What 'Value Added' do Utility Regulators Provide?

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INTRODUCTION

In 2022, following a discussion with Mongolia's utility regulator on the importance of evaluating utility performance, a delegate asked how regulators, in turn, evaluate their own performance.

It was surprisingly difficult to respond to this question. Traditional metrics used by regulators - such as turnaround time of proceedings or cost of regulation - seemed to fall woefully short of measuring our value added. By those metrics alone, no regulation would be the most preferable option.

Economics 101 tells us we get paid for adding value to the marketplace. So, what is the value added that utility regulators provide?

In order to articulate the key deliverables of utility regulators, we reach back in time to the seminal work undertaken by James Bonbright (1988). These deliverables could be used as a basis to measure a utility regulator's value added, and therefore provide further insight into a utility regulator's performance.

BONBRIGHT AND REGULATOR DELIVERABLES

The economic regulation of public utilities was put in place to address the risk to society arising from natural monopolies and dates back to the early 20th century. Bonbright's, *Principles of Public Utility Rates*, first published in 1961, was built around a model of vertically integrated electricity monopolies and approached rate-making largely as an exercise in balancing the ability of utilities to attract capital with those of ratepayers, all within a 'public interest' framework. As Bonbright stated in *Principles of Public Utility Rates,* the complete or qualified observance of the principles of rate-making policy subserve the public interest.[1]

Bonbright's (1988) *Criteria of a Fair Return* provides a starting point for developing the key deliverables of a utility regulator. To begin, we reword Bonbright's criteria to focus on the key regulator deliverables as follows:

Bonbright Fair Return Criteria	*Key Regulator Deliverables*
1. Ensure financial stability	1. Ensure the financial stability of regulated utilities
2. Encourage efficient managerial practice	2. Motivate utilities to operate efficiently and in the public interest
3. Promote consumer rationing	3. Encourage smart energy use
4. Providing a reasonable stable and predictable rate level to ratepayers	4. Aim for rates consumers can count on, without surprises
5. Ensure fairness to investors	5. Promote a fair playing field for all involved in the utility sector

These deliverables relate to the core mandate of utility regulators - addressing monopoly risk to ratepayers and society at large while ensuring utilities can raise sufficient capital to do the job they are required to.

Where the regulator has other responsibilities (such as market facilitator) additional deliverables may be required.

Each of these 5 deliverables is described in more detail below.

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1. Ensure the Financial stability of Regulated Utilities

Bonbright (1988) states that among these five principles, a high place - perhaps even first place - must be given to ensuring a utility is financially stable:

> Setting rates below a level that allows a utility to recover its legitimate operating expenses plus a return on investment sufficient to maintain sound corporate credit will, in the long run, result in a company that is unable to live up to its obligations to serve the community.[2]

Bonbright also states that there can be other negative impacts to customers if the financial stability principle is not met, including a higher cost of financing, worsening reliability, and higher costs overall if it results in a deviation from least cost long-term planning.

Indeed, government-owned utilities facing financial distress often signify a jurisdiction that lacks an effective independent regulator. Examples of this issue can be seen in both Papua New Guinea and Sri Lanka.[3]

Scott Hempling, professor at Georgetown University Law Center where he teaches public utility law, identifies eight questions courts have asked to assess whether utility rates are sufficient to maintain financial stability:

- Is the revenue sufficient to expand service and maintain working capital?
- Is revenue sufficient to ensure that service to customers will not be impaired?
- Is cash flow sufficient for operations and debt payment?
- Does the debt-equity ratio reflect financial strength?
- Are the bond ratings sufficient to maintain financial integrity?
- Is the quality of earnings - specifically, contribution work in progress and allowance for funds used during construction as a percentage of net income - sufficient to maintain financial integrity?
- How strong is the interest coverage ratio?
- Are there other factors affecting company value?[4]

These could be used to determine, for each regulated utility, whether there is a financial viability problem.

However, this does not mean that the utility regulator's solution to financial viability issues should always be a rate increase – regulators are under no obligation

to guarantee the returns of utilities facing competition pressures – they simply provide the utility the *opportunity* to earn a fair return.[5]

Great Britain's regulator, Ofgem, further states that it is important that the regulatory framework does not provide excessive returns, reward inefficiency, or 'bail-out' a company that has encountered financial distress as a result of its own behaviour.[6]

Regulator responses to identified financial viability issues may therefore include a variety of approaches, such as rate increases, rate smoothing, asset write-downs, or where financial viability issues are a result of government-imposed restrictions on rate increases, alerting the government to the problem.

2. Motivate utilities to operate efficiently, and in the public interest

The second deliverable is to motivate utilities to operate efficiently, and in the public interest.

Regulators have a unique ability to be able to use financial incentives to encourage a utility to move in one direction or another. However, to use this tool effectively the regulator has to have both a clear understanding of what desired utility outcomes are, whether it has the jurisdiction to incent those outcomes, and the tools it can use to incent a utility to deliver them.

