Decoupling Utility Profits From Sales

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The Regulatory Assistance Project

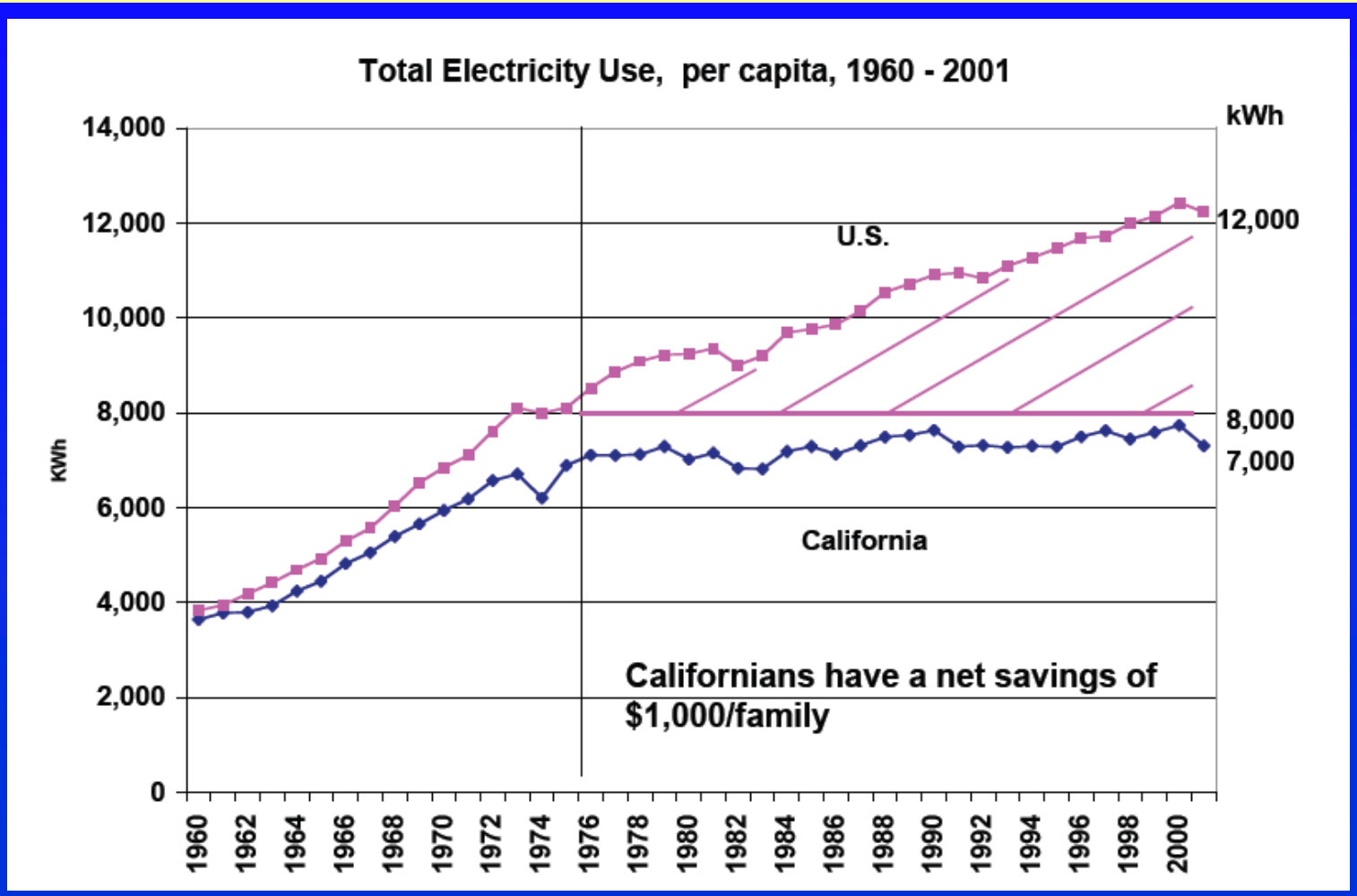
- RAP is a non-profit organization, formed in 1992, that provides workshops and education assistance to state government officials on electric utility regulation. RAP is funded by the Energy Foundation, US DOE and US EPA.
- RAP Mission:

  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
- RAP is an independent organization dedicated to the public interest and does not represent or consult for private interests or utilities

