

Consumer Behaviour Lessons from the USA

An Overview of Customers, Choice and EPRI Research Programs

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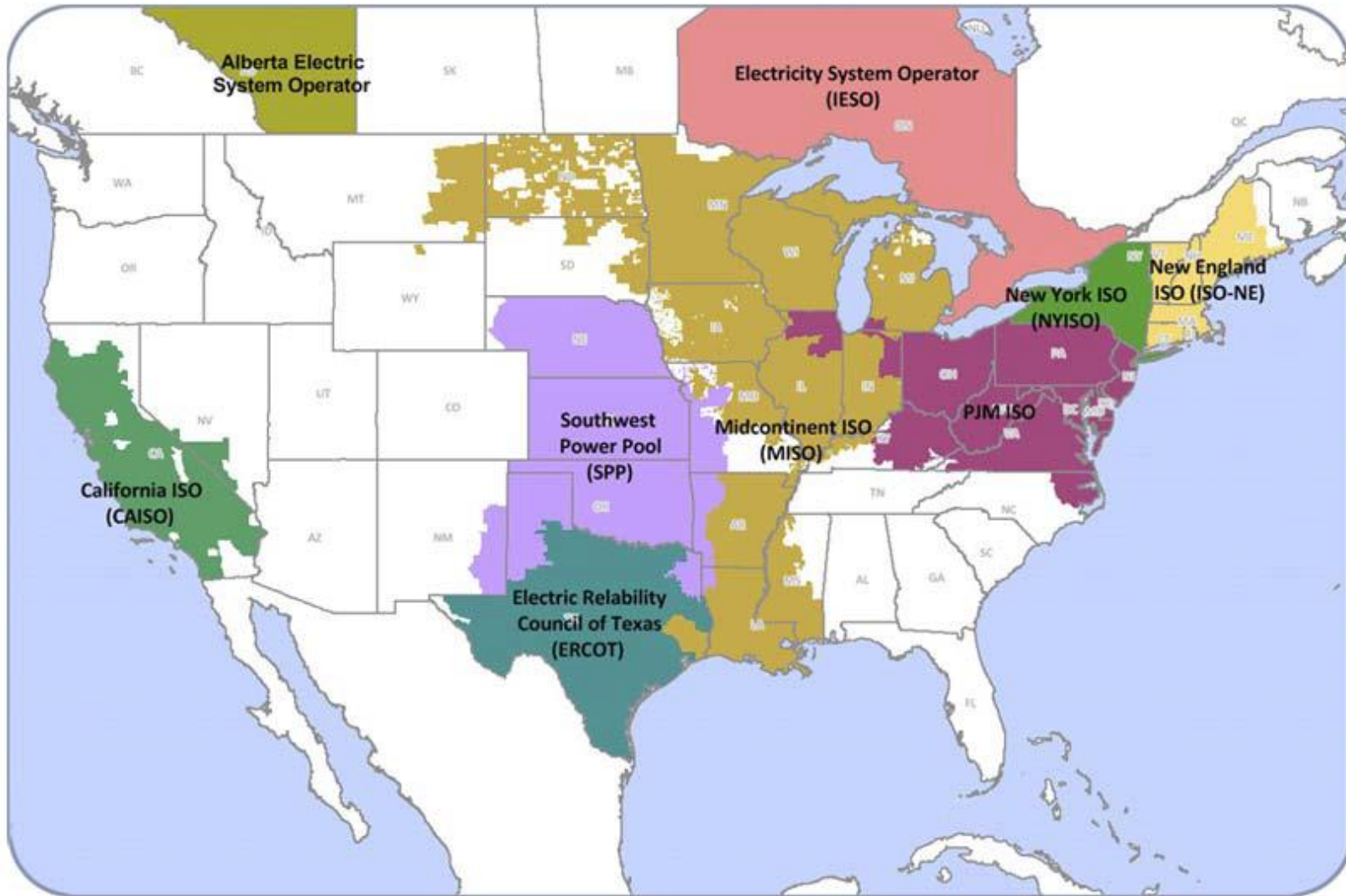


Electric Power Research Institute

- Founded in 1972 by the electricity industry and regulatory community to provide collaborative R&D to serve the public.
- 450+ members from more than 30 countries.
- International members from Europe, Asia and the Americas contribute to the research and development knowledge base.
- EPRI members generate approximately 90% of the electricity in the United States.



