

Influencing Customer Behavior Through Pricing and Technology

EnerVision Open House

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Pricing for the Madness

- Pricing for defense
 - Cost-based rates
 - Decoupling
- Pricing for offense
 - Influencing customer behavior
 - Technology update
 - Industry demand response activities
 - What you should be doing



Using Pricing for Defense



Pricing for Defense

- Even after economy comes back, there will be downward pressure on sales
 - Energy efficiency
 - Conservation
 - Customer generation
 - Demand elasticity
- Protect your revenue!



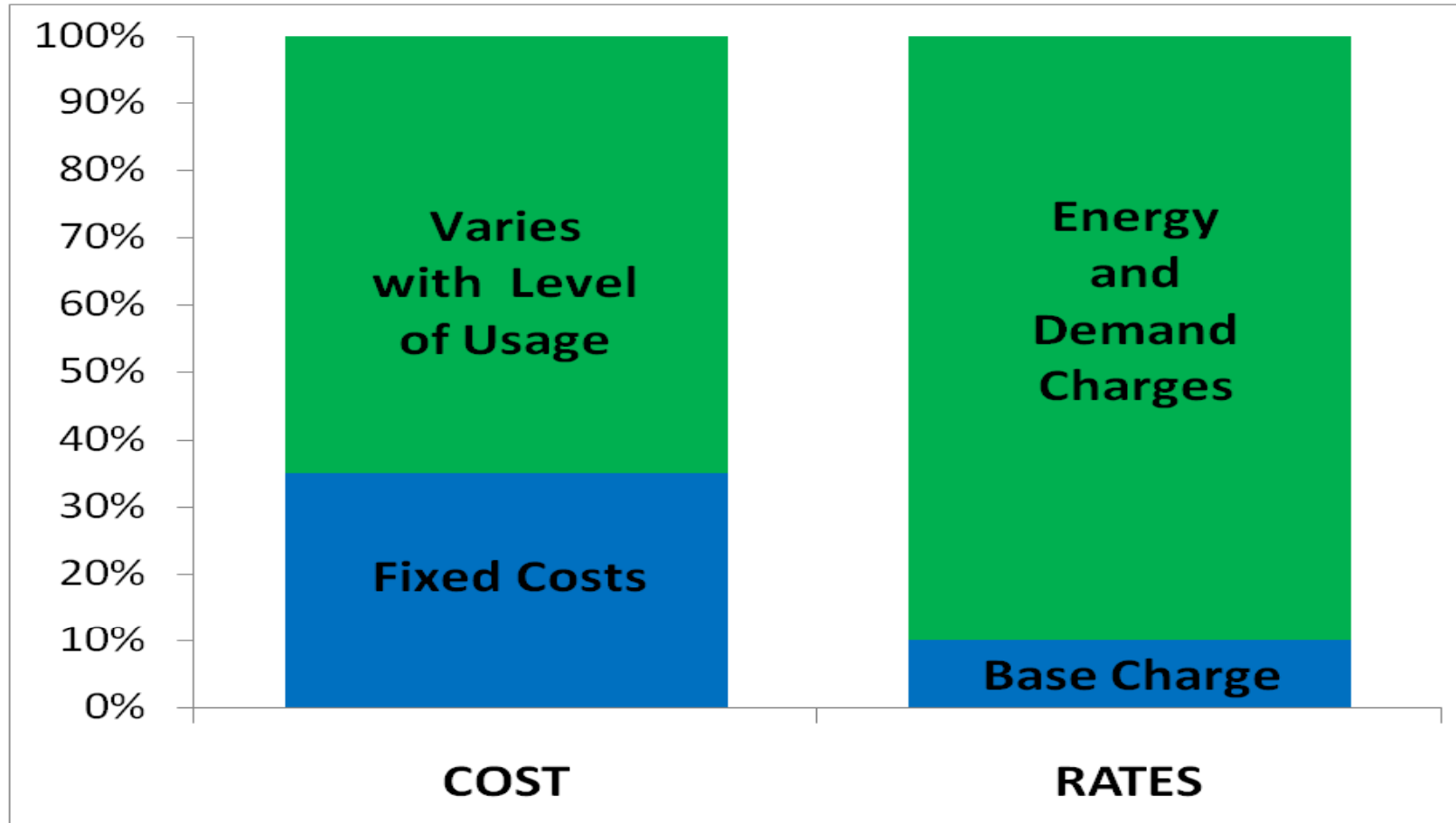
Pricing for Defense

- Two primary methods of pricing for defense
 - Cost-based rates
 - Decoupling

Cost-based Rates

- Cost-based refers to the alignment of cost causation with recovery from customers
 - Fixed costs through fixed components
 - Usage-related costs through demand and energy charges
- Revenue impacts from customer actions need to match cost impacts

Cost vs. Rates



Setting Cost-base Rates

- Start with the results of a cost of service study

To the degree *practical* . . .

