# Total Resource Cost (TRC) Test and Avoided Costs

## Public Utilities Commission of Ohio Workshop

Wednesday, August 5, 2009
10:00 a.m. – 3:00 p.m.

Presentations by Snuller Price and Richard Sedano
Representing
Electricity Markets and Policy Group
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory (LBNL)

# Agenda

Presentations 10:00 a.m. – 12:00 p.m.

1. Introduction of presenters: Snuller Price and Richard Sedano
2. Cost-effectiveness Nuts and Bolts
3. What Other States Do and Examples
4. Key Drivers to the C/E Results

Break 12:00 p.m. – 1:00 p.m.

Presentations 1:00 p.m. – 2:00 p.m.

5. Developing Avoided Costs in Restructured Markets
6. Specific Considerations in Ohio

Discussion of TRC Issues 2:00 p.m. – 3:00pm

# Workshop Objectives

- **Provide Stakeholders a common understanding of Total Resource Cost (TRC) test-related issues and to facilitate discussion**
- **Provide a forum for discussion of TRC-related issues as they relate to the development of a statewide technical reference manual**
- **Provide forum for discussion of TRC and cost-effectiveness issues.**

# Introduction: LBNL Technical Assistance to States on Energy Efficiency

- LBNL (and team of consultants) funded by DOE EERE and OE
- Working with 9 states (mainly PUCs, but also Energy Offices): Ohio, Pennsylvania, Illinois, Kansas, Maryland, Massachusetts, Hawaii, Wyoming and Kentucky
- Scope of activities varies by state depending on their priorities & needs:
  - Workshops on decoupling, shareholder incentives and cost recovery (Kansas)
  - Workshop on Benefit/Cost analysis (Kansas); EM&V issues (IL), Alternative models for EE Administration (Hawaii)
  - Technical assistance on Solicitations for Program Administrators (Hawaii); help negotiate Contract and Performance Incentives for 3rd Party administrator
  - Assistance on solicitations for statewide EM&V contractors (MD, PA, OH)
  - Input on EE Program plan filing template (PA and Ohio)
  - Strategies to oversee and manage Evaluation, Measurement & Verification (EM&V) planning and studies (MA, OH, PA, MD)
  - Assistance on Benefit/Cost analysis methods (PA)

# Contact Information


Snuller Price

Energy and Environmental Economics, Inc. (E3)

Email: snuller@ethree.com

Phone: 415-391-5100

Richard Sedano

Regulatory Assistance Project (RAP)

Email: rsedano@raponline.org

Phone: 802-223-8199


Original material from the National Action Plan for Energy Efficiency

- Public-private initiative supported by the U.S. EPA and DOE
- Copies of Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers available

**www.epa.gov/eeactionplan**

# Agenda

- **Walk-through of Key Cost-effectiveness Issues**
  - **Reviews the issues and approaches for policy-makers to consider when adopting EE cost-effectiveness tests**
  - **Discussion of the perspective represented by each of the five standard cost-effectiveness tests**
  - **Defining and clarifying key terms and issues**
- **Original material from the National Action Plan for Energy Efficiency**
  - **Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers**

# 2. Cost-Effectiveness Nuts and Bolts

# Key Cost-effectiveness Issues

| | Section |
|---|---|
| • Definition of cost-effectiveness tests | 2 |
| • Cost-effectiveness tests to use | 2 & 3 |
| • Point of cost-effectiveness measurement | 4 |
| • Discount rate | 4 |
| • Net to gross ratio and free-riders | 4 |
| • Emissions savings and RPS impact | 4 |
| • Non-energy benefits | 4 |
| • Calculation of avoided costs | 5 |

# Origins of Cost-effectiveness: Traditional Supply Side Planning

- **Cost-effectiveness analysis is rooted in least cost utility supply planning; where objective is to…**
  - **develop the least cost supply portfolio that**
  - **has acceptable level of cost risk,**
  - **meets established reliability criteria, and**
  - **complies with environmental regulations.**
- **Traditional analysis yields a preferred supply plan**
- **Integrated supply and demand planning ("IRP") can also yield a preferred supply plan**
- **No 'benefits' calculation is needed in this framework, just a complete characterization of all costs required to meet the object function**

# Why cost-effectiveness analysis?

- Shortcomings of "full IRP" approach
  - Complex analysis on broad set of issues from fuel supply, operability, supply technology
  - Significant time required (2+ years typically)
  - Lack of stakeholder transparency
  - Focus on ratepayer cost and risk, subject to minimum standards on reliability, environment
- Once you have your 'preferred plan'

**How do you test for a lower cost solution?**

# Cost-effectiveness Framework

**Testing whether an alternative plan is lower cost is the basic building block of CE analysis**

Step 1 **Evaluate the costs of EE program**

Step 2 **Evaluate the change in costs of your preferred supply plan ("avoided costs")**

- **These are the 'benefits' of implementing your program**

Step 3 **Compute the difference (or ratio)**

More formally, net present value difference of benefits and costs…

| | | |
|---|---|---|
| *Net Benefits (difference)* | Net Benefits$_a$ (dollars) | = NPV ∑ benefits$_a$ (dollars) -NPV ∑ costs$_a$ (dollars) |
| *Benefit-Cost Ratio* | Benefit-Cost Ratio$_a$ | $= \frac{\text{NPV} \sum \text{benefits}_a \text{ (dollars)}}{\text{NPV} \sum \text{costs}_a \text{ (dollars)}}$ |

# Definition of Cost Tests

| Cost Test | Acronym | Key Question Answered | Summary Approach |
| --- | --- | --- | --- |
| Participant Cost Test | PCT | **Will the participants benefit over the measure life?** | **Comparison of costs and benefits of the customer installing the measure** |
| Utility/Program Administrator Cost Test | UCT/PAC | **Will utility bills increase?** | **Comparison of program administrator costs to supply side resource costs** |
| Ratepayer Impact Measure | RIM | **Will utility rates increase?** | **Comparison of administrator costs and utility bill reductions to supply side resource costs** |
| Total Resource Cost | TRC | **Will the total costs of energy in the utility service territory decrease?** | **Comparison of program administrator and customer costs to utility resource savings** |
| Societal Cost Test | SCT | **Is the utility, state, or nation better off as a whole?** | **Comparison of society's costs of energy efficiency to resource savings and non-cash costs and benefits** |

# Summary of Costs and Benefits

- High level summary of costs and benefits included in each cost test
- Each state adjusts these definitions depending on circumstances
- Details can significantly affect the type of energy efficiency implemented

| Component | PCT | PAC | RIM | TRC | SCT |
|---|---|---|---|---|---|
| **Energy and capacity related avoided costs.** | - | Benefit | Benefit | Benefit | Benefit |
| **Additional resource savings** | - | - | - | Benefit | Benefit |
| **Non-monetized benefits** | - | - | - | | Benefit |
| **Incremental equipment and install costs** | Cost | - | - | Cost | Cost |
| **Program overhead costs** | - | Cost | Cost | Cost | Cost |
| **Incentive payments** | Benefit | Cost | Cost | - | - |
| **Bill Savings** | Benefit | | Cost | - | - |

