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HAWAII PERFORMANCE- BASED REGULATION POLICY

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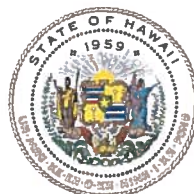


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I. INTRODUCTION

Hawaii is in the midst of a ground-breaking endeavor to investigate new approaches to the “public interest” standard in utility regulation. Appendix A of this paper includes a brief history of traditional cost of service regulation (COSR) to provide background and historical context as the PUC moves forward in this challenging arena. This paper offers strategies for consideration as new performance-based regulation (PBR) is discussed for implementation in the State of Hawaii and attempts to advance the dialogue.

Transformational change is occurring in the electric utility industry. Such change includes, but is not limited to, the dramatic expansion of renewables and energy storage, the broad advent of technological change (or disruptive technologies), increased consumer control of distributed generation, enhanced integration of transportation and building systems into the electric system, offset of utility sales from customer-sited resources, and broad changes in consumer expectations. These changes have driven consideration by utilities and regulators on evolving the utility revenue model from the traditional approach, where profit is driven by returns on capital investments, to models better aligned with public policy choices, promoting clean, affordable, reliable, modern, and customer-focused power systems.

Hawaii is at the forefront of such change, consistent with the State’s bold energy policy of achieving 100 percent Renewable Portfolio Standards (RPS) by the year 2045, and its goal of maximizing the deployment of cost-effective investments in renewable energy generation and management for the purpose of ensuring Hawaii’s energy security. Hawaii is the first state in the nation to pass a statute for a performance-based model, moving from the traditional COSR approach of utility ratemaking to establishing additional incentives and penalties that link electric utilities’ revenues to the utility’s successes in meeting various customer-focused performance

metrics. The PUC has established a PBR proceeding consistent with this mandate. This proceeding is in addition to almost decade-old mechanisms established by the PUC to de-link utility revenues and profits from their electricity sales, as well as other significant regulatory efforts undertaken to transform how electric utility services are planned and offered to meet evolving customer needs and meet the State's clean energy policies.

II. RECENT DEVELOPMENTS IN HAWAII REGARDING PERFORMANCE-BASED REGULATION

Many jurisdictions are exploring substantial reforms to COSR, including adoption of performance-based regulation (PBR).¹ Hawaii is at the forefront of this reform.

In April 2018, the State took two major steps to further advance the shift away from adherence to traditional COSR. On April 18, 2018, the Hawaii PUC issued Order No. 35411, which established a two-phase process for investigating PBR for the Hawaiian Electric Companies (HECO Companies).² Four principal premises underlie Order No. 35411: (1) traditionally, COSR has afforded utilities a reasonable opportunity to ensure their financial integrity while also allowing them to successfully provide utility service at affordable rates;³ (2) Hawaii's electric power industry is in the midst of a significant transition away from central-station, fossil-fuel-based generation to increasingly distributed generation systems;⁴ (3) in light of the transformation Hawaii is experiencing, COSR "may no longer provide a regulatory incentive framework that is well aligned with public policy goals;"⁵ and (4) in contrast to traditional COSR, "PBR enables

¹ See, e.g., New York Pub. Serv. Comm'n, Case No. 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting a Ratemaking and Utility Revenue Model Policy Framework*, at 2 (May 19, 2016) ("New York Policy Framework") ("The focus of this decision is to create a modern regulatory model that challenges utilities to take actions to achieve [the state's] objectives by better aligning utility shareholder financial interest with consumer interest."); Dist. of Columbia Pub. Serv. Comm'n, Formal Case No. 1139, *In the Matter of the Application of the Potomac Electric Power Company for Authority to Increase existing Retail Rates and Charges for Electric Distribution Service*, Order No. 18550 at ¶ 47 (Sept. 22, 2016) (explaining that the District of Columbia Public Service Commission "is considering whether we should require [the local electric utility] to propose some form of PBR in future rate case proceedings . . .").

² The HECO Companies are Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited.

³ Order No. 35411 at 11.

⁴ *Id.* at 1-2.

⁵ *Id.* at 13. Regardless of its past efficacy in setting reasonable rates, Order No. 35411 voices the PUC's concern that traditional COSR "may exert an 'infrastructure bias' to deploy capital intensive solutions." *Id.* at 11 (footnote omitted). The PUC also observed that COSR provides "few financial incentives for the utility to employ cost-saving measures, to reduce electricity sales, to improve energy efficiency, to increase customer choice, to integrate customer-sited generation, or to establish new and innovative services . . ." *Id.* at 11-12. "PBR attempts to address some of the issues and disincentives inherent in traditional [COSR] through a set of alternative regulatory mechanisms intended

regulators to reform legacy regulatory structures to enable innovations within modern power systems.”⁶

In Phase 1 of its investigation, which is expected to conclude within nine months, the PUC is examining the current regulatory framework and identifying areas of utility performance that warrant more detailed consideration. It will also consider the metrics for measuring successful outcomes in the areas identified.⁷ Phase 2, which the PUC anticipates will take approximately 12 months, will refine and modify the existing regulatory framework to create incentives for the HECO Companies to achieve the desired outcomes that were identified in Phase 1. Recognizing that implementing some proposals may require material revisions to the regulatory paradigm, the PUC explained that Phase 2 may also consider “longer-term, more strategic changes to the regulatory framework”⁸ Consequently, the PUC expressed its intent to “take into consideration the regulatory principle of gradualism.”⁹

The second major development came six days after the issuance of Order No. 35411, when Governor Ige signed Act 5 of 2018 into law. This statute is designed to “protect consumers by proactively ensuring that the existing utility business and regulatory model will be updated for the twenty-first century”¹⁰ After January 1, 2020, this statute mandates that “electricity rates

to focus utilities on performance and alignment with public policy goals, as opposed to growth in capital investments or other traditional determinants of utility earnings under COSR.” *Id.* at 3.

⁶ *Id.* at 3. Regulators in other jurisdictions—particularly those that are experiencing the transformative effects that technology, distributed generation, etc. have on the electric distribution system—have made similar observations. *See, e.g.*, New York Policy Framework at 2. Broadly defined, “modern power systems” may be those dealing with expanded consumer control, technological disruption, expansion of renewables, and other public policy considerations, *e.g.* 100 percent clean energy targets.

⁷ Order No. 35411 at 53-55; *see also* Order No. 35542 at 39-52 (further explaining the scope of Phase 1).

⁸ Order No. 35411 at 56; *see also* Order No. 35542 at 52-56 (further explaining the scope of Phase 2).

⁹ Order No. 35411 at 56; *see also id.* (explaining that “some of the strategic and/or transformational PBR elements discussed in Phase 2 may not be actionable within the anticipated timeline of this proceeding”).

¹⁰ 2018 Haw. Sess. Laws, Act 5, § 1 (“Act 5”).

[will] be considered just and reasonable only if the rates are derived from a performance-based model for determining utility revenues.”¹¹ In establishing rates using PBR, the PUC has been directed to consider the following non-exhaustive list of performance areas: (1) reducing the costs of energy and operations; (2) reducing curtailment of renewable generation; (3) accelerated retirement of utility-owned, fossil-fuel generation; (4) increased investment in transmission and distribution infrastructure and decreasing investment in utility-owned, fossil-fuel generation;¹² (5) customer affordability; (6) electricity reliability; (7) customer engagement and satisfaction, including options for managing electricity costs; (8) access to system information, including system planning data and aggregated customer energy use data and individual access to granular information about an individual customer’s own energy use data; (9) rapid interconnection of renewables and distributed resources; and (10) timely execution of competitive procurement and interconnection of third-party resources.

In light of these recent developments, this paper is intended to offer policy strategies for consideration with respect to the implementation of PBR. Numerous reports and studies discuss PBR implementation efforts in a number of jurisdictions. Order No. 35411 summarizes several different programs.¹³ While the considerations presented herein take those efforts into account, we do not repeat those summaries or otherwise attempt to synthesize material from a number of jurisdictions. The balance of this paper is organized into three substantive sections (following this Section II), namely, Sections III and IV and Appendix A. Appendix A provides an historical overview of how the current regulatory framework developed. Specifically, Appendix A explains

¹¹ *Id.*

¹² These first four areas are already set forth in statute. *See* H.R.S. § 269-6(d); *see also* Order No. 35411 at 8-9 (discussing these four areas). The remaining areas are discussed in section 3 of Act 5.

¹³ *See* Order No. 35411 at 18-27.

the legal basis for governmental regulation of private enterprises, identifies the legal standards governing ratemaking, and identifies permissible ratemaking methodologies in light of the governing standard. Considering those standards and methodologies, Section III identifies a number of issues, questions, and considerations that are important to address as Hawaii implements PBR.¹⁴ In consideration of the standards, methodologies, issues and outstanding questions that are identified in Sections II and III and Appendix A, Section IV offers a framework for considerations for implementing PBR in Hawaii.

III. QUESTIONS AND CONSIDERATIONS ASSOCIATED WITH IMPLEMENTING PBR IN HAWAII

This Section focuses on questions and considerations as Hawaii implements PBR.

A. Breaking the Link Between Utility Revenues and Investment in Property Dedicated to the Public Service

Most jurisdictions implement PBR or other modifications to COSR as incremental “add-ons” that supplement, but do not wholly replace, COSR.¹⁵ This is the case in Hawaii, as noted in Order No. 35411.¹⁶ While these jurisdictions no longer apply traditional COSR, there is a cost basis for their ratemaking decision. This cost basis is important given the natural interrelationship among the Constitutional protections of private property, the costs the utility incurs to provide service (both operational costs and the cost of property), and the capital attraction and comparable

¹⁴ As Hawaii has developed innovative clean energy policies and modified traditional utility regulation, especially over the past decade, some of the elements of PBR are already incorporated into Hawaii’s approach to utility regulation, whether identified as PBR, or not.

¹⁵ See, e.g., New York Policy Framework at 2 (“We build from the conventional cost-of-service ratemaking approach to add a combination of market-based platform earnings and outcome-based earning opportunities.”).

¹⁶ See Order No. 35411 at 40 (“The regulatory framework for the HECO Companies . . . currently incorporates, in at least some form, several of the fundamental components ordinarily associated with PBR . . .”).

earnings standards articulated in *Bluefield* and *Hope* (see Appendix A). In discussing this natural interrelationship, renowned scholar, Professor Bonbright, explained:

No writer whose views on public utility rates command respect purports to find a single yardstick by sole reference to which rates that are reasonable or socially desirable can be distinguished from rates that are unreasonable or adverse to the public interest . . . Nevertheless, one standard of reasonable rates can fairly be said to outrank all others in the importance attached to it by experts and by public opinion alike—the standard of cost of service . . .¹⁷

Justice Reed also discussed this interrelationship in his dissenting opinion in *Hope*. Indeed, he took issue with the end result doctrine precisely because it ignored this interrelationship. According to Justice Reed, the “statutory command” to ensure that rates are just and reasonable is “more explicit” than the majority’s “view that it makes no difference how the Commission reached the rate fixed so long as the result is fair and reasonable.”¹⁸ While he agreed with the majority’s decision not to mandate use of the COSR-based prudent investment rule,¹⁹ Justice Reed explained that ratemaking recognizes “the relation of fair and reasonable to fair value and reasonable return. The Commission must therefore make its findings in observance of that relationship.”²⁰

Act 5 directs the Hawaii PUC to “establish performance incentives and penalty mechanisms that directly tie an electric utility [*sic*] revenues to that utility’s achievement on performance metrics and break the direct link between allowed revenues and investment levels.”²¹

It is not clear whether this directive mandates the absolute separation of utility revenues from

¹⁷ Bonbright at 67 (emphasis added); see also *id.* at 66 (describing “cost of service as the basic standard of reasonableness”) (capitalization omitted).

