

# The Utility of the 21<sup>st</sup> Century and Resolving the Throughput Incentive

A Discussion with the New Hampshire Electric Cooperative

Board of Trustees

February 23, 2010

Richard Sedano



*The Regulatory Assistance Project*

Offices: Vermont ♦ Maine ♦ New Mexico ♦ California ♦ Illinois ♦ China ♦ Belgium ♦  
India



# About the Regulatory Assistance Project

---

- RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP Principals all have extensive utility regulatory experience.
  - Richard Sedano was commissioner of the Vermont Department of Public Service from 1991-2001 and is an engineer.
- Funded by foundations and the US Department Of Energy. We have worked in nearly every state and many nations.
- Also provides educational assistance to stakeholders, utilities, advocates.



# Outline

---

- Why I Think I Am Here
- Why the Throughput Incentive Is A Chronic Problem
- Why Decoupling is a Good Solution
- Discussion with You



# Redoubling Efforts on Clean Energy

---

## ➤ Strategic

- New Capacity expensive
- Fuel Price is volatile, trending up
- T&D Facilities can be avoided
- Future Regulation likely to be more  
constraining on supply and environmental  
quality



# Redoubling Efforts on Clean Energy

---

## ➤ Popular

- Interest in doing right by our environment
- Local jobs
- Service to buildings in the territory makes territory more efficient, competitive

## ➤ Always balancing **long run value** and short run investment cost – balance tipping toward former



# Programs Address

## Market Barriers to Efficiency

- Awareness
- Information
- Motivation
- Split Incentive
- Access
- First Cost, Savings
- Total Cost
- Constrained by how much money is available to spend
- Constrained by utility tolerance for revenue erosion from sales attrition
- Limited by unvalued utility system attributes

**Lost opportunities for cost-effective energy efficiency lead to more expensive supply and EE, but the bill comes later.**



# Redoubling Effort Means New Program Emphases

---

Program Emphasis of most energy efficiency program administrators:



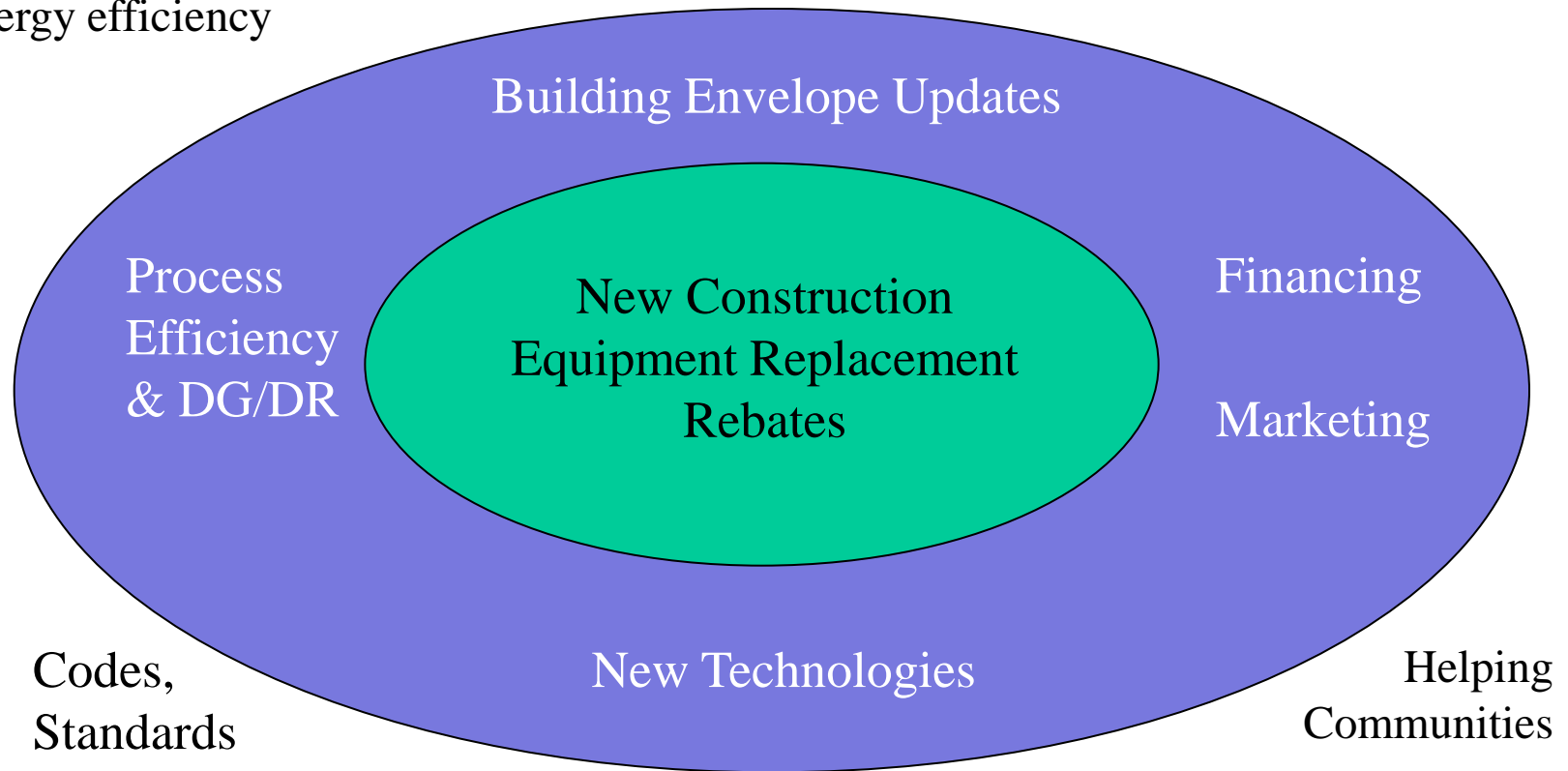
New Construction  
Equipment replacement  
Rebates