Wholesale Electricity Markets in North America

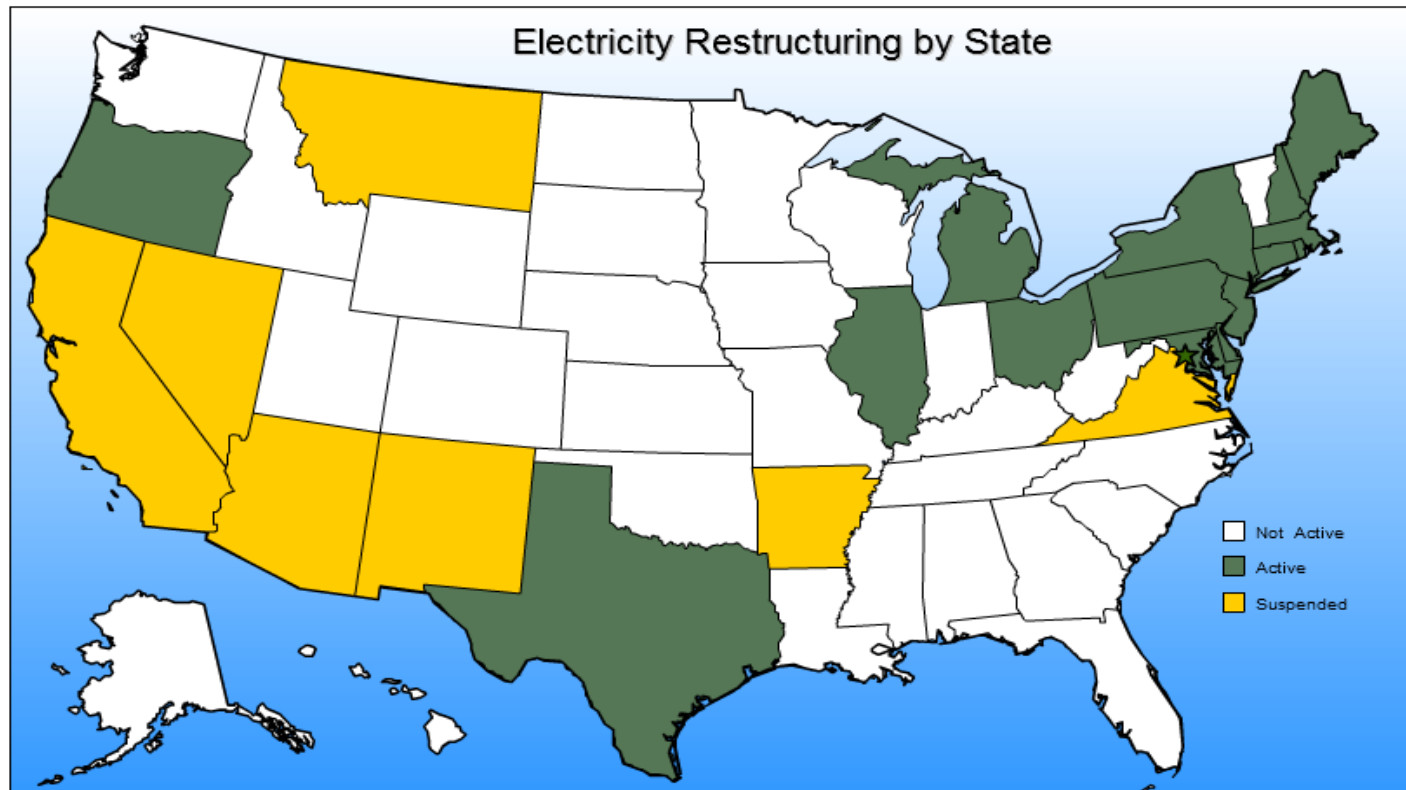


U.S. Retail Markets - Customer Choice States (15 of 50 States)

Status of Electricity Restructuring by State

Data as of: September 2010
Next Release Date: None

- The map below shows information on the electric industry restructuring. Click on a State for details.
- Restructuring means that a monopoly system of electric utilities has been replaced with competing sellers.



Source: Energy Information Administration

Texas Retail Market...

More and More Competitors. Even More Choices.