- Set base charges to fully recover fixed cost
- Set demand charges to recover costs that vary with demand
- Set energy charges to recover costs that vary with energy



However . . .

- While full cost recovery relates to historic or embedded costs . . .
- Matching the revenue impact of customer actions to the cost impact relates to incremental costs
- Depending on the pricing structure of your wholesale power, those embedded and incremental may be the same or different

Decoupling

- Refers to breaking relationship between customer usage and profit
- Response to bias of investor-owned utilities against sales reductions for profit reasons
 - Under-recovery of fixed costs results from sales reductions
 - Under-recovery flows straight to bottom line
- Applies to cooperatives as well

Cooperatives and Decoupling

- Rates are set such that fixed costs are recovered through usage charges
- Usage changes for any reason result in margins being higher or lower than planned
- Potential usage reductions typically drive setting rates higher to address risk
- Decoupling removes usage risk from revenue



How to Decouple

- Two basic methods
 - Recover all fixed cost through base charge
 - Periodic rate adjustments reflecting variation in usage from budget
- Setting base charges at \$30 or higher just not practical (at least for now)
- Rate adjustment relatively straightforward to implement

Using Pricing for Offense



Pricing for Offense

- Use your rates to influence customer actions
 - Conserve energy when you want them to conserve
 - Reduce peak when you want them to reduce peak
 - Use the energy cost implications as an input in their decision making
- Utilities have done this for years
 - Declining block rates
 - Load factor rates



“New” Strategies for Offense

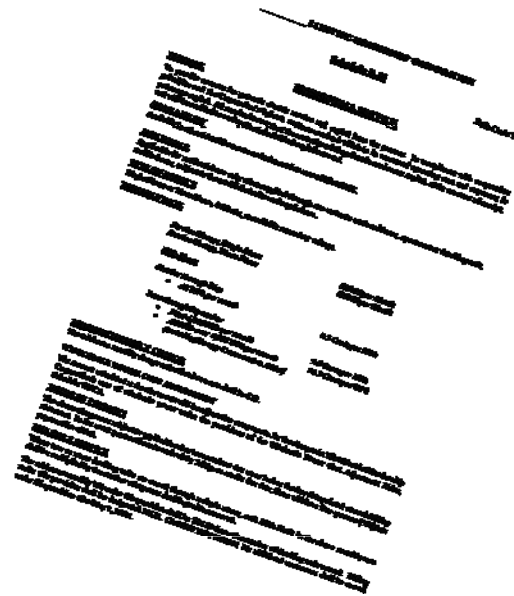
- Conservation, efficiency and peak reduction are not new strategies
- What IS new?
 - Even more severe potential cost increases
 - Potential environmental regulation piling on even more cost
 - Technology catching up to pricing needs
 - Shift in government direction from “you should do this” to “you will do this”



- Technology has long limited utilities' ability to innovate with pricing
 - Technology has often been unavailable to accomplish what we want
 - If available, technology has been too expensive



Which
comes
first??



Now let's talk about today's
technology to enable innovative
pricing and putting that
technology to work





SMART METER

EnerVision Open House

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So now that we have an innovative rate,
how do we implement it?

A **“SMART METER”** perhaps?



SMART METER:

The Federal Energy Regulatory Commission (FERC) defines them as:

A metering system that records customer consumption (and possibly other parameters) hourly or more frequently and that provides for daily or more frequent transmittal of measurements over a communications network to a central collection point and



SMART METER (cont'):

can enhance an electric customer's ability to reduce demand in response to a higher price and an electric utility's ability to meter and monitor the customer's electricity use. Such metering can also allow an electric utility to provide a variety of innovative services to benefit customer and reduce the utility's costs of operations.



