

Energy Efficiency for Natural Gas Utilities in Nebraska

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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 US Department Of Energy & Environmental Protection Agency, foundations, and international agencies. We have worked in nearly every state and 16 nations.
- Also provides educational assistance to stakeholders, utilities, advocates.



Reduced Gas Sales Caused by:

- Energy efficiency programs
- Sales attrition

Both are of interest to regulators to assure a reasonable standard of economic service delivery for natural gas customers



Energy Efficiency: Attrition and Programs

- Attrition occurring naturally in the market
 - Good news: furnaces are more efficient!
- More cost effective energy efficiency likely available
 - Deliver through programs
- Regulatory issues around revenues covering fixed costs need attention (decoupling discussed later), incentives matter



Today's Program

- Energy Efficiency Programs: some details from a selection of states
- Cost recovery options for energy efficiency costs
- Decoupling methods
- Discussion welcome at any time



Envisioning Energy Efficiency Programs



Iowa Utilities Board 2008 report on energy efficiency

- Natural gas energy efficiency programs of IOUs produce significant savings.
- Most comes from residential customers of IOUs who participated in programs to install new furnaces, increase home insulation and weatherization, and improve efficiency of water heating. In contrast to electric energy efficiency, residential customers have been the source of a large percentage of the total natural gas savings and this proportion has increased in recent years.



Terms

- Measure – specific change in the end use
- Program – all the elements that lead to a measure or group of measures to be installed
- Portfolio – the group of programs that make up the utility energy efficiency enterprise



Data:

Iowa Programs

- Iowa Natural Gas Energy Efficiency savings for residential customers doubled from 2000 through 2006
- While C&I customer savings have been volatile around a level trend
- By 2006, energy efficiency reduced total Iowa residential consumption of natural gas by nearly **11%**
- In 2006, natural gas IOUs spent over \$31 million on energy efficiency
- In 2006, Residential customers spent over **3.5% of revenues** on EE, C&I nearly 1%



Vermont Gas Systems Roster of EE Programs

➤ Residential

- Retrofit
- New construction
(Energy Star)
- Equipment
replacement
- Contractors

➤ C&I

- New construction
- Equipment
replacement and
retrofit
- Custom

Audits are available for all customers



Typical VGS residential retrofit deal

- Rebate one-third of installed cost
 - Balance financed through reduced interest loan
 - 0% for 3 years
 - 2% for 5 years
 - 4% for 7 years
 - **Low income customers** served through Weatherization Program network
- Utility is not the bank.
Socially responsible
institution with necessary
credit counseling skills

Equipment Replacement Program

Thank you for your interest in the Equipment Replacement program. Vermont Gas provides the following rebates to qualifying residential customers:

Eligible Equipment (must be purch'd. new)	Required Efficiency (as listed in GAMA)	Rebate
Hot Air Furnace	90% to 92% AFUE	\$100.00
Hot Air Furnace	92.1% to 93.9% AFUE	\$300.00
Hot Air Furnace	94%+ AFUE	\$400.00
Hot Water Boiler	87% to 91.9% AFUE	\$400.00
Hot Water Boiler with outdoor temp. reset	92%+ AFUE	\$600.00
Steam Boiler	82%+ AFUE	\$150.00
Water Heater	.62+ EF	\$100.00
Indirect-fired hot water storage tank	Heated by an 87%+ AFUE boiler	\$100.00
Tankless Water Heater	.80+ EF	\$100.00
Drain Water Heat recovery		\$200.00

From the VGS website



Typical C&I services

- Review of building plans, and as needed, engineering analysis of potentially cost-effective natural gas saving measures.
- Energy efficient equipment information, lists of manufacturers and improved construction techniques and building materials.
- Technical assistance for permits for applicants who have chosen natural gas as a fuel source.
- Financial incentives for certain applications.
- Energy code information.
- Utility and energy efficiency contacts of organizations that may provide additional assistance.