2002  2015



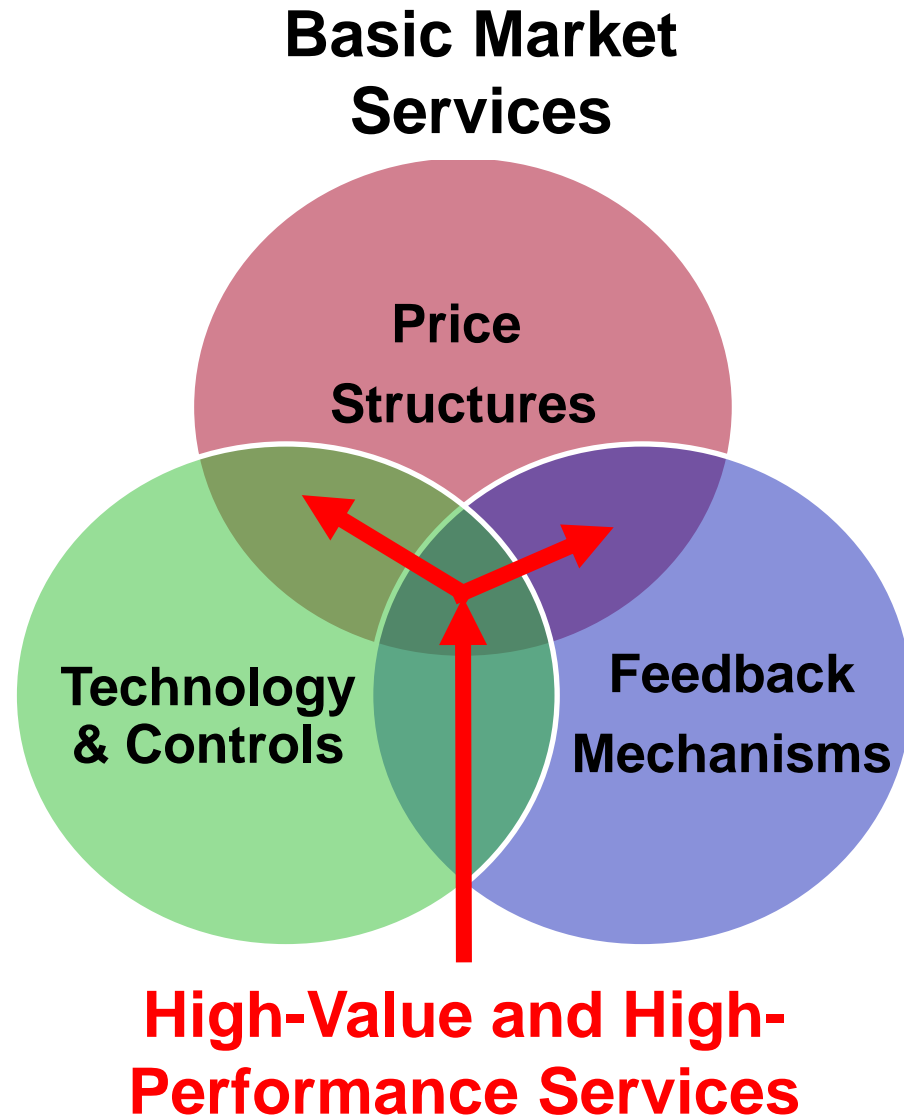
New York – Reforming the Energy Vision

Technology Track “Top 10”



1. Will use **Distributed System Platform Model (DSP)**
2. **The DSP function** should be served **by existing utilities**
3. Customers and energy service providers will have **access to system information.**
4. PSC Staff will propose platform to share **individual customer usage data**
5. Utilities should only be allowed to **own DER under clearly defined conditions** and in their own franchise territory
6. Utilities file **annual energy efficiency plans.**
7. Support development of **large-scale renewables**
8. Open to **micro-grids**
9. Utility responsible for **security**
10. **Benefit-cost framework** necessary and need framework

EPRI's Customer Choice and Control Initiative



- **Design**

- Identify the foundations for service diversification

- **Performance**

- Establish mechanism for constructing and forecasting the impacts of alternatives