# Redoubling Effort Means New Program Emphases

---

All cost-effective  
energy efficiency





# Implications for Program Administrators

---

- Benefit Cost Ratios going down
  - Cost effective programs that did not make the cut before due to limited funds are a “go”
- Cost per saved MWh going up
  - More costly savings drive up average
- Saved MWhs going up
  - In some cases, sales trend goes negative
  - MA setting the new standard: 2.4% savings/sales



# Implications for Customers and Markets

---

- More awareness of energy efficiency in transactions, investments, designs
  - Bills going down for participating customers
  - Trade allies increasingly are program ambassadors
  - Customer sited generation too: **systems**
- Value added services
- Customers see utility avoiding capacity
- Rates higher by 1-4% in near term



# Implications for Utility CFO

---

- Uh oh!!!!
- Fixed cost coverage at risk
- Slack gone from cash flow produced by rate > short run marginal cost relationship
- Rate case frequency increases to keep up with reconciliation, especially if rate changes take a long time
- Is energy efficiency bad news???



# Throughput Incentive: A Chronic Problem

---

- Imperative to cover fixed costs
  - Including TIER or ROE requirements
- Assure reliability and service performance
  - No self-defeating cost-cutting
- Distribution-only utility more exposed than an integrated utility

**Table 1: Lost Profits Math: Impacts of Efficiency on Utility Profits**

|     |                                            | Vertically Integrated Utility | Distribution-Only Utility |
|-----|--------------------------------------------|-------------------------------|---------------------------|
| (a) | Average Retail Rate/kWh                    | \$0.08                        | \$0.04                    |
| (b) | Annual Sales, kWh                          | 1,776,000,000                 | 1,776,000,000             |
| (c) | Annual Revenues, (a) * (b)                 | \$142,080,000                 | \$71,040,000              |
| (d) | Rate Base                                  | \$284,000,000                 | \$113,600,000             |
| (e) | Authorized Rate of Return on Equity        | 11.00%                        | 11.00%                    |
| (f) | Debt/Equity Ratio                          | 50.00%                        | 50.00%                    |
| (g) | Net income, (d) * (e) * (f)                | \$15,620,000                  | \$6,248,000               |
| (h) | % Reduction in Sales                       | 5%                            | 5%                        |
| (i) | Reduction in kWh Sales, 0.05 * (b)         | 88,800,000                    | 88,800,000                |
| (j) | Associated Revenue Reduction               | \$7,104,000                   | \$3,552,000               |
| (k) | Average Power Cost/kWh                     | \$0.04                        | na                        |
| (l) | Power Cost Savings from Reduction in Sales | \$3,552,000                   | na                        |
| (m) | Net Revenue Loss after Power Cost Savings  | \$3,552,000                   | \$3,552,000               |
| (n) | Reduction in Net Income, (m)/(g)           | (22.74%)                      | (56.85%)                  |

*From  
Efficient  
Reliability,  
June 2001*

<<<<<



# Decoupling: Advantages to Solving Throughput Incentive

---

- Assure coverage of fixed costs
  - Take fixed cost previously found to be “just and reasonable”
  - Adjust for significant cost category drivers into future
    - Adjustment can be by pre-determined amount or based on a formula
  - Reconcile rates to cover fixed costs