C&I Equipment Rebates for

- Unit heaters
- Furnaces
- Hot Water Boilers
- Steam Boilers
- Modulating Burners
- Pool Heaters
- Domestic Hot Water Heaters
- Venturi Steam Traps
- Kitchen Exhaust Hoods
- Air to Air Heat Recovery Equipment
- Waste Heat Recovery Equipment
- Heat Exchangers

National Grid

ENERGY STAR® Clock Thermostat Program

Maximize your energy savings without sacrificing your comfort by installing an ENERGY STAR® Clock Thermostat.

You can save approximately five to fifteen percent a year on your heating bill by turning your thermostat back ten to fifteen degrees for eight hours a day. But don't wake up or come home to cooler temperatures for savings. Maximize your energy savings without sacrificing your comfort by installing an ENERGY STAR® Clock Thermostat. By maintaining the highest or lowest required temperatures for four or five hours a day instead of 24 hours, a programmable thermostat can pay for itself in energy savings within four years.

Receive Up To \$50 In Rebates!

Currently, National Grid customers can qualify for a \$25 rebate for each ENERGY STAR® Clock Thermostat installed. Up to two thermostats per account with a maximum rebate of \$50 is allowed. Thermostats can be installed through energy conservation auditors, heating and cooling contractors or you can do it yourself.

http://www2.nationalgridus.com/pshome/energy/saving_ny_kedny.jsp



Program Goals

- Program designs include
 - anticipated customers touched,
 - anticipated measures installed,
 - savings per measure and
 - an estimate for overall savings
- Program management reveals that reality is often different, so management and oversight should be ready for adjustments



What's in a program?

➤ Description

- End use, Target market, barriers to be addressed

➤ Management and Implementation Strategies

- What will you do, and then what will you do when contingencies arise?

➤ Structure (applies to all programs over time)

- Cost effectiveness, Program tracking, QA, EM&V, reporting



Customer Financial Incentives in Programs

- Incentives make the difference for many participants
 - Yes, there are some “free riders”
 - But others do other efficient things on their own
- Non-participants have been known to resent paying for incentives given to participants
- Program is cost effective even with the cost of the incentive
 - This means ALL customers are better off



Market Transformation

- An investment
 - In trade allies
 - In customer awareness
- Hard to measure results in most cases
 - You can measure market share for Energy Star appliance
 - But how to measure effect of improved methods by architects?



Collaboration, Talking, Whatever

- Energy efficiency relies on most random element in utility regulation: customers
 - Changing technology, standards also confounding
- States have found value in maintaining communication structure to avoid surprises and to make timely changes to programs and portfolios



Some policy issues

- Class emphasis of programs: across the board, or heavy on residential
- Measure market transformation savings?
- Benefit cost test(s)
 - Screening for low income programs
- Decoupling and utility performance incentives



Stimulus Package: Opportunities and Challenges

- Formula-based funds for energy efficiency
- Additional funds based on ?? (performance)
- Many states will be challenged to develop an infrastructure and work force to use this money effectively
- Programs should be in place fast to deliver EE services to specified targets (low income, public and institutional buildings)



National Action Plan for Energy Efficiency

- Ideas
- Tools
- Mentors
- Look also to ACEEE Exemplary Programs



Cost Recovery



EE Cost Recovery

- Covered in rates, along with all other costs of service
- Or funded through a separate, “system benefits” charge on customers bills
 - Drawback: SBC suggests EE is unlike other resources. A political target.
- Rate and bill impacts
 - EE has rate and bill impacts, as do pipelines and other supply investments, but they’re not the same
 - There’s a mismatch between expensing EE and rate-basing pipeline
 - The rate and bill impacts over the long term must be compared, before a judgment can be made: cost-effective EE reduces bills
 - **Remember: Compared to what?**



Expense or Capitalize?