Public Interest Outcomes

For effective regulation, it is crucial that the regulator has a good understanding of what public-interest-driven outcomes (within the constraints of their regulatory mandate) should look like for each utility they regulate. Scott Hempling suggests the purposeful regulator ask themselves:

> Do I have a definition of "public interest"? Have I made my definition transparent by articulating it to my fellow commissioners and the parties who appear before my commission? Is my definition consistent with my fellow commissioners' definition? If not, have I worked out the differences?[7]

The Public Interest Toolkit describes the approach used by the newly formed New Zealand Electricity Authority to define its role (the link downloads the article). This Toolkit could assist regulators looking to develop their own public interest definition.[8]

The Toolkit includes a Public Interest Checklist, which could be used to help define outcomes that are within the scope of an economic regulator. For an economic regulator these outcomes include:

- Meeting legal requirements
- Fairness (prices that avoid undue discrimination)
- Economic efficiency (efficient utility operation and investment decisions, efficient customer decisions, innovation)
- Reliability and Safety
- Customer Satisfaction

Supporting economic efficiency is a key deliverable for an economic regulator. However, the clean energy transition is making it harder to identify what efficient outcomes in the public interest should look like.

For example, while the utility regulator has traditionally been agnostic regarding a customer's fuel choice, it may now be in the public interest to encourage customers to switch to cleaner fuels when making investment decisions. The need for regulators to get better visibility into these new risks is described in a recent article 'Stuck in the 1950's: Updating Regulatory Mandates for the 21st Century'.[9]

In addition, while economic regulators may not be responsible for addressing broader social issues, given their primary role as a stand in for the competitive market, public interest consideration suggest they do need to consider public acceptability of their decisions.

Investors in competitive markets are increasingly looking at environmental, social and governance (ESG) matters as a critical element to building a more sustainable business. Regulators therefore also need to consider what these social expectations are, whether to incent utilities to meet these expectations and, if so, whether the utility is delivering on them.

Regulatory framework

Once the regulator has identified the desired outcomes for each utility it regulates, it can assess whether the existing regulatory framework provides appropriate incentives for utilities to achieve these outcomes.

The regulator has a suite of tools available to it to provide a regulatory framework that encourages efficient utility managerial practice. However, the regulator must be knowledgeable about how those frameworks operate. As Malcolm Sparrow states:

> The regulator should be master of all the different regulatory structures - knowing the strengths and weaknesses of each model - and adept at determining which models would work best for different classes of risk.[10]

Sparrow stresses that there is no one 'best' regulatory approach for a particular industry, or even within a single company. He states that within each company there are multiple risks, and no reason to assume that a model suitable for one class of risk is the best model for other classes of risk.[11]

So, what are some of the tools that utility regulators have in their toolkit? These can include:

- *Cost of Service Regulation*: The regulator reviews the utility's budget and allows the utility the opportunity to recover its approved costs plus a return on investment through rates. This model only mildly incentivizes the utility to find operational cost savings between rate cases and provides a strong incentive to favor building assets over demand side alternatives.
- *Multi-Year Tariffs*: Rate levels are set based on a formula over a multi-year period (for example, annual increases linked to inflation) to encourage the utility to seek operational cost savings. Service level metrics, such as reliability and customer service, ensure that cost savings are not achieved at the

expense of service quality. This incentivizes the utility to find operational savings but can discourage investments in innovation and energy efficiency. A variation of this approach caps controllable costs (instead of rate levels) to remove the energy efficiency disincentive, but can also discourage beneficial electrification.

- *Performance incentive mechanisms:* This can be an 'add-on' to the two approaches above. The utility is allowed to earn additional amounts if certain outcomes are met (such as meeting energy efficiency targets, reduced connection time for distributed generation or undertaking meaningful customer consultation).
- *Rules and Penalties*: The regulator can develop rules that the utility must comply with, such as mandatory reliability standards.
- *Risk-based frameworks:* For risks such as cybersecurity, extreme weather, and wildfires, the regulator could also include risk-based frameworks, such as those described in the *Hackers and Extreme Weather* article.[12]

The regulator may also decide not to regulate a utility at all (for example where it is customer owned or not providing a monopoly service) or only regulate in certain circumstances (for example, if a complaint is received).

This is not a complete list of all regulatory tools available. For example, Great Britain's regulator Ofgem identified in 2010 that the existing regulatory framework did not support innovation and so made significant changes as a result, which included an innovation stimulus package.[13]

The key point is that the regulator considers whether the existing regulatory structure is providing utility management with the correct incentives to elicit the desired performance. If it does not, the regulator may want to address it.

Case Study – Great Britain Regulator

An example of a regulator currently reviewing its suite of regulatory tools in light of changing circumstances comes from Great Britain.