¹⁸ *Hope*, 320 U.S. at 623 (Reed, J., dissenting).

¹⁹ “Under the prudent investment rule, the utility is compensated for all prudent investments at their actual cost when made (their ‘historical’ cost), irrespective of whether individual investments are deemed necessary or beneficial in hindsight. The utilities incur fewer risks, but are limited to a standard rate of return on the actual amount of money reasonably invested.” *Duquesne Light*, 488 at 309.

²⁰ *Id.* (Reed, J., dissenting) (emphasis added).

²¹ Act 5, § 3 (emphasis added).

capital expenditures, or whether it permits an indirect link between allowed revenues and investment levels. If the direct link between allowed revenues and investment levels is breached, it leads to a novel question.²² Despite being free to use any methodology to *set the rates*, is a cost-based standard always required to *assess the rates' Constitutionality*?

Given the predominance of COSR or modified regimes that retain elements of COSR, this question has not presented itself often.²³ Nonetheless, the Supreme Court has acknowledged that this is, in fact, an open question. In *Wisconsin v. Federal Power Commission*, the Supreme Court addressed a challenge to a ratemaking methodology that established “area rates” that applied to all utilities in those areas, as opposed to cost-of-service based rates for the individual utilities. It upheld the area method without squarely addressing the cost issue: “To whatever extent the matter of costs may be a requisite element in rate regulation, we have no indication that the area method will fall short of statutory or constitutional standards.”²⁴ In a concurring opinion in *Duquesne Light*, Justice Scalia went further and intimated at an answer:

[W]hile “prudent investment” (by which I mean capital reasonably expended to meet the utility’s legal obligation to assure adequate service) need not be taken into account as such in ratemaking formulas, it may need to be taken into account in assessing the constitutionality of the particular consequences produced by those formulas.²⁵

He stopped short, however, of providing an answer since the issue was not before the Court.²⁶

²² Senator Chang characterized Act 5 as “revolutionary” and a “moonshot,” which suggests that the intent may be to implement PBR as a wholesale replacement to COSR.

²³ Even the United Kingdom’s RIIO method, which is often viewed as an advanced form of PBR, maintains a link between rates and the cost of providing service.

²⁴ *Wisconsin v. FPC*, 373 U.S. 294, 309 (1963). In his dissenting opinion, Justice Clark opined that “[i]t is of course true that the cost-of-service method is not the ‘*sine qua non* of natural gas rate regulation.’” *Id.* at 327 (Clark, J. dissenting).

²⁵ *Duquesne Light Co. v. Barasch*, 488 U.S. 299 (1989) at 317 (Scalia, J., concurring) (emphasis added).

²⁶ *Id.*

While Hawaii clearly has the authority to dictate that rates be established using a methodology that does not consider the cost of providing service, a cost-based standard may be employed should a court be asked to review whether those rates are Constitutional. For example, if PBR is used to establish rates that are based solely on performance, or that subject the HECO Companies to penalties that could reduce their earnings below what is required by *Bluefield* and *Hope*, the rates may be deemed confiscatory (discussed at length in Appendix A). In short, Hawaii may be in uncharted territory. Ratemaking, however, retains qualitative factors and ongoing judgment calls that generally offer PUCs broad discretion.

B. A Fair Return on What?

The Constitutional safeguards are rooted in property rights, and the *Bluefield* and *Hope* standards require that rates allow the utility to earn a fair return. These standards give rise to a question that is related to the question addressed immediately above regarding the scope of Act 5's mandate to break the link between utility revenues and capital investments: is the requisite fair return a return on property, a return on capital invested, or something else?

Smyth v. Ames recognized determining the level of compensation necessary to avoid a taking, and “the necessary elements in such an inquiry, will always be an embarrassing question.”²⁷ Nonetheless, *Smyth v. Ames* applied the fair return to the fair value of the utility which, as explained above, was generally deemed to be the cost of reproducing the utility's property at the time rates were being set. Justice Brandeis rejected this view, asserting that “[t]he thing devoted by the investor to the public use is not specific property, tangible and intangible, but capital embarked in the enterprise.”²⁸ Relating back to the Constitutional safeguards, Brandeis opined that it was that

²⁷ *Smyth v. Ames*, 169 U.S. 466, 546 (1898)

²⁸ *Missouri v. Southwestern Bell Telephone Co.*, 262 U.S. at 290 (Brandeis, dissenting).

capital, not the specific utility property, that “the Federal Constitution guarantees to the utility the opportunity to earn a fair return.”²⁹ In addition to the utility’s operating expenses, Justice Brandeis defined the cost of providing service as the capital charges that “cover the allowance, by way of interest, for the use of the capital, whatever the nature of the security issued therefor, the allowance for risk incurred, and enough more to attract capital . . . [A] a rate is constitutionally compensatory, if it allows to the utility the opportunity to earn the cost of the service as thus defined.”³⁰

Justice Brandeis’ view was expressed in minority opinions, and *Smyth v. Ames* was the law of the land when Brandeis left the Court. It is telling, however, that when *Hope* overturned *Smyth v. Ames*, it endorsed Brandeis’ formulation of the cost of providing service. “From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business.”³¹ Building on *Bluefield’s* comparable earnings and capital attraction standards, *Hope’s* focus was not on specific items of property, but on the rate’s effect on the utility’s ability to operate successfully, maintain its financial integrity, attract capital, and compensate investors.³² Combined with the conclusion that a rate determination will be upheld even if it “contain[s] infirmities,” *Hope* strongly suggests, if not outright holds, that the return requirement is linked to capital invested and not necessarily to property deployed to provide service.³³

²⁹ *Id.*

³⁰ *Id.* at 291 (emphasis added).

³¹ *Hope*, 320 U.S. at 603.

³² *Id.* at 605.

³³ *Id.* at 602. Even in his dissenting opinion, Justice Jackson criticized the Fourth Circuit decision. *See id.* at 628 (Jackson, J., dissenting) (“Certainly the theory of the court below that ties rate-making to the fair-value-of-reproduction-cost formula should be overruled as in conflict with *Federal Power Commission v. Natural Gas Pipeline.*”).

Duquesne Light provides further support for the notion that the return need not necessarily apply to specific property. In that case, the Supreme Court rejected a proposal to adopt the prudent investment rule as the Constitutional standard, which would have guaranteed full rate recovery for all prudent investments.³⁴ The Supreme Court also noted that “whether a particular rate is ‘unjust’ or ‘unreasonable’ will depend to some extent . . . on the amount of capital upon which the investors are entitled to earn [a fair] return.” Consistent with Justice Brandeis’ view, this holding suggests that the return is on the capital invested and not the property itself. In a concurring opinion, however, Justice Scalia observed that it is not possible to determine whether a rate “constitute[s] a fair return on investment, and thus whether the government’s action is confiscatory, unless we agree upon what the relevant ‘investment’ is. For that purpose, all prudently incurred investment may well have to be counted.”³⁵ Noting that this question was not before the Court, Justice Scalia went no further.

Similar to the considerations discussed in Section III.A above, this question is important to consider in Hawaii, particularly if Act 5 is construed so that rates are based exclusively on performance outcomes. A return established using PBR may be permissible if it meets the *Bluefield/Hope* comparable earnings and capital attraction standards even if the return is not directly tied to the property the HECO Companies have deployed in the past, or plan to deploy in the future, to provide service.

C. Implementation Timeline

Recognizing that implementation of certain proposals could require material revisions to the existing regulatory paradigm, Order No. 35411 reflects the PUC’s express intent to “take into

³⁴ *Duquesne Light*, 488 U.S. at 309, 315-16.

³⁵ *Duquesne Light*, 488 U.S. at 317 (Scalia, J., concurring).

consideration the regulatory principle of gradualism.”³⁶ A key consideration is the timeline established by statute to implement PBR by no later than January 1, 2020. The primary issue arises if the statute is construed as requiring PBR as a wholesale replacement to COSR. As compared to efforts to implement PBR in other U.S. jurisdictions, such a directive would be unique.

As explained above, most jurisdictions implement PBR incrementally as an add on, or series of “add ons,” that supplement, but do not wholly replace, COSR.³⁷ It is common for regulators to take a gradual approach to implementing these add ons. For example, the New York Public Service Commission approved a “customer load factor” earnings adjustment mechanism for Consolidated Edison (Con Ed) . It did not, however, fully implement that mechanism in the first year of Con Ed’s rate plan. Initially, Con Ed and stakeholders agreed to gather data and propose metrics and incentives that would apply in rate year two.³⁸ The need for additional analysis has further delayed full implementation of that mechanism to rate year three at the earliest.³⁹

³⁶ Order No. 35411 at 56.

³⁷ See, e.g., New York Policy Framework at 2 (“We build from the conventional cost-of-service ratemaking approach to add a combination of market-based platform earnings and outcome-based earning opportunities.”).

³⁸ See New York Pub. Serv. Comm’n, Case No. 16-E-0060, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Comments Supporting Resolution of Outcome-based EAM Collaborative Issues at 10 (Nov. 1, 2016) (“Given that additional analysis is necessary to meaningfully develop [Customer Load Factor], the Collaborative recommends that no targets or any associated incentives be allocated to [Customer Load Factor] for [rate year 1].”).

³⁹ See New York Pub. Serv. Comm’n, Case No. 16-E-0060, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, 2017 Outcome-based EAM Collaborative Report at 13 (Aug. 23, 2017) (“The Collaborative parties agreed that additional analysis regarding appropriateness of this metric is necessary. Consequently, the [Customer Load Factor] metric will not be instituted for [rate year 2], but it will continue to be investigated for appropriateness in [rate year 3].”). In Minnesota, where the Public Utilities Commission found that Xcel Energy’s multiyear rate plan proceeding needed to broaden the record to account for performance measures and incentives, a new proceeding was initiated by the PUC to identify performance goals and metrics in phase one and incentives in phase two. See Notice of Comment Period, *In the Matter of a Commission Investigation to Identify and Develop Performance Metrics and, Potentially Incentives for Xcel Energy’s Electric Utility Operations*, Docket No. 17-401 (September 22, 2017). The PUC squarely stated at the outset that initial development of appropriate incentives “could start with identification of some of the more established metrics from the first phase.” *Id.* at 2.

If Act 5 is interpreted as directing that PBR be a wholesale replacement for COSR, the relatively near-term deadline for implementing PBR would make it more difficult to draw from “lessons learned” from other U.S. jurisdictions that have implemented PBR as a supplement to COSR.⁴⁰

D. PBR’s Impact on Other Aspects of Utility Regulation

Cost allocation and rate design are important aspects of utility ratemaking. If Act 5 is construed as requiring the absolute separation of utility revenues from capital expenditures, it is not clear how the PBR equivalent of a revenue requirement should be allocated to various customer classes. Rate design could also require more attention under such a construction, particularly in determining what incentives and penalties are recovered through a particular rate element (*e.g.*, fixed charges, demand charges, energy rate, time of use rates, variable pricing, and so on.).

In addition, while ratemaking is an important aspect of the regulatory paradigm, it is not the only part. The PUC has authority over substantial matters such as resource planning and competitive procurements. PBR will affect other regulatory initiatives, such as the grid modernization proposal, and the investments identified in the Power Supply Improvement Plans (PSIP). Beyond its impact on ratemaking, the PUC is already incorporating aspects of PBR into other regulatory mechanisms.