# Decoupling: Advantages to Solving Throughput Incentive

---

- Consumer Incentives Aligned with Efficiency Value
  - Marginal rates consumers pay reflect marginal (new) resources which would be needed if consumers use more
  - Rate design remains fully available to deliver more sophisticated price signals via smart grid



# Decoupling

---

- Addresses both the utility problem of revenue erosion against fixed costs, and
- The consumer problem of receiving proper price signal to react to



# An Aside about Dynamic Prices

---

- Dynamic prices are designed to deliver to customers important information about the marginal cost of their consumption
  - These signals can be blurred by considerations associated with utility fixed cost recovery
    - Trying to address utility fixed coverage while also making market signals to customers risks making one, the other, or both ineffective



# Problem with Straight Fixed Variable Rate Design

---

- Straight fixed variable rate design drives marginal price (rate) below marginal cost, distorting customer choice on energy efficiency
  - Because the objective is to be sure that the utility recovers EMBEDDED fixed costs in the customer charge – price signal is not the point
  - If customers revolt over customer charge being too high, and the transition to SFV is incomplete, result still leaves throughput incentive in place

# Compare:

Avg Bill: \$55, Avg Use: 500 kWh/mo.

## Traditional Rate Design

- $\$5/\text{month} + \$0.10/\text{kWh} = \$55/\text{month}$
- \$5.00 is ~ equal to per-customer metering and billing costs.
- \$.10 recovers the balance of the embedded revenue requirement, and is ~ equal to total system long-run incremental cost (TSLRIC) for power, transmission, delivery, and carbon

## Straight Fixed Variable

- $\$30/\text{month} + \$0.050/\text{kWh} = \$55/\text{month}$
- \$30.00 is ~ covers the Embedded "fixed" costs.
- \$.05 is ~ equal to short-run marginal cost for power and line losses, with no assumed variable cost for transmission or delivery, and no monetized price for carbon.



# Consumer Respond (A little? A lot?) to Prices

---

- Elasticity of  $-0.1$  seems like a modest assumption (some suggest higher numbers)
  - Increasing the volumetric price from 5 cents to 10 cents (+100%) would produce a 10% decrease in sales
  - Leaving prices at 5 cents foregoes this consumer preference-driven reduction
- Theoretical elasticity, but illustrative of something intuitive: charge less, use more



# Consumer Respond (A little? A lot?) to Prices

---

- Plus, the consumer value from energy efficiency is significantly affected.
- Consumers need to save money from energy efficiency



# How Decoupling Works

---

- Cost of service as usual
  - Project, or include adjustment factor for significant cost changes, this is new
    - i.e. # of accounts, adjustor for increased per account use – ministerial; capital budget – more complicated to do outside a general cost of service investigation
- Periodically reconcile rates as actual revenues deviate from projection or formula
  - To collect appropriate revenue



# Regulatory Efficiency

---


- Why have a rate investigation when underlying costs don't change much or are changing in predictable ways?
  - If the only reason to change rates is because sales are down due to energy efficiency (or changed up or down for some other reason) why not ministerially adjust rates to reset revenues?
  - Are rates too sacred?



# Where Decoupling Shines

---

- Cost drivers are known with confidence
  - Built on quality cost of service
- When priorities of key stakeholders are clear and reflected in the plan
- When power costs are excluded



# Where Decoupling Seems to Fail

---

- When significant underlying costs changes need to be dealt with during the plan
  - Coop can reopen its plan if it wants to
- When applied to power costs – too volatile
- When significant sales decline from a recession occurs (rate change would happen anyway, but decoupling makes rate adjustment easier)

