



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

# NET SAVINGS PART 2: TRENDS & CASE STUDIES

FACILITATED BY

*Ms. Elizabeth Titus, NEEP*

*Dr. Daniel Violette, NAVIGANT*

*Ms. Teri Lutz, Tetra Tech*

*Ms. Pam Rathbun, Tetra Tech*

July 7, 2015



Welcome!

Please enter your audio pin.

Please keep your phone on mute until  
the Q&A

# Webinar Agenda



## 1) MARKET TRANSFORMATION

- a) Market Transformation and NY REV
- b) EPA's Retail Products Platform (Market Transformation for Plug Load Products) and its EM&V Framework
- c) California Pilot Market Transformation for Plug Load Products
- d) Q&A

## 2) TOP DOWN/MACROECONOMIC MODELING OF EE IMPACTS

- a) Massachusetts' Experience with 2 Models
- b) Q&A



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

# The Evolution of EM&V in New York and the Role of Market Transformation

July 7, 2015

Brian Buckley, NEEP Policy Associate  
Contact: [Bbuckley@NEEP.org](mailto:Bbuckley@NEEP.org)

# New York's Reforming the Energy Vision

## 14-M-0101/14-M-0094 - Relevant Documents



### [PSC's Order Adopting a Policy Framework and Implementation Plan](#) (February 26, 2015)

- Focus on using market mechanisms to overcome barriers to DER deployment
- Utility EM&V to complement NYSERDA EM&V activities
- Directed electric utilities to develop and propose **metrics applicable to market transformation strategies**, in consultation with Staff and NYSERDA
  - Expected July 15, 2015
- E2 Working Group's [Market Transformation Metrics Subcommittee](#) (formed 4/29/15)
  - Next E2 Working Group Meeting is [August 5, 2015](#) at the 3rd Floor Hearing Room at 3 Empire State Plaza, with subcommittee meetings to follow

### [PSC's Gas Efficiency Order](#) (June 17, 2015)

- Excellent summary of REV's Impact on Energy Efficiency (pages 2-7)
- Outlines recovery mechanism: EETracker Surcharge Mechanism (page 14)

### [NYSERDA's Clean Energy Fund Information Supplement](#) (issued June 25, 2014)

- Comments due July 31, 2015
- New metrics for Program Evaluation

### [Benefit Cost Analysis Whitepaper](#) (July 1, 2015)

- Comments due August 15, 2015
- Monetizes SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub>
- Non-energy benefits such as health impacts, employee productivity, property values, and service termination will be considered on a case-specific basis

# New York's Reforming the Energy Vision

## 14-M-0101 / 14-M-0094 - The Basics



### Resource Acquisition

- Using **rebates and subsidies** to “encourage individual customers to employ more efficient end use equipment and systems, thereby acquiring energy savings as a resource.” Combining with **3<sup>rd</sup> party activities** moving forward.
- **Utilities’ responsibility** in coordination with NYSERDA, except for low income programs which are primarily NYSERDA.

#### Total 2016 Budget:

- \$241,126,244

### Market Transformation

- Benefits of the program are defined in terms of **wide-scale penetration and market acceptance** of efficiency measures.
- **NYSERDA’s responsibility**, focusing on two separate areas:
  - Market Development
  - Innovation and Research

#### Total 2016 Budget:

- \$423,000,000

**A floor or a ceiling??**

# New York's Reforming the Energy Vision

## 14-M-0094- NYSERDA Clean Energy Fund Supplement



NYSERDA's [Clean Energy Fund Information Supplement](#) (issued June 25, 2014)

- Comments Due July 31, 2015
- ~\$5 billion invested over 10 years, with a 2016 Evaluation Budget of \$15 million
- Evaluations will “include identifying the outcomes and impact associated with CEF initiatives on the broader market” and “data from other markets beyond New York”
- **Forthcoming:** Informational Webinars “during the week of July 13, 2015” and FAQ summary summary posted “at least one week prior” to comment deadline

Market Transformation Portfolio

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<b>Request for Program Authorization</b>											
Market Development	\$356.6	\$298.2	\$265.2	\$256.2	\$256.2	\$256.2	\$256.2	\$256.2	\$256.2	\$256.2	\$2,713.4
Innovation and Research	\$66.4	\$73.8	\$73.8	\$71.8	\$71.8	\$71.8	\$71.8	\$71.8	\$71.8	\$71.8	\$716.6
2016 Main Tier Solicitation	\$150.0										\$150.0
<b>Other Initiatives Included in Proposed CEF Budget</b>											
NY-Sun <sup>1</sup> (including \$129M in 2015)	\$185.0	\$148.2	\$129.9	\$137.4	\$91.1	\$67.6	\$43.9	\$20.7	\$ 6.5	\$ 1.3	\$960.6
NYGB <sup>2</sup> (including \$150M in 2015)	\$30.0	\$30.0	\$30.0	\$30.0	\$30.0	\$30.0	\$112.9	\$112.9	\$112.9	\$112.9	\$781.5
<b>Total</b>	<b>\$788.0</b>	<b>\$550.2</b>	<b>\$498.9</b>	<b>\$495.4</b>	<b>\$449.1</b>	<b>\$425.6</b>	<b>\$484.8</b>	<b>\$461.6</b>	<b>\$447.4</b>	<b>\$442.2</b>	<b>\$5,322.1</b>

# New York's Reforming the Energy Vision

## 14-M-0094- NYSERDA CEF Proposed Evaluation Mechanisms



“Test, Measure, and Adjust” strategy for pilots and ongoing initiatives (pg 148-154)

- “Combines quick cycle feedback activities along with long term tracking and accountability”
- Framework focuses on Market Barriers; Activities; Outputs; and Outcomes

### Statewide Macro-Level Accounting

- Ex. reduced energy consumption by sector
- Conducted every 2-3 years

### Statewide Sector Building Stock and Potential Studies

- Ex. - building characteristics, energy use equipment characteristics, and behavioral and operational trends
- Conducted every 3-5 years

### Market Characterization and Market Progress Studies

- Designed to identify and assess the theory of change and market progress associated with specific initiatives
  - i.e., how early and intermediate accomplishments lead to long-range results

### Field Verification

- Budgets expected to decrease (“less resource intensive than in the past“)
- **Will NOT address attribution or net-to-gross analysis**, instead addressing market impacts via the above characterizations
- NYSERDA will invest in avenues that harness technology, expanding statistical data sets, and identification of key informative proxy metrics

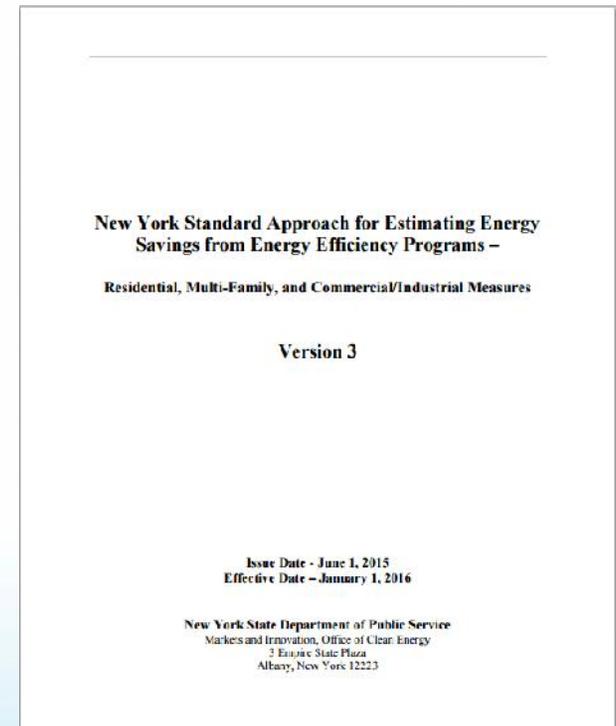
# New York's Reforming the Energy Vision

