Changing Environment for Electric Efficiency

ACEEE Smart Energy Conference

Presentation by

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Changing Utility Ecosystem

- Slowing growth, driven largely by EE
- Customer Choice: Restructuring of wholesale and retail markets
- Changing consumption patterns / load profiles driven by DER
- Moving beyond NEM to Value of DER
- Potential of AMI to support Big Data/IOT
- Changing expectations of consumers

Inexorable Trend in IOT

- Customers now pay to improve control, health and safety, connectedness, comfort and freedom, increase efficiency, reduce environmental impact.

- Changes the math for EE and DR M&V, aggregations.

- 10% of all customers have communicating thermostats, 40% of new homes have them installed,

- 16% of customers will purchase connected appliance in next 12-18 months.

Many Participants Large and Small

Laterally Scalable

- New Law of Multiplying Devices…..
  - 2007—10 million;
  - 2013—3.5 billion;
  - 2030—100 Trillion
- IPv6 expands available addresses to
  340 Trillion, Trillion, Trillion URLs
- Platforms are emerging to manage these; Energy not necessarily the driving force.

Living in a Digital World

- Uber, the world's largest taxi company, owns no vehicles.

- Facebook, the world's most popular media owner, creates no content.

- Alibaba, the world's most valuable retailer, has no inventory.

- Airbnb, largest accommodation provider, owns no real estate.

Utility as a Platform

- Still Asset Managers but also Information Platform Companies

- Focus more on relationships than on control and management of internal resources

- Facilitate transactions between consumers and producers

- Value of Platform increases with users

Changing Utility Business Model

- Moving away from utility mandates and subsidies for EE to generalized financial incentives?

- Rates as price signals and decoupling?

- Paying a fair price for what we want instead of what we got?

- Incenting behaviors that emulate what would be expected of a competitive environment:
  - Continuous product and service expansion and improvements
  - Cost Reductions

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SPEER Commission

- Addressing the Utility Business Model
- New Policy Project White Papers:
  - Aligning Utility Incentives with Increasing EE
  - Win-Win Utility Regulation
- The Internet of Things and Integration of Distributed Energy Resources

AMI Drives Energy Platform

- 50% of consumers have some form of advanced meter-data infrastructure.

- Meter Data Access has been achieved in most places with a wholesale/retail --for competitive electricity suppliers.

- Need Meter-Data Access for Other Third-Parties.

- Green Button Connect is Not Enough.

State Actions

- California "Click-Through" Working Group
- Pennsylvania Licensing Process
- Illinois Rate Cases
- NY REV Rate Cases
- MD Grid Modernization Docket
- Ontario Energy Ministry
- Smart Meter Texas Governance /Operation
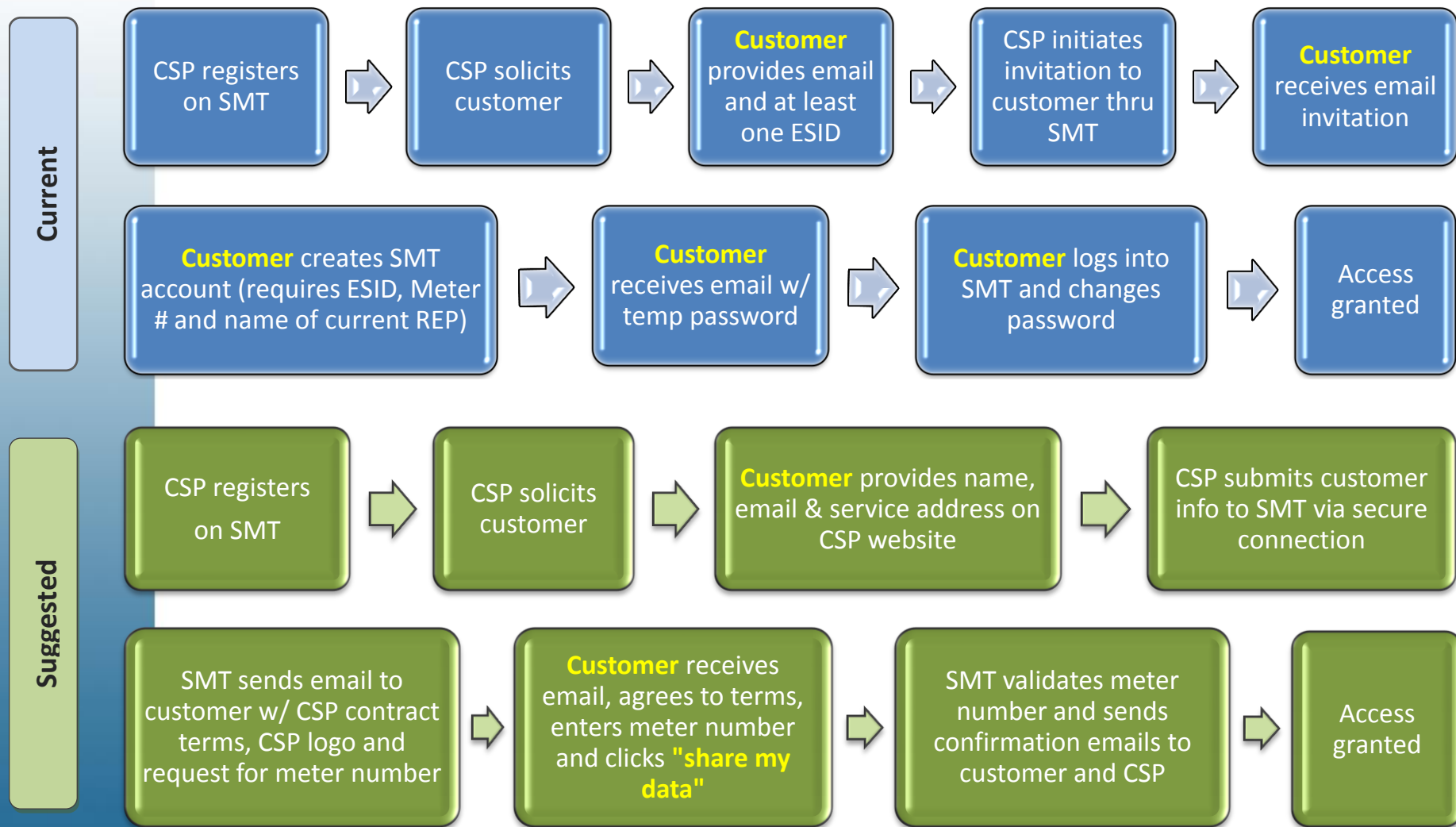 – Work in Progress....