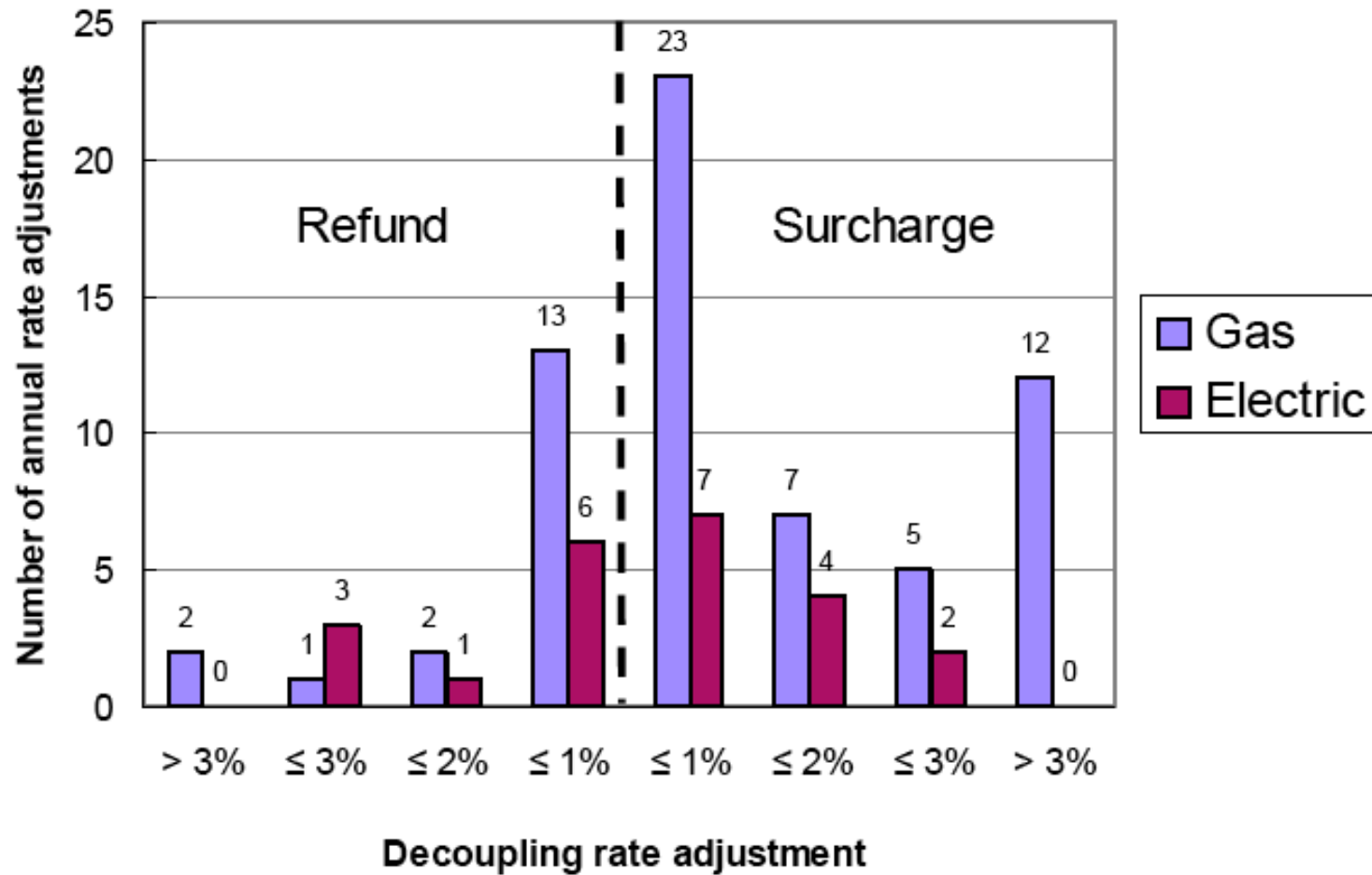


# Decoupling Features


---

- Apply by customer class
  - Or leave out industrials if class is just too small
- Cap rate changes
  - Defer balances until they can be reconciled within the cap
- Reconcile monthly or quarterly
- Dead band – don't bother reconciling unless deviation exceeds a significant amount

The figure below summarizes the distribution of decoupling adjustments in place since 2000.



*Rate Impacts and Key Design Elements of Gas and Electric Utility Decoupling: A Comprehensive Review by Pamela Lesh June 2009*