## 14-M-0101- REV and Program Evaluation



### Technical Reference Manual (TRM) Management Plan (issued June 1, 2015)

- TRM will be jointly managed by electric and gas utilities through a TRM Management Committee
- To be updated annually
- New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs, [Version 3](#), published June 1, 2015, effective January 1, 2016



# New York's Reforming the Energy Vision

## 14-M-0101- Additional REV Dates of Note



July 13, 2015	Market Design Platform Technology Working Group Report Out
July 15, 2015	Utilities File Efficiency Transition Implementation Plans (ETIPs), <b>budget and metrics plans</b>
July 28, 2015	Track II Order on Ratemaking issues
August 3, 2015	Staff issues Guidance for Distributed System Implementation Plans (DSIPs)
January 15, 2016	Utilities file DSIPS
February 1, 2016	REV Best Practices Guide



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

# The ENERGY STAR® Retail Products Platform (RPP)

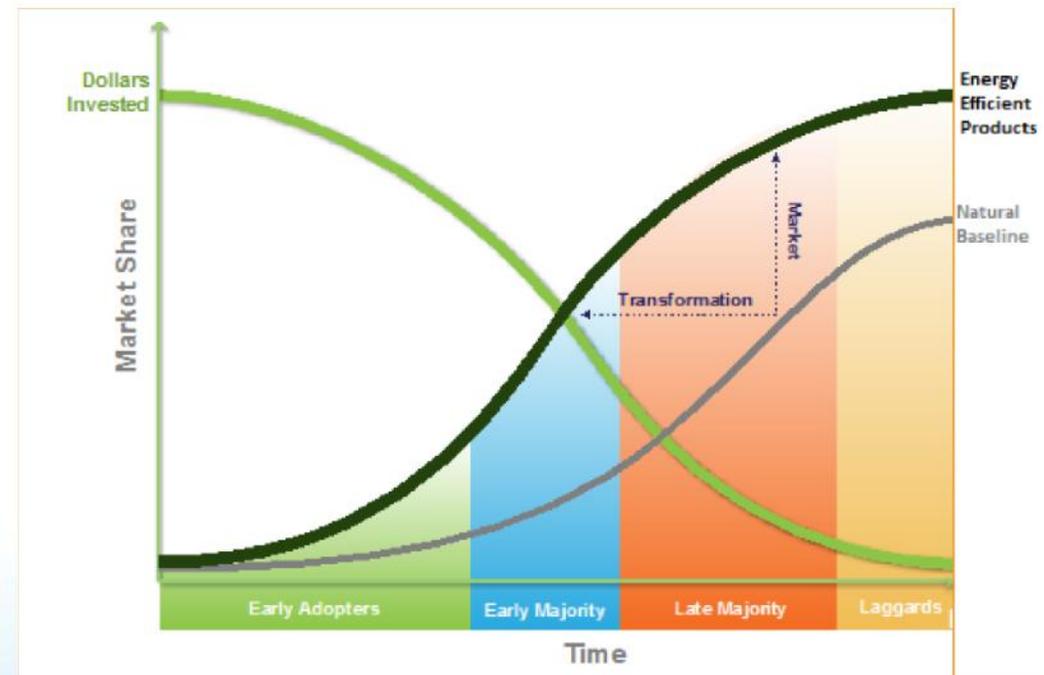
Brian Hedman, Cadmus Group,  
([brian.hedman@cadmusgroup.com](mailto:brian.hedman@cadmusgroup.com))

July 7, 2015

# WHAT IS THE ENERGY STAR RETAIL PRODUCTS PLATFORM?



- A grassroots, coordinated approach to align energy efficiency programs with retailers' business models
- A collaborative national effort to achieve scale through consistent program design—including product categories, specifications, data requirements, and midstream delivery
- Significant budgets through aggregation of low-per unit incentives coupled with low administrative costs create a strong value proposition for retailers
- Program model offers options for addressing energy savings opportunities in growing “miscellaneous/plug load” product categories at significantly lower cost to program sponsors



# 2016 PRODUCTS



The pilot is currently limited to the following products:

- **ENERGY STAR certified dryers** - new category
- **ENERGY STAR certified air cleaners** - small unit sales, high per unit energy savings
- **ENERGY STAR certified freezers** - difficult to administer cost effective downstream rebates
- **ENERGY STAR certified sound bars (+50%)** - high growth category, limited per unit savings
- **ENERGY STAR certified home theater systems** - high growth category, limited per unit savings
- **ENERGY STAR certified room air conditioners** - revised specification, positioned to influence stocking plans for 2016
- The pilot was designed to:
  - Test a mix of different products
  - Prove the program concept, and
  - Streamline implementation

# Evaluation—A Different Approach is Required



- Currently under development by EPA with guidance from evaluation experts from CA, Northwest and Northeast regions
- On-going communication with state regulators (NARUC)
- General agreement that evaluation methods need to have the following characteristics:
  - Be considerably faster and less costly than current methods
  - Be based on indicators of shifts in the marketplace, using several data sources
  - Be based on a national data template provided by retailers, including regional data
  - Be a continuous ongoing and fluid process, rather than a traditional stop and start process
- A consistent category sales data feed will be available
- Energy efficiency program sponsors will be able to capture full program impact. Data categories include:
  - Model number
  - Date
  - Transaction identifier
  - Zip code / Store ID

# Market Transformation Evaluation



- Short term indicators
  - Number of participating retailers
  - Retailer promotional activities and support
  - Number of households in participating geographic area
  - Program administrator budget (including number of incentives processed)
- Medium-term indicators
  - Participating retailers' market share for qualifying and non-qualifying product sales
  - National and regional market share for qualifying and non-qualifying product sales
  - Retailer purchasing and stocking
- Longer-term indicators
  - Expansion or change of manufacturing facilities and process
  - Number and types of products offered
  - New entrants into the market
- Savings calculation
  - Program qualified share
  - Unit energy and demand savings

# Who is Involved (as of April 2015)



## 2015 Pilot Sponsors

- NEEA
- PG&E - CA (*on behalf of SCE, SDGE, SoCalGas*)
- SMUD - CA

## 2015 Participating Retailers

- Best Buy
- Sears Holdings
- The Home Depot

## 2015 Other Key Stakeholders

- NRDC
- NEEP
- NEEA

## Interested Retailers

- Costco
- Nationwide Marketing Group
- Target
- Walmart

## Sponsors Developing Filings for 2016+

- BGE – MD
- Con Ed - NY
- DTE Energy – MI (2017)
- PEPSCO – MD
- NJCEP – NJ
- SMECO – MD
- Eversource – CT
- UIL Holdings – CT
- Xcel – CO or MN (2017)
- Efficiency Vermont (VT)
- DC SEU (DC).