SMART METER

- Metering System
 - End devices (Meters)
 - Communications Media
 - Central Station
- Records Consumer Consumption (possibly other parameters) Hourly or More Frequently
 - All Consumer Types (Residential, Industrial, Commercial)
 - Frequent Collection of Various Data
 - Hourly KWh or more frequently (30 min, 15 min)
 - Time of Use Data (On peak, Off peak, Shoulder)
 - Consumer Response to a Real Time Price Signal
 - Consumer Outage Data
 - Standards Based
 - Secure



SMART METER

- Communication Network
 - Two Way
 - Collect Timely Data with Various Intervals
 - Download Information (Prices / Consumption) to Consumers
 - Download New Programs to End Devices (Meters / Other)
 - Hardwired / Wireless
 - Power lines
 - Fiber
 - Unlicensed
 - Licensed Dedicated Spectrum
 - WiMax (leased services)
 - Flexible / Adaptable / Secure



SMART METER

- Central Station
 - Collects Consumer Data on Programmable Intervals
 - Collects Information on the Communications Network Functions and Parameters
 - Supports Standards Based Communication to Cooperative Enterprise Systems
 - Supports Long Term Storage and Analysis of Data Collected



SMART METER

- “Gateway” to the End Consumer
- Key Component of Implementing New Programs for and Services to the Consumer
 - Timely / Accurate Consumer Use Information
 - TOU / RTP
 - Net Metering (Local DG Installations)
- A Key Component / Device for the Implementation of a Smart Grid



SMART METER to SMART GRID

- SMART GRID

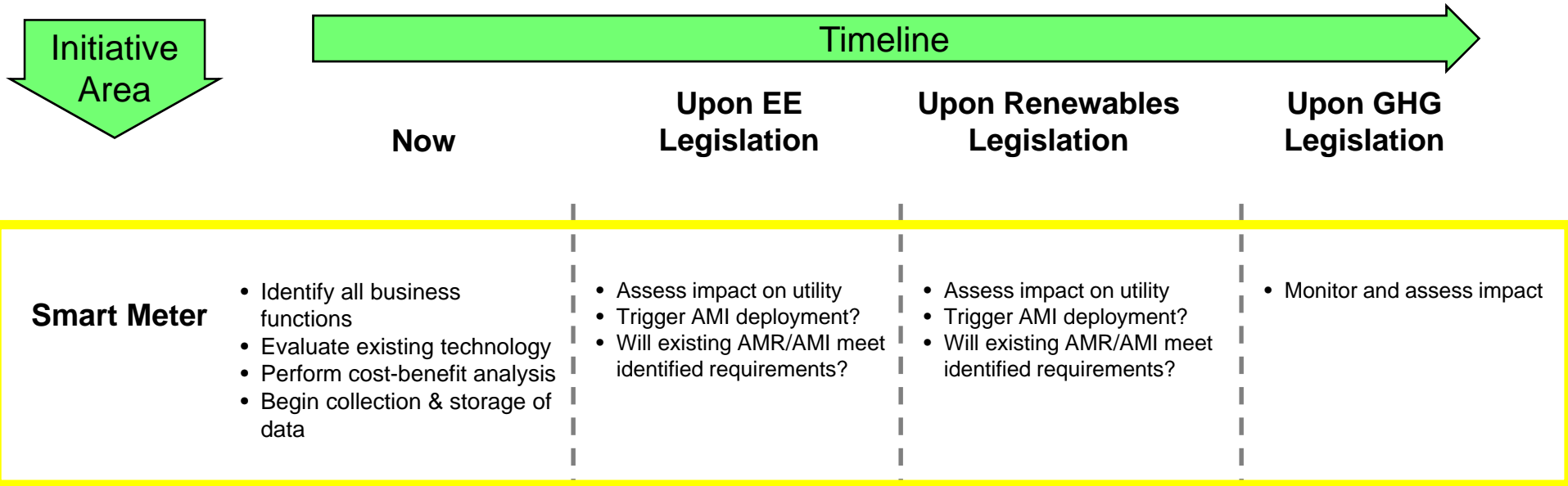
- Intelligent / Timely Link to the Consumer
- Provides Timely Access to Data and Information on New “Loads” (DG, Renewables, PHEV, other)
- Reduce Costs
 - Reduce Meter Reading Costs
 - Reduce Outage Costs
 - Improve Response Time to Restore Outages
- Use of Real-time load Information Improves System Planning