E. Outcome-based PBRs and the UK Model

Regardless of the timeline or nature of the de-linking of investment and outputs, the aim of PBR is to create positive outcomes. To that end, the United Kingdom’s PBR regime can prove instructive. When the UK instituted performance-based ratemaking in 2013, it prioritized

⁴⁰ While there is no generic recipe for implementing any regulatory policy given the unique circumstances of each jurisdiction, examples from other U.S. jurisdictions often provide valuable insight that can be tailored to Hawaii.

outcomes over capital inputs, “delivering outputs that reflect what consumers want from energy networks and meeting the needs of a sustainable energy sector.”⁴¹ The UK’s gas and electricity regulatory authority, Ofgem, intended to transition away from the traditional approach of capital and operational expenditure to a total expenditure paradigm, encapsulating it as “Revenue = Incentives + Innovation + Outputs” (RIIO). RIIO prioritized outputs that include: customer satisfaction; reliability, safe network services and connection, environmental impact, and societal obligations. Investor incentives come from a system that aims to provide clear, long-term opportunities for companies to earn higher returns if they operate and deliver efficiently and outperform their targets. RIIO retains the strong cost control incentives from the previous capital expenditure model, while attempting to focus on long-term performance, outputs, and outcomes, with less focus on *ex-post* review of investment costs.⁴² RIIO sets one- and eight-year targets. The one-year target sets an upfront price control so companies know the revenue they are allowed to earn, adjustments for inflation, and a return on the regulatory asset value. The eight-year price caps also allow a longer planning window, while incentivizing companies that come in under budget for a particular project to keep their extra revenue. Consumers have the added benefit of lower bills. The market will, in turn, penalize poorer performing companies with lower-returns and additional regulatory scrutiny. The goals of this new model are to find efficient investment and innovation to meet consumer and network participant needs. With the eight-year cost control target, the RIIO model encourages utilities to innovate to deliver cost savings and value for customers by ensuring that the utilities will retain most of the efficiency savings they generate for

⁴¹ Ofgem (2010): RIIO: A New Way to Regulate Energy Networks. Factsheet. Retrieved from: <https://www.ofgem.gov.uk/ofgem-publications/64031/re-wiringbritainfs.pdf>

⁴² *Id.* at 2.

a longer period. RIIO gives utilities the potential to earn incentives for over-delivering in certain performance areas and penalties for under-delivering in certain areas, both equating to approximately 3 percent of utility base revenues.⁴³ The RIIO model's revenue cap plan allows for annual revenue increases only at inflation levels, but any cost savings that utilities achieve can generally be retained.⁴⁴

IV. CONSIDERATIONS FOR PBR IMPLEMENTATION FRAMEWORK

This section discusses considerations for a possible framework to implement PBR in Hawaii. The considerations for the framework include both existing, modified, and new regulatory mechanisms. A possible framework that is somewhat akin to the United Kingdom's RIIO model is one option.⁴⁵ That is, the PUC could consider: (1) revising the multi-year rate plan; (2) approving, on an *ex ante* basis, a base level of revenues;⁴⁶ (3) enhancing the suite of performance outcomes, including the metrics to measure performance in each specified area; and (4) reevaluating the range of incentives and penalties associated with performance in each specified area, which acts to increase authorized revenues above the baseline (up to a cap) for positive performance and reduced authorized revenues below the baseline where performance metrics are

⁴³ See Whited, M., Woolf, T., Napoleon, A., *Utility Performance Incentive Mechanisms: A Handbook for Regulators*, Synapse Energy Economics (2015) at p. 49. Accessed at: https://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098_0.pdf

⁴⁴ *Id.* at 50.

⁴⁵ Though it maintains a link to capital investments and cost, RIIO is a comprehensive alternative to COSR. Order No. 35411, and sources cited therein, provide additional details on the RIIO model.

⁴⁶ The PUC could either establish baseline revenues for each year the plan is in effect, or it could establish baseline revenue for the first year of the plan, which will be escalated over the term of the plan by a PUC-approved escalation factor.

not met. Under this framework, base rates would be set at the baseline revenue target and adjusted accordingly.

A. Multi-Year Rate Plan

Consideration of stakeholder input could help determine the term of the plan in conjunction with the following additional considerations. First, the PUC may consider it important to establish a term that is of sufficient length to influence the HECO Companies' behavior and ensure that short-term solutions do not dominate the HECO Companies' focus. There may be a need, therefore, for a period of between six to eight years before the program is revisited to provide reasonable time within which the utility could make appropriate adjustments. Provisions also could incorporate the opportunity for a "reopener" as a result of material changes in circumstances or external factors. Since PBR is in its infancy across the United States, this approach may give sufficient time for a true test to occur. The possibility of "reopeners" at certain milestones and defined time frames (*e.g.*, three years, six years) could allow the PUC an opportunity to make mid-course corrections, should it so choose. Six to eight years would be unusually long for a rate plan but may be warranted for these circumstances. As noted, *supra*, the (UK) RIIO model uses an eight-year rate plan.

Second, material or frequent changes can create uncertainty and undermine the program's benefits. Unforeseen issues, however, could and probably will arise; therefore, consideration should be given to a mid-point review process that would enable the PUC to order adjustments that may be necessary to protect consumers and to ensure the integrity of the program. For example, adjustments may be warranted to correct unintended consequences, such as a financial incentive that results in utility management shifting attention away from other performance areas.

If the HECO Companies propose changes within the term of the multi-year rate plan, the PUC may consider that they be required to meet a standard that is similar to the "public interest

application” of the “just and reasonable standard” that Federal Energy Regulatory Commission (FERC) employs with respect to changes to agreed-upon structures.⁴⁷ Under this standard, FERC requires parties to meet a relatively higher burden if they want to be excused from agreed-upon obligations (*i.e.*, relatively higher than would be required under normal circumstances, where the party would simply have to show the obligation is not just and reasonable). In particular, the “public interest” application requires that a party that wants to be excused of its obligations must show: (1) that the obligation, if left in place, would “seriously harm[] the consuming public;”⁴⁸ (2) “extraordinary circumstances where the public will be severely harmed” by leaving the obligation in place;⁴⁹ or (3) that the obligation “impose[s] an excessive burden on consumers or otherwise seriously harm the public interest.”⁵⁰ The purpose of this standard is to hold parties to their commitments except in only the most extreme circumstances.⁵¹ Adopting some form of this strict standard may strike the appropriate balance because it allows for program changes but ensures that any such changes are critical to the financial health of the utilities. A rebuttable

⁴⁷ In *Morgan Stanley*, the Supreme Court explained that there is only one standard, *i.e.*, the just and reasonable standard. However, there is a public interest *application* of that standard, which imposes a higher bar. *Morgan Stanley v. PUD No. 1 of Snohomish County*, 128 S.Ct. 2733, 554 U.S. 527 (2008). The public interest application of the just and reasonable standard is often referred to as the *Mobile-Sierra* standard because the standard originated in the Supreme Court’s decisions in *United Gas Pipe Line Co. v. Mobile Gas Service Corp.*, 350 U.S. 332 (1956) (“*Mobile*”) and *FPC v. Sierra Pacific Power Co.*, 350 U.S. 348 (1956) (“*Sierra*”).

⁴⁸ *Morgan Stanley*, 128 S. Ct. at 2746; *see also id.* at 2747 (“[t]he contract rate must seriously harm the public interest” before it may be set aside).

⁴⁹ *Id.* at 2749.

⁵⁰ *Id.* at 2750.

⁵¹ While FERC “may not normally impose upon a public utility a rate which would produce less than a fair return, it does not follow that the public utility may not itself agree by contract to a rate affording less than a fair return or that, if it does so, it is entitled to be relieved of its improvident bargain...In such circumstances the sole concern of the Commission would seem to be whether the rate is so low as to adversely affect the public interest—as where it might impair the financial ability of the public utility to continue its service, cast upon other consumers an excessive burden, or be unduly discriminatory.” *Sierra*, 350 U.S. at 355.

presumption could be applied that the multi-year rate plan is prudent, with adjustments requiring the utility to clearly carry the burden of proof.

B. Base Level of Revenues

The options for setting base revenues will be influenced in part by timing and in part by resource availability. One option is to place the onus on the HECO Companies to develop a proposal that stakeholders could scrutinize and address in comments to the PUC.⁵² The PUC could then consider issuing an order setting the base level of revenue. Another option would be for the PUC to consider proposing a base level of revenue. Stakeholders could opine on the PUC's proposal in Docket No. 2018-0088, with the PUC then deciding after consideration of the input. While this option may be more expedient, it imposes a substantial workload on the PUC and its staff. Another option is to exercise this approach during future PBR cycles if deemed a prudent course of action.

Regardless of which entity develops the proposal, and assuming that Act 5 permits an indirect link between allowed revenues and capital investments, the Original Cost New Less Depreciation value of the HECO Companies' hard assets could be the starting point for developing the base level of revenue that would be proposed to stakeholders. The proposal also could be informed by studies and data included in previous filings, including rate cases, the PSIPs, Distributed Energy Resource (DER), and other plans that the HECO Companies submitted in the wake of the PUC's April 2014 orders.⁵³ The base level of revenue also would have a forward-

⁵² Pragmatically, the most recent general rate case could be used as a starting point for establishing a base level of revenues should the compressed schedule for development of PBR necessitate. The revenue requirement was obviously set by the PUC in this most recent case. The statute, however, appears to set forth a procedure where PBR is really set to performance. As explained in more detail in Appendix A, care must be taken to avoid constitutional claims.

⁵³ See, e.g., Hawaii Pub. Util. Comm'n Docket No. 2011-0206, *Instituting a Proceeding to Investigate the Implementation Of Reliability Standards for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited*, Order No. 32053 (April 28, 2014).

looking component that considers planned expenditures as identified in the PSIPs, DER, and other relevant plans. It could also consider the performance outcomes identified below, as well as analyses of the costs to achieve those outcomes and the value of expected benefits. If Act 5 is interpreted as requiring the absolute separation of utility revenues from capital expenditures, developing the base level of revenue may become much more difficult as it would have to be decoupled from capital investments and operations and maintenance expenditures.

C. Performance Metrics Incentives and Penalties

While this paper offers considerations for implementing a PBR framework in Hawaii, specific details such as performance metric targets or the levels of incentives and penalties are not presented. In addition to being difficult, if not impossible to develop such details in the abstract, it is appropriate that such details be developed in a process that includes stakeholder participation consistent with the PUC process for PBR currently underway. With that caveat, where examples exist, the discussion here identifies considerations relative to performance metrics, incentives, and penalties that could be employed.⁵⁴

While metrics could consider historical data from the HECO Companies and forward-looking plans such as the PSIPs, incorporating a comparison of the HECO Companies' performance against industry benchmarks provides an additional degree of protection against the potential for windfall earnings. Benchmarks on reliability, resiliency, accelerating the penetration of renewables, expansion of energy efficiency, and responsiveness to consumer issues are all examples of "benchmarks" that might make sense in this context. In addition, consideration could be given to the creation of another rebuttable presumption, whereby a higher burden of proof would

⁵⁴ We should note that this paper has been prepared while the relevant PUC docket is ongoing, with extensive stakeholder processes and three high quality PUC staff reports already completed. As a result, this paper should be seen as a "living document" which could inform the process.

be applied to the HECO Companies to make an affirmative demonstration, supported by substantial evidence, that incentives (*i.e.*, upward adjustments from the baseline) are warranted. Benchmarks may be new but could include yearly staged progress to renewable energy goals not only in total but also on individual islands and an option particularly for strengthening the flexibility of the transmission and distribution system⁵⁵ with fewer measured outages (by percentage).