Expense

- No regulatory asset
- No return on unamortized balance
- No accounting confusion about what is capitalized and what is expensed
- Full amount in rates
- Rider can true up if actuals deviate a bit from planned expense rate

Capitalize

- Treated like capital asset substitute (if avoided cost includes a component of capital) – consistent with IRP
- Lower rate impact in early years
- Can choose any amortization period up to life of measure



Keep Scale in Mind

- Higher spending states are at ~3% of revenues for energy efficiency
 - Saves capacity costs due to accumulated peak day savings – sustained long term benefit
 - Degree varies depending on utility excess capacity
 - Protects consumers and economy from larger effects of volatile commodity prices



Competitive Issues

- In some states, natural gas alternatives are available and some (many?) customers can switch back and forth
- Where energy efficiency is offered,
 - Some are concerned that it is a price disadvantage compared with alternatives
 - Others see energy efficiency as a service advantage and bill stabilizer that other alternatives do not offer



Decoupling



Incentives Matter

➤ See: Wall Street





Traditional Regulatory Methods Provide Strong Disincentives for Customer-Sited Resources

- Utility revenues and profits are linked to unit sales (therms)
 - But, in the short run, a utility's non-commodity marginal costs are small relative to demand for gas
- Loss of sales between rate cases lowers utility revenues, while non-commodity costs don't change much, so net income is reduced
- Successful acquisition of customer-sited resources—energy efficiency and distributed generation / combined heat and power—becomes bad news, unless there are frequent rate cases
- *The effect may be quite powerful. . .*



How Changes in Sales Affect Earnings

% Change in Sales	Revenue Change		Impact on Earnings		
	Pre-tax	After-tax	Net Earnings	% Change	Actual ROE
5.00%	\$9,047,538	\$5,880,900	\$15,780,900	59.40%	17.53%
4.00%	\$7,238,031	\$4,704,720	\$14,604,720	47.52%	16.23%
3.00%	\$5,428,523	\$3,528,540	\$13,428,540	35.64%	14.92%
2.00%	\$3,619,015	\$2,352,360	\$12,252,360	23.76%	13.61%
1.00%	\$1,809,508	\$1,176,180	\$11,076,180	11.88%	12.31%
0.00%	\$0	\$0	\$9,900,000	0.00%	11.00%
-1.00%	-\$1,809,508	-\$1,176,180	\$8,723,820	-11.88%	9.69%
-2.00%	-\$3,619,015	-\$2,352,360	\$7,547,640	-23.76%	8.39%
-3.00%	-\$5,428,523	-\$3,528,540	\$6,371,460	-35.64%	7.08%
-4.00%	-\$7,238,031	-\$4,704,720	\$5,195,280	-47.52%	5.77%
-5.00%	-\$9,047,538	-\$5,880,900	\$4,019,100	-59.40%	4.47%



Least-Cost Service Should be the Most Profitable

- The “throughput” incentive is at odds with public policy to supply electric power services at the lowest total cost:
 - inhibits a company from supporting investment in and use of least-cost energy resources, when they are most efficient,
 - encourages the company to promote incremental sales, even when they are wasteful
- Ratemaking policy should align utilities’ profit motives with public policy goals: acquiring all cost-effective resources, whether supply or demand
- The utilities’ throughput incentive promotes inefficient outcomes, even where:
 - there is no programmatic energy efficiency; and
 - even with third-party administration of energy efficiency programs.



Regulatory Priorities

➤ Revenue Requirement

- The principal outcome from a rate case
- Support wires and pipes system over time

➤ Prices

- The outcome of revenue requirement and billing determinants
- Important to consumers, but in what ways?