# TRC Test Implications

- TRC Test measures <u>overall</u> cost-effectiveness
  - Pop Quiz
    - Does the size of the incentives change the TRC?
    - Do the customer bill savings change the TRC?
  - Think 'control volume' around Ohio, is more or less money flowing into Ohio for energy?
- Distribution Tests (RIM, PCT, UCT)
  - If the TRC is positive, what can we say about the distribution of costs and benefits?
  - Need 'distributional tests'
    - PCT (cost-effectiveness for participants)
    - UCT / PAC (cost-effectiveness from a utility perspective)
    - RIM (economics for non-participants) *

# 3. What Other States Do and Examples

# Cost Tests by State

| Primary Cost Test Used by Different States | | | | | |
|---|---|---|---|---|---|
| PCT | UCT/PAC | RIM | TRC | SCT | Unspecified |
| | **CT, DC, TX** | **FL** | **CA, CO, DE, IL, MA, MO, NH, NJ, NM, RI, UT** | **AZ, ME, MN, VT, WI** | **AR, CO, DE, GA, HI, IA, ID, IN, KS, KY, MD, MT, NC, ND,, NV, OK, OR, PA, SC, VA, WA, WY** |

| Secondary Cost Test Used by Different States | | | | |
|---|---|---|---|---|
| PCT | UCT/PAC | RIM | TRC | SCT |
| **AR, FL, GA, HI, IA, IN, MN, VA** | **AT, CA, CT, HI, IA, IN, MN, MO, NV, NY, OR, UT, VA, TX** | **AR, DC, FL, GA, HI, IA, IN, KS, MN, NH, VA** | **AR, CA, CT, FL, GA, HI, IL, IN, KS, MA, ME, MN, MO, MT, NH, NM, NY, UT, VA** | **AZ, CO, GA, HI, IA, IN, MW, MN, MT, NV, OR, VA, VT, WI** |

# TRC Variations

- **Illinois: Gas savings excluded**
- **Rhode Island: Default test looks only at electric savings, but alternative is allowed – actual test used includes natural gas and water savings**
- **New York: Includes effect on energy market prices (called "total market test")**
- **Colorado must include non-energy benefits, by law**

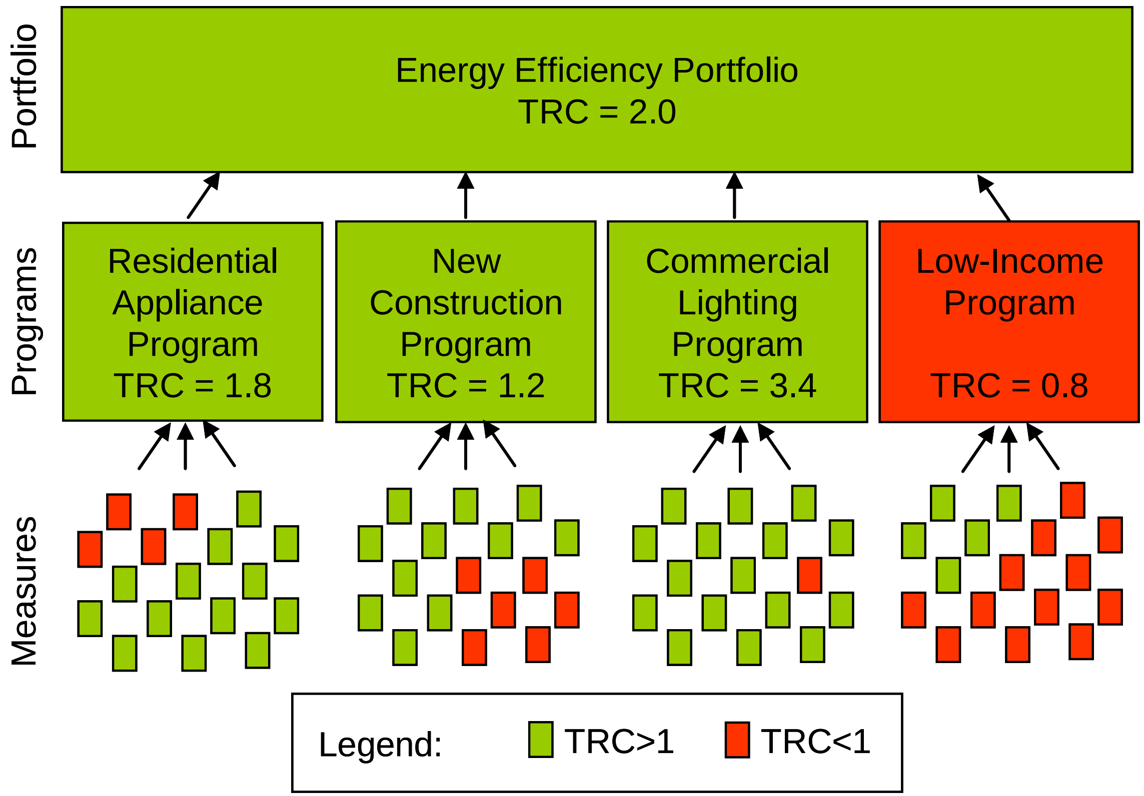
# Example Cost Test Results

- **Benefit / Cost ratio results from three programs**
- **Energy efficiency is widely cost-effective**
- **RIM test results are often less than one**

| Test | So. Cal. Edison Residential Program | AVISTA Regular Income | Puget Sound Energy Com/Ind Retrofit |
|---|---|---|---|
| PCT | **7.14** | **3.47** | **1.72** |
| PAC | **9.91** | **4.18** | **4.19** |
| RIM | **0.63** | **0.85** | **1.15** |
| TRC | **4.21** | **2.26** | **1.90** |
| SCT | **4.21** | **2.26** | **1.90** |