SMART GRID

- SMART GRID – Going Forward
 - “Self Serving” vs. “Self-healing” or Both?
 - Open Issues
 - General Consensus between Utilities, Investors and Governmental entities
 - Standards (EPRI, NIST, NASEB, LBNL, and Others)
 - Consumer Pushback (Less Expensive Ways to Conserve)
 - Latest Drivers (Pacific Coast study)
 - Demand Response & Peaking Shaving
 - Improve Reliability
 - Defer Construction of New Facilities / New Lines
 - Federal Stimulus Funds (\$4.3B available in 2009)







Bringing It All Together – Demand Response

EnerVision Open House

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Key Topics

- The Brattle Group Study
- What is Demand Response?
- Benefits
- Pilot Programs & Technology
- Obstacles to Implementation
- Criticisms of the Study
- Methods to Our Madness



The Brattle Group Study

“Household Response to Dynamic Pricing of Electricity”

- A Survey of 17 Recent Residential Pricing Experiments
 - Pilots Programs / Dynamic Pricing / Technology Impact
- Results: Residential Customers **DO** respond to higher prices by lowering usage

The Brattle Group Study

- EnerVision, Inc. has reviewed this Brattle Group report and feels it encompasses numerous studies that provide value on Demand Response. Although varied in scope and means, 17 studies reached the same conclusions.



What is Demand Response?

- A DSM approach that automatically, through software/hardware applications, gets customers to respond to variations in the electricity/power market prices.
- Dynamic Pricing Is The Trend
 - Current Model is a Fixed Pricing Scheme
- Useful Market
 - Commercial & Industrial Users
 - Next Stop-**Residential Customers**