## Other Potential Pilot Sponsors

- Austin Energy – TX
- ComEd – IL
- FirstEnergy Utilities – PA, MD, NJ
- LADWP – CA
- Mass Save Contributing Sponsors – MA
- Oklahoma Gas Service – OK
- Oncor – Texas
- PECO – PA
- PSEG LI – NY
- Texas Gas Service – TX
- National Grid – RI

# PROJECT UPDATE



## What's Being Worked On?

- ✓ **EM&V:** Development of guidelines and resource for pilot sponsors
- ✓ **Data:** RFP for 2016 national programs solution, July 2015 results
- ✓ **Products:** Products for pilot programs confirmed; begin development of framework for product specification transitions
- ✓ **Legal:** Draft agreement between utilities and retailers for national program
- ✓ **Marketing:** Developed draft, look, and feel, based on current retailer guidelines
- ✓ **Outreach:** Discussions at industry events (e.g. CES, NEEP's EM&V Forum, NARUC Winter Meetings)
- ✓ **Field Services:** Drafting overview document and creating tool kit for sponsors

## What's Next?

- ❑ EPA to Complete EM&V framework document
- ❑ EPA to support regions with market data and program planning documents
- ❑ PGE & NEEA complete national data RFP (on behalf of all future participants)
- ❑ Create framework for product specification transitions
- ❑ Continue developing national marketing strategy
- ❑ Develop legal agreements
- ❑ Continue discussions at industry events
- ❑ Connect with ENERGY STAR Retail Action Council members to discuss field services/implementation overview document
- ❑ Plan and launch 2016 pilots



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

# California Phase I Retail Plug-load Portfolio (RPP) Trial: Evaluation Results

Brian Arthur Smith, Pacific Gas And Electric, [B2sg@pge.com](mailto:B2sg@pge.com)

Richard Ridge, Ridge & Associate, [rsridge@comcast.net](mailto:rsridge@comcast.net)

Todd Malinick, EMI Consulting, [Tmalinick@emiconsulting.com](mailto:Tmalinick@emiconsulting.com)

July 7, 2015

# Agenda

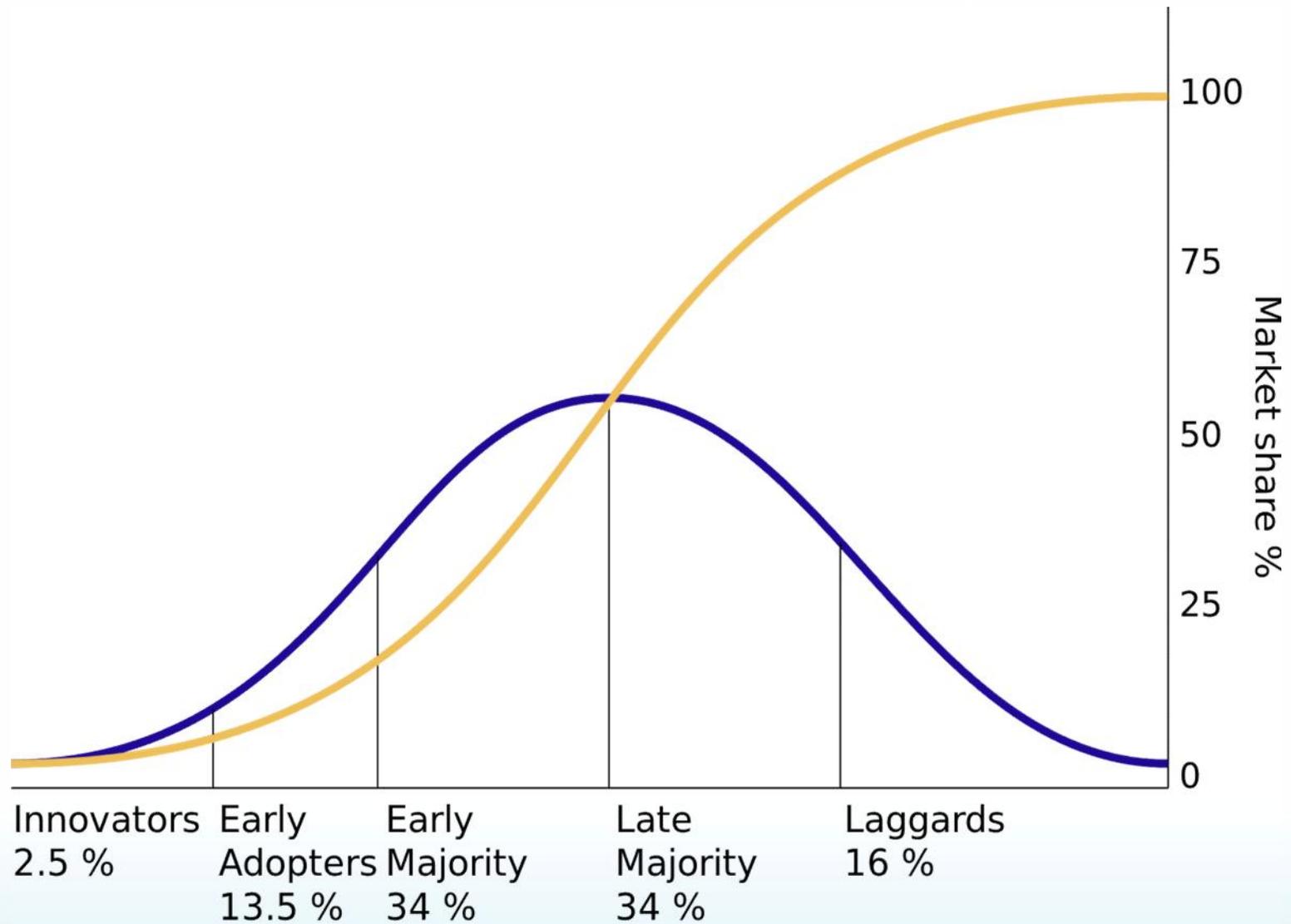
1. Program Theory and Objective
2. Trial Overview
3. Evaluation Objectives
4. Evaluation Methods
5. Evaluation Conclusions
6. Evaluation Recommendations
7. Questions

# MT Programs Are Unique

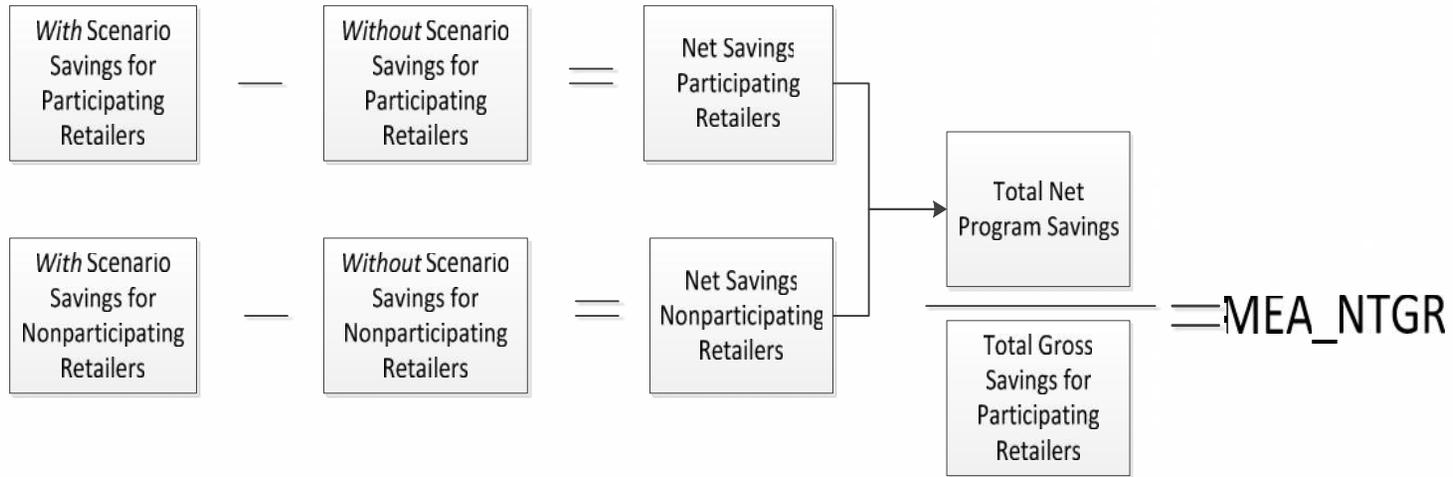


- For Market Transformation programs:
  - Timeframe for costs and benefits is much longer *and* dynamic.
  - Initial costs can be significant but are expected to decrease over time.
  - Incremental costs will decline over time (e.g., CFLs, rooftop PVs and LEDs)
  - Initial benefits (while relatively small in the short-run) are expected to grow over time as market share of program-qualified measures increases.
  - To estimate the NTGRs, naturally-occurring savings must be forecasted and subtracted from the gross savings expected.
- Basing benefit-cost ratio on short-term costs (which are substantial) and short-term benefits (which are small) would be misleading.
- Benefits and costs over the full program period (which can be 10 to 15 years) must be considered.