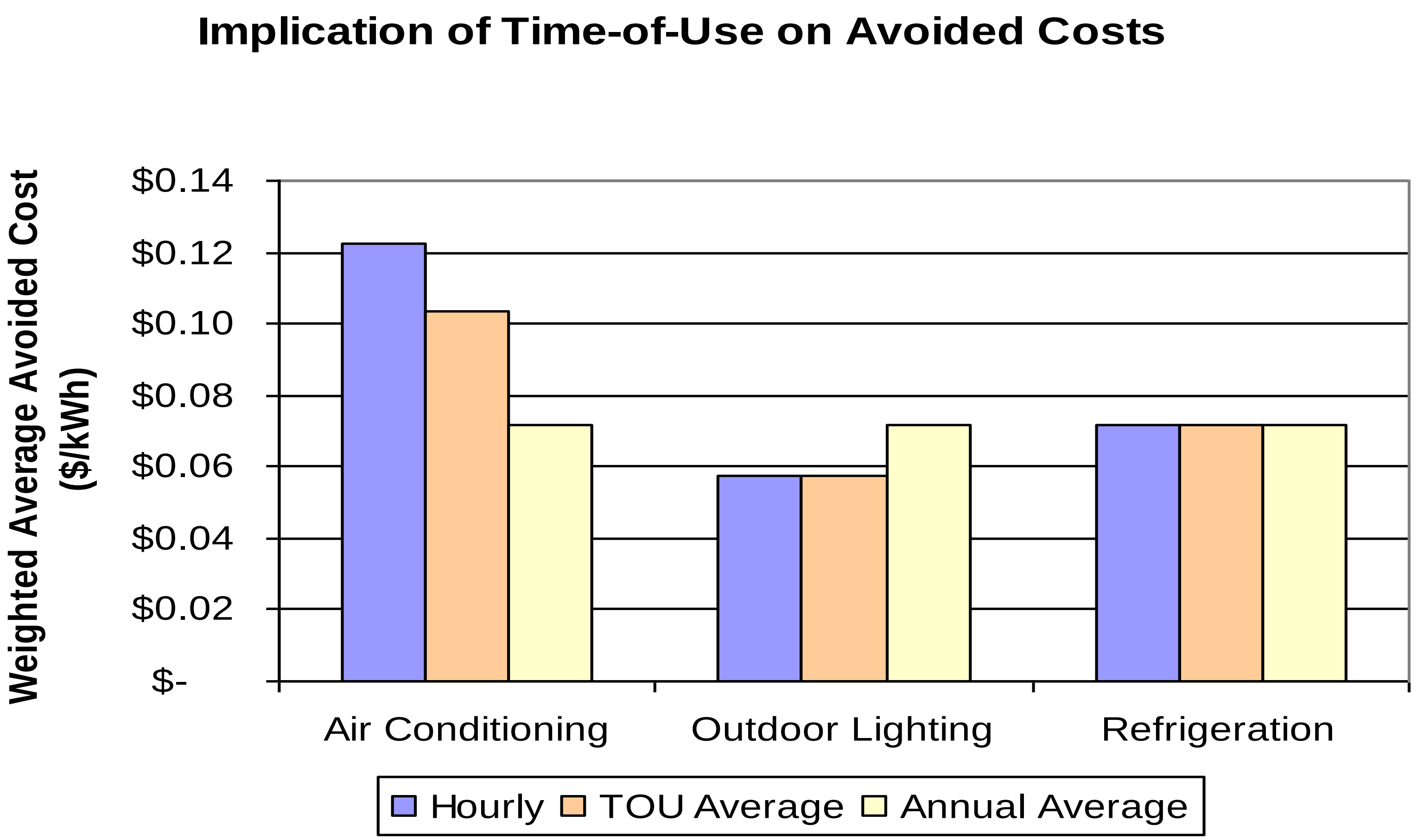
# 4. Key Drivers to the C/E Results

# Point of Cost-Effectiveness Measurement




- **Application at portfolio level allows for inclusion of individual programs or measures that do not past cost test**
  - **Low Income, emerging technologies, market transformation**

# Time specific avoided costs




Example from California Avoided Cost Analysis

# Discount Rates are a key input

| Tests and Perspective | Discount Rate Used | Illustrative Value | Present Value of $1/yr for 20 years | Today's value of the $1 received in Year 20 |
|---|---|---|---|---|
| Participant Cost Test (PCT)) | **Participant's discount rate** | **10%** | **$8.51** | **$0.15** |
| Ratepayer Impact Measure (RIM) | **Utility WACC** | **8.5%** | **$9.46** | **$0.20** |
| Utility Cost Test (UCT/PAC) | **Utility WACC** | **8.5%** | **$9.46** | **$0.20** |
| Total Resources Cost Test (TRC) | **Utility WACC** | **8.5%** | **$9.46** | **$0.20** |
| Societal Cost Test | **Social discount rate** | **5%** | **$12.46** | **$0.38** |

# RIM Test and Impact on Non-participants over Time

- **RIM Test fails to capture the change in rates over time which can vary and are difficult to asses in an 'NPV' type approach**

| | Install EE → Short-term | Adjust Rates → Medium-term | Adjust Capital Expansion Plan → Long-term |
|---|---|---|---|
| Participant | Better Off | Better Off | Better Off |
| Non-Participant | Unaffected | Rates are Higher | Rates may be higher or lower |
| Utility | ROE Lower | ROE unchanged Earnings unchanged | ROE unchanged Earnings lower |

Time →

Action Plan and LBNL have developed the 'EE Benefits Calculator' which can estimate the rate trajectory over time

# Net To Gross (NTG) Ratio

- **Net to gross ratio may derate the program impacts and significantly affects the results of the TRC, SCT, PAC, and RIM tests**
- **Difficult to estimate the NTG with confidence**
- **Key factors addressed through the net-to-gross ratio are:**
  - **Free Riders**
  - **Installation Rate**
  - **Persistence/Failure**
  - **Rebound Effect**
  - **Take Back Effect**
  - **Spillover**

# Incentives

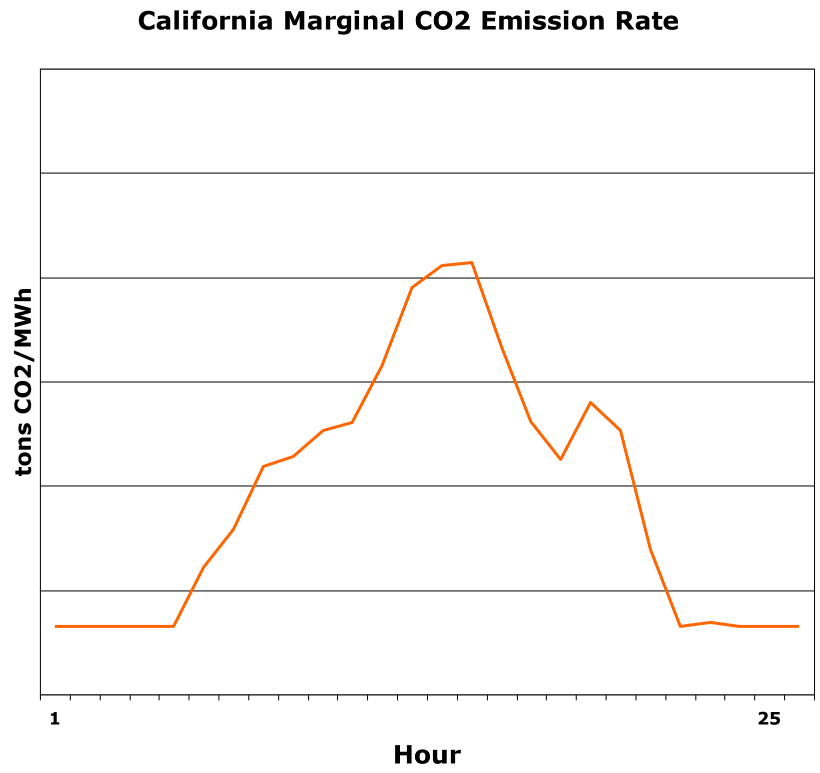
- **With an energy efficiency resource standard, program administrators must produce savings**
  - **So is there a place for incentives?**
- **If there are public interest goals beyond the EERS, there could be.**
  - **What if small commercial customers are harder to work with to sell energy efficiency?**
  - **Temptation to market to population segments with less challenge, more yield**
  - **Do small commercial customers lose out?**

