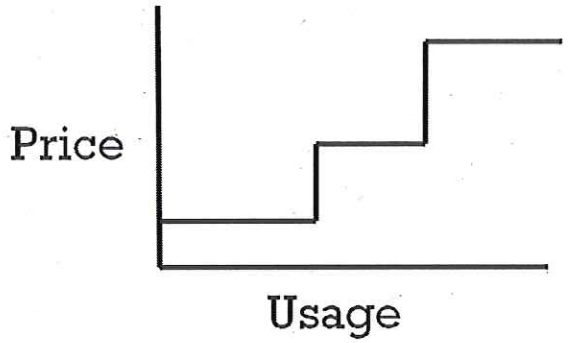
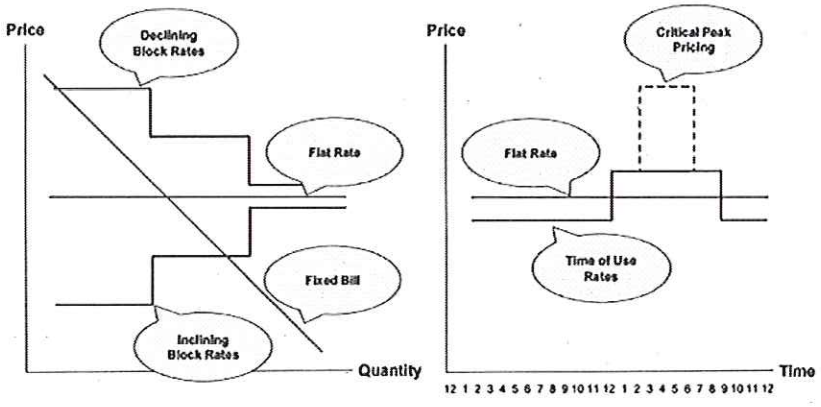
Rate Design:

Residential Electric Inclining Block Rates

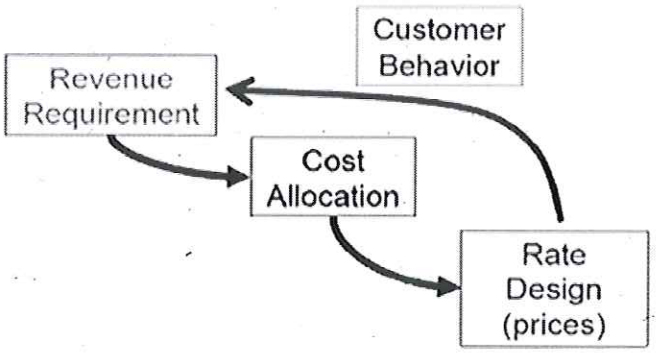


Geoff Marke, Economist
Missouri Office of the Public Counsel

Pricing influences usage



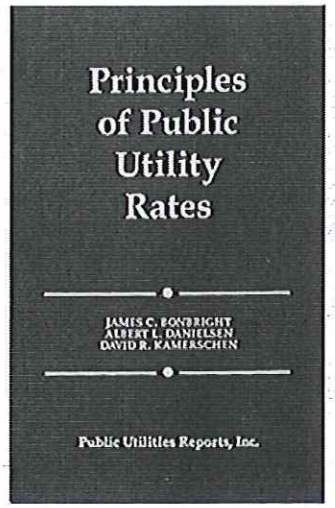
The Feedback Loop



Determine Rate Design Goals

Bonbright Principles

- Efficiency
- Simplicity
- Continuity
- Equity
- Stability



More art than science

- Tradeoffs between principles
- Different conditions between utilities
- Different interpretations of the principles
- Competing policy and/or mandates

- **Positive statements**

  are objective statements that can be tested, amended or rejected by referring to the available evidence.