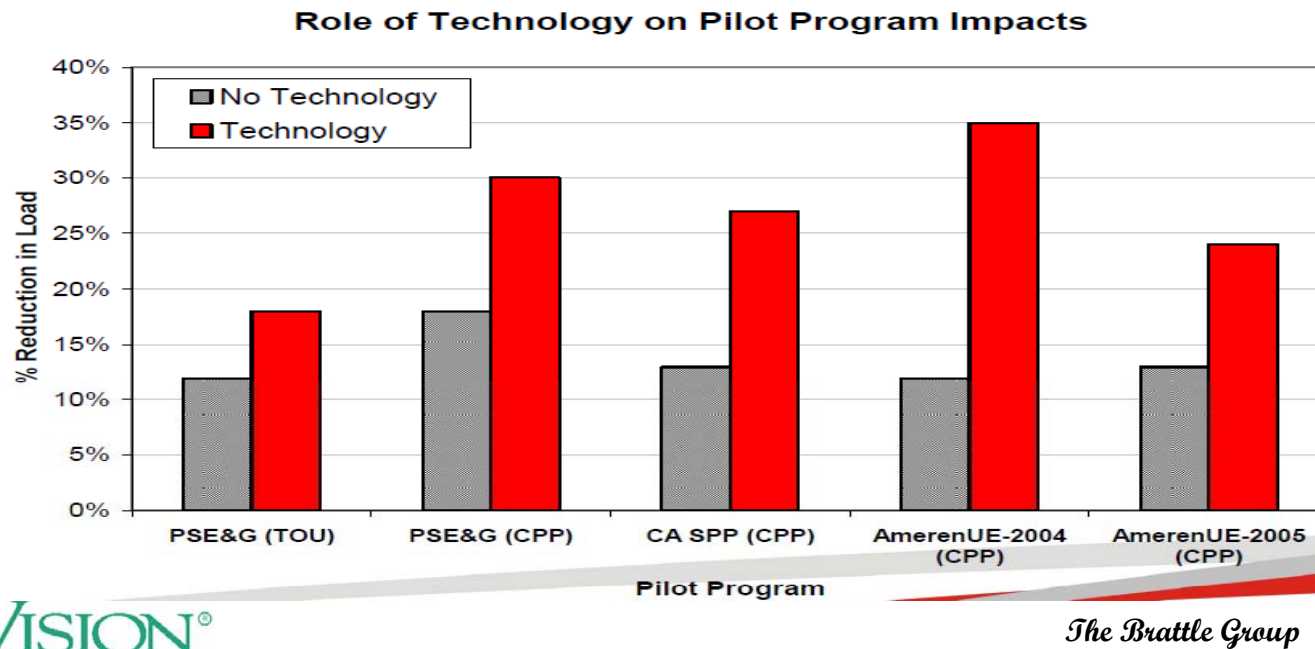
DR Savings and Benefits

- A 5% Reduction in Peak Electric Demand =
\$35 Billion for the U.S. over the next 20 years!
- DR Benefits:
 - Long Term Advantage to Customers via Lower Utility Bills
 - Educates Customers on the Dynamic Variations in Wholesale Energy Costs
 - Reduces Transmission & Re-dispatch Costs by Reducing Congestion Patterns
 - Reduces Future Emissions Costs
- Largest Current DR Contributions
 - Mid-Atlantic, Midwestern, Southeastern U.S. according to FERC
 - 2008 FERC Study indicates 8% of customers in U.S. in some DR program

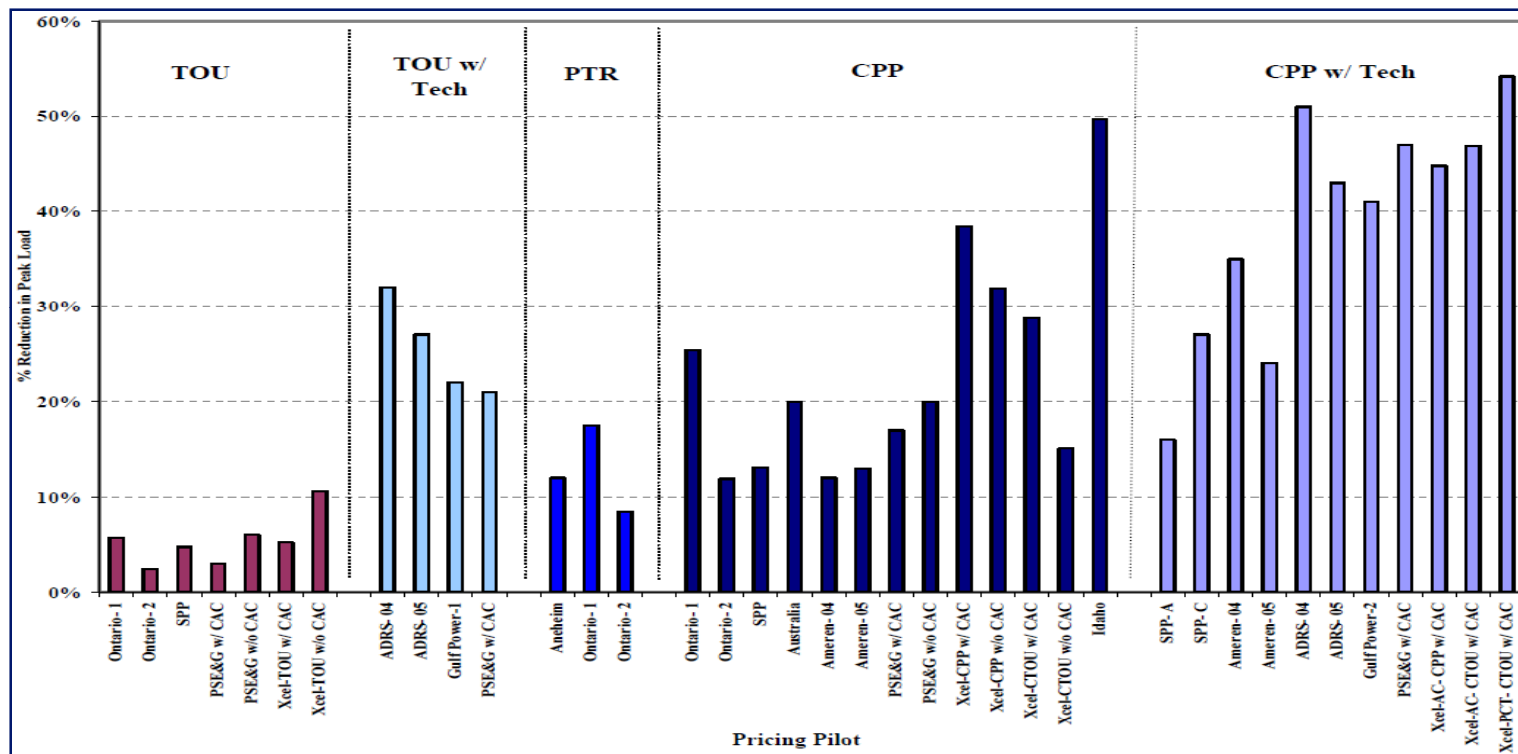


Pilot Program Residential DR Reductions

- Time-of-Use (TOU) Rates Induce 3-6% Drop in Peak Usage
- Critical Peak Pricing (CPP) Tariffs Induce 13-20% Drop
- Enabling Technologies Further Increase Reduction 27-44%