A well-structured PBR framework will, hopefully, ensure that incentives and penalties are set at the appropriate levels. While determining those levels is a fact-specific exercise that could be undertaken as part of the regulatory process under PUC Docket No. 2018-0088, the following considerations are offered to guide the discussions.

First, clearly define and establish easily understood financial consequences. Second, the level of the financial incentive(s) should be commensurate with the level of customer benefits. Otherwise, the HECO Companies could be rewarded for achieving performance levels that customers do not value. Of course, measuring consumers' priorities is difficult beyond just, reasonable, and reliable service at a low price. In Hawaii, this probably also includes achieving clean energy goals and mitigating climate change. Focus groups could be used.⁵⁶ Third, consider setting financial incentives to achieve State energy policy goals based on the broader public

⁵⁵ As a general matter, Hawaii has lower voltage circuits functioning as transmission facilities as compared to mainland utilities. In addition, extensive work has already been conducted in examining loadings on distribution circuits for consumer-owned distributed solar facilities. Flexibility, as conceived in this context, could contemplate increased levels of reliability through improved technology (*e.g.*, "smart grid" sensors) while still expanding both consumer-owned distributed generation and utility-owned renewables, such as community solar.

⁵⁶ Focus groups managed by independent third parties could be divided by customer class and level of income using standard sociological behavioral group dynamics, *e.g.*, one would want to avoid having an energy savvy individual dominate a focus group.

interest.⁵⁷ Criteria could include: (1) progress towards achieving 100 percent RPS; (2) progress towards generation diversity; (3) progress towards reliable service; and (4) progress towards a resilient energy sector. Fourth, financial incentive(s) could be set at graduated levels that are appropriate given the costs to achieve the desired outcome. For example, the highest possible incentive would recognize achievement of the most desired outcome, where lower levels of incentives would recognize desired outcomes where there is still area for improvement. Fifth, adjustments to the base level of revenue should be easy to implement.⁵⁸ Finally, penalties should be meaningful in terms of level and use of funds generated by penalties.⁵⁹ For example, customers are likely to view rebates, a more direct benefit to customers, as being more meaningful than deposits into the general fund. Penalties cannot fail the tests set forth in Appendix A, and the line of Supreme Court cases. If the penalties, however, are returned to the public either directly or indirectly through specific public benefits programs, then equitable benefits under the *cy pres* doctrine (“as near as possible”) could help address concerns about expropriation.

Similarly, consideration may be given to establish a range of positive performance adjustments (*i.e.*, incentives) that would facilitate higher earnings, subject to a PUC-established revenue cap, as well as the range of negative performance adjustments (*i.e.*, penalties) that would reduce earnings below the base line.⁶⁰ Stakeholders could comment on a proposal by the HECO

⁵⁷ For example, FERC awards incentive adders to utilities base returns on equity simply for the utility’s decision to join an RTO or ISO. Those incentives may be outsized in relation to public benefits, if not entirely unwarranted.

⁵⁸ As explained above, incentives or penalties are most commonly expressed in terms of basis-points adjustments to return on equity. Because return on equity is directly linked to utility investments, that approach would not be allowed if Act 5 is construed to prohibit any link between rates and cost of service.

⁵⁹ As explained in more detail in Article III, Sections A and B, and Appendix A of this paper, such penalties must be within constitutional norms.

⁶⁰ It is not suggested that each of the performance-outcome areas be afforded equal weight when determining the degree to which each will drive upward or downward adjustments from the baseline revenues. For example, some performance outcomes are so important to the State’s goals that a larger percentage of revenue-earning opportunities should be tied to them as compared to important, but less critical outcomes. Also, the PUC may wish to consider

Companies or the PUC, and then the PUC could establish final performance adjustments. Metrics and incentives could be set to ensure that ratepayers are not required to provide incentive returns for performance that mirrors present performance.⁶¹ To achieve that end enhanced data analytics will be necessary on a timely basis.

D. Proposed Performance Areas

In Order No. 35542, the PUC proposed a hierarchy for establishing goals and desired outcomes. In addition to the above discussion on metric incentives and penalties, the following Section 1 offers considerations in the design and establishment of metrics and metric targets. Section 2, Targeted Performance-Based Outcomes, identifies areas where performance-based outcomes could be targeted.

1. Metric Design Considerations

One strategy could be to develop metrics with an evolutionary approach of the existing regulatory framework. In setting metrics there can be unintended consequences which should be carefully reviewed. Below are a few principles that should be taken into consideration when developing metrics.

a. Designing Metrics for Utility Influence

Priority for the first metrics could focus on outcomes that are not easily addressed by the existing regulatory framework mechanisms. This would include social outcomes as well as the establishment of a competitive market framework. Examples discussed in greater detail below include beneficial electrification, resiliency, and DER use. It is important to note that while these

devoting a performance incentive (e.g., 5 percent of the total incentives) to achievement of positive outcomes in all performance areas.

⁶¹ A “fail-safe” mechanism should always be preserved. For example, the recent volcanic eruptions in and around Kilauea, causing a natural disaster, should be an opportunity for reexamination, so long as negligence by the utility is not a factor.

outcomes are not entirely within the HECO Companies' control, outcomes cannot be effectively achieved without their playing a critical if not central role. This point was noted in Staff Report 3: *"...it is important that metrics and mechanism design appropriately reflect factors that the utility has influence over. Even in these cases, however, it might not be appropriate to strictly apply a principle of utility control as it can be helpful to align and market the utility more responsive to external market factors...."* (Commission, November 14, 2018)⁶²

The establishment of incentives and penalties for the HECO Companies will need to take into account and be set to a level commensurate with the degree to which the utilities have control over the given metric. It would be desirable for the HECO Companies to take a holistic approach in the pursuit of state energy policies that requires many actors to achieve. The HECO Companies must play their part for PBR to be an effective mechanism.

b. Ensuring Market Competition is Maintained or Advanced

The HECO Companies' ability to help achieve state energy policies, such as the first state to commit to a zero emissions clean economy and statewide carbon neutrality by 2045, support of the Paris Climate Accord, and 100 percent RPS, requires support from stakeholders. For instance, the HECO Companies cannot guarantee the achievement of a net zero economy; however, they can control aspects of achieving a net zero economy. The questions to consider when developing a metric for a particular aspect, such as electric vehicle (EV) charging infrastructure, are whether participation will support the overall state policy while not impeding market solutions. If it is appropriate for the HECO Companies to participate, then clear accounting is important to identify

⁶² Prioritized Outcomes, Regulatory Options, and Metric Development for Performance-Based Regulation in Hawaii, Concept Paper to Support Docket Activities, Proceeding to Investigate Performance-Based Regulation (2018-0088), Hawaii Public Utilities Commission / November 14, 2018 ("Staff Report"); page 18

how the costs and benefits of the metric flow to customers to enable equitable allocation of benefits and costs for all.

c. Transparency and Simplicity of Metrics

Devising the measurement and verification of each metric is always cause for careful consideration. Staff Report 3 notes that metrics should be quantifiable using reasonably available data.⁶³ Who will be responsible for measurement and verification, how will the responsible party perform the measurement and verification, and who will bear the costs associated with performing the measurement and verification? These are all critically important factors that must be determined prior to implementing any metric. Unfunded mandates to measure and verify a large number of metrics may cause undue burden and lead to less successful PBR implementation.

d. Considerations in Design of Metrics Altering Revenue

While each metric may measure a specific state policy outcome, such as decarbonization of transportation, trying to achieve the metric may require the coordinated efforts of multiple market participants. A metric, however, could focus on what the utility can directly control and the contribution to a specific desired outcome/state policy. The metric may then not directly measure success in terms of the outcome/state policy. This was noted in Staff Report 3 under “Reflect Desired Outcomes.”⁶⁴ It is desirable to set metrics that more closely reflect the goal or outcome. If revenues are to be tied to achieving specific targets, it may be appropriate in the early phases to measure aspects that can be more directly attributed to the utilities’ actions until more experience is gained and confidence developed. Also, design of metrics that address specific outcomes the utility can influence could be new and untested. The availability of data required to

⁶³ Staff Report 3, page 17

⁶⁴ *Id.*

calculate the information may be emerging and require greater quality control in the initial phases of collection. Metrics and their associated incentives and penalties need to reflect what can be accomplished and take into account that outcomes may be dependent upon others.

e. Utility Planning and Competitive Procurement

One goal of metric design could be to support the integration of procurement within utility planning, specifically for resources that are currently not subject to a formal procurement process. The HECO Companies' Integrated Grid Planning (IGP) process proposes to integrate utility-scale resource procurement within the planning process. It is less clear how the competitively priced procurement of resources without a utility procurement process (for example, customer-sited DER) would be aligned with the assumptions incorporated in the IGP. One option for future PBR cycles or check points is setting the DER metric targets in the IGP based on assumptions for DER market prices, utility avoided cost and utility rates, and state policy objectives. In that way the IGP process could integrate the procurement process of utility-scale resources and the utility would be incentivized to achieve the DER penetration levels identified by the process. Adjustment mechanisms for the target could be put in place to measure success based on actual rate levels and market pricing. Such a metric would likely require a third-party observer to oversee any assumptions going into a formulaic adjustment to metric targets.

In future PBR cycles or check points, the IGP process can also support setting penalties and incentives for total renewable penetration. Accelerated achievement of total renewable energy penetration can incentivize the utility to achieve the integration of procurement within the IGP process as proposed. Successfully integrating competitive procurement with the planning process will benefit customers and help achieve state energy policy.

2. Targeted Performance-Based Outcomes

The outcomes listed below are areas which could be the focus of PBR metrics and subject to utility influence to varying degrees. Some outcomes, such as third-party interconnections and reliability, could reasonably be seen as largely within the HECO Companies' control. Other outcomes, such as beneficial electrification, energy efficiency, and resiliency are less directly controlled by the HECO Companies either due to the nature of the outcome or the current regulatory framework. Therefore, the level of control over the performance-based outcome will influence the design of applicable metrics.

a. Beneficial Electrification

The goal of including Beneficial Electrification as a performance outcome is intended to encourage the HECO Companies to expand opportunities for end uses that are currently dependent upon fossil fuels, which if transitioned to electricity could be done in a way that supports an integrated grid, lowering costs to all customers. Examples include smart charging of EVs,⁶⁵ and electrification of ground support equipment at airports and harbors. One potential metric to be considered would quantify, either in MW or MWh, new installations of each pre-defined categories

⁶⁵ Vehicle electrification in which the source of energy is from renewables and storage can be used for off-peak charging, coupled with a future program where EVs can actually discharge into the electric system during on-peak periods, would provide a broader societal benefit. On the other hand, EV expansion programs can be seen as a way for utilities to offset declining load growth from effective energy efficiency programs and expanded consumer-owned distributed generation. Numerous states are examining these issues at the present time. For example, the New York Power Authority just announced a dramatic expansion. New York, in May 2018, announced a \$250 million initiative called Evolve NY to expand EV infrastructure through an EV charging station corridor across the state, New York City airport charging hubs, and establishing an EV model charging communities program. A number of cities are shifting school bus fleets to EVs. Several California communities, including McClellan, Rescue, Mountain View, and Los Angeles have school districts transitioning to EV fleets; so are a number of cities in Oregon, including Monroe, Coquille and North Bend; and Amarillo, Texas, to name just a few. In addition, the City of Austin, Texas developed a program for charging stations at all City of Austin public schools. On the other hand, in a decision by the Missouri Public Service Commission, Ameren's plans for rate base treatment of EV chargers was rejected. *See Report and Order, In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Approval Of a Tariff Setting a Rate for Electric Vehicle Charging Stations*, File No. ET-2016-0246 (April 19, 2017), *reh'g denied* (June 14, 2017). The design of an EV program, just like the design of energy efficiency programs, must ensure that all consumers can benefit, not just the utility.

of Beneficial Electrification (*e.g.*, EVs). Metrics would reward achievement of desired levels of expansion on a graduated scale or penalize the HECO Companies for failing to achieve certain levels. For example, the use of EV charging infrastructure during off-peak periods could help justify spreading of costs over a larger number of customers. This outcome could be influenced through charging infrastructure siting and time-differentiated pricing programs which work for customers and support a more efficient grid. The HECO Companies, however, are not the sole actors in achieving the adoption of customer-sited technologies; therefore, metric incentives and penalties should be set in recognition of these constraints.

b. Distributed Energy Resources Use

DER will play a critical role in achieving state energy policy goals. As such, the efficient incorporation of DER within the electric system's resource mix is a relevant outcome for discussion when exploring performance-based regulation. In examining the role of metrics for the efficient incorporation of DER, there are issues that are worth noting to avoid unintended consequences.