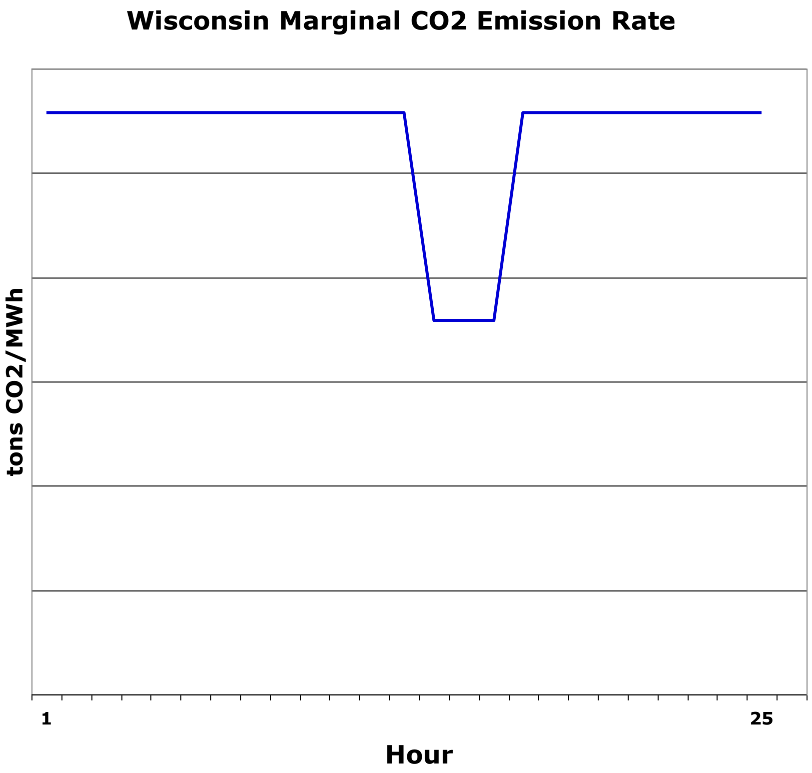
# Sub-class incentives can promote the public interest

- There could be several instances where the public interest is served by assuring success with energy efficiency with particular customer segments
  - Schools, public buildings, low income residential, small stores
- Or with particular programs
  - Energy Star appliance or equipment penetration
- Incentives to achieve stretch goals can promote the public interest

# GHG Emissions Savings from EE

- **Carbon savings profile can vary significantly**



# Value of Carbon Adder

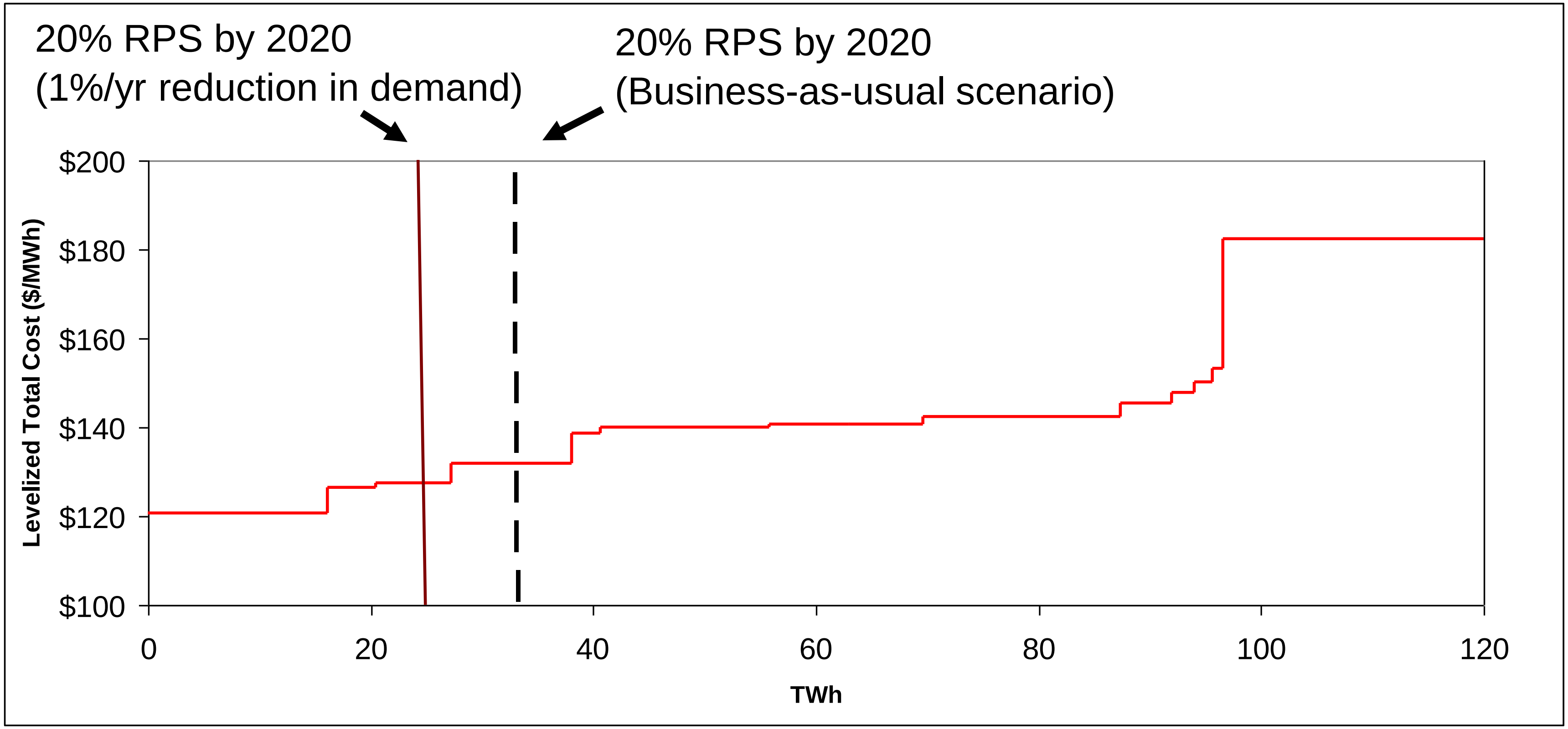
- **Simple Calculation of Value**

| Incremental Avoided Cost of Conventional Generation ($/kWh) | | | |
|---|---|---|---|
| | **Marginal Emissions Source and Rate (Tonnes/MWh)** | | |
| | Natural Gas CCGT | Natural Gas CT | Coal with Steam Turbine |
| | 0.4 | 0.63 | 0.91 |
| CO2 Cost $/tonne $ 10.00 | $ 0.004 | $ 0.006 | $ 0.009 |
| $ 20.00 | $ 0.008 | $ 0.013 | $ 0.018 |
| $ 30.00 | **$ 0.012** | $ 0.019 | **$ 0.027** |
| $ 50.00 | $ 0.020 | $ 0.032 | $ 0.046 |
| $ 100.00 | $ 0.040 | $ 0.063 | $ 0.091 |
| $ 150.00 | $ 0.060 | $ 0.095 | $ 0.137 |
| $ 200.00 | $ 0.080 | $ 0.126 | $ 0.182 |

**At $30/tonne CO2, natural gas combined cycle costs increase about $0.012/kWh and coal $0.027/kWh**

# Including RPS in Avoided Cost

## California Example Assuming a 20% RPS Target




- Reducing demand 1%/yr saves 9 TWh of RPS generation @ $0.123/kWh
  - Results in ~$8.03/MWh higher avoided cost if included

    Change in avoided cost = ($124/MWh - $82.75/MWh) * 20%

# Accounting for Non Energy Benefits

- Customer perspective
  - **Increased comfort, quality of life**
  - **Improved air quality**
  - **Greater convenience, quality of product**
- Utility perspective
  - **Reduced shut-off notices**
  - **Reduced bill complaints**
- Societal Perspective
  - **Increased community health**
  - **Improved aesthetics.**
  - **Reduces reliance on imported energy sources**

# 5. Developing Avoided Costs in Restructured Markets

# Electric Avoided Cost Components

- **Range of avoided cost components that are considered in developing the benefits for EE**
- **Each state selects their own elements and methods for quantification**