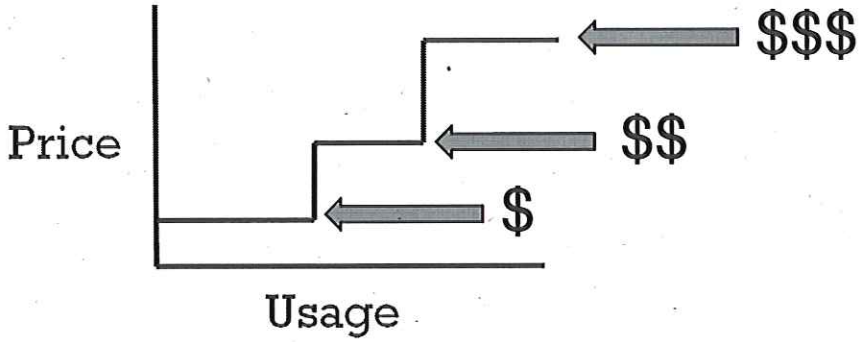
- **Normative Statements**

  expresses a value judgment about whether a situation is desirable or undesirable. It looks at the world as it "should" be.

What is an Inclining Block Rate?

Inclining Block Rates

- The more you use, the more expensive it gets



What does the literature say?

High usage = bigger price elasticity

- As prices increase, less quantity is demanded

TABLE 1 DISTRIBUTION OF RESIDENTIAL PRICE ELASTICITIES

		Low	Most Likely	High
Short Run	Block 1	-0.01	-0.13	-0.20
	Block 2	-0.02	-0.26	-0.39
Long Run	Block 1	-0.03	-0.39	-0.60
	Block 2	-0.06	-0.78	-1.17

Farqui, A. (2008) Inclining Toward Efficiency. The Brattle Group
https://www.fortnightly.com/fortnightly/2008/08/inclining-toward-efficiency

Kansas Corporation Commission Study

Table 5.1: Percentage Changes in Usage by Season and Utility, *SFV*

Utility	Summer	Winter
KCP&L	+3.0%	+1.1%
Westar	+6.8%	+2.5%
Midwest	+4.5%	+2.6%

Straight-Fixed Variable Rate Design Increases Consumption

Table 5.2: Percentage Changes in Usage by Season and Utility, *IBR*

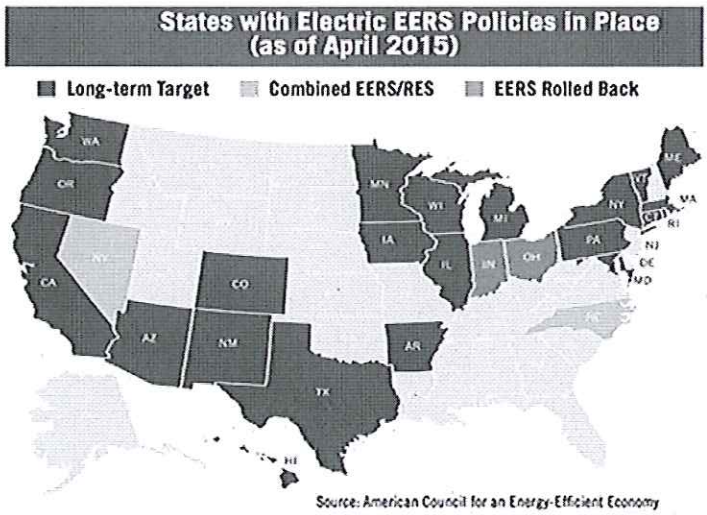
Utility	Summer	Winter
KCP&L	-2.3%	-3.4%
Westar	-0.3%	-3.7%
Midwest	-2.8%	-3.9%

Inclining Block Rate Design Decreases Consumption

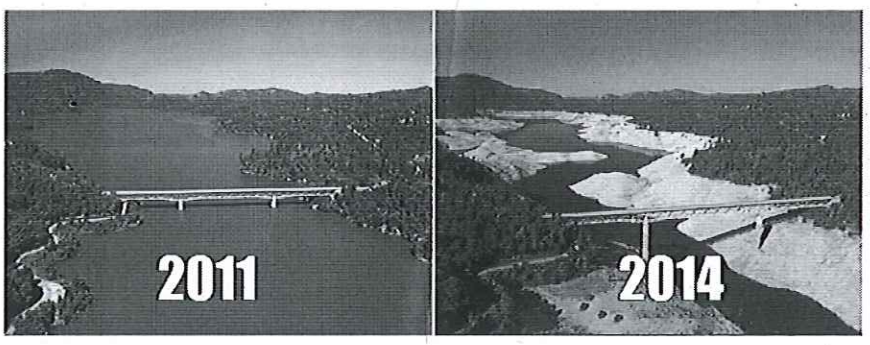
Hansen, D.G. and Michael O Sheasy (2012) Residential Rate Study for Kansas Corporation Commission Final Report.
http://www.kcc.state.ks.us/electric/residential_rate_study_final_20120411.pdf

