# Incorporating Energy Efficiency Impacts in Long-Term Forecasts

**Arthur Maniaci**

*Supervisor, Load Forecasting & Energy Efficiency*

*New York Independent System Operator*

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# The Roles of the NYISO


## Reliable operation of the bulk electricity grid

- *Managing the flow of power nearly 11,000 circuit-miles of transmission lines from more than 300 generating units*


## Administration of open and competitive wholesale electricity markets

- *Bringing together buyers and sellers of energy and related products and services*


## Planning for New York's energy future

- *Assessing needs over a 10-year horizon and evaluating projects proposed to meet those needs*


## Advancing the technological infrastructure of the electric system

- *Developing and deploying information technology and tools to make the grid smarter*

# NYISO Long-Term Forecast Methodology

- **Prepare econometric forecasts of monthly energy usage for a 10-year horizon**
  - ***This includes naturally-occurring conservation***
- **Prepare energy efficiency forecasts**
  - ***For each Program Administrator***
    - **Authorized spending levels, realization rates, net-to-gross ratios and budget utilization factors by program or portfolio**
  - ***For Building Codes and Standards***
    - **Stock-based approach to include impacts of new appliance standards and building codes not otherwise included in econometric model**
      - *Market transformation impacts can be included as an additional impact, not otherwise accounted for*

# NYISO Long-Term Forecast Methodology (Cont.)

- **Attribute impacts among programs**
  - ***Naturally occurring impacts and market transformation is not formulaic due to overlaps***
  - ***Objective is to neither over count nor under count Energy Efficiency impacts***

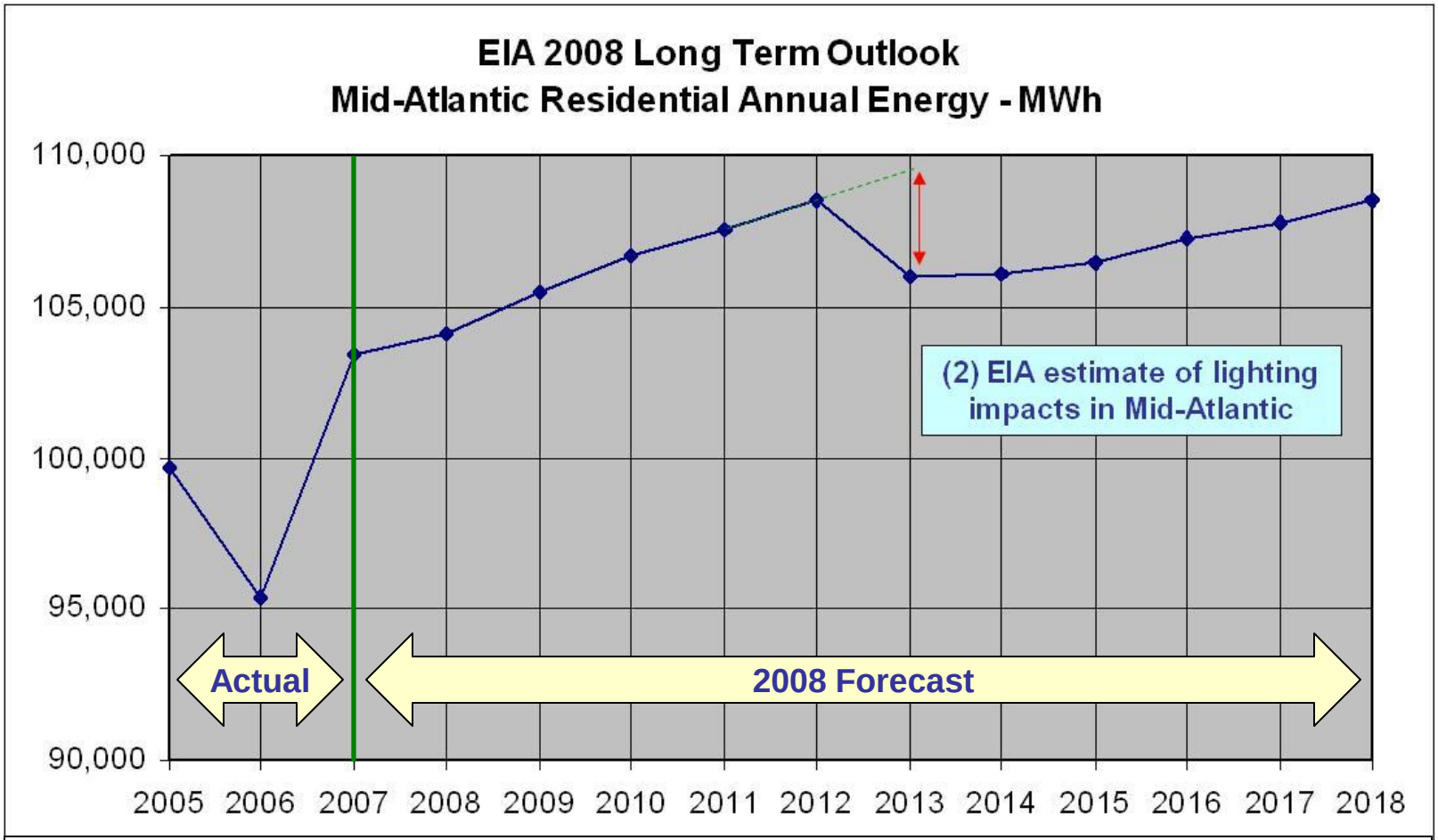
# EE Accounting: Adding Up All the Pieces