Developing metrics for the efficient use of DER options could include (1) a measure of the volume of DER incorporated (*e.g.*, MW, estimated MWh) or (2) a measure of the efficiency with which DER is used, such as distributed-generation photovoltaics (DGPV) curtailment or battery storage load factor. In the case of a volumetric measurement such as MW or estimated MWh (as reported for customer sited DG in the RPS), the metric is simply and transparently tracked and reported; however, the incentive would encourage the utility to potentially interconnect customer-sited DER without consideration as to whether the resources would be efficiently used. PV systems could be installed only to result in uneconomic levels of curtailment or battery storage systems underleveraged, as there is no incentive beyond interconnection. If DER metrics were

designed as in (2), to measure the efficiency of DER use, this would encourage efficient deployment of DER. Metrics could account for the level of curtailment of DGPV systems and the load factor of customer-sited energy storage. As long as the systems are integrated into the broader electric system such that their operation improves the broader electric system performance, all customers would benefit. Metrics to measure DER use, however, would require monitoring, if not reporting on, thousands of individual systems. While the information collected could be supported by DER system providers, the resources required to implement such a metric in both cost and manpower could outweigh the benefits. In addition, the measurement of efficient DER use would need to be tracked with the broader system performance to ensure that efficient use of DER was not leading to unintended consequences.

There are a number of ways the issues noted above can be addressed through programmatic approaches such as Demand Response (DR), smart load management programs, and time-of-use (TOU) and dynamic rates. All of these issues will need to be closely coordinated so as not to work at cross purposes with an efficiently run energy system or lead to inefficient incentives. DER resources are an important component of a holistic approach to meeting the State's energy goals and will require scrutiny as they are incorporated within the regulatory framework.

c. Third-Party Interconnections

The goal of a Third-Party Interconnection performance outcome is to streamline the interconnection process.⁶⁶ To implement this program, the PUC could track the time it takes for DER to connect to the grid and create an incentive for accelerating approval of applications. For example, the highest performance target could be achieved when a certain percentage of total

⁶⁶ The New York REV process is looking at both options to help improve interconnection times for DERs.

applications are interconnected within 15 days of receipt of the fully completed application, an intermediary performance target could be achieved when a certain percentage of total applications is interconnected within 30 days of receipt of the fully completed application, and so on. Care will need to be taken to ensure that no applications are improperly rejected so as to obfuscate actual performance. To achieve this result, the program could incorporate a number of factors including, but not limited to, an interconnection survey process for all interconnection customers, timeliness of circuit studies, and median interconnection times. It will be crucial to avoid gamesmanship. The program might benefit from embedding a third-party reviewer in the process and provide defined time frames.

d. Energy Efficiency

The need for aggressive energy efficiency targets out to 2045 will be essential to achieve state energy policy goals. The PSIP included scenarios for Oahu that would require roughly two-thirds of the land identified in the National Renewable Energy Laboratory's solar technical potential assessment to be developed.⁶⁷ (The Hawaii State Energy Office estimates that the acreage would be approximately 18,000 acres.) It is important to note that the PSIP contemplated roughly 15 percent EV penetration in 2045 compared to roughly 50 percent penetration in the recent Electrification of Transportation strategy, which would significantly increase the amount of renewable energy that would need to be developed.

Given the crucial role of aggressive energy efficiency targets in achieving state energy policy goals, consideration might be given to the HECO Companies' roles and contributions to address energy efficiency. There may be energy efficiency opportunities for utility systems and

⁶⁷ Instituting a Proceeding to Review the Power Supply Improvement Plans for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited; Hawaiian Electric Companies' PSIPs Update Report; Book 2 of 4; Docket No. 2014-0183, Hawaii Public Utilities Commission / December 23, 2016; page F-31

operations, as well as customer energy efficiency programs. Program offerings might address low income customers; creating a commercial energy index; incorporating non-wires alternatives, new technologies for energy efficiency, and additional DR programs; or an expansion of individual large projects, such as the energy savings performance contracts at the Honolulu airport. Data analytics and increased measurement of individual programs are enhanced elements of California's recently expanded programs; they can be a model. New York is presently working with the metrics associated with its Reforming the Energy Vision programs.⁶⁸ While the current regulatory structure puts energy efficiency programs under Hawaii Energy, it is important to highlight how important energy efficiency is to achieve the State's energy policy goals. Accordingly, it is worth discussing what, if anything, the HECO Companies could potentially do to further the objectives of energy efficiency if an appropriate role is identified.

e. Reliability and Resiliency

In light of the State's policy to address climate change, enhanced reliability and resiliency should be rewarded.⁶⁹ In terms of reliability, the traditional measurements of System Average Interruption Duration Index, System Average Interruption Frequency Index, and Customer Average Interruption Duration Index are important parts of the program. Specific performance

⁶⁸ Both the California and New York models expand both consumer access to data and State access to data, while attempting to ensure privacy through aggregated means. Data analytics is improving at an exponential pace and as the building systems and the electric system furthers the integration process, data analytics should permit improved program design. This is an area where flexibility will be necessary in a PBR process, including a two to three-year target for reevaluation. See, e.g., *Order Instituting Rulemaking on the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation*. R 94-04-031. See, also, New York Pub. Serv. Comm'n, Case No. 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*.

⁶⁹ Reliability and resiliency focus on avoiding negative impacts of stressors to the system or ensuring that the system can return to normal operations after being subjected to stressors. Going beyond these concepts, we recommend that the PUC consider a metric that would incentivize the HECO Companies to develop "antifragile" hardware, software, or processes that *improve* when subjected to stressors. "Antifragile," a neologism coined by Nassim Taleb, is the opposite of fragile. "Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better." Taleb, Nassim, *Antifragile: Things that Gain From Disorder* (New York: Random House Press Paperbacks, 2012) at 1.

outputs, as determined by an index of industry performance, would ensure improvement beyond the current.

To measure resiliency beyond the current state of affairs, performance metrics tied to outcomes could measure the percentage or number of identified critical infrastructure's ability to either withstand, or be back on line, within a defined period (e.g., 3 days), following a defined event (e.g., Category 4 hurricane, tsunami). Generally, this would require a process to identify what infrastructure served critical community services (e.g., hospitals, water supply and treatment facilities, first responders), defining an event for resiliency assessment (e.g., category 4 hurricane, tsunami) and the current baseline for critical infrastructure withstanding or recovering from the event within a defined time period. In future PBR cycles or check points, the IGP process could then be used to establish an appropriate target by running scenarios to determine the appropriate balance between benefits and costs. Currently the targets would incorporate existing planning efforts such as the PSIP. It should be noted that the assumptions in the PSIP were not developed as targets and should simply be viewed as a data point when developing a metric target.

The metrics targeting specific solutions could be incorporated including (i) micro-grid development, particularly in high-value locations; (ii) storm hardening of specific assets; and (iii) specific smart-grid deployments. Finally, cyber security and physical security should also be considered as part of the performance outcomes associated with this program. Cyber and physical security are difficult to measure, unless there is a disaster.⁷⁰ Third-party evaluations, including US DOE's Office of Cybersecurity, Energy Security, and Emergency Response (CESER) may provide useful guidance that could inform metrics.

⁷⁰ Companies are developing compliance planning activities for these security functions. In addition, the CESER office at the Department of Energy is working with DOE National Laboratories to provide expanded technical assistance and best practices.

Hawaii increasingly is threatened by natural disasters such as hurricanes and it is imperative that the HECO Companies are focused on resilient outcomes. This metric is one of the more difficult ones to establish, given the holistic approach required and the broad group of stakeholders which all have their part to play. It is also important to note that metrics for resiliency will be evolving over time. Hawaii can ill afford to delay the incorporation of resiliency into the build out of the infrastructure required for the transition to 100 percent RPS. Building new infrastructure for resiliency may be cheaper than retrofitting existing infrastructure; therefore, it may be prudent to proceed with incorporating the design and implementation of resiliency metrics in a measured fashion despite less-than-perfect information. Consideration should be given to resiliency metrics rather than delayed by the schedules of complementary proceedings such as the IGP, since the initial metrics may well contribute to the development and evolution of resiliency metrics over time.

f. Beneficial Customer Load Management

System beneficial customer load management is an element in the public interest and could be a targeted performance outcome. Options could include incentives created to reduce system costs, and complementary metrics in consideration of the level of reductions as compared to categories such as industry indexes and historical data.

Though primarily an issue of rate design, TOU rates are one means of achieving this goal.⁷¹ For example, where individual customers are capable of responding to TOU rates where they exist (battery storage or clothes drying in off-peak periods), customer bills could be reduced. For individuals or entities that cannot shift usage or choose not to shift use, TOU rates may or may not

⁷¹ Low-income customers and those on fixed incomes, including the elderly, should be protected as TOU rates are rolled out.

increase their bill. Since by choice or circumstance their energy use pattern remains the same, their bill would not be materially different from current rate design. Incentives could be developed, in conjunction with TOU rates, to incentivize load shifting.

g. Customer Engagement and Satisfaction

Given the purpose and nature of PBR, customer engagement and satisfaction should be a specific performance outcome that is considered for inclusion in the PBR implementation. The goal of the program would be to ensure that customers are satisfied with the level of service they receive.

Unfortunately, customer satisfaction is one area that is difficult to measure on a meaningful basis. For example, different customers are likely to value different things, making it difficult to measure different elements of service and satisfaction/dissatisfaction. In addition, if surveys are used as a measurement tool, the quality of the metric will depend, in part, on the quality of the questions asked. If the number of customer complaints is used as a measurement tool, it must be understood that a relatively low number of complaints could be due to factors such as favorable weather conditions, “complaint fatigue,” and other reasons.

Nonetheless, the number of complaints to the utility is a common metric. Other metrics could consider the time to resolve complaints, response time to service requests, answered call rates, or telephone wait times. Complaints also could be tracked geographically, such as by zip code, to track service quality in particular areas.