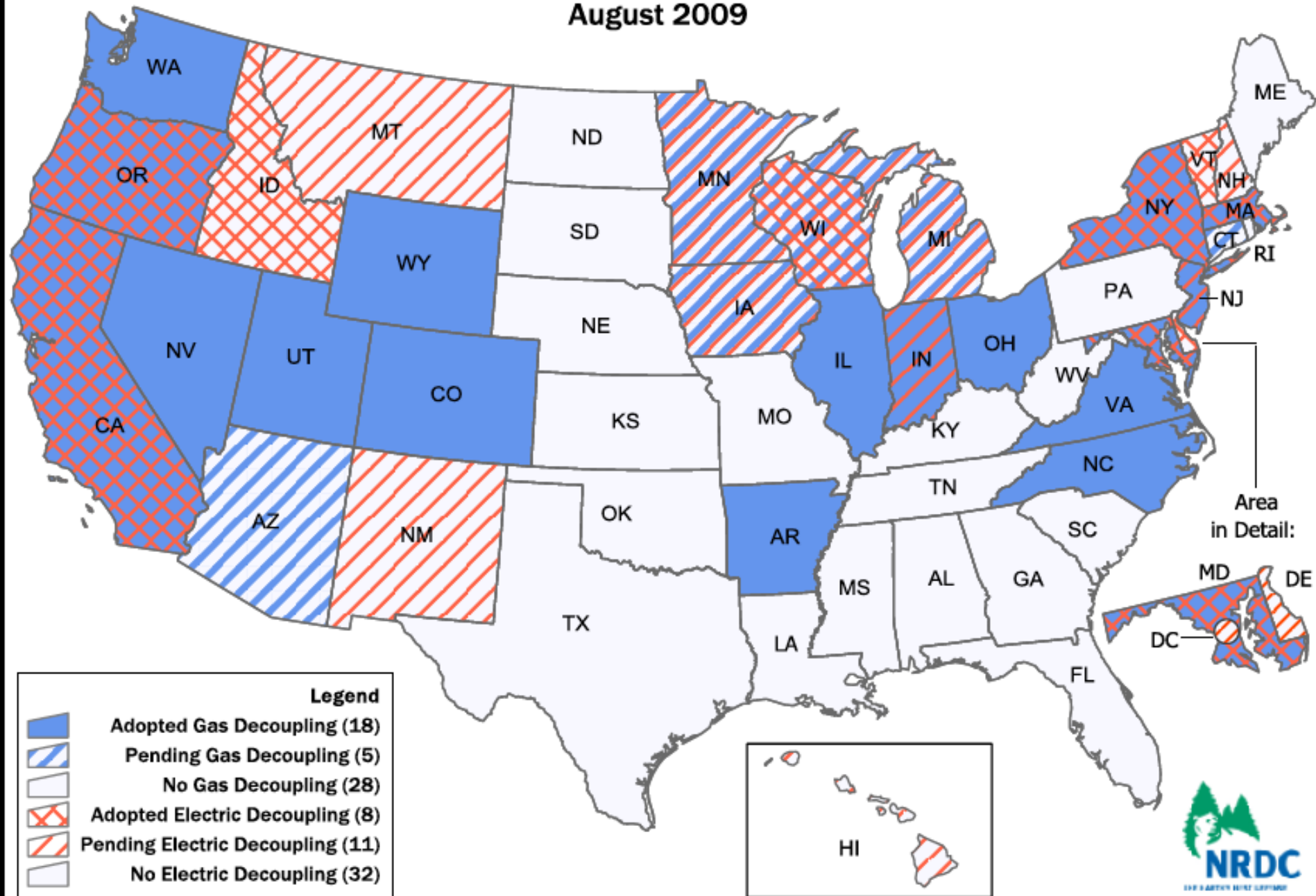
# States with Decoupling in Place for Electric IOUs

---

- Vermont
- Massachusetts
- Minnesota
- California
- Maryland
- Wisconsin
- Oregon
- New York
- Michigan
- Pending
  - Connecticut
  - Idaho
  - Washington
  - Others in varying states of discussion

# Gas and Electric Decoupling in the US

August 2009





# Decoupling and Co-ops

---

- Since most co-ops can change rates without asking for state regulatory approval, or waiting for external approval,
  - Rates can be reconciled at will, is decoupling useful for a self-regulated co-op?
- NHEC is distribution only, yet is also providing significant share of default service for its delivery customers
  - Is NHEC interested in total consumer bill?



# Core Question:

---

- When considering cost-effective energy efficiency (or DR/DG)
  - Does management hesitate out of concern for fixed cost coverage?
- If so, the throughput incentive is operating and serving potentially to discourage robust energy efficiency programs
- Decoupling can remove the reason for this hesitation while preserving sound prices



# Utility of the Future

---

- Service oriented
- Reliability as important as ever
- Risk awareness
  - Probably managing to environmental limits
    - Supply de-carbonizing over time
- Throughput will cost more to consumers
  - So service means helping consumers manage costs, like promoting energy efficiency options



# A Strong Buildings Energy Efficiency Program Will Have:

---

- High level, enduring **policy commitment**
- **“Whole buildings”** approach
- **Customer focus**
- **Sufficient & stable funding**
- Motivated and capable **“Efficiency Program Manager”** with performance incentives
- Tapped and expanded **competitive markets** for product and service delivery



# Thanks for your attention

---

- [rapsedano@aol.com](mailto:rapsedano@aol.com)
- <http://www.raponline.org>
- RAP Mission: *RAP is committed to fostering regulatory policies for the electric industry that encourage economic efficiency, protect environmental quality, assure system reliability, and allocate system benefits fairly to all customers.*