Attributes of Energy Efficiency

- More than 20 years of experience demonstrates energy efficiency is a very large and low cost resource.
- Energy efficiency is clean, cheap, and fast.
  - Reduces market prices for gas and electricity,
  - Reduces transmission congestion,
  - Reduces air and water pollution and
  - Improves reliability
- Energy efficiency is good for all except utilities

Value of Efficiency: California Experience



Source: Commissioner Art Rosenfeld, CEC

Traditional Regulation: The Throughput Problem

- Traditional ROR regulation sets *prices*, not *revenues*
  - The revenue requirement is simply an estimate of the total cost to provide service
- Without adjustment, consumption-based rates ($/kWh and $/kW) link profits to sales
  - The more kilowatt-hours a utility sells, the more money it makes
  - This is because, in most hours, the price of electricity is greater than the cost to produce it
    - *Utility makes money even when the additional usage is wasteful, and loses it even when the reduced sales are efficient*
- The profit incentive to increase sales is extremely powerful

Assumptions for A Sample Utility

Assumptions	
Operating Expenses	$160,000,000
Rate Base	$200,000,000
Tax Rate	35.00%

Cost of Capital	% of Total	Cost Rate	Wtd. Cost		Dollar Cost Amt.	
			Pre-tax	After-Tax	Pre-Tax	After-Tax
Debt	55.00%	8.00%	4.40%	2.86%	$8,800,000	$5,720,000
Equity	45.00%	11.00%	4.95%	7.62%	**$9,900,000**	$15,230,769
Total	100.00%			10.48%		

Revenue Requirement	
Operating Expenses	$160,000,000
Debt	$5,720,000
Equity	$15,230,769
Total	$180,950,769
Allowed Return on Equity	$9,900,000

Manager A: Purple Results
Manager B: Green Results
Which Manager Gets Promoted?

	Revenue Change		Impact on Earnings		
% Change in Sales	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%

Approaches to the Problem:

- Straight Fixed Variable (SFV) Rate Design
  - Short-run fixed costs translated into fixed customer charge or ratcheted demand charge
- Adjustments for net lost revenues under traditional ROR ratemaking
  - Compensates utility for contribution to fixed costs that is lost as a consequence of successful specifically identified distributed resource deployment
- Decoupling
  - Ratemaking is reformed to break the link between sales and profits entirely

One Approach to Decoupling: Per-Customer Revenue Cap

- A truth that traditional regulation ignores:
  - ***In the short run, electric utility costs vary more closely with changes in numbers of customers than they do with changes in electricity sales***
- A per-customer revenue formula tells the company how much money it will be allowed to keep, on average, for every customer it serves
  - This gives the company a very strong incentive to make sure its customers are efficient, that is, that they impose as few costs upon it as possible: the fewer the costs, the greater the share of revenue that can go to its bottom line

What is Revenue Per Customer Decoupling (RPC)?

- RPC is an extension of traditional ratemaking
- RPC begins with a traditional rate case and traditional pricing structures
- However, instead of setting prices and ignoring changing throughput (and profits), RPC sets a target revenue per customer for each class and periodically adjusts prices so that the average "revenues per customer" for each class remain at the target level
- RPC uses "known" values (billing determinants) and is not subject to significant "judgment" issues – as a result, RPC is less likely to be the subject of controversy regarding inputs or calculations
- Is a revenue mechanism, not a rate design mechanism

Per-Customer Revenue Formula

- Revenue-per-customer (RPC)
  - RR_t/number of $customers_t$ = revenue per customer (RPC)
- The RPC can be adjusted by inflation (*I*), productivity (X), and exogenous factors (Z) to allow for multi-year plan
  - Revenues in the first year (RR_t) are calculated in the traditional manner: a revenue requirements analysis (e.g. California)
- $RPC_{(t+1)} = [RPC_t * (1 + I_t - X_t)] \pm Z_t$
- Allowed revenues in year t + 1
  - $RR_{(t+1)} = RPC_{(t+1)} *$ number of $customers_{(t+1)}$
- ***Important: This is <u>not how rates should be designed</u>, but only how revenues should be determined***

Pricing Under RPC Formula

- Prices are still set in the usual way
  - Consumption-based unit prices: per therm, per kWh, per kW, etc.
  - Retains customer incentives for efficiency
- Prices are adjusted periodically (up or down) to reflect:
  - Changes in the allowed revenues and
  - Over- or under-collections from the previous periods