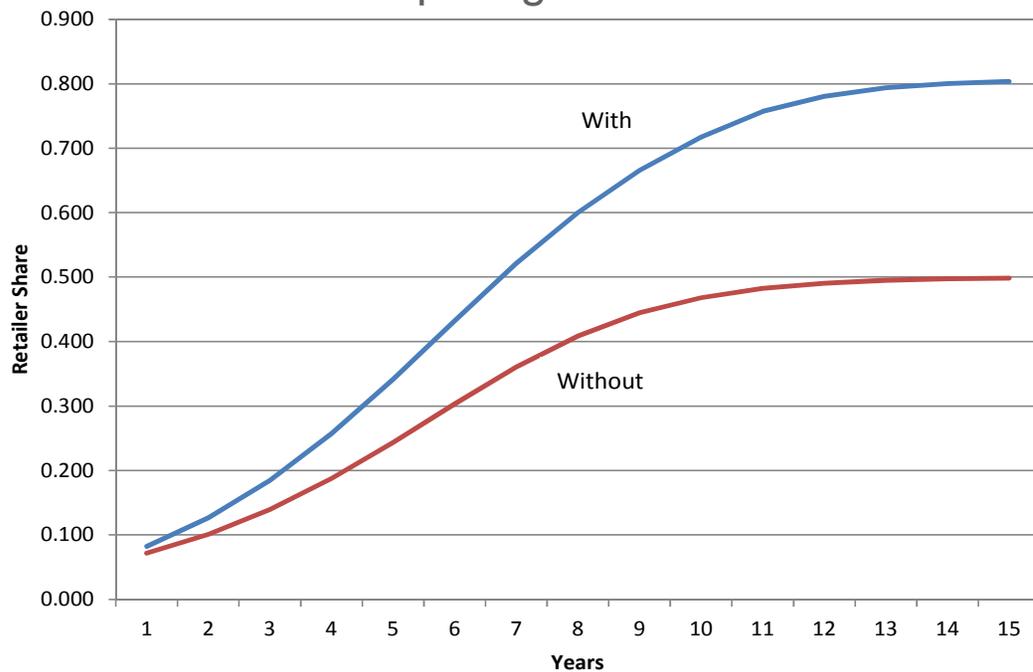
# A Traditional S-Shaped Diffusion of Innovation Curve



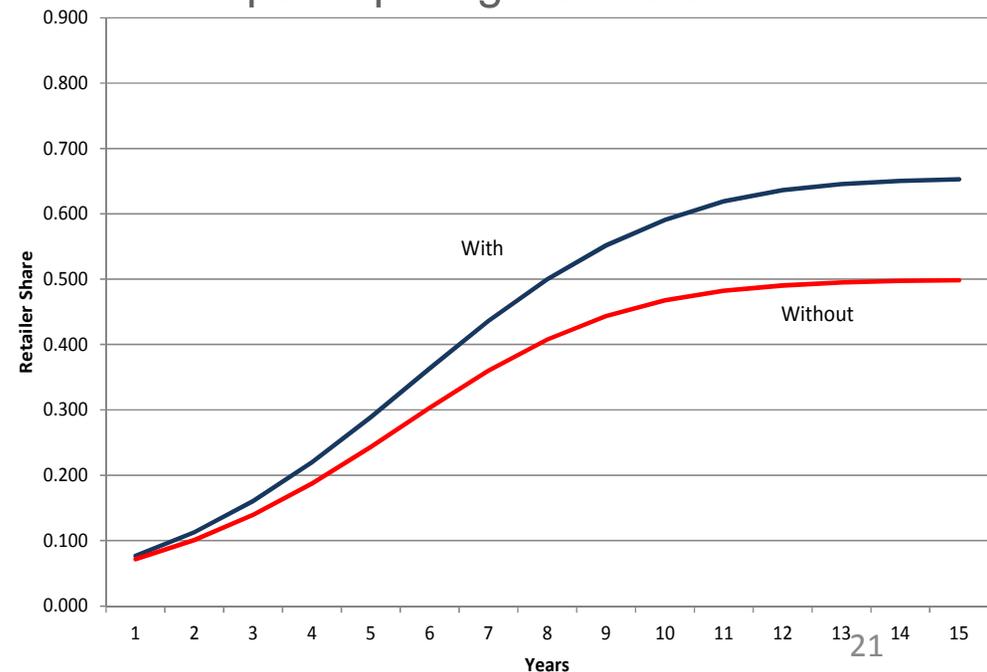
# Market Share Scenarios for Participating and Nonparticipating Retailers: Gas Clothes Dryers