- **Acceptance**

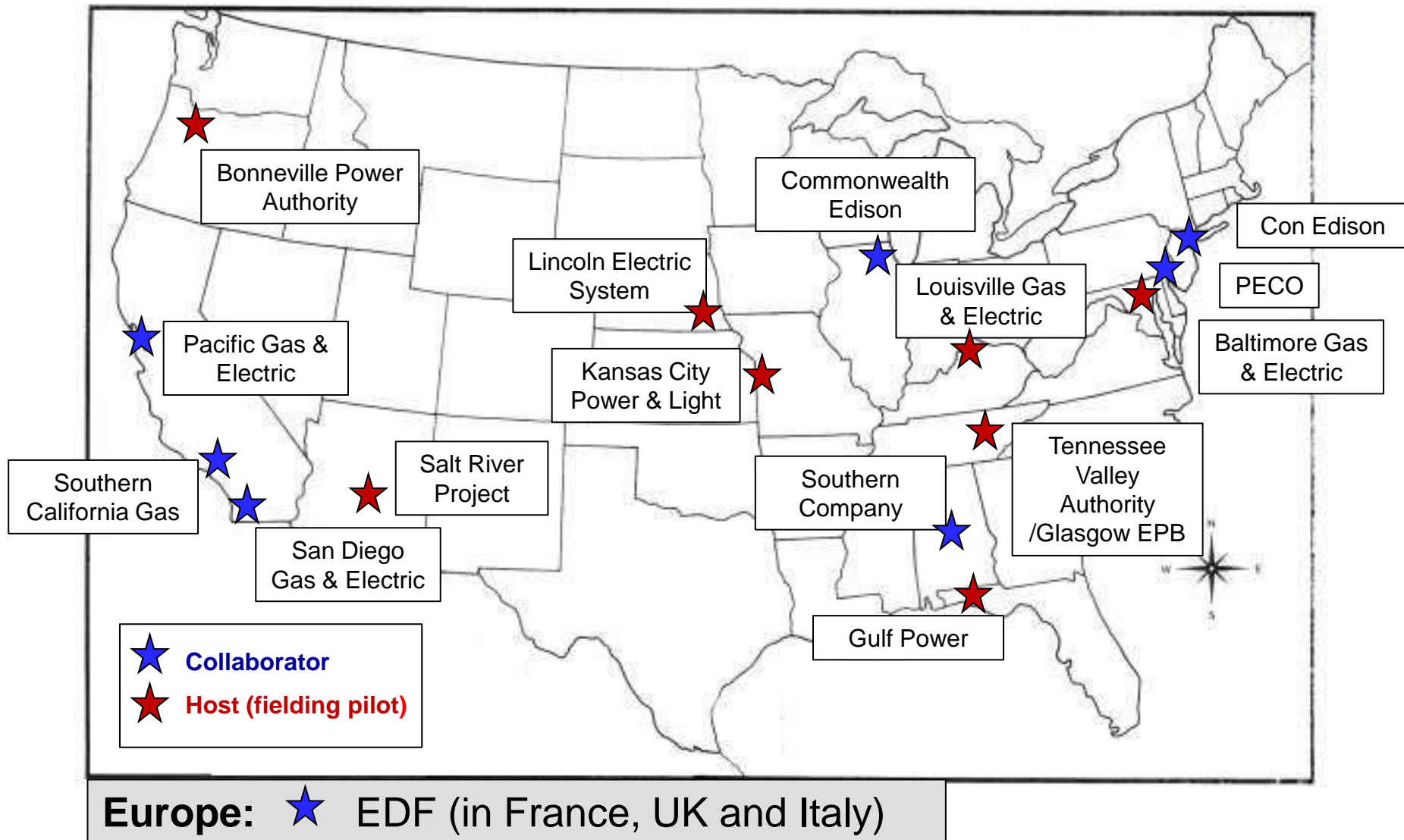
- Measure customer preferences
- Forecast market shares