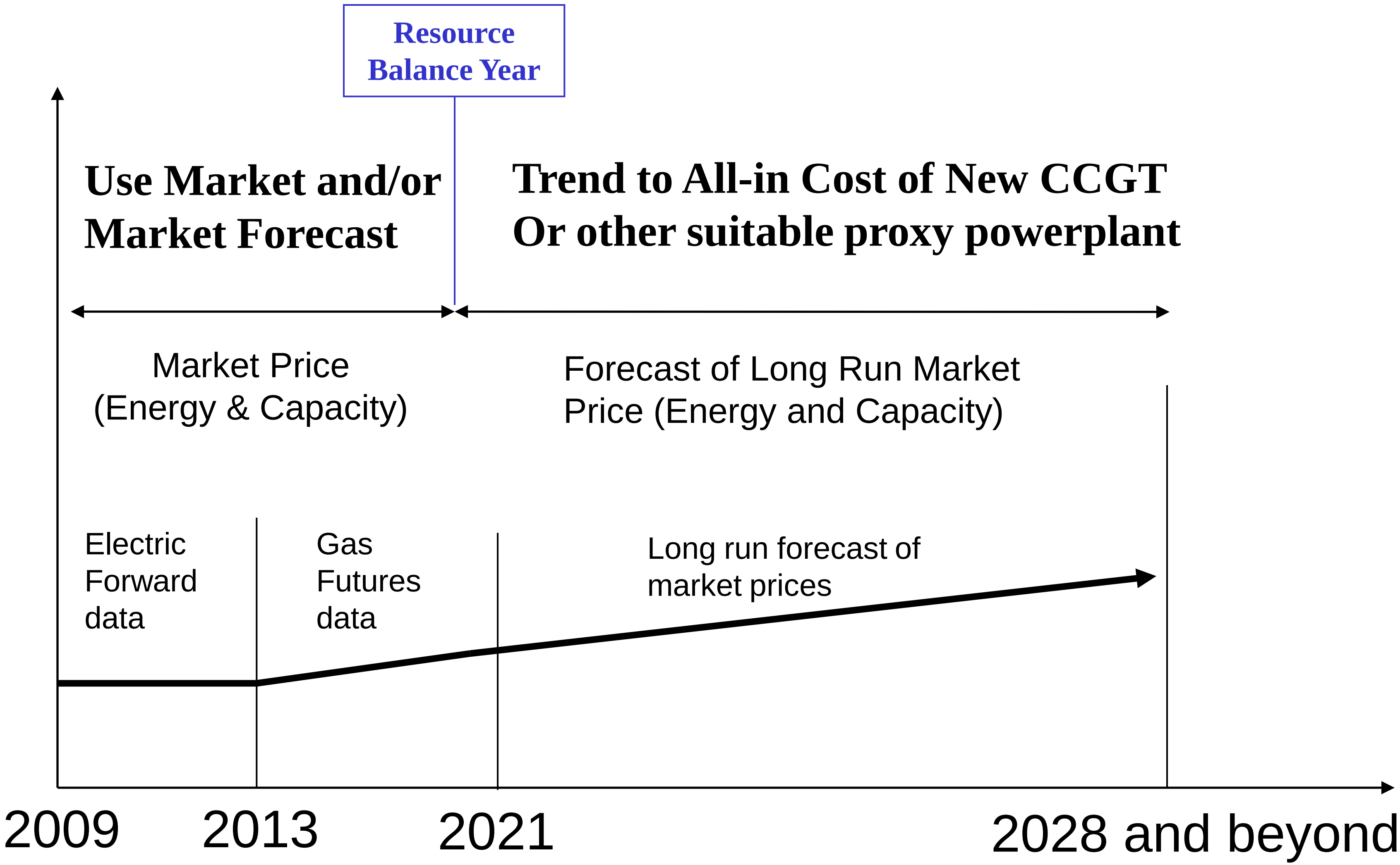
| Electricity Energy Efficiency | |
|---|---|
| Energy Savings | Capacity Savings |
| **Market purchases *or* fuel and O&M costs** | **Capacity purchases *or* generator construction** |
| **System Losses** | **System losses (Peak load)** |
| **Ancillary services related to energy** | **Transmission facilities** |
| **Energy market price reductions** | **Distribution facilities** |
| **Co-benefits of water, natural gas, fuel oil savings (if applicable)** | **Ancillary services related to capacity** |
| **Air emissions** | **Capacity market price reductions** |
| **Hedging costs** | **Land use** |

# Methodology of Avoided Costs

- **Methodology depends on market structure**
- **Lots of variation across states**

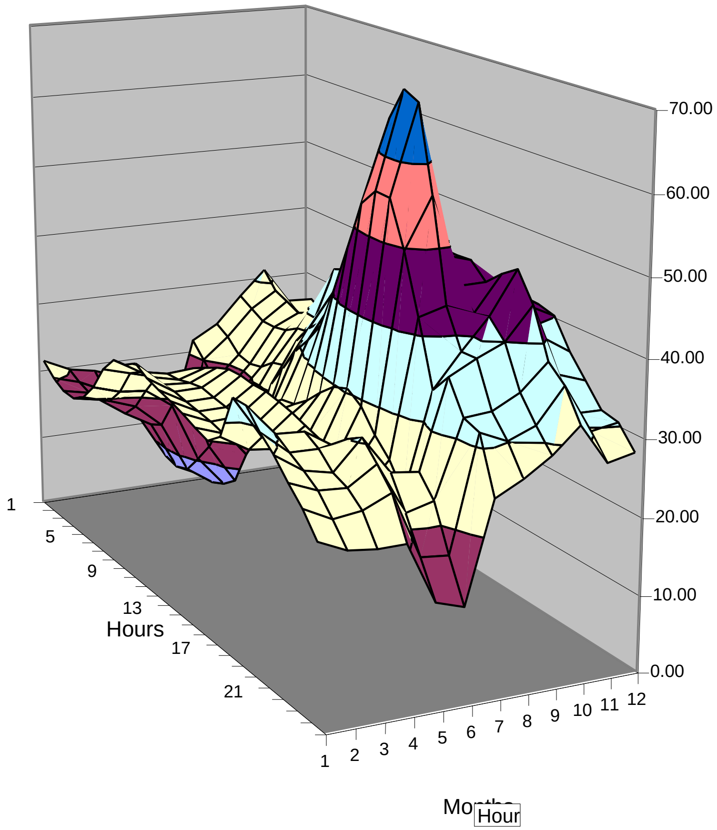
| **Approaches to Value Energy and Capacity** | | |
|---|---|---|
| | Near Term<br>(Market data is available) | Long Term<br>(No market data available) |
| **Distribution electric or natural gas utility** | **Current forward market prices of energy and capacity** | **Long-term forecast of market prices of energy and capacity** |
| **Electric vertically-integrated utility** | **Current forward market prices of energy and capacity**<br>***or***<br>**Expected production cost of electricity and value of deferring generation projects** | **Long-term forecast of market prices of energy and capacity**<br>***or***<br>**Expected production cost of electricity and value of deferring generation projects** |