Use Per Customer Trends: An Important Factor to Consider

- Average Use Per Customer is not a constant
  - Is already going up or down over time
- Changes in types of end-uses change:
  - More efficient appliances, but
  - More appliances and
  - More energy intensive appliances
- Changes in types of new customer facilities change usage patterns
  - Energy efficient building codes
  - New appliances tend to be more efficient than old appliances
  - Types of building being built or converted can be radically different from average “old” customers

Use Per Customer Trends: How It Impacts Utility

- If going down
  - Utility is on declining profit path between rate cases
  - If you do nothing else, RPC acts as an attrition (some might say “windfall”) mechanism
- If going up:
  - Utility is on an increasing profit path between rate cases
  - If you do nothing else, RPC reduces profitability path

What to do?: "K" Factor To The Rescue

- K Factor is a variable used to address changing revenue per customer issues
  - Can be used to eliminate shortfalls or windfalls occasioned by use of RPC
  - Can also be used to "push" efficiency targets
- K Factor is a variable used to impose a "slope" on an otherwise flat RPC curve and allows the RPC to go up or down over time, depending on policy objectives
- K Factor is like having a fine tuning knob for rates

PP&L Case Study: Time Frame

- October “Reference Month”
- December “Filing Month”
- February “Billing Month”

PP&L Case Study: Residential Energy Charge Target RPC (TRPC) Calculation

Test Year Data For Month of October		
1	Test Year Price	$0.01644
2	Test Year Billing Units	824,896,488
3	Test Year Energy Revenues (L1 x L2)	$13,561,110
4	Number of Test Year Customers	1,139,330
5	$TRPC_{Energy}$ (L3 ÷ L4)	$11.9027

PP&L Case Study: Residential Energy-based Charge Computation of Revenue Adjustment

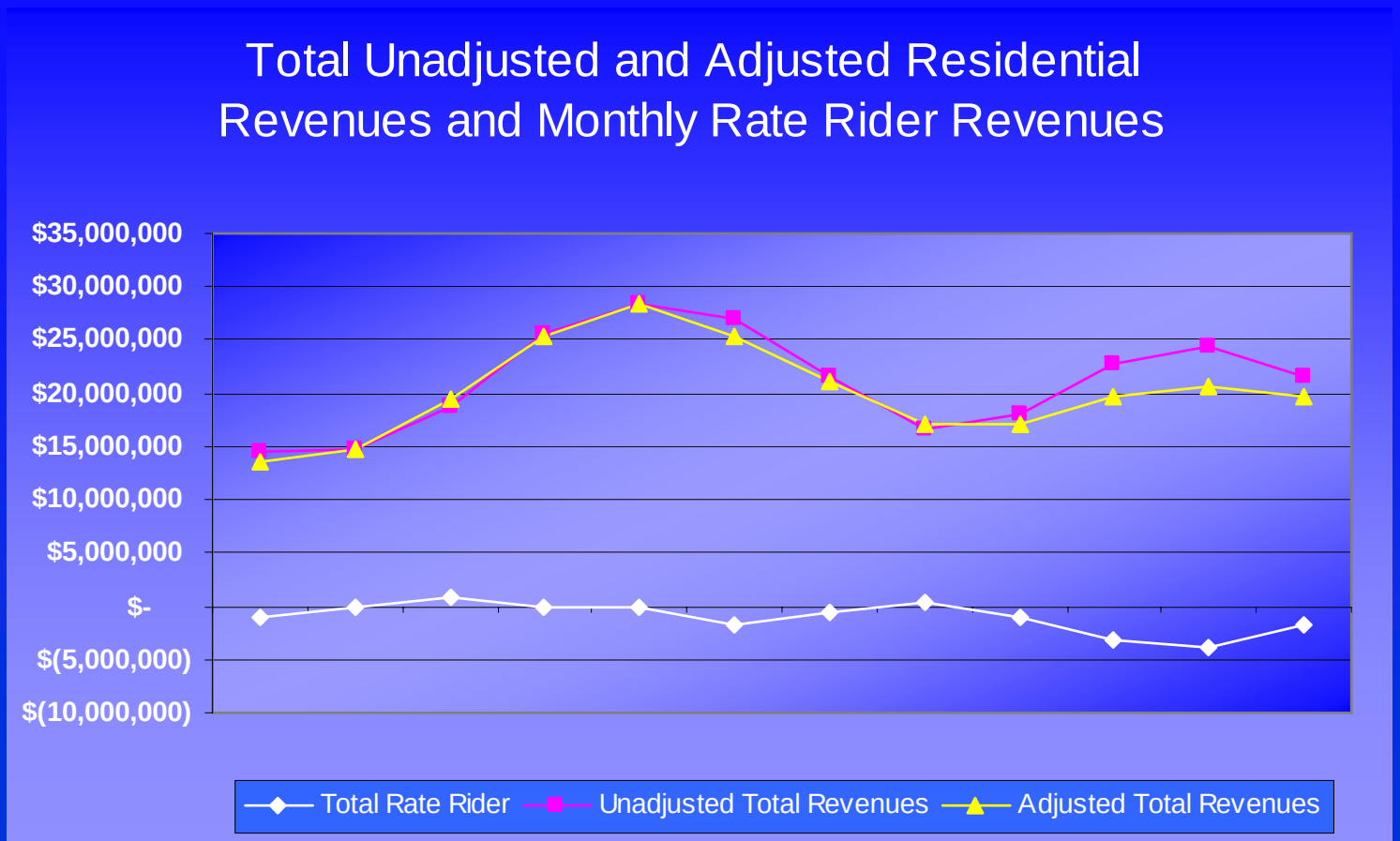
Reference Period Data For Month of October		
1	Test Year Price	$0.01644
2	Reference Period Billing Units	880,313,022
3	Reference Period Revenues (L1 x L2)	$14,472,145
4	No. of Reference Period Customers	1,165,022
5	Target Revenue Per Customer	$11.9027
6	Allowed Revenues (L4 x L5)	$13,745,627
7	Revenue Adjustment (L6 – L3)	$(726,518)