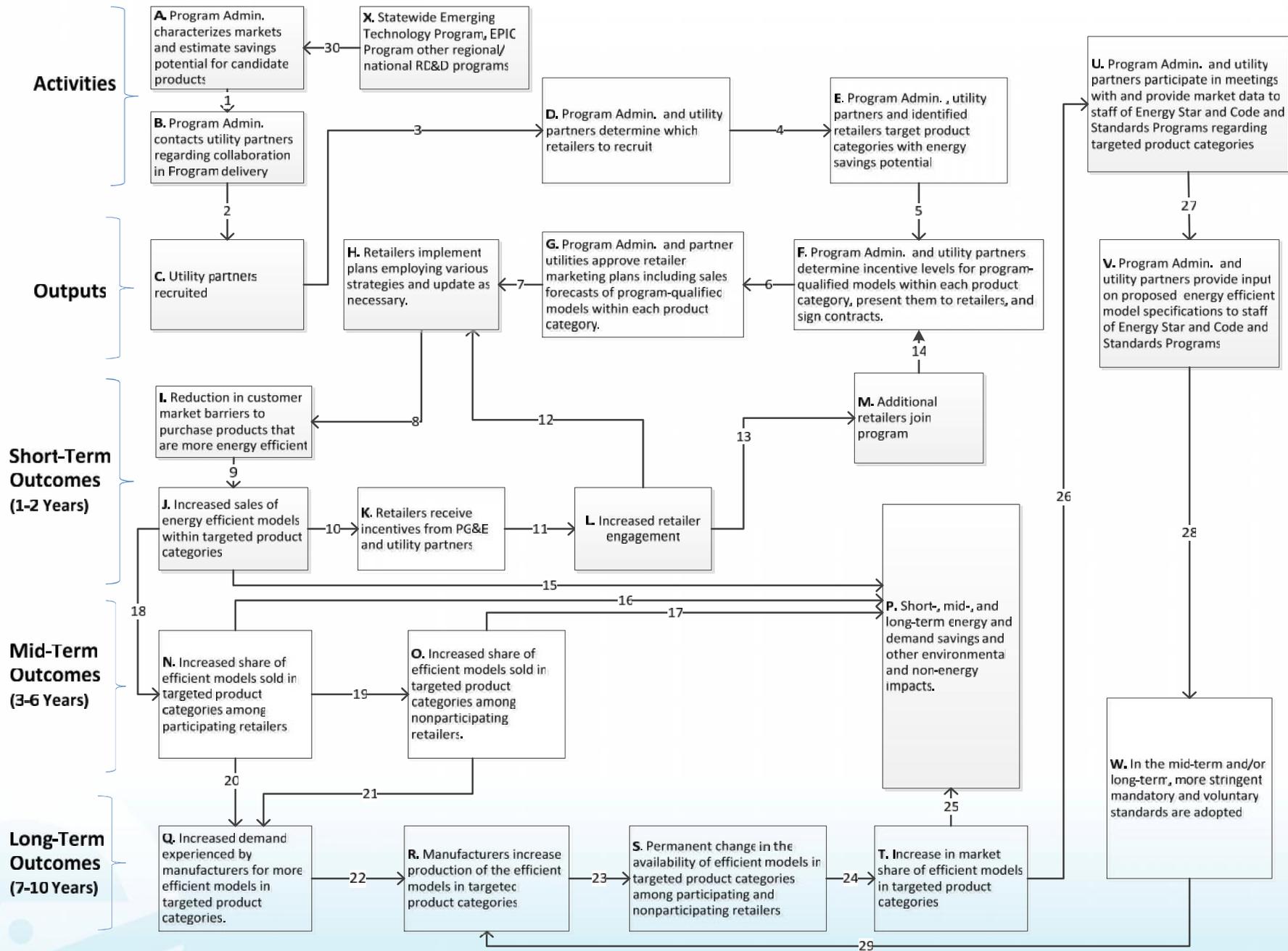
## Participating Retailers



## Nonparticipating Retailers



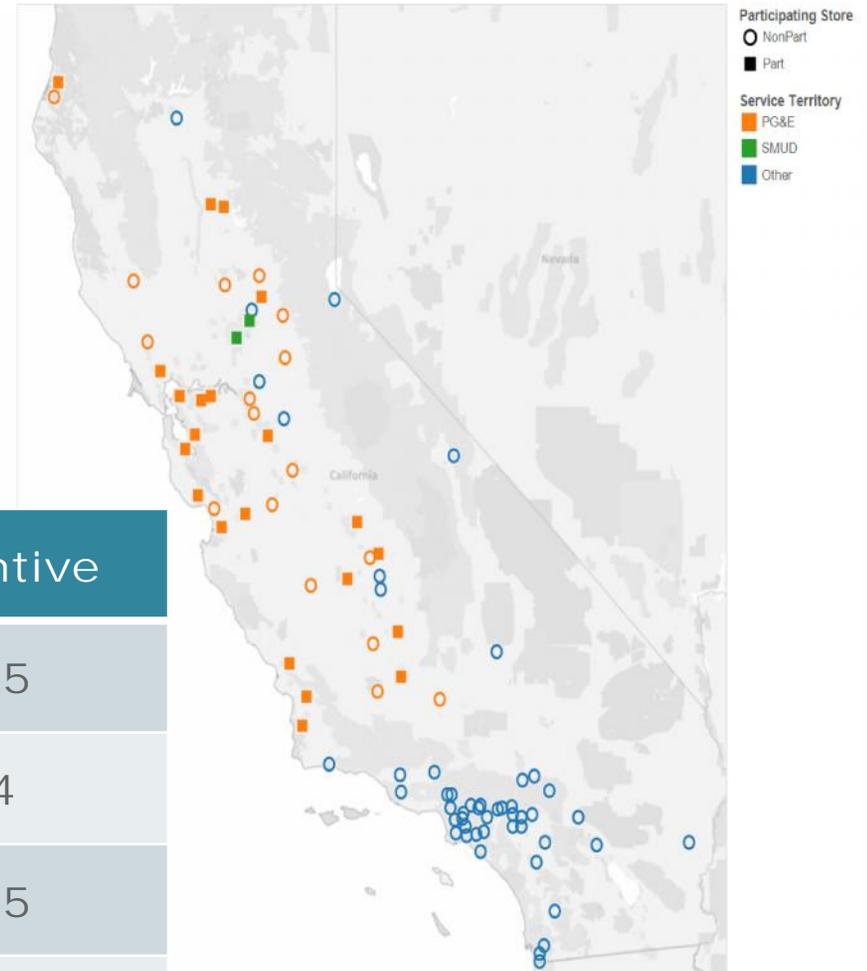
# Program Logic Model



# Trial Overview



- 14-month duration, Nov/13 - Dec/14
- 1 participating retail chain (retailer requested confidentiality)
- 26 participating stores in PG&E (N=24) and SMUD (N=2) service territories and 66 non-participating stores statewide
- 6 targeted product categories



Product Category	Efficiency Standard	Incentive
Air Cleaners	ENERGY STAR v1.0	\$25
DVD/Blu-Ray Players	ENERGY STAR v3.0	\$4
Home Theaters-in-a-Box/Sound bars	ENERGY STAR v3.0	\$15
Freezers	ENERGY STAR v4.0	\$25
Refrigerators	ENERGY STAR v4.0	\$40
Room ACs	ENERGY STAR v2.0	\$40

# Phase I Trial Objectives



- 1. Performance Objectives:** Two objectives targeted at: (1) assessing changes in program-qualified share due to the program, and (2) estimating gross and net program savings.
- 2. Operational Objectives:** Seven objectives focused on assessing program implementation, administration, and processes/protocols.
- 3. Evaluation Team Objectives:** Six objectives aimed at assessing an array of approaches for evaluation the RPP Program as well as defining trackable metrics.

# Evaluation Methods



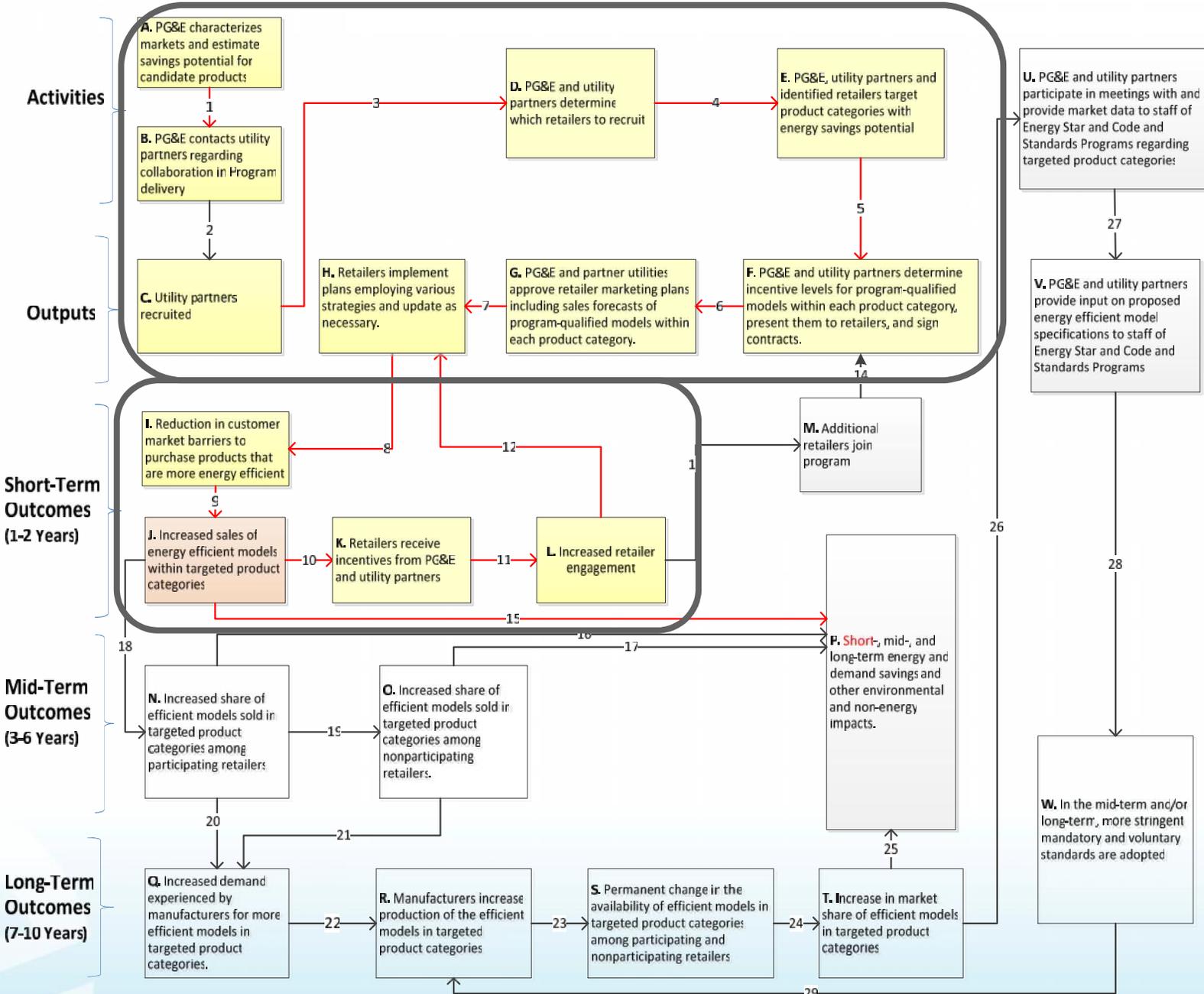
## Process Evaluation

- Retailer Interviews
- Shelf Surveys
- PG&E Program Staff Interviews
- Implementation Team Interviews
- Salesforce Data Review
- Program documents review