➤ Energy Efficiency **New**



A Regulatory Model: Revenue-Sales Decoupling

- Breaks the mathematical link between sales volumes and revenues (and, ultimately, profits)
 - Makes revenue levels immune to changes in sales volumes
 - Fundamentally, it's a matter of enabling recovery of the utility's prudently incurred fixed costs, including return on investment, in a way that doesn't create perverse incentives for unwanted actions and outcomes
- Two objectives:
 - To protect the utility from the financial harm associated with least-cost actions and
 - To remove the utility's incentive to increase profits by increasing sales



A Regulatory Model: Revenue-Sales Decoupling

- Decoupling revenues, rather than earnings directly, preserves the utility's incentive to improve its operational and managerial efficiency
- This is a revenue issue, not a pricing issue: it is not intended to decouple customers bills from consumption
 - Unit-based consumption pricing approaches remain
 - Customers continue to see the cost implications of their consumption decisions, while the utility's risks associated with variations in sales due to efficiency are mitigated
 - Unit-based consumption pricing reflect the relationship between demand and cost causation in the long-run



Purpose of Decoupling

- Utility profits no longer linked to sales, but to operational efficiency
- A key barrier to least-cost energy service is removed



Design Goal

- Over time, utility revenues track what frequent rate cases would have produced
 - Note emphasis on revenues
 - Rates change from time to time to meet revenue sufficiency, the base was set in the last rate case



Suggested Alternatives to Decoupling

- Business as Usual
- Lost Revenue Adjustment Proceedings
- Straight Fixed Variable Rate Design



Lost Revenue Adjustment

Pros

- Clear focus on revenue effects of energy efficiency

Cons

- Strains EM&V process with contention
- Requires choice of avoided cost dataset
- Costly in dollars and regulatory time
- Utility always in a position of clawing back what is “lost”
- Broader effects on utility sales are not included




Straight Fixed Variable

Pros

- Set rates, no administration

Cons

- Raise bills to low use customers by large %
 - Damage value to customer of reduced energy use
 - Interfere with use of rates for “smart pricing”
 - Confuses short run and long run marginal costs, corrupts effect of price on long run investment
- 



Business as Usual

Pros

- Participants are used to it
- Consumer protections in place, such as they are, including stable price

Cons

- Throughput incentive in force and associated incentive conflicts
- Actual revenues inevitably diverge from rate case result
- Better opportunities for other innovations to promote public interest
- Rate cases needed more frequently



Revenue Decoupling: The Essential Concept

➤ Basic Revenue-Sales Decoupling

- Utility “base” revenue requirement determined with traditional rate case
- Each future period has a calculable “allowed” revenue requirement
- Differences between the allowed revenues and actual revenues are tracked
 - Variety of ways of tracking differences
- The difference (positive or negative) is flowed back to customers in a small adjustment to unit rates



Cost of Capital

- Decoupling takes variability out of utility revenues and coverage of fixed costs
 - Business risk is reduced compared with same utility in traditional regulation
 - Combine decoupling and rate case to value
- Wtd Avg cost of capital can be reduced by changing debt/equity ratio or ROE



Other important decoupling elements


- Formula to adjust revenue requirement?
- Full or partial decoupling
 - Adjust for weather or economic cycle?
- Limited true up or customer class
- True up interval (and accrual rate)
- Capping adjustments, dead bands
- Sharing earnings, dead bands



Oregon PUC Order 09-020

pg 27

“... PGE does have the ability to influence individual customers through direct contacts and referrals to the ETO. PGE is also able to affect usage in other ways, including how aggressively it pursues distributed generation and on-site solar installations; whether it supports improvements to building codes; or whether it provides timely, useful information to customers on energy efficiency programs. We expect energy efficiency and on-site power generation will have an increasing role in meeting energy needs, underscoring the need for appropriate incentives for PGE.”