1. **Develop top-down gross savings estimate of achievable market potential for specific measures, using end-use forecasting techniques**

   ***EE Potential = Customers * Savings per Customer * Percent Adoption***

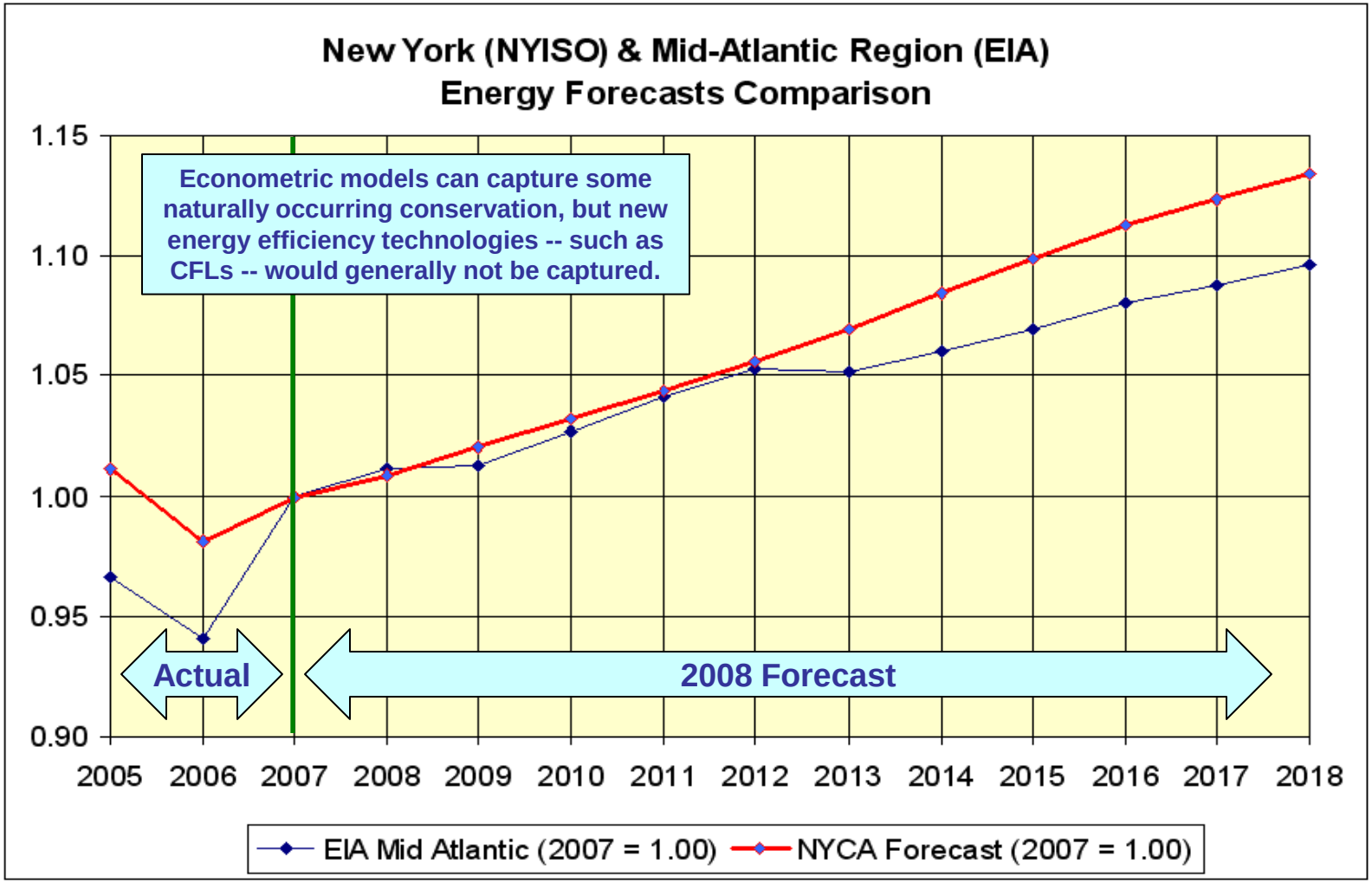
2. **Estimate attribution percentages**
   - ***Naturally occurring in econometric or end-use forecast***
   - ***Impacts from Program Administrators***
   - ***Impacts from Codes & Standards, not captured by econometric or end use models***
   - ***Impacts from Market Transformation (if any)***
   - ***Whole is equal to sum of parts***
3. **Perform reasonableness check & iterate as necessary**
4. **Account for overlaps -- avoid over-counting and under-counting**