Current

CSP registers on SMT → CSP solicits customer → **Customer** provides email and at least one ESID → CSP initiates invitation to customer thru SMT → **Customer** receives email invitation

Customer creates SMT account (requires ESID, Meter # and name of current REP) → **Customer** receives email w/ temp password → **Customer** logs into SMT and changes password → Access granted

Suggested

CSP registers on SMT → CSP solicits customer → **Customer** provides name, email & service address on CSP website → CSP submits customer info to SMT via secure connection

SMT sends email to customer w/ CSP contract terms, CSP logo and request for meter number → **Customer** receives email, agrees to terms, enters meter number and clicks **"share my data"** → SMT validates meter number and sends confirmation emails to customer and CSP → Access granted

Figure 1. The current and suggested processes for a customer to authorize a competitive energy services provider to access their meter data via the Smart Meter Texas web portal.

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Focus on Small Load Aggregation

- Residential and Small Biz, Weather Sensitive:
  - They vary seasonally
  - They are not like industrial loads
  - Their ability to provide load reduction depends on their load
  - The load depends on the weather
  - The capacity to reduce load is variable, but predictable and reliable
  - Their capacity to contribute to reliability or capacity is correlated with the most likely time it will be needed

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Weather Sensitive Loads Drive Peak

**Wednesday March 9, 2011 5:15 PM ERCOT Load: 31,262 MW Temperature in Dallas: 64°**
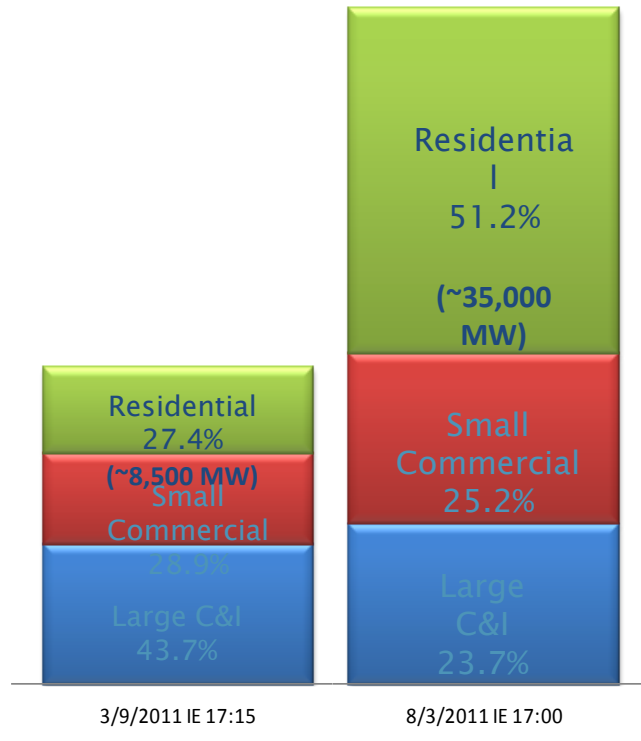
Wed., Aug. 3, 2011 5:00 PM ERCOT Load: 68,416 MW Temperature in Dallas: 109°

37,000 MW of weather-sensitive load -- 54% of peak

Residential
51.2%

(~35,000 MW)