Attrition, Energy Efficiency and Decoupling

- Decoupling can be a good policy response to any structural reduction in sales on a utility network with heavy short run fixed costs
- Natural gas companies facing attrition have proposed decoupling
 - Justification sometimes looks more self-interested than public interested



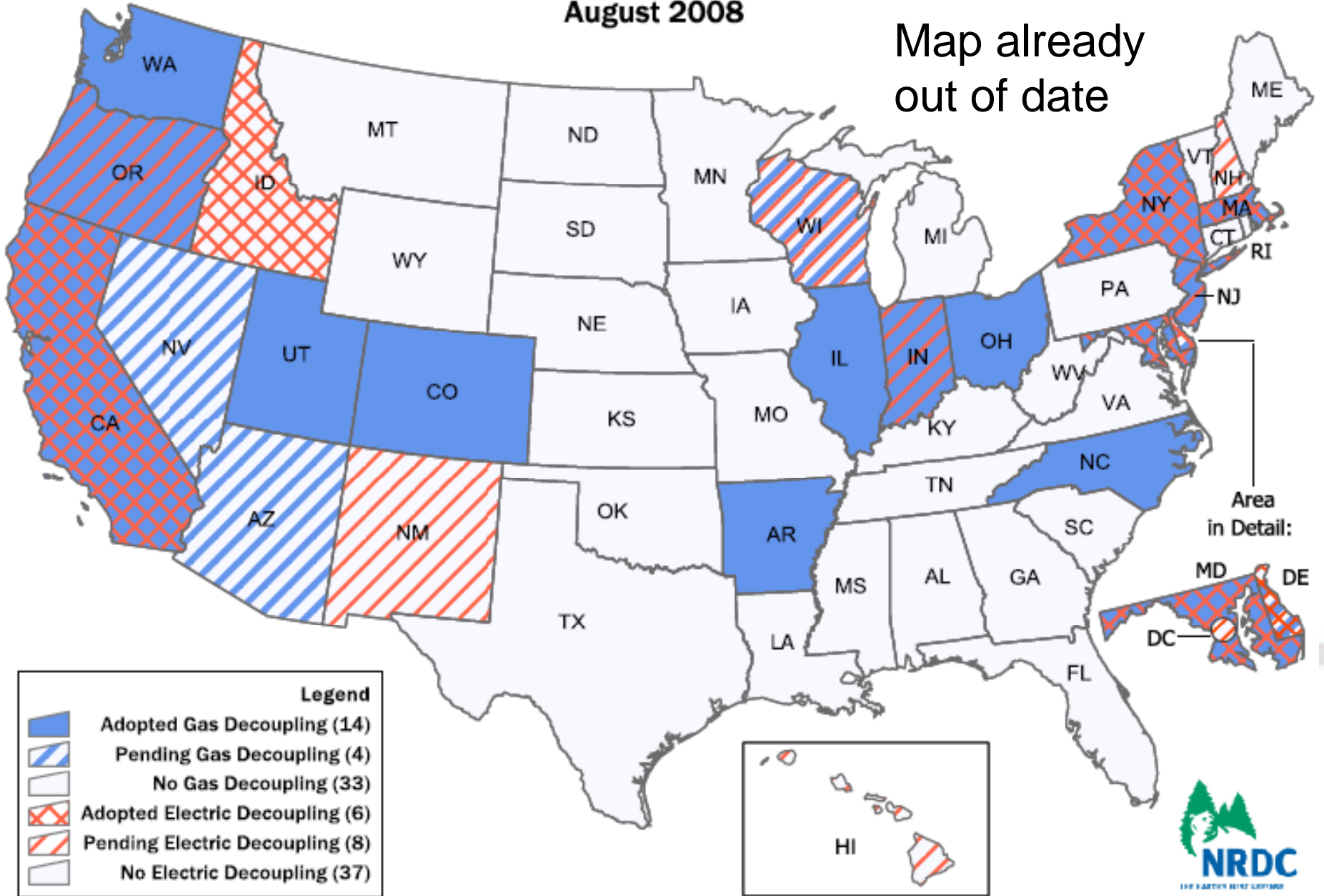
Attrition, Energy Efficiency and Decoupling

- Important for decoupling, as a departure from traditional regulation, create a clear public interest benefit
- This can be expressed as
 - Enthusiasm for developing efficiency and customer resources
 - Enhanced support of monopoly

Gas and Electric Decoupling in the US

August 2008

Map already out of date





Thanks for your attention

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