## Impact Evaluation

- Difference-in-Differences
- Regression Analysis Using Program-Tracking Data
- Self-Reports by Retailer Interviewees

# In the Short-Term, the Full Program Cannot be Adequately Assessed



# Conclusions



- The performance, operational, and evaluation objectives were achieved.
- Short-term lift in sales for participating retailers was small, but not unexpected.
- Recommendations for improvement in program design and delivery, as well as evaluations plans, are being implemented.
- Report can be found at: [http://www.etcc-ca.com/sites/default/files/reports/retail\\_plug\\_load\\_trial\\_et13pge8052.pdf](http://www.etcc-ca.com/sites/default/files/reports/retail_plug_load_trial_et13pge8052.pdf)

# Program Recommendations



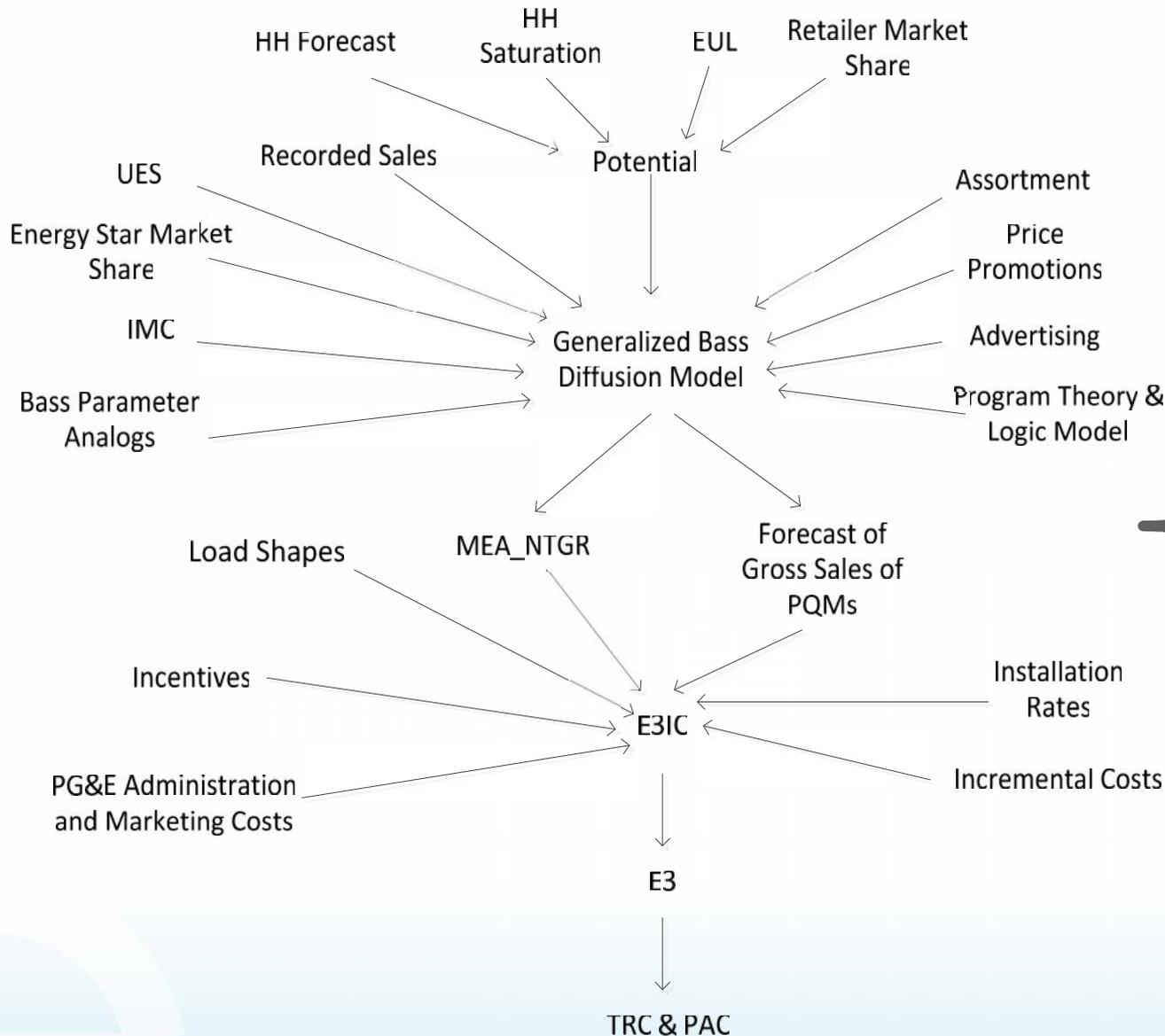
- **Timing.** Avoid launching a program in the last quarter.
- **Access for evaluation.** Retailer commitments to provide access to staff for interviews/surveys.
- **Marketing plans.** Require detailed marketing plans that outline strategies, time of implementation, and ideally, sales goals. Marketing plans must be timely after contracts signed to ensure rapid interventions.
- **Immediate performance goals.** Set dates for marketing plan launch to qualify for incentives.
- **Exceed EnergyStar when possible.** Focus on promoting and incenting energy efficiency tiers that exceed the minimum ENERGY STAR specs.

# Methodological Recommendations



- The evaluation team should employ a theory-driven approach, i.e., one that relies on the preponderance of evidence.
- A range of NTGRs along with an internally consistent, coherent and plausible story about the efficacy of the RPP Program will be produced.
- In close collaboration with the CPUC identify and operationalize key market transformation indicators so that baselines can be established as soon as possible.
- Modify the CPUC benefit-cost model to address the unique characteristics of MT programs.

# Annual Updates of Parameters Critical to Assess Program Performance and Mitigate Risk



Annual updates to parameters based on:

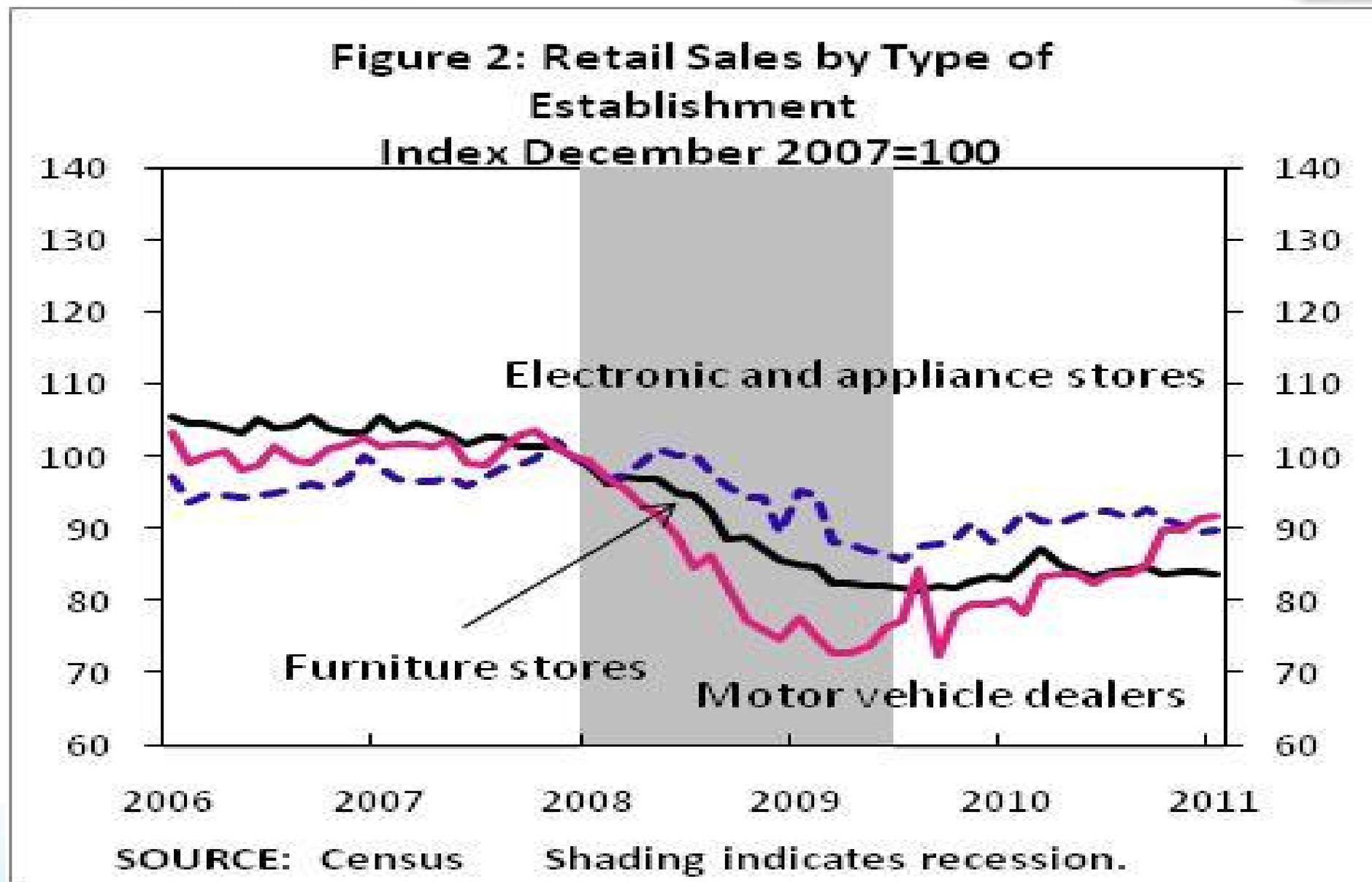
- Results of Theory-Driven Evaluations
- Recorded sales
- Results of parameter-specific studies (i.e., IMC, UES, EUL)
- Market characterization and assessment studies
- Literature review

# References



- <http://www.caltf.org/tf-meeting-materials> (search on “RPP” to find relevant documents)

# Q&A on Market Transformation





NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

# CASE STUDY ON TOP DOWN ANALYTICAL APPROACH TO ESTIMATING EE PROGRAM NET IMPACTS

July 7, 2015

Noel Stevens, DNV GL

Miriam Goldberg, Ph.D., DNV GL

Chris Russell, NMR

# Agenda



- Definitions of top-down and bottom-up modeling
- Motivations for pursuing top-down
- Expectations for top-down modeling
- Contributions of MA top-down research

# What are we talking about?



**Goal of top-down modeling:**

To isolate the effect of program activity from other natural changes and policy variables in regional consumption over time.

# Comparison of top-down and bottom-up?



## Top-down modeling

*Holistic approach* - Estimates program impacts across all energy-efficiency programs or initiatives in a region

- Econometric (regression based) approach
- Changes to aggregate energy consumption
- Program activity is an explanatory variable
- Controls for economic factors at aggregate level (e.g., county, IOU territory)
- Ideally accounts for free-ridership, combined impact of programs, and market effects



## Bottom-up modeling

*Disaggregate approach* - Measures impacts program by program within a utility territory

- Add up changes from units to programs to portfolios to determine aggregate energy consumption change
- Program activity is an explanatory variable
- Economic factors at disaggregate level (e.g., account level)
- Separate free-ridership and market effects studies used to capture net savings

# Motivations in pursuing top-down



- “Low cost” supplemental estimates of net program savings  
- Another tool in the toolkit
- Provide measure of net savings across portfolio of programs
- Use with bottom up savings to triangulate “true” net savings - Possible realization rate on bottom-up
- View of market transformation across portfolio of programs capturing full program effects that include Spillover, Market Effects, and Snapback

# Setting expectations



**What are we trying to do?**

Construct regression model to isolate 2% of total consumption attributable to energy efficiency – this is difficult given modeling challenges in even the best of circumstances.

# Setting expectations - Criteria for success



## Elements that increase signal

- **Diversity of program activity** - Programs have to vary over time (year over year) and across geography (towns, counties or states have different offerings)
- **Minimal effect of one area on another (cross-area spillover)** - Information and experience from one area influencing behavior in another area
- **Long enough time series to detect and isolate program impacts** - Research shows successful models have more than 10 years of program and consumption data
- **Account for the lag structure of program impacts** - Program expenditures 3 to 5 years ago may result in savings today through equipment survival and spillover

## Elements that reduce noise in estimates

- **Consistent reporting of data** - Aggregate data compiled the same across geographies and may report the same phenomena
- **Consistent relationship between program activity metric and savings** - The influence of program variables and consumption must be consistent across units of observation

# Setting expectations: What it can and cannot do?



## Can do if successful

- Inexpensive estimates of net impacts (**Data permitting**)
- Combined effects of cumulative activity over programs and over time
- Net savings including spillover, market effects, and snapback
- Provide confidence intervals and precision levels for net energy savings estimates (WHY)

## Cannot do

- Obtain savings estimates net of free riders only
- Separate free-ridership, spillover, and market effects estimates
- Isolate effect of a particular program and year
- Identify which groups of measures or customers are performing better, or worse