It may be wise not to create any distinction between types of customer complaints (*e.g.*, a complaint about billing versus a complaint about delayed processing of an interconnection request). Creating such distinctions could result in some service elements being ignored because they were omitted from an “index” of service elements or create a focus on those service elements

that receive greater emphasis. Stated conversely, aggregating all complaints should create an incentive to improve satisfaction in all areas.

h. Holistic Approaches to PBR

An over-arching element of PBR could be a combined factor that incorporates improved utility performance with advances in state policy, improved societal outcomes, and an enhanced customer experience. Rather than having PBR simply focus on individual stovepipes, the metrics should include how all the factors interact, to avoid overall negative consequences. One can envision the use of an advisory committee composed of individuals without a specific economic interest in the outcome of the Hawaii PBR docket.⁷²

i. Affordability and Data Access

While certainly a part of other performance-based outcomes, affordability and data sharing may be more appropriately pursued through regulatory actions outside of PBR. The average total bill and the total bill for low-income customers, those on fixed incomes, and those suffering from a disability might be considered for discussion in the evolution of any new affordability program. Materials are widely available from the National Consumer Law Center that could specify program details, but the PUC, with advice from the Consumer Advocate, determines regulatory practice regarding state policy goals versus customer affordability, both short-term and long-term. Low-income programs have been implemented successfully in other jurisdictions without the use of PBR. Specific federal programs offer financial support for low-income consumers, such as the Low-Income Home Energy Assistance Program and the Low-Income Weatherization Assistance Program. Both federal programs operate in Hawaii. California recently initiated a low-income

⁷² Participants could include national experts, such as representatives from the Department of Energy's National Laboratories.

solar program, so that low-income customers would directly benefit.⁷³ Low-income consumers, senior citizens, and those on fixed incomes tend to be the most inelastic energy consumers, and the least able to take advantage of technological change.

Specific direction may be a more appropriate avenue to pursue open data access for customers and third-party service providers, with customer consent. Customers and service providers can use energy cost and usage data to make more efficient decisions, reduce their costs, and increase the value of their energy systems. It is important to note that data sharing in other jurisdictions such as California is provided to customers by the investor-owned utilities at the direction of the California Public Utilities Commission⁷⁴ without the need to develop a PBR metric. While this example relates to customer data, it could easily translate to other types of system data as well.

V. CONCLUSION

PBR development in the United States is a nascent adventure. Hawaii is at the forefront with both the PUC efforts and Act 5. With that over-arching perspective, the PUC may choose to consider a range of outcomes of the type set forth in this paper. An overall strategy could consider both intended and unintended consequences and a matrix of possible actions. We recognize the enormity and complexity of the task, especially since changes in the electric system and

⁷³ See *Alternate Decision Adopting Alternatives To Promote Solar Distributed Generation In Disadvantaged Communities*, CPUC Decision 8-06-027 (Issued June 22, 2018), creating the Disadvantaged Communities (“DAC”)-Single Family Affordable Solar Homes (“SASH”) program and the DAC Green Tariff program.

⁷⁴ See *Decision Authorizing Provision Of Customer Energy Data To Third Parties Upon Customer Request* D.13-09-025, In the Matter of Pacific Gas and Electric Company for Adoption of its Customer Data Access Project (September 23, 2013).

technological changes are, by definition, difficult to accommodate through regulatory and policy action.

The PUC has a challenge, though holistic approaches will likely lead to more efficacious outcomes. Consideration could include the following: (1) financial incentives and penalties with both graduated levels, and possible caps and floors; (2) a temporal quality to all PBR elements, setting time frames and milestones for measuring success or failure, or providing degrees of flexibility; (3) adjustments to base revenues associated with (1) and (2) in this Section, with more alacrity than a major rate case would permit; (4) the role of Hawaii State energy policies and goals; (5) the advantages of “beneficial electrification”; (6) the role of DER use and expansion; (7) the value of grid modernization; (8) the value of data analytics and enhanced measurement as a way to more accurately assess PBR results; (9) streamlining of third-party interconnections; (10) expansion of energy efficiency programs; (11) possibly valuing energy affordability; (12) the value of reliability and resiliency; (13) the value of customer satisfaction; (14) the importance of short- and long-term utility planning and flexibility as utility business models evolve; and (15) the historical context described in detail in Appendix A, to avoid claims of an unlawful taking. Additionally, the PUC Staff Report #3, under Docket No. 2018-0088, notes that setting priority outcomes and designing metrics should be key elements.

With regard to outcomes, “emergent outcomes,” as noted in Staff Report 3, page 11, will attempt to accommodate the 100 percent RPS and account for technological disruption, whereas “traditional outcomes,” as noted in Staff Report #3, page 12, include reliability and capital formation. The traditional and emergent outcomes also require consideration of constitutional limitations (see Appendix A). Metrics, a scorecard, and data availability should clearly help drive

future actions. A performance mechanism and focused set of desired outcomes are crucial to PBR for improved utility performance coupled with achievement of State policy goals.

As discussed in this paper, and as amplified in Appendix A to Staff Report #3, the New York REV initiative is in mid-process without clear outcomes. The RIIO model from the UK is briefly discussed in this paper and has similar targeted outcomes; the eight-year multi-year rate plan has yet to play out; and the economic uncertainty associated with the UK's leaving the European Economic Union may yet have an impact.

Ultimately, the Regulatory Adjustment Mechanism now in place in Hawaii will need to be balanced with a multi-year rate plan, including interim milestones (*e.g.*, “Major Project Interim Recovery”). Modifications to the Revenue Balancing Account (“RBA,” referred to as revenue decoupling) needs to be carefully tied to metrics and performance so that the utilities do not over-earn. Service quality and state policy goals (*e.g.*, RPS and EEPS) should be essential features of any final PUC action in developing a PBR mechanism.

This paper is offered to provide additional background to the PUC, participants in Docket No. 2018-0088, and other state and local officials as they develop a new PBR paradigm that retains flexibility in pursuit of our state policy goals.

Appendix A

This appendix is divided into two main sections. Section I provides a primer on ratemaking. Section II provides an historical overview of the regulatory framework for economic regulation of public utilities. In sum, these two sections are meant to inform the PUC, Docket No. 2018-0088 participants, and other State and local officials on the ongoing conversation pertaining to the development of a new PBR paradigm in Hawaii.

I. RATEMAKING

Effective economic regulation of public utilities aligns the private behavior of the public utilities with the broader public interest.⁷⁵ In setting a public utility's rates, economic regulators are not bound to use any particular methodology.⁷⁶ Rather, under "[t]he guiding principle . . . that the Constitution protects utilities from being limited to a charge for their property serving the public which is so 'unjust' as to be confiscatory,"⁷⁷ regulators may use any ratemaking methodology that produces "reasonable" rates,⁷⁸ where reasonableness is bounded by (i) a floor that protects the utility and its investors from an unconstitutional taking of private property without

⁷⁵ See *FPC v. Hope Natural Gas Co.*, 320 U.S. 591, 602 (1944) ("*Hope*") ("The rate-making process . . . i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests."); see also Hempling, Scott, *The "Public Interest": Who Has a Definition?* (September 2017) ("In regulating public utilities, the public interest is served when shareholder and ratepayer interests are aligned[.]"), available at <http://www.scotthemplinglaw.com/monthly-essays>.

⁷⁶ *Hope*, 320 U.S. at 602.

⁷⁷ *Duquesne Light Co. v. Barasch*, 488 U.S. 299, 307 (1989).

⁷⁸ See *Jersey Central Power & Light Co. v. FERC*, 810 F.2d 1168, 1187-88 (D.C. Cir. 1987) (explaining that *Hope* requires "that the resulting rate is just and reasonable"); see also Bonbright, James C., *Principles of Public Utility Rates* (New York: Columbia University Press, 1961) at 33 ("*Bonbright*") ("It is a general doctrine of American law, almost universal in its application to public utility companies operating under special franchises or 'certificates of convenience and necessity,' that these companies are under a duty to offer adequate service at 'reasonable' (or 'just and reasonable') rates.").

just compensation or due process of law,⁷⁹ and (ii) a ceiling that protects the utility's customers from paying excessive charges.⁸⁰

Despite being free to use any ratemaking methodology, provided that the resulting rates are reasonable, cost of service regulation ("COSR"),⁸¹ or some variant thereof, emerged as the dominant ratemaking methodology. In its simplest and most traditional sense, COSR produces the rates that end users pay by first establishing a utility's cost of service, or "revenue requirement." At a high level, the revenue requirement is composed of two main components: (1) the operational costs the utility incurs to provide service (*e.g.*, tax expense, O&M expense, A&G expense, etc.),⁸² and (2) a return on the rate base, which is the assets and capital investments the utility has made to provide utility service.⁸³ Understanding that specific formulations may vary, a generally accepted formula for determining revenue requirement is as follows:

$$\text{Revenue Requirement} = E + d + T + (V-D) * R$$

⁷⁹ See U.S. Const., amend. V, cl. 5 (prohibiting the taking of private property for public use without just compensation); see *id.*, amend. XIV, sec. 1 (prohibiting states from, *inter alia*, depriving citizens of property without due process and equal protection of law); *Duquesne Light*, 488 U.S. 299, 308 (1989) ("If the rate does not afford sufficient compensation, the State has taken the use of utility property without paying just compensation and so violated the Fifth and Fourteenth Amendments.").

⁸⁰ See *FPC v. Natural Gas Pipeline Co.*, 315 U.S. 575, 593 (1942) (rejecting a proposal to include in rates any expense in "excess of cost" on the grounds that such inclusion would "unjustly penalize consumers"); see also *Atlantic Refining Co. v. Pub. Serv. Comm'n*, 360 U.S. 378, 388 (1959) (explaining that the just and reasonable standard embedded in the Natural Gas Act "was so framed as to afford consumers a complete, permanent and effective bond of protection from excessive rates and charges").

⁸¹ COSR is also referred to by a number of terms, including "cost of service ratemaking," "rate of return regulation," and "embedded cost ratemaking." Unless specifically noted otherwise, we use the term COSR generally to mean a regulatory paradigm that allows utilities to recover prudently incurred costs of providing service, pay debt costs, and earn a reasonable return.

⁸² See generally Lazar, Jim, *Electricity Regulation in the U.S.: A Guide* (Montpelier, Vermont: The Regulatory Assistance Project, 2d ed. 2016) at 57-59 ("Lazar"), which is accessible at <http://www.raponline.org/wp-content/uploads/2016/07/rap-lazar-electricity-regulation-US-june-2016.pdf>.

⁸³ Rate base generally is the original cost of the property the utility uses to provide service, net of depreciation and adjusted to account for a variety of negative or positive offsets. See Lazar at 51-53. Of course, offsets and other factors include customer advances, contributions in aid of construction and other forms of capital provided by entities other than Shareholders. Capital provided by Shareholders may also include regulatory assets and Cash Working Capital.

E = O&M and A&G expenses

d = depreciation expense,

T = taxes,

V = gross value of utility property,

D = depreciation on utility property,

and R = rate of return.

Under traditional COSR, rates are set for a prospective period, making it difficult to know what the actual operational costs will be. Thus, a traditional application of COSR establishes operational costs based on the costs the utility incurred during a historical “test year.” The idea is that the costs incurred during the historical test year are reflective of the costs the utility will incur during the period in which the rates are in effect.⁸⁴ In jurisdictions such as Hawaii, future test years are required and are, by definition, based upon a forecast. As shown in the formula above, the utility’s expenses are a direct input into the revenue requirement. The utility recovers its prudently incurred expenses but does not earn a return on them.

The second component of the revenue requirement, the rate base, is the property and physical assets that the utility devotes to providing service.⁸⁵ Rate base is established by taking the original book value of the assets (*i.e.*, gross plant) and reducing that amount by accumulated depreciation that has been recovered through previously effective rates. The result is the depreciated book value (*i.e.*, net plant). In contrast to operational expenses, rate base is not a direct

⁸⁴ See Phillips, Charles F., Jr., *The Regulation of Public Utilities: Theory and Practice* (Arlington, VA: Public Utilities Reports, Inc., 1985) at 182 (“Phillips”) (“A commission is setting rates for the future, but it has only past experience . . . to use as a guide. Philosophically, the strict test year assumes the past relationship among revenues, costs, and net investment during the test year will continue into the future”) (emphasis removed) (quotation omitted).