Pilot Programs Demand Response



The Brattle Group

TOU=time-of-use, PTR=peak time rebate, CPP=critical peak pricing



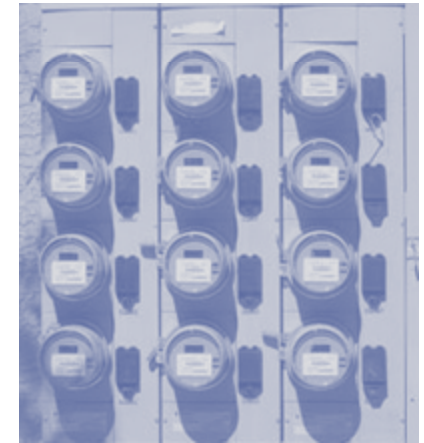
Demand Response Technologies

- Automated Home Climate Control System
 - Web interface to control home appliances
- Smart Thermostats
 - Programmable Communicating Thermostats (PCT)
 - AC Cycling Switches
- Advanced Meter Readings (AMR)
 - Interval Meters, Digital Control Units (DCU)
- Day Ahead Hourly Electricity Pricing Announcements
- Color Coded Awareness Indicators
 - e.g. Energy PriceLight, Energy Orb- glass globe that receives wireless price info and relays information by glowing in different colors



Obstacles to Implementation

- AMI Infrastructure is Expensive
- Customer Confusion and Discrepancies
- Utility Administrative Costs



Criticisms of the Brattle Group Study

- Wide Variance between the 17 Studies
 - Length of Time for Each Experiment (months vs. years)
 - Demand Response Technology Used
 - Type of Time-Varying Pricing Used (TOU, CPP, PTR)
 - Sample Size

Conclusions

Methods to Our Madness

*If it worked for them, will it work with my customers?

- Key Messages:

- The Brattle Group Studied 17 Different DR Approaches yet ALL yielded similar results:

“Our review of these pilots reveals that dynamic electricity pricing programs are effective in reducing electricity usage for residential customers.”

- The more information and ways to act given to the customer, the more response occurs.
- Legislators look at this study.



What You Should be Doing



Skate to Where the Puck is Going

- Plan for the future, not for today
 - Cost of new government mandates will be felt in the future
 - Power costs generally take long period to reshape
 - Customer behavior will take time to change
 - Significant rate changes may call for phased implementations



Strategy First, Then Tactics

- Establish corporate strategies for managing changes, such as
 - Change customer behaviors in such a way to use less energy during all hours to reduce carbon emissions
 - Influence customers to reduce usage during hours that drive the need for new capital expenditures
 - Continue to fully recover costs plus required margins



Pricing Strategies and Tactics

- Pricing strategies are the corporate strategies
- Develop pricing tactics to achieve strategies
 - Decoupling
 - Time of Day rates
 - Demand response
 - Peak load pricing
 - Direct load control
 - Numerous other potential tactics



One Specific Action to Consider

- Rate development is based on customer usage data
- Generalized rates in place today can use general usage data
- Future rates will require more detailed usage data
- Technology, once an barrier to innovative rates, will now be a facilitator



Collect and Save Detailed Data

- Most AMR provides ability to collect interval customer data
- As AMR is implemented, data should be collected and stored
- Data storage, while adding cost, will provide benefits
 - Modeling potential rates with data from YOUR customers instead of generic data will improve design
 - Detailed usage data can be paired with appliance saturation and demographic data for full customer picture
 - Detailed baseline will lend support to claims of efficiency gains, which will be needed when efficiency is mandated



