Decision-Making Strategies for Assessing Ratemaking Methods: The Case of Natural Gas

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I. State commission decision-making on ratemaking methods

A. Ratemaking requires state commissions to consider and make decisions on mechanisms that have differing effects on regulatory objectives, with most advancing some regulatory objectives while impeding others

B. Making trade-offs among ratemaking objectives that best serves the public interest poses a difficult challenge for state commissions

C. Three-step process for good decision-making

1. Define the public interest in terms of ratemaking objectives

2. Understand the performance of each ratemaking method in advancing and impeding the objectives

3. Apply a logical and transparent decision-making process

II. The standard requirements for "just and reasonable" rates and policy-based objectives

A. *Core principles of ratemaking*

1. Rates reflect the costs of an efficient or prudent utility

2. Rates reflect the cost of serving different customer classes and of providing different services and different level of services

3. Rates allow a prudent utility a reasonable opportunity to receive sufficient revenues to attract new capital

4. Rates avoid undue price discrimination

B. *Policy-based objectives*

1. Public acceptability
2. Rate stability and gradualism
3. Equity or fairness
4. Affordable utility service
5. Efficient consumption
6. Efficient competition
7. Moderate regulatory burden
8. Promotion of specified social goals

III. Overview of standard ratemaking mechanisms

A. Recovery of non-gas costs in a two-part tariff ("base rate")

1. Recovery of fixed costs dependent upon gas usage
2. Incentive of a utility to increase sales between rate cases
3. Fixed costs disproportionately recovered from high-usage customers
4. At the margin, price deviates from marginal cost
5. Below-cost fixed monthly charge
6. More unstable gas bills compared with a rate design that includes a smaller portion of the fixed costs in the volumetric charge

B. Recovery of purchased gas and other costs via a rider or tracker

IV. New ratemaking proposals in recent rate cases

A. Motivation **(See Table 1)**

1. Recent emphasis by many state public utility commissions (PUCs) on utilities promoting energy efficiency

2. Increased risk to the utility and consumers from high gas prices (e.g., higher bad debt expenses, unaffordable gas service to more customers, lower demand)

3. Capital-cost requirements to satisfy new safety regulations and to replace and upgrade old distribution mains

4. Changing regulatory and public-policy objectives in response to dynamic market conditions

B. Examples from a survey of rate cases (these mechanisms encompass both the cost-recovery and rate-design components of ratemaking)

1. Revenue decoupling (RD) rider

2. Straight-fixed variable (SFV) rate design

3. Earnings sharing mechanism

4. Rider for bad-debt costs

5. Rider for pipeline-integrity-management costs

6. Rider for pipeline-replacement costs

7. Rider for utility energy-efficiency costs

C. Basic arguments by gas utilities for new ratemaking mechanisms

1. Prevailing conditions make it difficult to measure with adequate precision certain costs and sales in a test year

2. Asymmetrical distribution of certain costs and sales around some baseline or normalized level (e.g., the likelihood of gas sales falling below the baseline level is much greater than the likelihood of sales exceeding the baseline level)

D. The challenge for PUCs: Each mechanism has varying effect on advancing and hindering the different regulatory objectives **(See Table 2)**; illustration of SFV and RD rider – from the perspective of the public interest, which option is preferred? **(See Table 3)**

V. The typical decision-making process for assessing ratemaking mechanisms

A. Characterization of the current ratemaking process

1. Commission defines the public interest in ambiguous terms, not explicitly related to the underlying objectives of ratemaking

2. Utility frames and shapes the issues, and initially controls the agenda, in its rate filing

3 Other stakeholders rebut the utility's proposal and make recommendations

4. Commission staff advises commissioners

5. Commissioners issue order rationalizing their decision and frequently trying to balance the positions presented by different stakeholders

B. Problems with the current process

1. Lack of adequate commission directives to stakeholders beforehand on what objectives of ratemaking it considers most important and what those objectives are, in addition to articulating the desirable and undesirable attributes of ratemaking methods

2. Commission reacts to stakeholders' arguments, often trying to reach a "balanced" decision

3. Decisions not explicitly linked to an operational definition of the public interest

4. No explicit consideration of the trade-offs involved

VI. An alternative approach: multi-criteria decision analysis (MCDA)

A. Overview of MCDA

1. Well suited for comparing and ranking different ratemaking mechanisms with varying effects on individual regulatory objectives

2. Combines commissioners' judgment and objective information and analysis

3. Allows for transparent and objective-oriented decision-making

B. Tasks required for MCDA **(See Table 4)**

1. Framing the decision problem

2. Defining the objectives and the set of evaluation criteria

3. Specifying the options

4. Developing a performance matrix

5. Identifying the preferences of decision makers

6. Selecting a strategy for processing all the information

7. Interpreting the results and applying sensitivity analysis

C. An example of a performance matrix for three ratemaking options (additive linear decision rule, where each option receives a total score and each objective is weighted)