Policy Rationale
Supporting
Inclining Block Rates

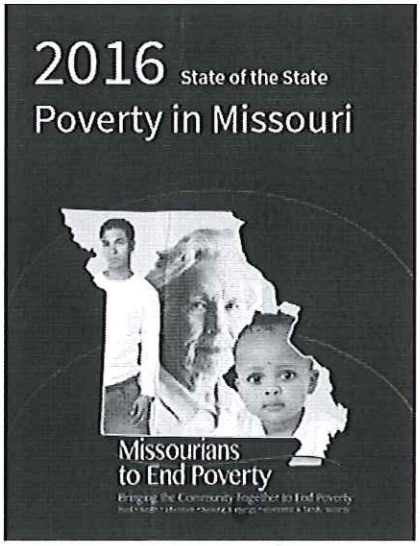
Promote conservation & meet mandates



Resource Crisis



Lifeline Rates



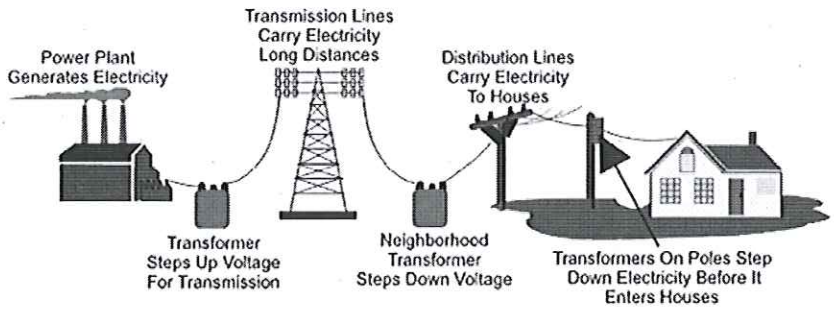
Lifeline Rates Cont…

Figure 2: Characteristics of above-average and below-average Empire residential ratepayers[31]

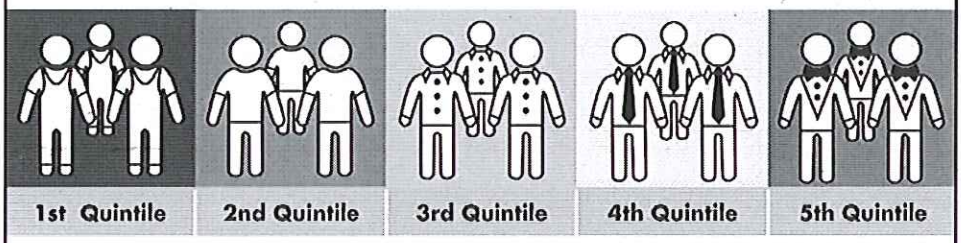
Who uses more energy on average?	Who uses less energy on average?
Homeowners	Renters
Homes with 3+ people living in them	Homes with 1 person living in them
Single-family homes and mobile homes	Multi-family apartments with 5+ units
Homes with more than 3,000 square feet	Homes with less than 1,000 square feet
Homes built 2000-2009 (pre-tornado)	Home built prior to 1970
High-income earning homes ($75K+)	Low-income earning homes (<$35K)

Long-run or social marginal costs

- In the long run, all costs are variable



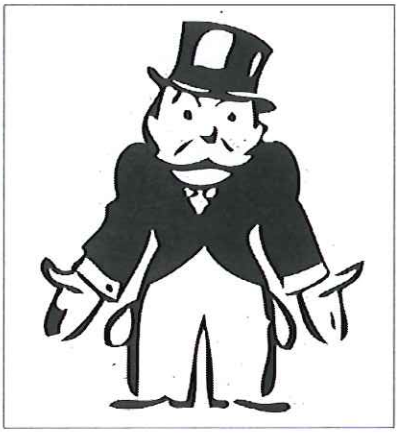
More "equitable" than energy efficiency?