Technology Driver: Connected Devices

A New World of Consumer Options



EPRI Smart Thermostat Collaborative



Pilot Research Questions

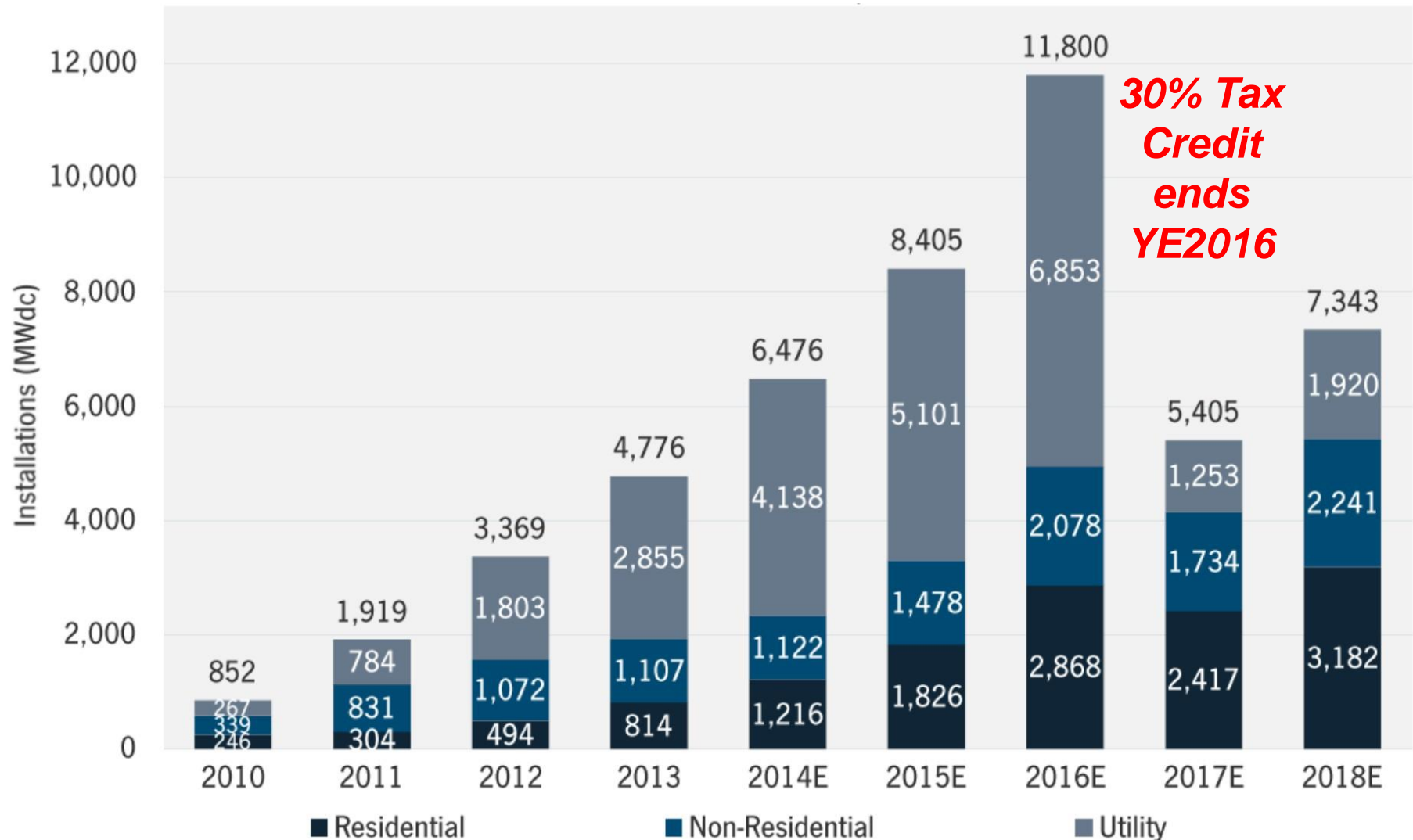
- Impacts on:
 - Overall energy consumption
 - Peak demand
 - Customer satisfaction
- Effects of:
 - Pre-cooling
 - Customer differences
- Customer adoption levels
- Uses of thermostat-level data
 - Understand user behavior
 - System functional verification
 - Support EM&V

Pilots at a Glance

- 8 pilots, several thousand customers & devices
- Product providers: ecobee, EcoFactor, Emerson, Energy Hub, Honeywell, nest, Opower, Radio Thermostat

Technology: Solar PV Continues to Grow

U.S. Solar PV Installations, 2010-18E (MW)