⁸⁵ Lazar at 47.

input into the revenue requirement. Rather, rate base is reflected in the revenue requirement as the level of return that the utility is authorized to earn on its net rate base.⁸⁶ The rate of return is a composite figure that includes both the cost of debt and the cost of equity, which are weighted to reflect the utility's capital structure.⁸⁷ Determining the cost of debt is not often subject to dispute, as actual debt costs are known and measurable.⁸⁸ In contrast, the cost of equity is not observable, making it a focal point, if not one of the most contentious issues, of utility rate cases.⁸⁹

Establishing the revenue requirement answers the question of how much revenue the utility is authorized to earn through rates. The next step in the ratemaking process, referred to as cost allocation, determines the portion of the revenue requirement that each customer class is responsible for paying.⁹⁰ Following the cost-causation principle,⁹¹ utilities divide the revenue requirement among their various customer classes using a cost of service study.

The final step in the ratemaking process under COSR, which is known as "rate design," establishes the rates that customers will be billed for utility service. In this step, the revenue requirement that is allocated to each customer class is divided by billing determinants to establish

⁸⁶ The return on equity is a return *on* the investment, whereas depreciation expense is a return *of* the investment.

⁸⁷ See generally Lazar at 53-57; see also Phillips at 346 (defining cost of capital). For example, consider a utility that is capitalized with 60percent equity and 40percent debt, has a cost of debt of 4.0percent, and has a cost of equity of 10.0percent. The utility's weighted average rate of return would be 7.6percent.

⁸⁸ See Lazar at 54.

⁸⁹ See, e.g., *id.* at 55. Regulators use a variety of methods to establish the cost of equity, and expert witnesses in rate cases typically do not agree about which approach is superior. In addition, each method has multiple steps that require the exercise of judgment, making this issue ripe for dispute.

⁹⁰ See generally *id.* at 61-67.

⁹¹ Per the cost-causation principle, "all approved rates [must] reflect to some degree the costs actually caused by the customer who must pay them." See *KN Energy, Inc. v. FERC*, 968 F.2d 1295, 1300 (D.C. Cir. 1992). The cost-causation principle is also commonly referred to as the "beneficiary pays" principle. See *Illinois Commerce Comm'n v. FERC*, 721 F.3d 764, 780 (2013) ("The requirement of proportionality between costs and benefits requires that all beneficiaries . . . shoulder a reasonable portion of . . . costs."); see also *Midwest ISO Transmission Owners v. FERC*, 373 F.3d 1361, 1368 (D.C. Cir. 2004) (explaining that compliance with the cost-causation principle compares "the costs assessed against a party to the burdens imposed or benefits drawn by that party").

the rates. Rates may be per-unit rates, where the customer is charged a set rate based on volumes of energy used. Or, rates may be designed as customer charges or demand charges, which require the customer to pay based on their peak demand, demand during specific periods, and/or a set amount regardless of usage. Alternatively, rates could be a combination of volumetric and fixed charges.⁹² Please note that this description of traditional ratemaking is generic and is not intended to address every nuance of traditional COSR ratemaking in Hawaii or elsewhere.

COSR has been viewed as an effective regulatory paradigm when increasing demand for electricity was driving capital investment, economies of scale favored large-scale investments by utilities, and electricity flowed in one direction, *i.e.*, from central generation stations through transmission and distribution lines to the end users' premises.⁹³ Despite its predominance, however, COSR has not been without criticism. For over 50 years, critics have noted problems inherent in the structure of COSR. Namely, by allowing utilities to recover their operational expenses, COSR does little to encourage the utilities to improve efficiency; by linking a utility's earnings to its investments, COSR encourages capital-intensive solutions.⁹⁴ In light of these criticisms, many jurisdictions have instituted reforms that modify COSR in order to improve regulatory outcomes.⁹⁵ Hawaii is a good example of one such jurisdiction. While the Hawaii

⁹² See generally Lazar at 68-80.

⁹³ See, e.g., McDermott, Karl, *Cost of Service Regulation in the Investor-Owned Electric Industry: A History of Adaptation* (Washington, D.C.: Edison Electric Institute, June 2012) at viii, 17-18 ("McDermott"). Dr. McDermott is a former commissioner on the Illinois Commerce Commission. He now serves as a Professor of Business and Government at the University of Illinois, Springfield.

⁹⁴ In 1962, Professors H. Averch and L. Johnson published an article in the *American Economic Review*, positing that COSR creates an incentive for regulated utilities to overcapitalize, which reduces efficiency and results higher than optimal rates. See Averch, H. and Johnson, L., *Behavior of the Firm under Regulatory Constraint*, (*American Economic Review*, 1962) at 1068 (explaining that a "misallocation of economic resources may result from the use by regulatory agencies of the rate-of-return constraint for price control").

⁹⁵ For example, as explained above, traditional COSR uses historical data as a proxy for the cost of providing service in a future period. To help ensure that the rates reflect the actual costs of providing service in the future, some jurisdictions have allowed forward-looking adjustments to this historical information. See Phillips at 182; see also

Public Utilities Commission (“PUC”) uses COSR as the foundation for its regulatory structure,⁹⁶ it has explored and implemented a number of reforms to shift its regulatory structure away from traditional COSR and improve regulatory outcomes.⁹⁷

Though criticisms of COSR are not new, they have been amplified in light of the transformational changes the electric industry has experienced in recent years.⁹⁸ As discussed in the accompanying paper, the advent of more diverse generation sources (*e.g.*, renewables), increased consumer-owned generation, enhanced energy efficiency, the introduction of “disruptive technologies,” state policy overlays (such as renewable portfolio standards and energy efficiency resource standards), the flattening of demand and the expansion of the use of electric vehicles, all militates in favor of new approaches to regulation, including PBR.

D.C. Mun. Reg. § 200.4 (permitting utilities to use a test year that contains 6 months of historical and 6 months of projected data). As another example, some jurisdictions, including Hawaii, have adopted “add ons” to COSR that are designed to influence utility decision making by adjusting earnings opportunities in accordance with performance in a certain area. *See, e.g.,* Littell, David, *et al.*, *Next Generation Performance-Based Regulation: Emphasizing Utility Performance to Unleash Power Sector Innovation* (National Renewable Energy Laboratory, 2017) at 1 (“Littell”), which is accessible at <https://www.nrel.gov/docs/fy17osti/68512.pdf>; *see also* *Promoting Transmission Investment through Pricing Reform*, Order No. 679, FERC Stats. & Regs. ¶ 31,222 (2006), *order on reh’g*, Order No. 679-A, FERC Stats. & Regs. ¶ 31,236, *order on reh’g*, 119 FERC ¶ 61,062 (2007) (establishing basis-point adders to utilities’ base returns on equity to encourage investment in transmission infrastructure).

⁹⁶ *See* Hawaii Pub. Utils. Comm’n, Docket No. 2018-0088, *Instituting a Proceeding to Investigate Performance Based Regulation*, Order No. 35411 at 50 (April 18, 2018) (“Order No. 35411”) (explaining that “Hawaii’s current regulatory framework continues to evolve from traditional COSR.”).

⁹⁷ The Hawaii PUC has been exploring and implementing reforms to traditional COSR since the 1990s. *See* Hawaii Pub. Utils. Comm’n Docket No. 96-0493, *Instituting a Proceeding on Electric Competition, Including an Investigation of the Electric Utility Infrastructure in the State of Hawaii*, Order No. 15285, at 3 (December 30, 1996) (“In the transition to a competitive electric industry in Hawaii, competition and industry restructuring are expected to radically change the manner in which electricity services are planned, priced, and provided.”). In addition, Hawaii’s legislature has enacted statutes that allow the PUC to implement a variety of “economic incentives or cost recovery mechanisms” to help reduce the State’s dependence on fossil fuel. HRS § 269-6(d).

⁹⁸ Regardless of whether COSR effectively aligned private interests with the public interest in the past, critics argue that developments in disruptive technologies, usage patterns, and changes in customer preferences and expectations have fundamentally altered the role of the utility. *See, e.g.,* Littell at 1; *see also* *Rhode Island Power Sector Transformation: Phase One Report to Governor Gina M. Raimondo* (November 2017) at 7 (explaining that “the traditional regulatory framework will not continue to serve the public interest” given that “demand for electricity has plateaued; many customers generate their own power; electricity flows to and from customers; technologies are being introduced at rapid pace; and the need to mitigate and adapt to climate change is real”). This report may be accessed at the following link: www.ripuc.org/utilityinfo/electric/PST%20Report_Nov_8.pdf.

II. ECONOMIC REGULATION OF PUBLIC UTILITIES: AN HISTORICAL OVERVIEW OF THE REGULATORY FRAMEWORK

Because PBR is a change to the current regulatory framework, any discussion of PBR would be incomplete without a discussion of the current regulatory framework. In turn, that discussion starts by looking back at how the current regulatory framework developed. Section II.A of this Appendix establishes the legal basis for government regulation over the rates charged by privately owned companies. Section II.B of this Appendix explains the circumstances that gave rise to the creation of utility regulatory agencies. Section II.C of this Appendix explains the Supreme Court’s development of the standards that determine whether a ratemaking decision passes muster under the Fifth and Fourteenth Amendments. Section II.D of this Appendix identifies the methodologies that economic regulators use to establish rates in light of the governing standards.

A. The Legal Basis for Government Regulation of Private Enterprises

“Rate making is a species of price fixing.”⁹⁹ As such, “[t]he guiding principle has been that the Constitution protects utilities from being limited to a charge for their property serving the public which is so “unjust” as to be confiscatory.”¹⁰⁰ Specifically, the economic regulation of public utilities is barred by the Fifth and Fourteenth Amendments to the United States Constitution unless the government provides the proper owner with just compensation and due process of law.¹⁰¹ Prior to the twentieth century, however, economic regulation was based on the common

⁹⁹ *Hope*, 320 U.S. at 599 (Black, J., concurring).

¹⁰⁰ *Duquesne Light*, 488 U.S. at 307.

¹⁰¹ U.S. Const., amend. V, cl. 5 (prohibiting the federal government from taking of private property (i) without due process of law, and (ii) for public use without just compensation); *see id.*, amend. XIV, sec. 1 (prohibiting states from, *inter alia*, depriving citizens of property without due process and equal protection of law).

law principle that rates be “reasonable.”¹⁰² As one scholar opined in the early days of modern regulation, “[t]he doctrine of confiscation had not yet arisen.”¹⁰³ While economic regulation of private companies was not unheard of in America in the late 1700s to early 1800s, many scholars agree that, by the first quarter of the nineteenth century, “America had developed an economic and political liberalism which was adverse to government regulation. Competition was regarded as the best form of control for the general welfare.”¹⁰⁴ As a result, “regulation was a small cross current in the general economic life of the nation.”¹⁰⁵

These circumstances would change as the nation’s economy evolved and expanded in the second half of the nineteenth century. A special category of private business enterprise became increasingly important, both as a component of the nation’s economy and in the lives of citizens. That special category is composed of private companies that were engaged in providing services that “affected the public interest.”¹⁰⁶ Circumstances surrounding private companies in this category of business enterprise challenged *laissez-faire* economic principles of the nineteenth century.¹⁰⁷ Notably, many of these companies operated as monopolies or oligopolies; many

¹⁰² See *Stone v. Farmers’ Loan & Trust Co.*, 116 U.S. 307, 331 (1886) (discussing “the rule of the common law which requires all charges to be reasonable”).