# Generation Marginal Cost Forecast

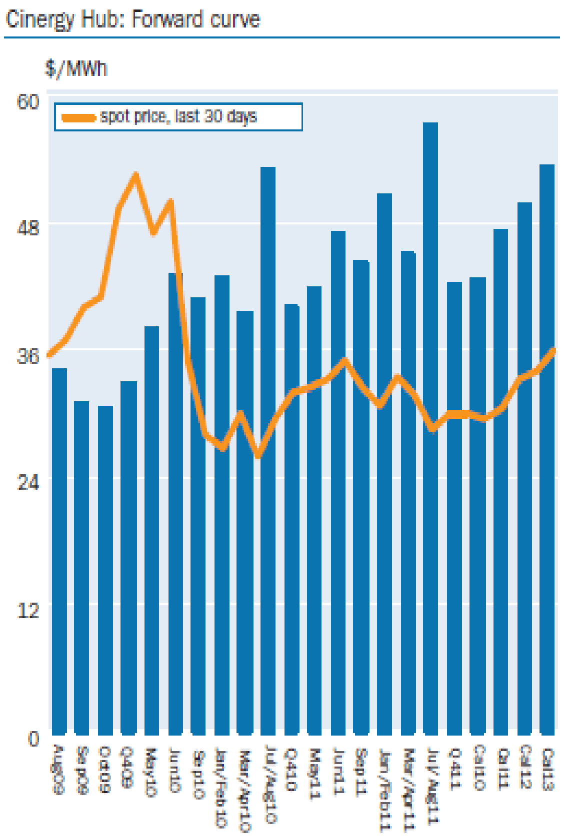


# Market Data Available

## Hourly Day-ahead Market Prices MISO and PJM

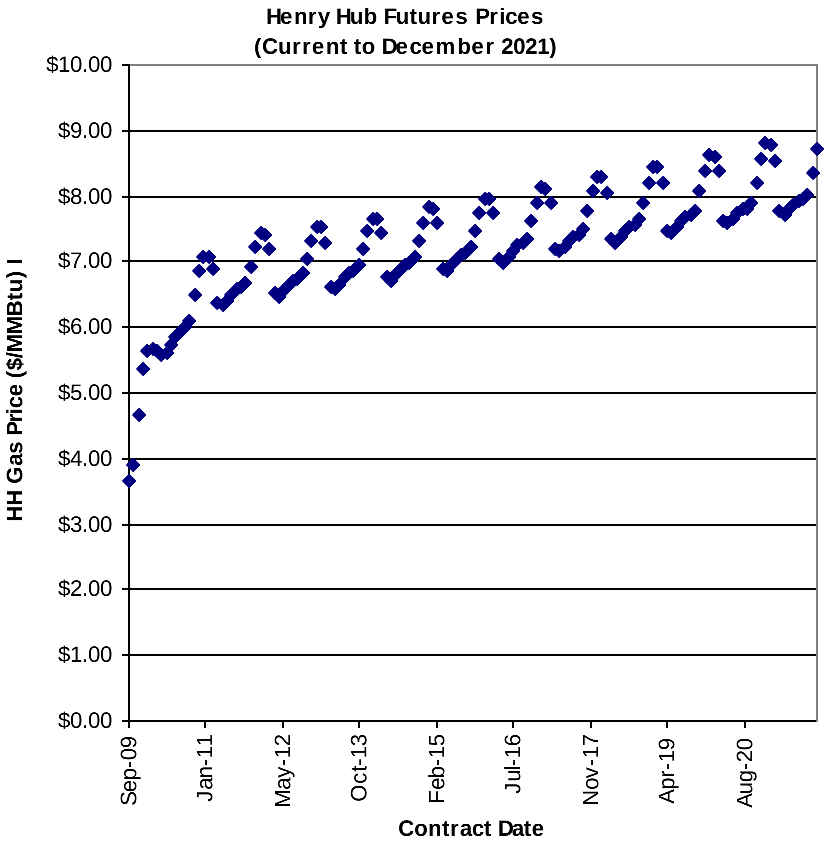



## Long-term Forward Curve



# Natural Gas Price Data

- **Natural Gas Combined Cycle powerplan most common long-run proxy**
- **Varying degrees of linkage to utility-specific resource plans or market data**
- **For Natural Gas Combined Cycle, gas price sum of;**
  - **Henry Hub Futures**
  - **Basis Differential to nearest gas market hub**
  - **Delivery cost to electric generation customers**




**from nymex.com 8/3/2009**

# Available Forecasts

- **Publicly Available Forecasts**
  - **Department of Energy EIA**
    - **Annual Energy Outlook has most comprehensive set of long-run forecasts by region for the US**
  - **State Energy Offices**
    - **May produce a forecast of natural gas prices based on specific local market, storage, and supply**
- **Non-public Forecasts**
  - **Each utility with market operations typically would maintain a proprietary forward curve**

# Generation Capacity Value

- **Near term, use capacity market prices**
  - **PJM has established market, MISO developing**
- **Long term, use established CONE methodology**

**Net Capacity Value = Cost of New Entrant – Margin**

**Table 1: CONE Areas used for LDA VRR Curves**

| | CONE Area 1 | CONE Area 2 | CONE Area 3 |
|---|---|---|---|
| CONE: Levelized Revenue Requirement, $/MW-Year | $122,040 | $112,868 | $115,479 |
| Historic (2006-2008) Net Energy Offset, $/MW-Year for the Zone in the CONE Area Specified | $47,275 | $50,417 | $8,842 |
| Ancillary Services Offset, $/MW-Year per Tariff | $2,199 | $2,199 | $2,199 |
| Area used for E&AS Calculation | AE zonal LMP | BGE zonal LMP | ComEd zonal LMP |
| **Net CONE, $/MW-Day, ICAP Price** | **$198.81** | **$165.07** | **$286.13** |
| **Net CONE, $/MW-Day, UCAP Price** | **$212.50** | **$176.44** | **$305.83** |

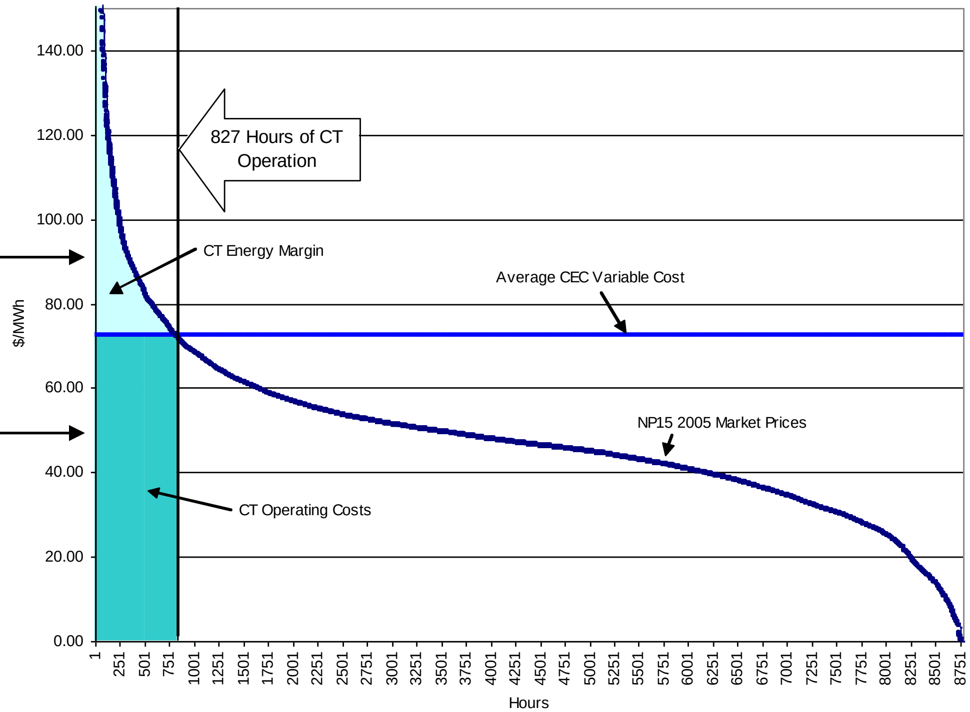
**PJM 2012-2013 Net Cone Calculation: see http://www.pjm.com/markets-and-operations/rpm/~/media/markets-ops/rpm/rpm-auction-info/2012-2013-net-cone-calculation.ashx**