In response to decarbonization goals, Great Britain is creating a new entity who will be responsible for natural gas and electric long term system planning – called a Future System Operator. These system plans will specify the network infrastructure needed to meet long-range net zero targets at the least overall cost to consumers.[14]

Great Britain's electricity and gas regulator (Ofgem) is reviewing its regulatory framework in light of this change. Ofgem states that the Future System Operator (and not the utility) will now possess detailed expert system knowledge of assets and demand conditions, and so this allows it to consider regulatory frameworks that were previously off the table.[15]

This includes consideration of a 'Plan and Deliver' regulatory framework, where grid expansion occurs in line with top-down system plans prepared by the Future System Operator. This is intended to reduce the risk that needed investments are not built.[16]

While this may seem like a step backwards -from the incentive regulation currently used towards a more prescriptive approach - it demonstrates how regulatory frameworks can and should evolve with changing market conditions.

3. Encourage Smart Energy Use

The third deliverable of a utility regulator is to encourage smart energy use, which Bonbright calls the 'consumer-rationing criterion'.

Bonbright describes this as having rates that encourage all consumption for which ratepayers are ready to pay avoidable, marginal cost, and deter any consumption for which ratepayers are not prepared to pay these costs. Total revenues should also cover total costs.

As Scott Hempling articulates:

> Customers are not passive recipients of utility services. They create the demand that causes utilities to incur costs. Just as individual driving habits ease or impede the traffic flow, smoothing or slowing everyone else's trip, customer consumption influences the utility's cost structures, operations, capital plans and financing. Alert customers help make markets competitive, while indifferent customers support inertia—that powerful force that keeps the incumbent in place.[17]

So, how does the regulator know if it is encouraging smart energy use? Regulators can look at whether a utility, through its rate design and energy efficiency/electrification programs, is providing the right incentives to its customers.

Bonbright (1988), when discussing his rate design principles, states that efficiency is best supported when rates reflect marginal costs to the extent feasible. However, while this approach is theoretically sound, customers may not respond efficiently to accurate pricing signals due to behavioural biases, inattention, and transaction costs. Customer income levels can also affect price elasticity.[18]

In addition, even in competitive wholesale energy markets with transparent locational marginal prices, identifying the marginal cost of externalities (such as environmental emissions) and lumpy regional distribution investments can be difficult.

For example, utilities could end up in a circular situation of designing rates with only a small peak/off-peak differential on the basis that the customer response will be too small to defer network costs.[19]

As a result, the approach supported here is to adopt a more holistic approach. Instead of just evaluating the utility's rate designs to see if they signal the appropriate marginal costs, the regulator could consider whether existing rates are promoting efficient consumer behaviour.

For example, would there be a net benefit from higher marginal rates (to promote energy efficiency), lower electricity marginal rates (to promote electrifica-

tion), or different peak/off-peak differentials (to promote load shifting)?

Hempling states that utility regulators should regularly research and identify the best customer practices, then act to induce those behaviors.

Bonbright also supports this view, stating that it is virtually impossible to exaggerate the importance of the behavioral modification function of prices on all economic agents, noting that rates are often based on historical costs yet have their most profound impact on future behaviours.

The regulator should also consider other tools to promote smart energy use, such as utility targeted energy efficiency or fuel switching programs. The article 'Effectiveness and Balance' describes how regulators can evaluate utility energy efficiency programs to determine if they promote smart energy use.[20]

Other questions a utility regulator could ask in determining if utility rates/programs encourage smart energy use include:

- Net metering rates: Is the retail rate a reasonable proxy for the value of electricity produced by the distributed generator (including network and ancillary benefits)?
- Electrification rates: Are these rates set between incremental costs (at a minimum) and stand-alone costs? Do these rates take into account customer competitive options?
- Electric Vehicle (EV) rates: Do the rates set for public charging stations reflect the benefit a utility may receive if they increase EV adoption and so increase revenues from home charging?

The regulator will also need to ensure utility rate offerings meet public environmental, social and governance expectations. As Bonbright notes, the development of sound ratemaking policy is cause for a resort to wise compromise, for it is not an exact science but a judicious blending of alternative goals.

4. Aim for Energy Rates Consumers Can Count On, Without Surprises

The fourth deliverable of a utility regulator is to aim for energy rates that consumers can count on, without surprises (stable and predictable).

Utility regulators have tools to promote rate stability that companies in competitive markets do not have. This includes allowing the utility to defer costs or revenues to future periods. However, caution should be exercised in using these tools as they could distort pricing signals and raise intergenerational equity considerations.

The regulator could therefore consider whether the regulatory framework provides the optimal level of rate stability, while preserving price signals to customers, appropriately balancing risks between customers and the utility, and supporting intergenerational equity.