Ratemaking Option/Criterion	**Revenue sufficiency w = .3**	**Incentives for utility-initiated energy efficiency w = .2**	**Economic efficiency w = .1**	**Public acceptability w = .4**	**Total score**
Traditional	2 **.6**	1 **.2**	3 **.3**	5 **2**	**3.1**
RD rider	5 **1.5**	3 **.6**	3 **.3**	3 **1.2**	**3.6**
SFV	5 **1.5**	3 **.6**	5 **.5**	1 **.4**	**3.0**

Scores for performance range from one to five, with a higher score indicating better performance. The boldface score in each cell equals the performance score for the ratemaking option for a criterion times the weight of the criterion.

D. Alternative strategies or decision rules (all addressing the underlying objectives of ratemaking but in different ways)

1. *Additive linear rule* (options evaluated on a total-score index determined by the subjective weights assigned to the identified objectives/criteria and the performance of each option for each objective/criterion)

2. *Bounded rationality* (option not rejected when it meets a minimum threshold for the most important criteria; identifies acceptable options, rather than the optimal one)

3. *Elimination-by-aspects* (options eliminated that fail to have desirable attributes in achieving the most important objectives)

4. *Incrementalism* (new options evaluated and compared based on their ability to overcome the problems associated with the existing ratemaking mechanism)

5. *Conjunctive* (option must satisfy a minimum threshold for *all* of the ratemaking criteria)

VII. Comparison of the current decision-making process with the MCDA approach: how decision-making could improve? (See Table 5)

A. Definition of the public interest in terms of the specified regulatory objectives

B. Shaping and framing of the issues

C. Availability of unbiased information and analysis

D. Commission order supporting its decision directed at the public interest

VIII. Concluding thoughts

A. Making decisions on ratemaking issues is complex, requiring a combination of analytics, unbiased information, and judgment by commissioners

B. The several objectives underlying ratemaking complicate the decision-making process for state commissions, which often have to make trade-offs among valid objectives

C. A systematic approach to evaluating ratemaking options can help commissioners to reduce the complexity of decision-making and to better serve the public interest; it makes ratemaking decisions based on principles and what it considers desirable attributes of rates and ratemaking mechanisms, rather than attempt to react to stakeholders' positions by "balancing" their interests in some ad hoc (or non-transparent) manner

D. State commissions should consider defining more explicitly the public interest in terms of the different objectives assigned to ratemaking

Table 1: Consequences of High Natural Gas Prices

• Fewer households find natural gas affordable
• Energy conservation becomes more beneficial
• Fuel-switching becomes more imminent
• Price elasticity effect becomes more pronounced
• Bad-debt expenses increase
• Both utility and its customer generally face more risk
• Hedging becomes more important from both the utility and consumer perspective
• Utility customers become less satisfied with their utility and regulatory oversight
• Overall, the gas industry becomes less stable with usage levels, gas bills and utility earnings more volatile and uncertain

Table 2: Individual Ratemaking Practices and Effects on Regulatory Objectives

Ratemaking Practice	Objective(s) Advanced	Objective(s) Hindered
Standard Two-Part Tariff	Public acceptability, fairness in risk sharing	Efficient price-driven gas consumption, revenue and earnings stability, promotion of utility-initiated energy efficiency
Revenue-Decoupling Rider	Revenue and earnings stability, neutral utility incentives for the level of gas usage, fairness to the utility in recovering fixed costs	Fair allocation of business risk, public acceptability, efficient price-driven gas consumption
Straight Fixed-Variable Rate	Revenue and earnings stability, efficient price-driven consumption, neutral utility incentives for the level of gas usage, more equitable cost allocation	Equity to low usage customers (many of whom may be low-income), public acceptability; gradualism
Weather Normalization Adjustment	Revenue and earnings stability, winter gas-bill stability	Public acceptability
Inverted-Block Rate	Promotion of customer-initiated conservation, assistance to low-income households	Revenue and earnings stability, allocative efficiency; non-discrimination
Declining-Block Rate	Revenue and earnings stability, improved system utilization (i.e., productive efficiency)	Promotion of price-driven energy conservation, non-discrimination
Cost Rider	Earnings stability, fairness to the utility, fewer rate cases	Robust incentives for cost control (less regulatory lag), fair allocation of risk
Cost-Based Customer Charge	Allocative efficiency, more levelized gas bills across seasons	Public acceptability, equity to low usage customers (many of whom may be low-income)
Flexible Rate	Responsive to competitive and other conditions, improved system utilization (i.e., productive efficiency), avoidance of uneconomic bypass	Non-discrimination, fairness to captive customers
Special Contract	Responsive to competitive and other conditions, improved system utilization (i.e., productive efficiency), avoidance of uneconomic bypass	Non-discrimination, fairness to captive customers
Discriminatory Rate in General	Responsive to competitive and other conditions, improved system utilization (i.e., productive efficiency)	Fairness to captive customers
Rate Based on Marginal Cost Allocation	Price efficiency, improved system utilization (i.e., productive efficiency)	Preciseness of cost data, rate stability, public acceptability
Seasonal Rate	Allocative efficiency, equitable cost allocation across seasons	Affordability, public acceptability
Earnings Sharing	Earnings stability, fewer rate cases, allocative efficiency	Robust incentives for cost control (less regulatory lag)
Targeted Subsidized Rate	Affordability	Allocative efficiency, non-discrimination