# Hourly Costs Already Reflect Market Prices for Various Generator Types

- **Generators that operate few hours (like peakers) will have relatively high average market prices.**
- **Baseload plants will have relatively low average market prices, as they will be operating when marginal costs are lowest,.**

Peaker Average

Baseload Average



# T&D Capacity Value

- **Forward Estimate of Marginal Avoided Cost**
  - **Based on T&D Capital Expansion Plan**
  - **Can capture the block nature of major new transmission projects**
- **Proxy from Transmission and Distribution Tariff**
  - **Based on historical data, averages costs that may not be avoidable**

## Example of Forward-looking T&D Value

| Example Marginal Distribution Capacity Cost (MDCC) Calculation | | | |
|---|---|---|---|
| A | Net Present Value Distribution Growth-related Capital Expenditures (1) | $100 | Million |
| B | Horizon for Net Present Value | 5 | Years |
| C | Forecast Inflation | 2% | |
| D | Post-tax Weighted Average Cost of Capital | 8% | |
| E | Average Load Growth per Year | 50 | MW |
| F | MDCC ($/kW)<br>MDCC = A * (1 - (1+C)/(1+D))/E * 1000 | $111 | $/kW |
| G | MDCC ($/kW-year) (2) | $27.83 | $/kW-year |

(1) This should include only those distribution capacity investments necessary due to load growth. Costs for new customer connections should not be included. Additional transformers or new substations in areas with service should be included. Typically land costs are also excluded.

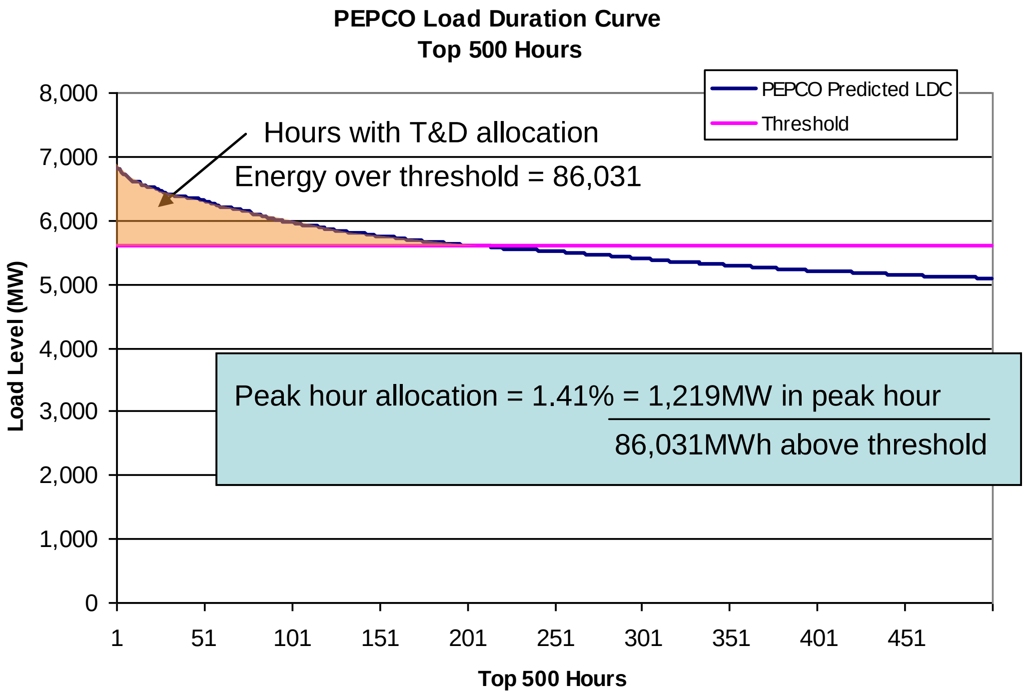
(2) The annualized MDCC is the total MDCC ($/kW) levelized over the horizon used to collect the capital expenditures (from B).

# Allocation of Capacity Costs to Hours or Time Periods

- Generation
  - Simple
    - assign to peak load period – summer peak
  - More Complex
    - Assign to top X hours (100 or 200) in inverse proportion to system reserve margin
  - Simulate
    - Use relative Loss of Load Probabilities by hour – not readily available
- Transmission and Distribution
  - Simple
    - Assign to peak load period – summer peak
  - More Complex
    - Use Peak Capacity Allocation Factor method – similar to reserve margin concept
  - Engineering Assessment
    - Engineering group identifies necessary loads by hours to reduce peak, allocates costs

# T&D Allocation with PCAFs

- **Approach to develop hourly allocations of capacity value**
- **Based on hourly load data**
- **Approach**
  - **Set threshold that engineers worry stress the system**
  - **Allocate hours as the load over threshold divided by total at risk energy**
- **Can be summarized into time periods after completion**

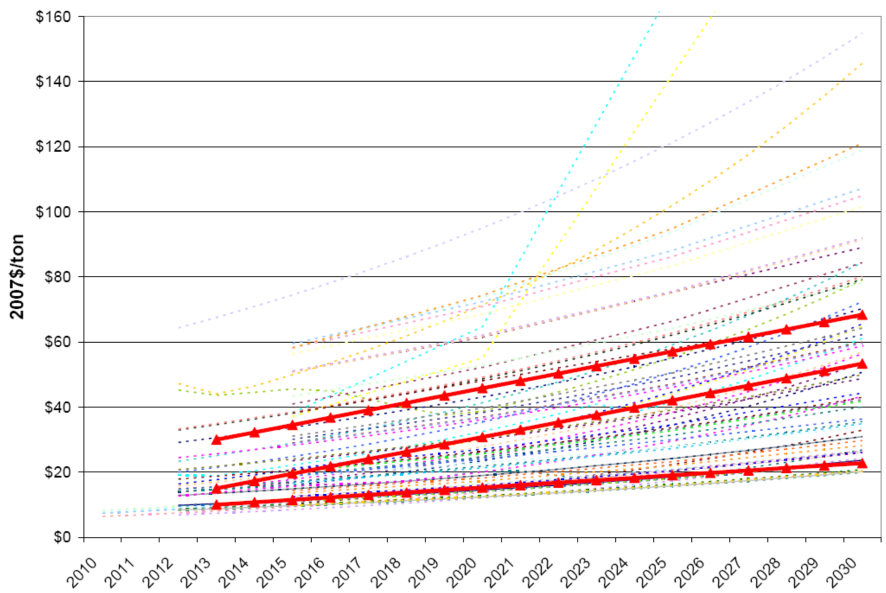


# $CO_2$ Prices and Emissions Rates

- **Two parts to the equation**
  - **Marginal emissions rate depends on generation type and heat rate**
  - **Value of reduced $CO_2$ emissions depends on expectations of future market for $CO_2$, and forecast**
- **Variation state to state on whether $CO_2$ is an 'externality' or should be included in the TRC**