# Top-down is an on-going research effort...



You get an answer **BUT** these are still estimates

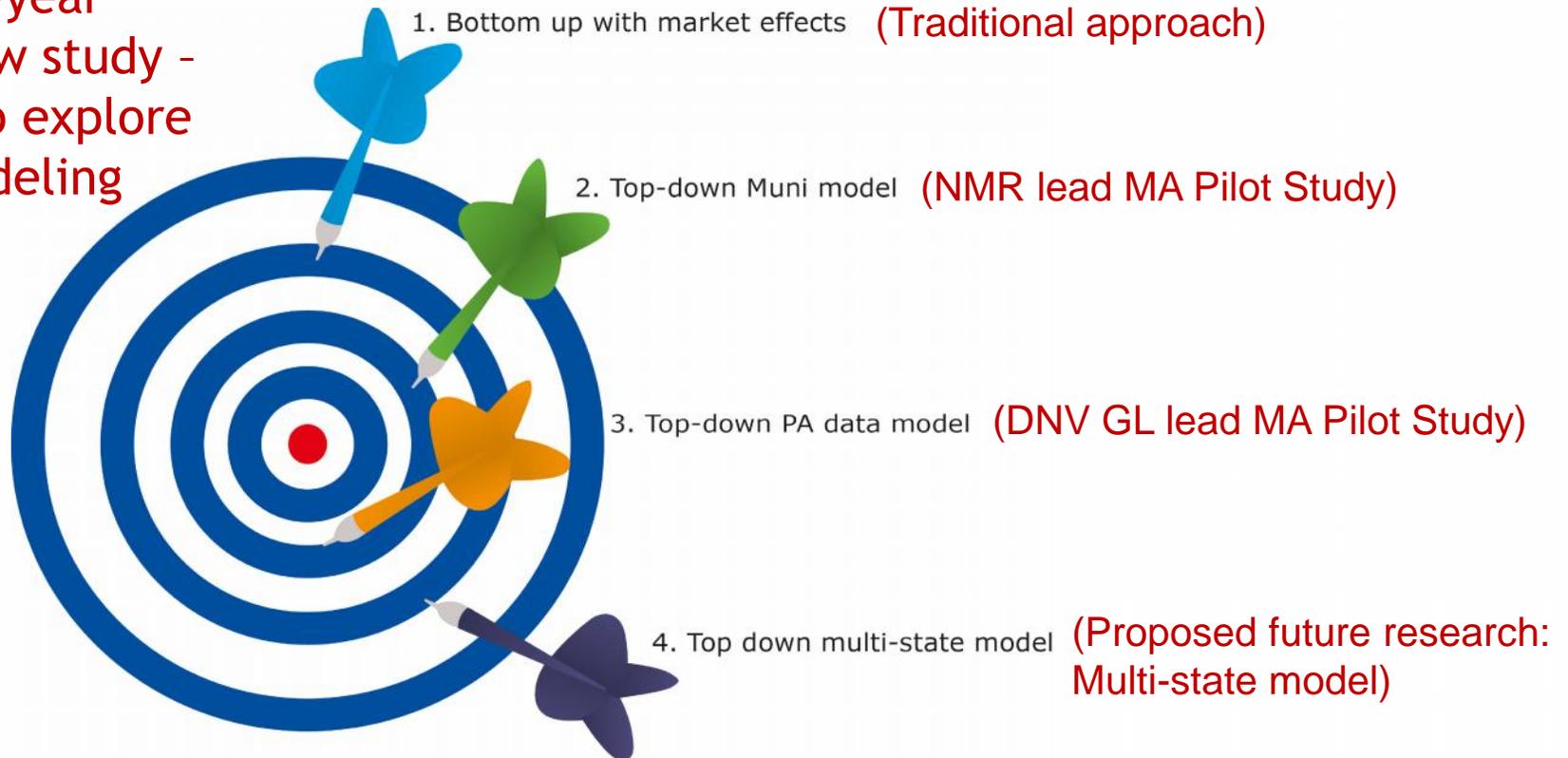
**Caution about regression results:**

- Easily summarized and explained with  $R^2$  and statistical significance
  - Run a different model and you may get a different result
  - With shorter time series, results may be very sensitive to data points included or not
  - With longer time series the factors being estimated may not be constant
- Results are highly dependent upon model specification and the availability of data
  - Many familiar challenges apply
    - Really an extension of typical “billing analysis” techniques used in bottom-up evaluation apply
  - Broader geography and timeframe imposes additional challenges

# 2014 MA program administrator studies - 2 points on the target



This is a multi-year methods review study - we continue to explore and refine modeling approaches



## Features of PA-Data Model

- ✓ Account level consumption and program data - Aggregated to town and county level
- ✓ Estimated separate models for large and small commercial, and industrial separately
- ✓ Use normalized annual consumption as the dependent variable Data series limited to just 3 years; and no comparison area possible
- ✓ Program activity measured as program expenditures and ex ante savings; lighting and non-lighting, upstream and downstream measured separately

## Features of PA-Muni Model

- ✓ Data aggregated at PA-municipal utility level
- ✓ Residential and Commercial & Industrial models
- ✓ Total PA-municipal utility level consumption over 22 years
- ✓ Program activity measured as total program expenditures
- ✓ Variables control for economic conditions and weather
- ✓ 1 to 6 previous year's expenditures included to account for cumulative impacts
- ✓ Municipal utilities served as no-program comparison area

# Pros and Cons of MA PA's - 2014 pilot studies



- Both models seek to estimate net savings
- PA-data model
  - ✓ Uses differences in time period and geography to simulate net conditions
  - ✓ Use of account level data provides for investigation of program, measure, and customer type differences, key policy drivers
- PA-muni model
  - ✓ Uses longer time series and activity in muni territories to simulate net conditions
  - ✓ Aggregate PA and muni level data limits investigation of program, measure, and customer type differences

Factor for successful models	PA-muni model	PA-data model
Diversity of program activity	*****	**
Minimal effect of one area on another	*	*
Consistent reporting of data	**	*****
Long enough time series to detect and isolate program impacts	*****	*
Account for the lag structure of program impacts	*****	*
Consistent relationship between program activity and savings	***	****

# Results: Each model contributes different insights to policy concerns



## PA-muni models

- **Residential model**
  - Statistically significant estimates
  - Estimates had wide confidence intervals and varied substantially between model specifications
  - Realization rate on bottom up savings estimates ranged from 280% to 2%
  - Further analysis of results showed results highly sensitive to some individual observations and the recession period
- **C&I model**
  - Fewer models statistically significant estimates
  - Realization rate on bottom up savings estimates ranged from 168% to 9%
- **PA-muni models tire-kicking - Results highly sensitive to individual observations and the recession period**

## PA-data models

- **No models were statistically significant** - Data availability a primary obstacle to successful estimation
- **Segmentation of top-down models is possible given enough data** - It is possible to use top-down techniques to examine differences in program types and customer groups.
- **Effective top-down models require a sufficiently long time series to account for:**
  - *Variation in the level of program data over time* - Our time series included only three years of data, which all occur during a period of economic recovery and rapid increase in programmatic activity.
  - *Multiple lags in programmatic activity* - Previous research, as well as the PA-Muni pilot study, illustrate the importance of using multiple lags in both the program variables and dependent variable.
  - *Use of first-difference in the dependent and independent variables* - **By including only three years of data in the model, the first-difference models included in this study contain only two years of data for unit of observation.**
  - Absent these measures, it is not surprising that the model results did not provide statistically significant parameter estimates.

# Conclusions and Takeaways from MA Pilots



- Top-down can provide ADDITIONAL ESTIMATES of net savings
  - Each approach has pros and cons
  - Each contributes to the overall picture of net impacts
- Top-down models face a range of data concerns that complicate estimation and can add substantially to costs
- Consistent reporting of consumption and program tracking data across geographies and time periods is a major obstacle
- It is challenging to properly define a model or set of models that truly isolate program impacts
  - Models can be sensitive to individual observations or particular time periods
  - Model specification is a work in progress – Variables needed to control for non-program variations are not necessarily available, or don't have enough data to separate effects
  - Just because you have a model with some control variables and a coefficient on program activity with nominally good precision does not mean it's a good estimate
- PA data model allows for examination of program and measure level impacts, exploration of savings by customer segment, but requires account level data
- Muni model has enough observations and a comparison area but results have wide confidence intervals and are sensitive to model specification and observations

# Summary: What's a utility/PA to do?



- Utilities/PAs and stakeholders interested in top-down should develop a data collection strategy that:
  - Accumulates the necessary data as it becomes available
  - Refines models over time
- Continue to support exploratory top down work
- Include plenty of tire-kicking in any top-down analysis
- Do **not** be determined to get “the answer” from top-down analysis
  - Use the results under alternative specifications and data restrictions along with bottom up results as informative

# Contact us?



- MA Top-down research:

<http://ma-eeac.org/wordpress/wp-content/uploads/Top-down-Modeling-Methods-Study-Final-Report.pdf>

- **Noel Stevens, Senior Consultant**

DNV GL - Energy

[Noel.Stevens@DNVGL.com](mailto:Noel.Stevens@DNVGL.com)

Phone (781) 418-5806

- **Chris Russell, Ph.D., Senior Quantitative Analyst**

NMR Group, Inc.

[crussell@nmrgroupinc.com](mailto:crussell@nmrgroupinc.com)

Phone: (617) 284-6230 ext. 11

# Q&A on Top Down Modelling





Thank you for participating today. Will you please...

- ✓ Respond to Follow Up Survey
- ✓ Email Elizabeth Titus ([etitus@neep.org](mailto:etitus@neep.org)) about what you would like to hear more about from NEEP.