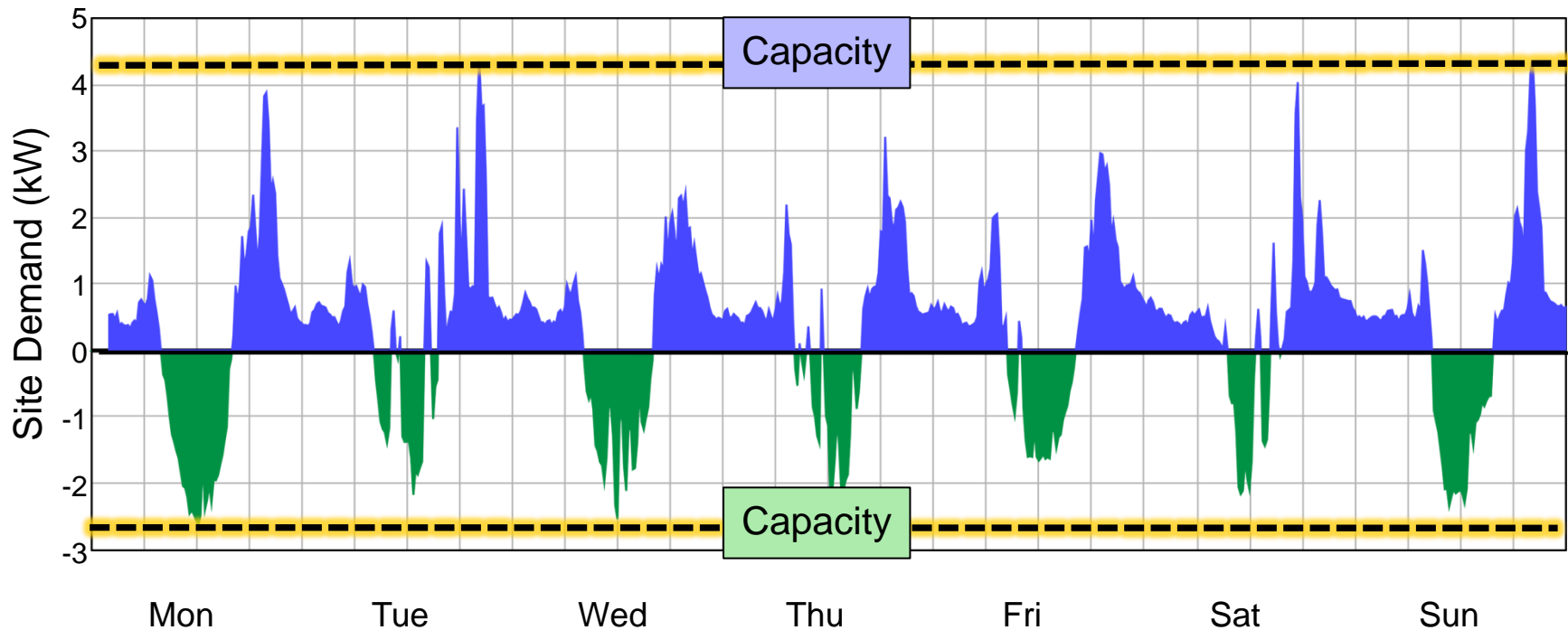
Source: GTM Research/SEIA U.S.

Price Structures:

The Energy vs Capacity Challenge



Zero Energy Home in California



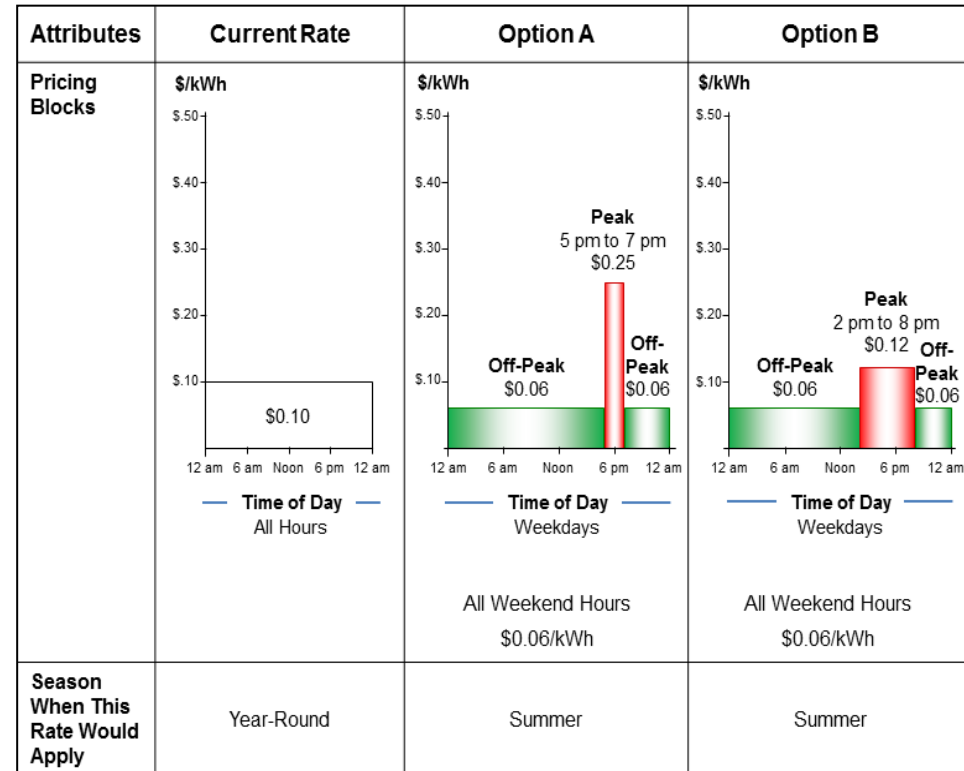
Zero Energy... is not Zero Capacity

January 2014 data

Pricing Structures: Preferences Research

Shows 20 to 30% Prefer Time-of-Use Rate Over Flat Rate

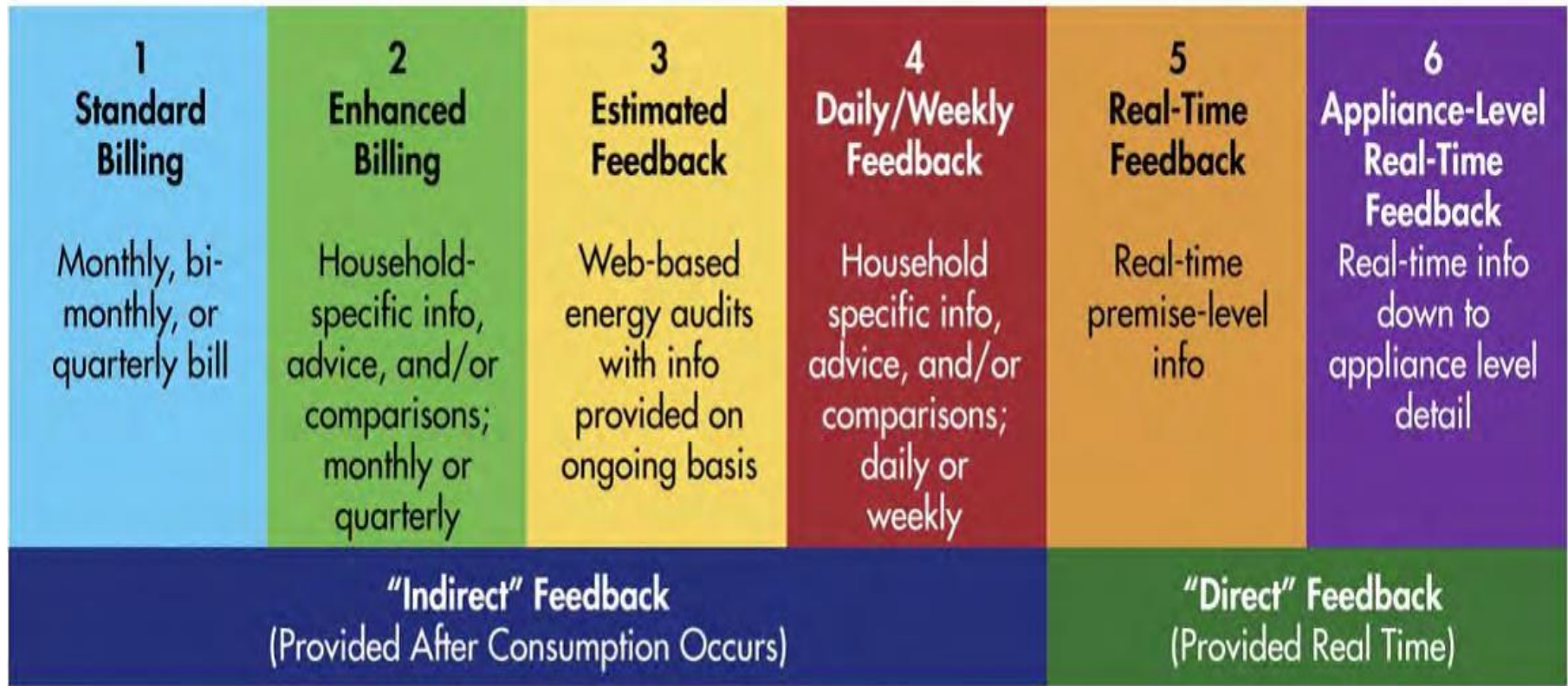
- EPRI developed a methodology – Discrete Choice Experimentation - to measure preferences for unfamiliar offerings – time-of-use rates compared to status quo – fixed rate
- Customer preferences for time-of-use rates don't vary significantly regardless of region
- Discrete choice experimentation is a meaningful tool for measuring preferences