**Example meta-analysis of $CO_2$ prices**

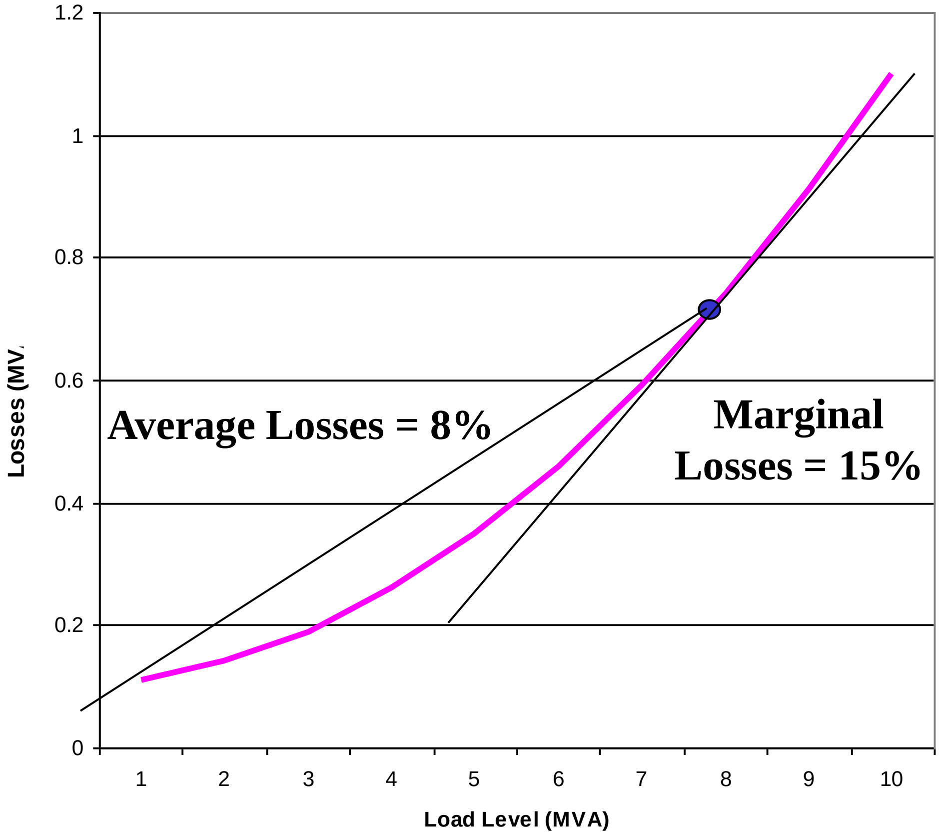
**Figure 4: Synapse 2008 $CO_2$ Price Forecasts vs. Results of Modeling Analyses Major Bills in Current U.S. Congress – Annual $CO_2$ Prices (in 2007 dollars)**



# Energy Losses

- Losses should be applied for both energy and capacity savings
- Average losses are typically used in ratemaking for recovery of losses
- Marginal losses measure the change in losses due to change in load
  - Approximately 2x average losses
- ‘Average Marginal’ losses are typical – the average of the marginal loss savings over a period of time

**Example of Losses as Function of Load**



# 6. Specific Considerations in Ohio

# Transparency

# Cost-Effectiveness Has Many Details

- **How to keep them straight?**
- **How to factor in public interest considerations?**
- **How to resolve disagreements?**
- **How to account for inevitable changes?**
- **How to maintain confidence?**

- **Stated method approved by a commission to calculate avoided cost**
- **Guidance on energy savings from electric substitutes (natural gas, fuel, oil propane, etc.)**
- **Directions on using discount rate**
- **TRC thresholds, especially if < 1**
  - **DC allows certain programs at 0.8**
  - **What does not count in calculations but gets reported and may influence decisions**
- **Collaborative or other process to discuss anomalies and new information**

# The Distinct Perspectives Regarding Energy Efficiency of Industrial Customers and Ratepayers

# Industrial Customer Perspective

- **Industrial customers need to be competitive**
- **Energy efficiency helps industrial customers be more competitive by lowering production costs and also by inspiring process improvements that can raise quality**
- **Energy efficiency projects compete with other projects for limited capital**
- **Winning projects often have payback periods of 24 or even 18 months**
- **These are projects a motivated industrial customer will do and define as "all cost-effective"**

# Ratepayer Perspective

- Ratepayers have a different perspective
- Ratepayers want to avoid more expensive new resources
- Total Resource Cost reveals programs that are cost-effective for ratepayers and for society
- Programs and measures with participant paybacks of 5, or even 7 years without incentives (incentives create acceptable payback) will screen
- Industrial customers will not do these on their own, but they will if given an offer as part of an energy efficiency program

- **In that event, the participant wins**
  - **Gets a capital infusion for plant or process improvement that now meets internal budget screen**
  - **Lowers operating costs and improves quality**
- **And the ratepayer wins**
  - **Gets more cost-effective energy efficiency deployed to avoid more expensive choices**
- **Promoting industrial customer participation in energy efficiency programs is in the public interest**

# Evaluation of
# Market Transformation Programs

# Savings and Transformation

- Different categories of programs
- Savings: get savings now, count them now
  - Opportunities
  - Create opportunities
- Transformation: get savings later
  - Create awareness, knowledge, training
  - Create, strengthen supply chains, support

# Overseeing Market Transformation

- **If Market Transformation is useful…**
  - **How to screen in the B/C test process?**
  - **How to make savings count in EERS?**

# Market Transformation Puzzler

- **The case of Business As Usual lagging Building Energy Codes**
- **What happens if standard construction practices do not produce code-compliant buildings?**
  - **Survey would reveal current status**
- **Programs could assume code-compliance and just offer opportunities to be more efficient (and just count those incremental savings**
- **Has this approach addressed barriers to energy efficiency effectively?**

# Code Remediation

- **A market transformation program could be a plan to address lagging building design and construction performance**
  - **Noting that code enforcement is generally lax or even absent**
- **Program could focus on training of <u>architects</u>, <u>engineers</u>, <u>builders</u>, <u>suppliers</u> and <u>customers</u> and be time-limited to bring a very high percentage of new construction (what about existing buildings?) up to code within that time**

# Screening MT Programs

- **One approach**
  - **Decide on a plan for market transformation – it looks like a business plan, and should address clearly described barriers to energy efficiency**
  - **Do not bother to screen the MT programs**
  - **Screen the portfolio including all costs with no savings**

# Screening MT Programs

- Another approach
  - Decide on a plan for market transformation
  - Forecast savings from MT based on marketing studies and other data
  - Screen the MT programs
  - Screen the portfolio including all costs and forecasted savings
- Consider including forecasted savings in EERS when programs are evaluated (evaluation of MT is about process, not counting current savings)

# Exceptions

- **For some Market Transformation programs, counting savings can be rather straight-forward**
  - **Energy Star appliances (i.e. clothes washers)**
    - **Distributed over a population of customers**
    - **Penetration is measured in market areas (states: yes, utilities:?)**
    - **Delta penetration equals savings, but must avoid double counting with spillover from targeted programs (program goal: increase penetration of new Energy Star clothes washers from 20% to 30%)**