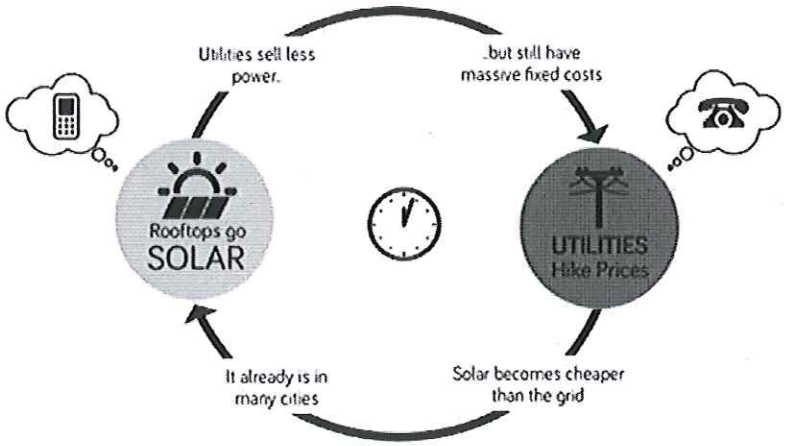
Policy Rationale Against Inclining Block Rates

Revenue Instability

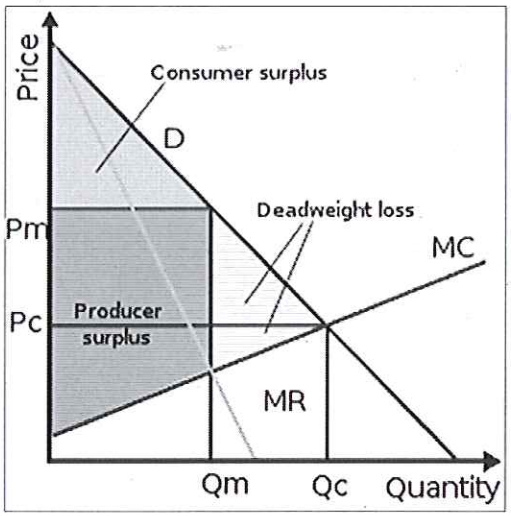
- Natural Monopolies = large fixed costs