PP&L Case Study: Residential Energy-based Charge Computation of Adjustment Factor

1	Required Revenue Adjustment	$(726,518)
2	Expected February Billing Units	1,465,616,561
3	Adjustment Factor* (L1 x L2)	$(0.000496)

*This is the amount by which the rate case price is adjusted up or down.

PP&L Case Study Backcast: What Would Have Happened?



RPC: Pros and Cons

- Pros:
  - Simplicity – a simple extension of traditional ratemaking (not unlike a fuel adjustment clause in terms of administrative burden)
  - Captures all conservation and energy efficiency (not just specific programs as in Net Lost Revenue approach), without M&V costs
  - Optionally places weather risk on customer (easiest to administer) or company (requires weather normalization of billing information for each RPC adjustment)
  - K Factor gives fine-tuning ability
  - Allows any rate design
- Cons:
  - May inadvertently serve as "attrition" adjustment
  - Not as finely tuned as Net Lost Revenue approach
  - May not work well for large customer classes (especially if few customers in class)
- Pro or con?: Should be combined with regular rate cases (3-5 years) to recalibrate RPC values.

RPC Adds New Policy Tools With Choices to Make

- Should RPC be “profit neutral”?
- Should RPC be tweaked to impose more aggressive energy efficiency?
- How often should RPC adjustments be made?
- Should RPC be combined with PBR or other incentive mechanisms
- What about risk and cost of capital?

Decoupling: California Style

- Includes RPC
- Uses authorized annual margin
- Comprehensive PBR mechanism
  - Adjusts for inflation, productivity, etc.

California Decoupling: Pros and Cons

- Pros
  - Captures weather and conservation
  - More control over changes in margin from year to year based on formulas (inflation, customer growth, etc) versus being tied strictly to rate case margin per customer
  - Includes all customer classes
  - Allows any type of rate design
- Cons
  - Much greater complexity in determining annual changes in margin
  - Data and formula intensive
  - May be too California-centric
- Pro or con?
  - Regular rate case calibrations
  - Uses a rate case cycle of 3 or 4 years.

Decoupling Examples

- California – All gas & electric IOUs
  - e.g. http://www.sdge.com/tm2/pdf/EPBR.pdf
- Oregon
  - Northwest Natural Gas
    - Limited to "decoupling" revenues associated with 90% of the non-weather induced variation in usage for residential and commercial customers
    - Has both price elasticity and "deferral" mechanisms
  - See Lisa Schwartz, Oregon PUC Staff
- Maryland
  - Washington Gas
  - Baltimore Gas & Electric (source of MADRI approach)
  - See Calvin Timmerman, MD PSC staff)
- North Carolina – Piedmont Gas
- New Jersey – Filing pending for NJ Natural Gas
  - See Michael Winka, NJBPU Staff
- Ohio – Filing pending for Vectren
  - See Janine Midgen-Ostrander - Ohio's Consumers' Counsel
- Washington – Filing pending for Puget Sound Energy and Cascade