Small Commercial
25.2%

Large C&I
23.7%

Residential
27.4%

(~8,500 MW)
Small Commercial
28.9%

Large C&I
43.7%

| 3/9/2011 IE 17:15 | 8/3/2011 IE 17:00 |

- Customer class breakdown is for competitive choice areas; percentages are extrapolated for munis and co-ops to achieve region-wide estimate
- Large C&I are IDR Meter Required (>700kW)

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DR Capacity vs. Average Temperature (30 min alert)
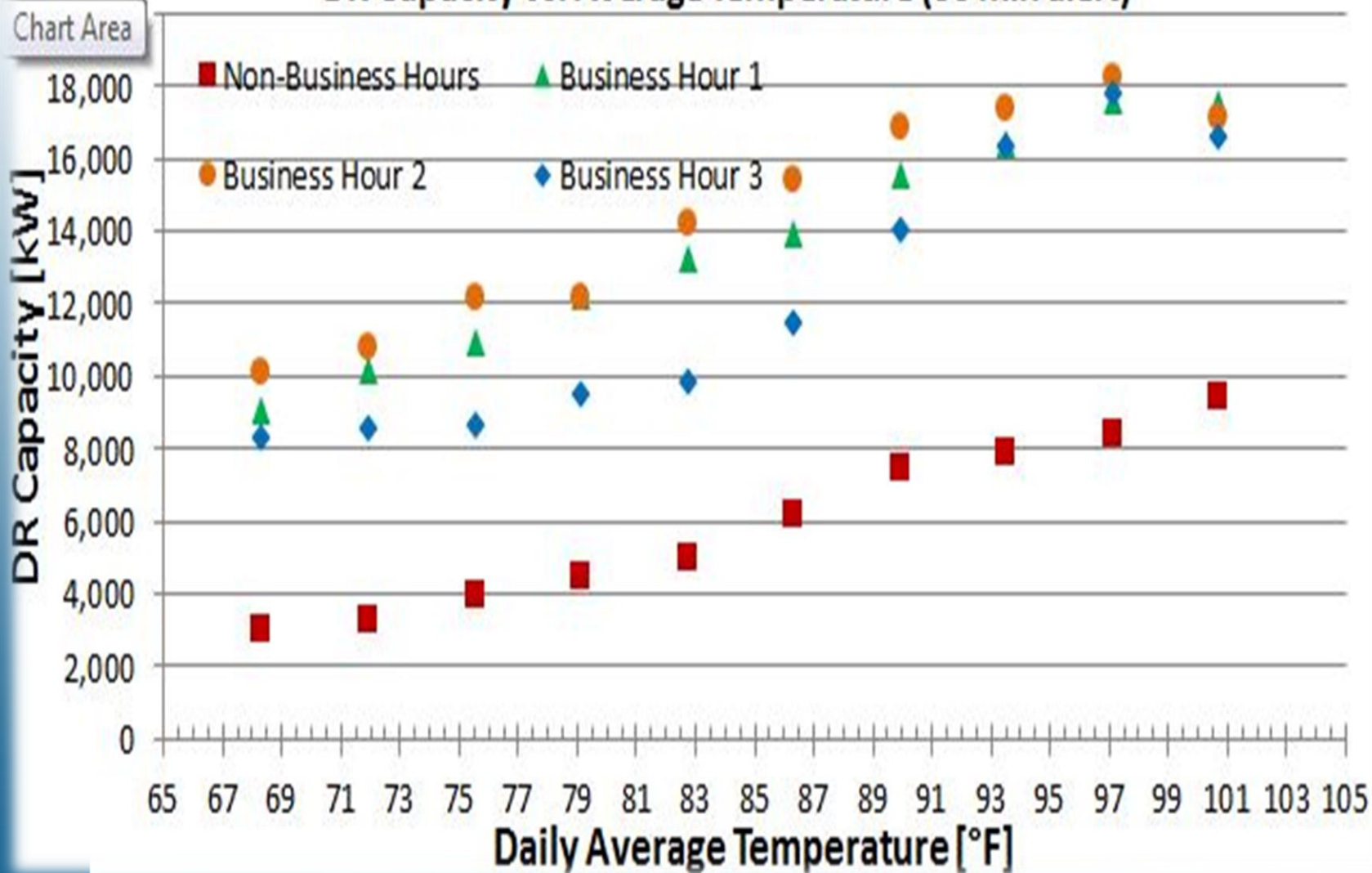
AMI Enables Cost–Effective M&V

- Most existing baselines were created for relatively stable industrial loads (Previous 5 of 10, high 3 of 5 days, etc.)
- All tend not to measure residential/weather sensitive loads well, and mostly under measure.
- SCE found even with day-of adjustment of 300% not accurate
- Nexant study found Control Group Protocols most accurate (Random Control Testing or Propensity Score Matched Groups)
- Option is "Like Days" Matching