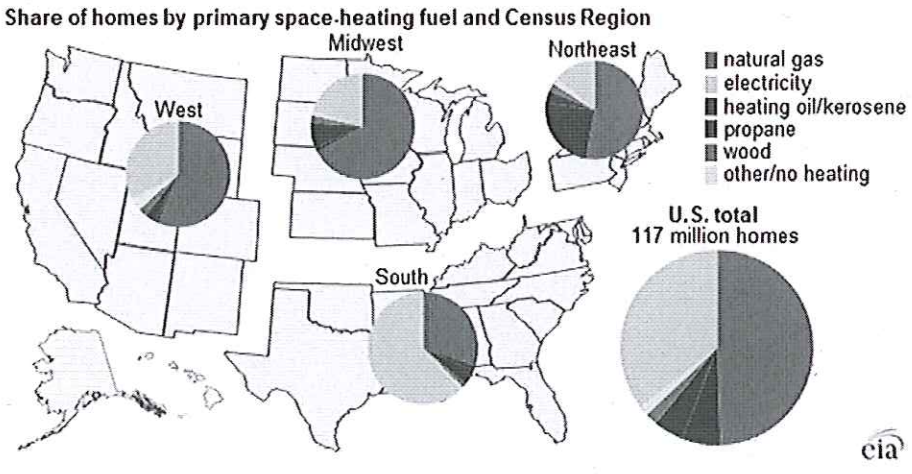
Grid Defection



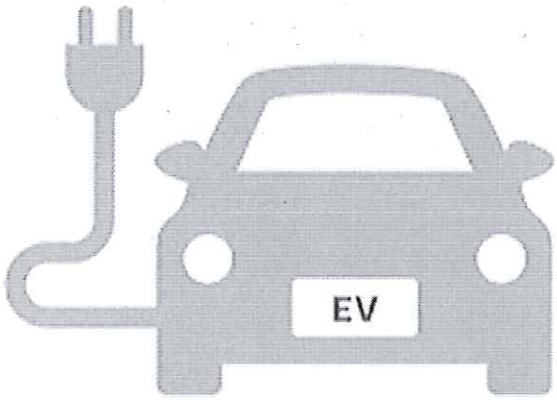
Deadweight Loss



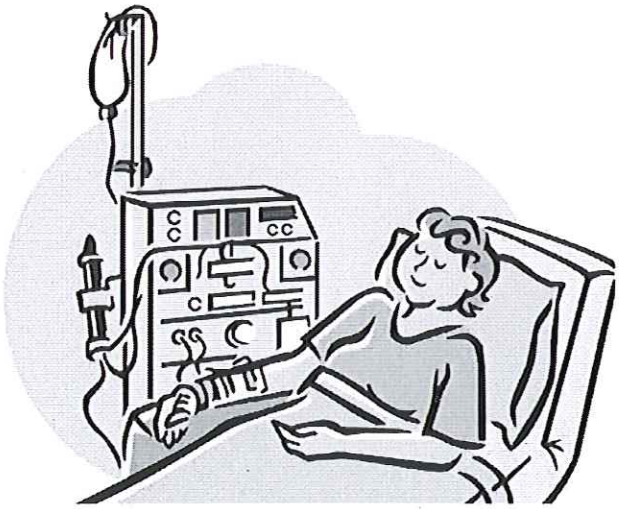
Space Heating



Special Rates



Special rates



Summary

Policy Arguments For:

- Promote conservation and meet mandates
- Resource crisis
- Lifeline rates
  - Low usage, low income
  - Multi-family
- Long-term or social marginal costs
- More equitable than energy efficiency

Policy Arguments Against:

- Revenue Instability
- Deadweight loss
- Grid Defection
- Space Heating
- Special rates
  - (e.g., electric vehicles, medical baseline etc…)

Final Thoughts

Do ratepayers understand this?

Account Detail

Electric 000011-11-0011 For Service at 101 Main Street, Anywhere, MO 11111 Rate: RG-Residential

Read for: 00118237 From 10/08/16 to 11/06/16 (29 Days), Curr Read - 13701 Prev Read - 12701, Totaling 1,000 KwH

11/08/16	Customer Charge	1 x 13.00	$13.00	
11/08/16	Usage Charge	600KWH x .13006	$78.04	
11/08/16	Usage Charge	400KWH x .10574	$42.30	
11/08/16	Energy Efficiency Program Cost	1000KWH x .0004	$0.40	
11/08/16	Fuel Adjust Charge	1000KWH x .00207	$2.07 CR	
11/08/16	Anywhere County Tax	111.18 x .00875	$0.97	
		Current Months Charges:	$132.64	
11/08/16	APP Installment			$135.00
		Billed Charges:		$135.00

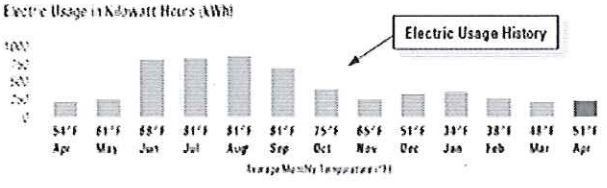
Contract Update

APP Status before payment is $132.64, after payment in full $2.36. This account will be reevaluated in October.

Do ratepayers understand this?

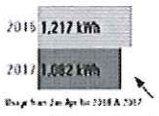
Electric Service Details **April Statement**

Electric Usage in Kilowatt Hours (kWh)



Electric Usage Summary (kWh)

So far this year, you're using 11.1% less than last year



Research suggests that

- "In reality, consumers make such decisions with limited information, attention and cognitive abilities."
- "It is quite clear from studies of cellphone pricing and marginal income taxes that consumer understanding of non-linear price schedules varies widely…

- Such understanding seems amenable to education campaigns, though such approaches will still run up against attention and cognition constraints that are likely significant for the vast majority of consumers who don't think like economists, and even for many who do."

Borenstein, S. (2009) To what electricity price do consumers respond? Residential demand electricity under increasing-block pricing. *Energy Institute at Haas.*
http://faculty.haas.berkeley.edu/borenste/download/NBER_SI_2009.pdf

And

- "Given the information available to most residential electricity customers in my sample period, the information cost of understanding the marginal price of electricity is likely to be substantial."

Ito, Koichiro (2012) Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing. *Energy Institute at Haas.* https://ei.haas.berkeley.edu/research/papers/WP210.pdf

Recommendations

- Display the rate structure on the consumer's bill in a way that conveys the cost (savings) from increased (decreased) usage.
- Do not raise the (fixed) residential customer charge.

Questions

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