# EIA 2008 Forecast




**2008 EIA forecast included impact of CFLs in 2012 -- in addition to other federal codes and standards**

# EIA & NYISO 2008 Forecasts



# Energy Efficiency Forecast Elements

## *Explicit Impacts in Addition to Naturally Occurring Conservation*

### 2012 Statewide Energy Efficiency Projections - GWh

| Year | LIPA | NYPA | Codes & Standards | EEPS - NYSERDA | EEPS - Utilities | Expected Annual GWh | Expected Cumulative GWh |
|---|---|---|---|---|---|---|---|
| 2012 | 351 | 45 | 255 | 607 | 661 | 1,919 | 1,919 |
| 2013 | 156 | 45 | 198 | 689 | 455 | 1,543 | 3,462 |
| 2014 | 314 | 45 | 154 | 653 | 487 | 1,678 | 5,140 |
| 2015 | 141 | 45 | 107 | 665 | 522 | 1,505 | 6,645 |
| 2016 | 240 | 45 | 103 | 465 | 380 | 1,258 | 7,903 |
| 2017 | 243 | 40 | 106 | 419 | 413 | 1,246 | 9,149 |
| 2018 | 177 | 40 | 105 | 305 | 265 | 917 | 10,066 |
| 2019 | 170 | 40 | 108 | 239 | 22 | 604 | 10,670 |
| 2020 | 130 | 40 | 109 | 239 | 17 | 560 | 11,230 |
| 2021 | 93 | 40 | 109 | 238 | 20 | 525 | 11,755 |
| 2022 | 86 | 40 | 87 | 238 | 13 | 489 | **12,244** |
| GWh | 2,101 | 465 | 1,441 | 4,757 | 3,255 | **12,244** | |

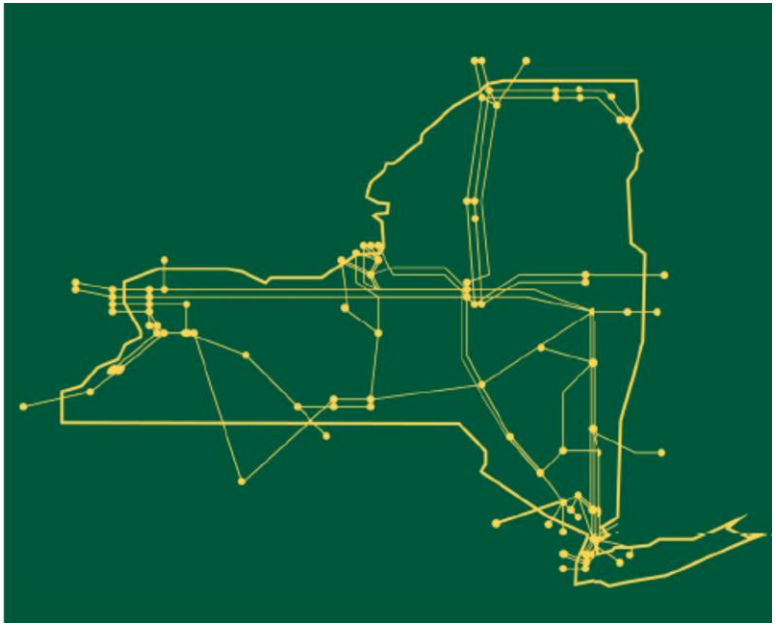
# Recent Experience in NY

- Compact Fluorescent Light (CFL) program designed by the Program Administrator in 2008 -- providing funds to retailers to offset high initial cost of CFLs
- Market research initially indicated pre-program Net-to-Gross ratio of 160%
- Follow-up market research indicated Net-to-Gross ratio was about 40% for the first 18 months of the program
- Conclusion -- Market transformation had succeeded
- Although program net energy impacts were reduced, NYISO forecast included a portion of CFL impacts in its Codes and Standards accounting -- so that gross savings were not entirely eroded
- Reinforces need for frequent assessment of market conditions in order to properly assess program performance -- especially in rapidly changing markets

# Literature Survey

- ***All These Years Measuring Free Ridership & Now We Measure A Portion of These As Caused by Market Transformation*, Megdal, AESP Annual Meeting, 1996**
- ***A Discussion and Critique of Market Transformation*, York, Energy Center of Wisconsin, 1999**
- ***Theory-Based Estimation of Energy Savings from DSM, Spillover, and Market Transformation Programs Using Survey & Billing Data,* Kandel, ACEEE, 2002**
- ***Market Transformation: Substantial Progress From a Decade of Work*, Nadel et al, ACEEE, 2003**
- ***Massachusetts Energy Efficiency Programs – C&I Freeridership & Spillover Methodology Study*, Tetra Tech & KEMA, NEEP Regional EM&V Forum, 2011**

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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