In addition, the regulator can play a role in supporting rate predictability by ensuring rate designs are understandable to customers, and by educating customers of any anticipated significant future rate increases. This becomes more important as the clean energy transition puts upward pressures on rates.

5. Promote a Fair Playing Field for all Involved in the Utility Sector

Bonbright states that the first four principles are consumer focused – things that a customer would want anyway. The last principle is instead focused on supporting the history of ratemaking law as a means of protecting owners of public utility properties against confiscation of their assets.

Specifically, utilities have an obligation to serve customers in their territories, and the regulator has an obligation to allow them the opportunity for a fair return. Anything less than an opportunity to earn a fair return amounts to confiscation. The regulator should ensure it is delivering on this obligation for each utility it regulates.

The energy transition is raising questions about the appropriate regulatory approach to ensure fairness to investors, for example around potential stranded assets for gas utilities and the risk of building in advance of load that may not materialize, especially for electric utilities. For example, Ofgem states, "When considering depreciation we will focus on how best to balance the costs paid by existing and future consumers, taking account of the expected economic life of assets and uncertainty in the future use (and usefulness) of assets."[21]

The utility regulator mist be alert to these issues and ensure that risk follows the reward.

KEY TAKEAWAYS

The purpose of this article is to respond to the Mongolian regulator's question – how do utility regulators evaluate their own performance?

This is not an easy question to answer. As Scott Hempling states:

> Measurement of value is necessary, but the currency of value is elusive. Let's keep thinking.[22]

This article aims to contribute to this thinking by describing five key output deliverables of utility regulators, based on the seminal work of Bonbright (1988):

1. Ensure the financial stability of regulated utilities
2. Motivate utilities to operate efficiently and in the public interest
3. Encourage smart energy use
4. Aim for rates consumers can count on, without surprises
5. Promote a fair playing field for all involved in the utility sector

We encourage utility regulators to evaluate their own performance against these deliverables. Evaluation against these deliverables enables regulators to focus their limited resources on areas where they can provide the most value - what gets measured, gets done.

Footnotes

[1] Bonbright, p. 27.

[2] Bonbright, J. et. al. (1988). *Principles of Public Utility Rates*

[3] Papua New Guinea: Nepal, R. et al (2023), The National Research Institute Papua New Guinea. *Independent Power Producers and Deregulation in an Island-Based Small Electricity System*, p. 2, 5, 12. Sri Lanka: https://www.ifc.org/content/dam/ifc/doc/mgrt/sri-lanka-cpsd-full-report-final.pdf (p. xv, 53, 54) and https://economynext.com/how-sri-lankas-electricity-tariffs-are-expected-to-be-revised-interview-111873/.

[4] Hempling, S. (2013). *Regulating Public Utility Performance: The Law of Market Structure, Pricing and Jurisdiction*, p. 232-233

[5] Market Street R. Co. v. Railroad Commission, 324 U.S. 548 (1945

[6] Ofgem (2017), Guide to the RIIO-ED1 electricity distribution price control, p.59

[7] Hempling, S. (2013). *Preside or Lead? The Attributes and Actions of Effective Regulators*, p. 203-209

[8] Ashley, J. et al. (2021). IAEE 2021 Conference. An Energy Regulator's Public Interest Toolkit (link downloads article)

[9] Nock, M. (2023). IAEE Energy Forum. *Stuck in the 1950's: Updating Regulatory Mandates for the 21st Century*

[10] Sparrow, M. (2020). *Fundamentals of Regulatory Design*. Chapter 5

[11] *Ibid.*

[12] Ashley, J. et al. (2021). IAEE Energy Forum. *Hackers and Extreme Weather: Using a Risk Based Framework to Protect Consumers from Both*

[13] Ofgem (2018). *RIIO-2 Framework Decision*, p. 30-33

[14] Ofgem (2022). *Future System Operator: Government and Ofgem's response to consultation*

[15] *Ibid.*

[16] Ofgem (2023). *Consultation on frameworks for future systems and network regulation: enabling an energy system for the future*

[17] Ofgem (2017), Guide to the RIIO-ED1 electricity distribution price control, p.59

Hempling, S. (2013). *Preside or Lead? The Attributes and Actions of Effective Regulators*, p. 203-209

[18] Csereklyei, Z. (2020). *Energy Policy. Price and income elasticities of residential and industrial electricity demand in the European Union*

[19] Nock, J. (2022). IAEE Energy Forum. Rate Setting for an Electrified World

[20] Ashley, J. et al. (2020). IAEE Energy Forum. *Effectiveness and Balance: A Canadian Regulator's Approach to Review of Energy Efficiency Funding Proposals*

[21] Ofgem (2010), RIIO: A New Way to Regulate Energy Networks, p. 36, 40

[22] Hempling, S. (2013). *Preside or Lead? The Attributes and Actions of Effective Regulators*, p. 203-209