Beyond Disincentives: Performance Incentives

- Decoupling and, to a lesser extent, net lost revenue recovery remove the profit *disincentive* to EE investment
- To encourage superior performance, utility may earn positive financial incentives (ROE adder)

Performance Incentives: For Both ROR and RPC

- Shared savings
  - Return to utility of some fraction (say, 10-20%) of the savings (avoided costs) from distributed resource deployment
    - Goes directly to utility's bottom line
  - Collars and dead bands
- Performance targets
  - Specified rewards (e.g., % of program budget) for achieving a mix of targets
    - Energy savings, capacity reductions, customer installations, reductions in program administration costs, etc.
- ROE adder
  - A premium on the ROE applied to unamortized portion of EE costs included in ratebase

RPC: What's in it for the customers?

- Lower total cost
  - EE is usually the cheapest resource on the margin – see California experience
- Reduced externalities
  - EE is the cleanest resource available
  - Reduced water consumption (see SWEEP "Mother Lode" report)
- Correctly aligns profitability with public policy (something traditional regulation does not do)

Myths and Misunderstandings About Decoupling

- Utilities already have a duty to deliver lowest cost service, so no remedy is required
- Decoupling makes customers pay for energy not used and raises prices
- Too complex or hard to administer

In closing…

- All regulation is incentive regulation, so consider the incentives you currently give utilities and compare them to your public policy objectives
- No matter what approach you take, you should establish aggressive energy efficiency and conservation targets that should or must be met to entitle utility to decoupling adjustment
- Utility's least cost option should be its most profitable course of action

NARUC 1989 Resolution

Resolution in Support of Incentives for Electric Utility Least-Cost Planning

WHEREAS, National and International economic and environmental conditions, long-term energy trends, regulatory policy, and technological innovations have intensified global interest in the environmentally benign sources and uses of energy; and

WHEREAS, The business strategy of many electric utilities has extended to advance efficiency of electricity end-use and to manage electric demand; and

WHEREAS, Long-range planning has demonstrated that utility acquisition of end-use efficiency, renewable resources, and cogeneration are often more responsible economically and environmentally than traditional generation expansion; and

WHEREAS, Improvements in end-use efficiency generally reduce incremental energy sales; and

WHEREAS, The ratemaking formulas used by most state commissions cause reductions in utility earnings and otherwise may discourage utilities from helping their customers to improve end-use efficiency; and

WHEREAS, Reduced earnings to utilities from relying more upon demand-side resources is a serious impediment to the implementation of least-cost planning and to the achievement of a more energy-efficient society; and

WHEREAS, Improvements in the energy efficiency of our society would result in lower utility bills, reduced carbon dioxide emissions, reduced acid rain, reduced oil imports leading to improved energy security and a lower trade deficit, and lower business costs leading to improved international competitiveness; and

WHEREAS, Impediments to least-cost strategies frustrate efforts to provide low-cost energy services for consumers and to protect the environment; and

WHEREAS, Ratemaking practices should align utilities pursuit of profits with least-cost planning; and

WHEREAS, Ratemaking practices exist which align utility practices with least-cost planning; now, therefore, be it

RESOLVED, That the Executive Committee of the National Association of Regulatory Utility Commissioners (NARUC) assembled in its 1989 Summer Committee Meeting in San Francisco, urges its member state commissions to:

1) consider the loss of earnings potential connected with the use of demand-side resources; and

2) adopt appropriate ratemaking mechanisms to encourage utilities to help their customers improve end-use efficiency cost-effectively; and

3) otherwise **ensure that the successful implementation of a utility's least-cost plan is its most profitable course of action**.

Sponsored by the Committee on Energy Conservation, Adopted July 27, 1989

Thanks for Your Attention

- More Resources:
  - MADRI Website:
    - http://www.energetics.com/madri
    - PDF Versions of all documents, meeting schedules, etc.
  - MADRI Weblog:
    - http://www.raponline.org/madri
    - Excel and Word versions of selected working documents
    - See specifically:
      - MADRI Model Revenue Stability Rate Rider
      - PPL Case Study (Excel Spreadsheet)
- RAP Website: http://www.raponline.org
- E-mail: rapwayne@aol.com

What About the Long Term?

- Costs may vary with numbers of customers in the short run (several years), but in the long run costs are driven by demand
- Thus, the prices that consumers pay must be designed to reflect the causes of costs in the long run
  - Therefore, consumption-based prices
- Each customer does not pay the RPC
  - The RPC is merely a tool for calculating how much money the company is entitled to each year.