring Tool, version 2.0** ([http://aceee.org/research-report/u1511](http://aceee.org/research-report/u1511))
- **State and Local Policy Database** ([http://database.aceee.org/](http://database.aceee.org/))

- **Coming soon: The 2017 City Energy Scorecard!**

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ACEEE: American Council for an Energy-Efficient Economy
Upcoming Webinars in this series

• City/Utility Partnerships: Minneapolis Case Study: Sept 20

• Meeting Climate Change Goals with Energy Efficiency: Oct 25

• Serving All Customers with Utility Energy Efficiency Programs: December 6

All begin at 2 pm Central
Any questions?

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Next Call: September 20, 2016
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