Table 3: Comparison of SFV with RD Rider

Advantages of SFV over RD	Disadvantages of SFV over RD
More compatible with sound economic (e.g., marginal cost) principles	Adverse effect on low-usage customers, many of whom may be low income
Increased competitiveness of the utility for high-usage customers from lower volumetric charge	Reduced incentives for customer-initiated energy efficiency from a lower volumetric charge
Elimination of intra-class "subsidies" favoring low-usage customers	Possible significant increase in summer gas bills
Simpler to implement and for customers to understand	Likely stronger opposition from the public, stakeholders, and commission staff
Common pricing method for capital-intensive services	
No periodic true-up or price changes between rate cases, with longer regulatory lag	
More stable gas bills during the winter months	
Evenly allocates the recovery of fixed costs across seasons	

Table 4: A Generic Multi-Criteria Approach for Evaluating Ratemaking Options

Step	Task
Framing the decision problem	• What is the nature and consequences of problems with the existing ratemaking mechanism? • How would the situation look under ideal conditions? • How would alternative ratemaking options address the problems? • What effect would the ratemaking options have on individual regulatory objectives?
Defining the objectives and evaluation criteria	• Articulating ratemaking principles underlying "just and reasonable" prices • Identifying criteria of ratemaking consistent with those principles
Specifying the ratemaking options	• Identifying ratemaking options that can address current problems
Developing the performance matrix	• Collecting objective information • Analyzing each candidate ratemaking option for each specified criterion • Ranking or measuring the performance of each ratemaking option for each criterion
Identifying the preferences of the commissioners	• Ranking or weighting of criteria by commissioners
Selecting a strategy or decision rule	• Combining the information from the performance matrix with the commissioner's preferences for each criterion • Comparing each ratemaking option based on a decision rule (e.g., additive linear rule)
Interpreting the results and applying sensitivity analysis	• Evaluating each ratemaking option based on the decision rule • Identifying the stability of the relative rankings with varying criterion weights and performance assessments

Table 5: Comparison of the Current Decision-Making Process for Ratemaking with the MCDA Approach

Current Approach	MCDA Approach
• The commission defines the public interest in terms of a list of principles and attributes underlying ratemaking (based on past decisions and other past actions taken by the commission) (no explicit or implicit weighing of objectives in advancing the public interest)	• In a separate public forum, the commission identifies the underlying objectives of ratemaking and the relative importance of each one (i.e., the commission constructs a "public interest" index that relates the public interest to weighting of the underlying objectives)
• A utility files ratemaking proposals rationalized on the basis of advancing those regulatory objectives skewed to its own interest	• A utility files ratemaking proposal addressing each underlying objectives identified by the commission (i.e., makes arguments for its rate proposal using commission guidelines)
• Other stakeholders, with their own interests, respond to utility proposal with criticisms and recommendations	• Other stakeholders respond to the utility proposal by addressing the objectives previously identified by the commission, either for rejecting the utility proposal or for recommending an alternative ratemaking proposal, or both
• Commission staff advises commissioners on the proposals and recommendations of stakeholders	• Commission staff complies unbiased information and conducts an objective and comprehensive analysis of ratemaking proposals by stakeholders
• Commission staff sometimes proposes its own preferred ratemaking mechanism	• Commission staff makes recommendation taking into account both its analysis and previously enunciated commission guidelines
• Commissioners issue an order rationalizing its decision and its rejection of proposals, based partially on reaching a compromise of the different positions	• Commissioners issue an order rationalizing its decision based on consideration of all the objectives of ratemaking previously identified and the "public interest" index, in addition to the information provided by stakeholders and commission staff