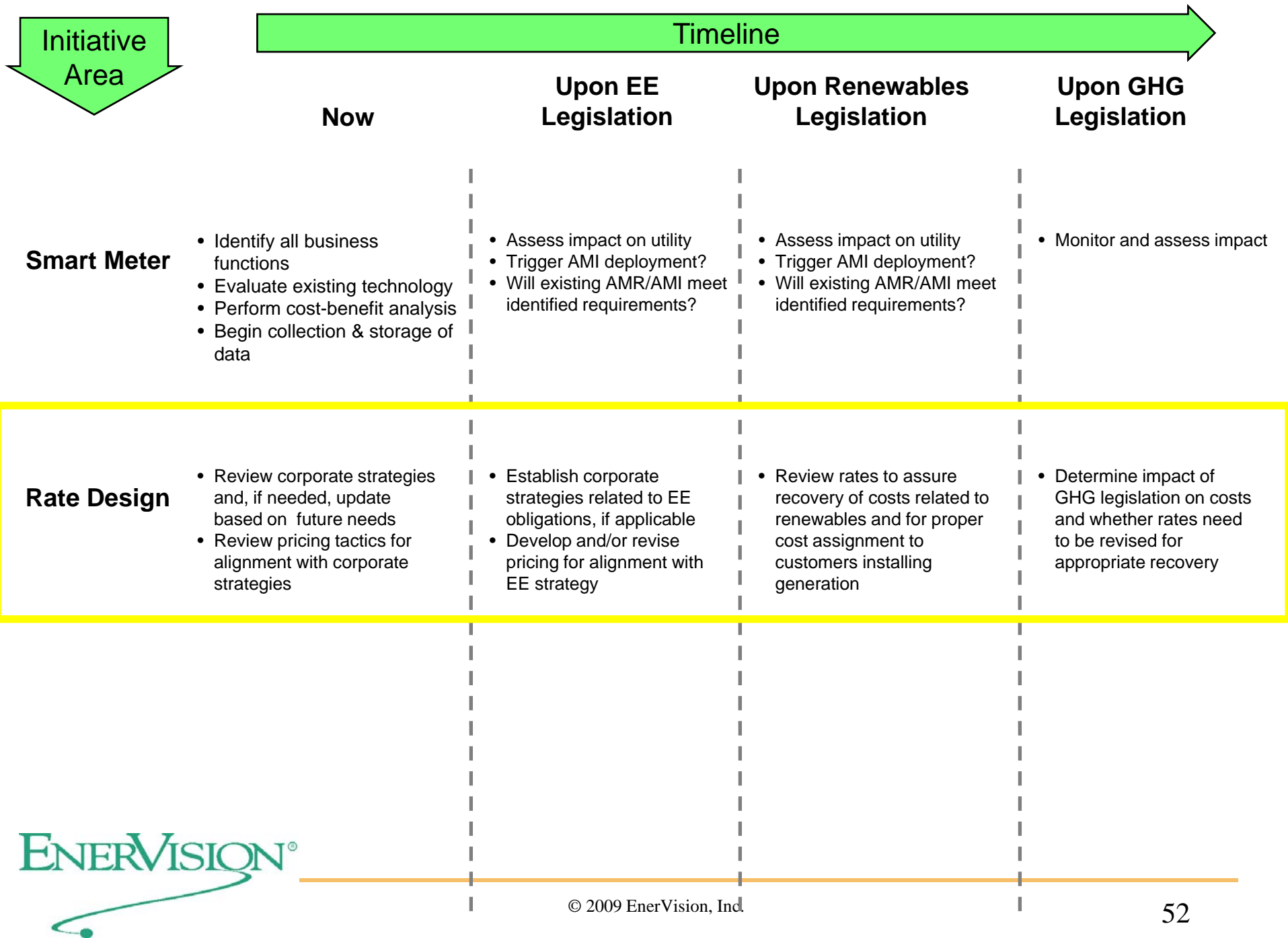
Using Detailed Data Now

- Lack of customer-specific data has historically impeded TOU rate success
- AMR implementation can be used to build customers' comfort with TOU
 - Report peak and off peak usage on bill
 - Provide rate comparisons
 - Show impact of usage changes



Wrapping Up

- Pricing can be used for offense and defense
 - Protecting cost and margin recovery
 - Influencing customer behavior
- Metering and communications technology better supports the needs of pricing
- Utilities' experience shows that customers respond



Next Steps

- Establish corporate strategies for meeting future challenges successfully
- Develop pricing tactics to achieve those strategies
- Plan for and meet technology needs
- Implement customer data collection and storage programs



Thank you for
joining us today!