Feedback Mechanisms & Advanced Metering

Building Customers' Understanding

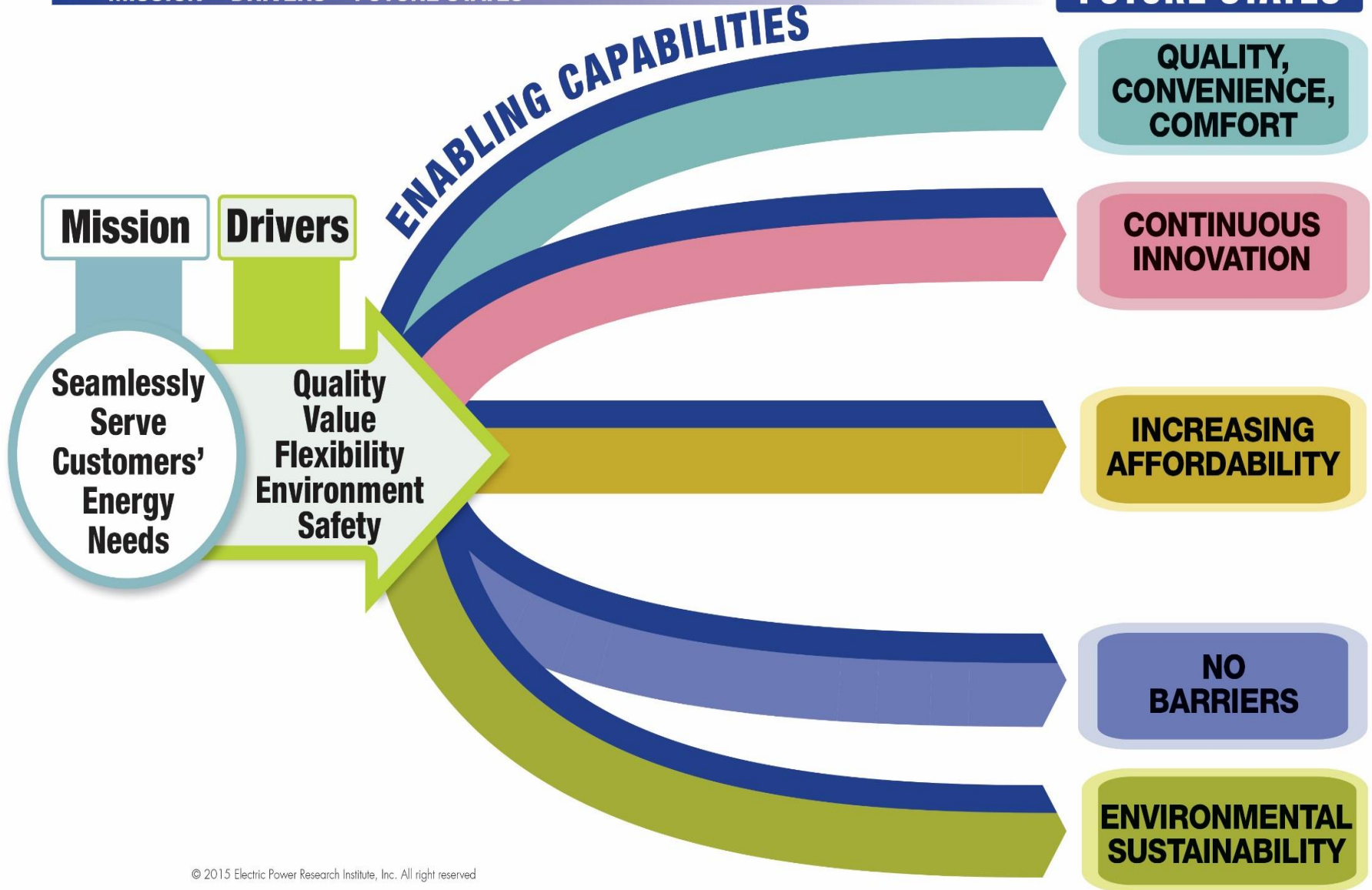
Use of New Tools



Energy Utilization Roadmap

MISSION – DRIVERS – FUTURE STATES

FUTURE STATES





Together...Shaping the Future of Electricity