¹⁰³ Merrill, Maurice, “On the Distinction Between a Nonconfiscatory Rate and a Just and Reasonable Rate,” *Cornell Law Review* (Vol. 14, Issue 4, June 1929) at 450.

¹⁰⁴ Phillips at 77-78. Indeed, a central theme of Adam Smith’s famous work, *An Inquiry into the Nature and Causes of the Wealth of Nations*, published in 1776, is that an economic structure based on regulating commerce is inferior to a structure that promotes free competition.

¹⁰⁵ See Phillips at 78 (quoting Troxel, Emery, *Economics of Public Utilities* (New York: Hot, Rinehart & Winston, 1947) at 5).

¹⁰⁶ See Swartwout, Robert, “Current Utility Regulatory Practice from a Historical Perspective,” *Natural Resources Law Journal* (Vol. 32, 1996) at 289 (“[E]lectric . . . utilities . . . compose a special category of business in the United States.”); see also Phillips at 80 (discussing a “separate category of businesses affected with a public interest”).

¹⁰⁷ See McDermott at 2 (“[T]he symbiotic relationship between serving the public interest and private property rights represented one of the most unique aspects of modern capitalism.”).

customers experienced price increases, discriminatory practices, and price fixing.¹⁰⁸ Circumstances surrounding this new category of business enterprise gave rise to a novel question: Can a private enterprise become so affected with a public interest that government regulation is warranted?¹⁰⁹ The Supreme Court answered this question in *Munn v. Illinois*, establishing the legal basis for government regulation of private companies that are affected with a public interest.¹¹⁰

Munn v. Illinois involved an 1871 state law that required operators of grain elevators to obtain a license to operate; it also prescribed the maximum charges that operators could assess.¹¹¹ Munn, the operator of a grain elevator, refused to comply with the law.¹¹² After being fined for non-compliance, he sued Illinois, challenging the law on the grounds that it deprived him of his private property. In upholding Illinois' ability to regulate operators of grain elevators, the Supreme Court considered the price-fixing regulations under the Constitutional prohibitions against confiscatory actions. Citing English common law, "from whence came the right which the Constitution protects," the Supreme Court espoused the general principle that, "when private property is 'affected with a public interest, it ceases to be *juris privati* only.'"¹¹³ As a result, "statutes regulating the use, or even the price of the use, of private property [do not] necessarily deprive[] an owner of his property without due process of law."¹¹⁴ Based on that principle, the

¹⁰⁸ See, e.g., Buck, Solon, *The Granger Movement* (Cambridge, MA: Harvard University Press, 1913) at 9-14.

¹⁰⁹ See Phillips at 79.

¹¹⁰ *Munn v. Illinois*, 94 U.S. 113 (1876).

¹¹¹ *Id.* at 136-37 (Field, J., dissenting).

¹¹² *Id.* at 138 (Field, J., dissenting).

¹¹³ *Id.* at 126; see *id.* at 133 (explaining that there is no precedent for the Court's decision as this new category of business is an example of "new development[s] of commercial progress").

¹¹⁴ *Id.* at 125 (emphasis added). This quote discusses the Fourteenth Amendment, as *Munn v. Illinois* involved a state action. However, the same principle would apply to the federal government under the Fifth Amendment.

only issue to be decided was whether Munn’s grain elevators were, in fact, clothed with a public interest.¹¹⁵ The Supreme Court answered this question in the affirmative based on the magnitude of the operations and the fact that the grain elevators operated as a virtual monopoly.¹¹⁶ Thus, it held that the state had a legitimate interest in regulating the maximum rate that grain operators may charge.¹¹⁷

Notably, the Supreme Court stopped short of addressing whether the maximum charges prescribed by the Illinois law were, in fact, reasonable, finding that “[t]he controlling fact is the power to regulate at all. If that exists, the right to establish the maximum charge, as one of the means of regulation, is implied.”¹¹⁸

B. The Birth of the Electric Utility Industry and Utility Regulatory Agencies

The first electric utilities began operating shortly after *Munn v. Illinois* and firmly established within American jurisprudence the government’s ability to regulate the rates charged by private enterprises that operate in the public domain. Many of the earliest utility systems were either unregulated or regulated by the municipalities in which they operated.¹¹⁹ As a practical matter, utility operations required extensive use of public streets, which established municipalities’

¹¹⁵ *Id.* at 130.

¹¹⁶ *Id.* at 131-32 (internal quotations omitted) (noting that Chicago’s 14 grain warehouse were owned by 30 people, and that the grain production of seven or eight states passes through these facilities).

¹¹⁷ *Id.* at 129 (“[W]hen private property is devoted to public use, it is subject to public regulation.”).

¹¹⁸ *Id.* at 134.

¹¹⁹ Phillips at 109.

authority over the utility companies.¹²⁰ Municipalities “viewed franchises as a method of regulation via competition between utilities and often issued overlapping franchises.”¹²¹

Eventually, the expansion and maturation of the electric utility industry saw a push away from municipal regulation. Citing the capital-intensive nature of electric systems, many argued that such competition was wasteful.¹²² In a June 7, 1898 speech, Samuel Insull, Chief Executive Officer of the companies that would merge to become Commonwealth Edison, asserted:

It is supposed by many who discuss municipal affairs that the granting of competitive franchises for public-service work is the true means of obtaining for users the lowest possible price for the service rendered, where, as a matter of fact, the exact opposite is the ultimate result.

While it is not supposed to be popular to speak of exclusive franchises, it should be recognized that the best service at the lowest possible price can only be obtained, certainly in connection with the industry with which we are identified, by exclusive control of a given territory being placed in the hands of one undertaking.

The more certain this protection is made, the lower the rate of interest and the lower the total cost of operation will be, and, consequently, the lower the price of the service to public and private users.¹²³

¹²⁰ Geddes, Richard, “A Historical Perspective on Electric Utility Regulation,” CATO Review of Business & Government (Washington, DC: CATO Institute 1992) at 75 (“Geddes”); see also Glaeser, Edward and Goldin, Claudia, Ed., *Corruption and Reform: Lessons from America's Economic History* (University of Chicago Press, 2006) at 260 (“Glaeser”) (“Franchises gave utilities the power to dig up streets and operate in particular cities and, in return for these rights, imposed obligations on the utility in question.”).

¹²¹ Geddes at 75.

¹²² In 1848, John Stuart Mill published *Principles of Political Economy*. In pertinent part, he argued that public utility services in London (i.e., gas and water, specifically) could be supplied at lower cost if competitors agreed on a division of service territory, thereby avoiding the duplication of facilities necessary to provide service. Mill, John Stuart, *Principles of Political Economy with Some of Their Applications to Social Philosophy* (New York, D. Appleton & Company, 5th ed. 1920) at 189-90; see also *id.* at 501-02 (characterizing gas and water utilities as natural monopolies); Lazar at 4 (discussing Mill); Geddes at 76.

¹²³ The text of Mr. Insull's speech is available at <https://www.masterresource.org/edison-electric-institute/the-insull-speech-of-1898/>.

Ultimately, the prevailing view was that electric utilities are “natural monopolies.”¹²⁴ Consistent with the Supreme Court’s rationale in *Munn v. Illinois*, government regulation was deemed necessary in the absence of effective competition. Between 1907 and 1920, over 30 states enacted reforms that shifted regulatory authority from municipalities to newly created “public utility commissions.”¹²⁵ In 1920, the federal government established the Federal Power Commission, FERC’s predecessor, to regulate utilities that operated in interstate commerce.¹²⁶

The organic statutes that created these regulatory agencies vary by jurisdiction. However, they generally recognized four foundational, interrelated concepts that are hallmarks of utility regulation. One is the requirement that rates be “just and reasonable” (or any like formulation). Recognizing that “just and reasonable” is a term of art that is difficult to define in the abstract, this paper uses that term generally to mean a rate that meets the applicable Constitutional standards, which are discussed in more detail below.¹²⁷ Notably, Hawaii statutes mandate that “[a]ll rates, fares, charges, classifications, schedules, rules, and practices made, charged, or observed by any public utility . . . shall be just and reasonable.”¹²⁸

¹²⁴ See Phillips at 38 (“Public utilities are frequently referred to as ‘natural monopolies’” even though that term may be misleading); see also Melnyk, Markian, M.W., *et al.*, “PUHCA’s Gone: What is Next for Holding Companies?” *Energy Law Journal* (Vol. 27, No. 1, 2006) at 12.

¹²⁵ See Glaeser at 262, 272 (arguing that, while public utilities would have preferred no regulation, state regulation was acceptable because it allowed public utilities to avoid “shakedown schemes implemented by local authorities”). While some commentators view the shift toward regulation by state commissions as a response to the failures of municipal regulation and competition, another view is that it provided the means by which utilities could “insulate themselves from the discipline of competition.” See Geddes at 76.

¹²⁶ 16 U.S.C. § 792.

¹²⁷ Though codified in many statutes, this requirement coincides with the common law requirement that rates be reasonable, as well as the applicable Constitutional standards. See *Stone v. Farmers’ Loan & Trust Co.*, 116 U.S. at 331; *In re Permian Basin Area Rate Cases*, 390 U.S. 747, 770 (1968) (explaining that “the just and reasonable standard of the Natural Gas Act ‘coincides’ with the applicable constitutional standards”).

¹²⁸ HRS § 269-16(a).

The second key concept is that of the certificated service territory, which is a specific geographic area wherein the utility is authorized to provide service. Service territories may be established by franchises or certificates of public convenience and necessity.¹²⁹ As is the case in Hawaii, franchises often recognize the requirement that rates be just and reasonable. HECO's franchise affords it the "right charge, receive, and collect from all consumers of electricity such reasonable prices as may from time to time be fixed"¹³⁰ In addition, it states that the "franchise, and the person or corporation holding the same, shall be subject [to the PUC] as to reasonableness of rates, prices, and charges"¹³¹ HELCO's and MECO's franchises afford similar rights.¹³²

The third key concept is the obligation that regulators act in the "public interest." Though that term lacks a universally accepted definition,¹³³ this paper uses "public interest" to refer to the combination of interests of all individuals or groups of individuals that are affected by the utility's operations. These interests may be (and, traditionally, were) traced to people (*e.g.*, the utility's investors, employees, residential ratepayers, commercial ratepayers, etc.), or they may be broader (*e.g.*, society's interests in safety, preservation of the environment, economic stability, etc.).¹³⁴

¹²⁹ Some states grant exclusive franchises, while states like Hawaii do not. The HECO Companies' franchises are part of the Territorial Revised Laws of Hawaii ("RLH") and State Session Laws of Hawaii ("SLH"). HECO's franchise dates from 1903 to 1916, the HELCO franchise is Act 130, SLH (1963), and the MECO franchise is Act 12, SLH (1991).

¹³⁰ Franchises: Electric Light and Power, RLH (1925), § 4.

¹³¹ *Id.*, § 16.

¹³² See Act 130, SLR (1963), § 6 (HELCO); see also Act 12, SLH (1991), § 6 (MECO).

¹³³ See Hempling, Scott, *The "Public Interest": Who Has a Definition?* (September 2017) ("Regulatory statutes direct commissions to act in the 'public interest.' Rarely do statutes, commissions or applicants define the term."), available at <http://www.scotthemplinglaw.com/monthly-essays>; see also Shapiro, Martin, *The Supreme Court and Administrative Agencies* (New York: The Free Press, 1968) at 260 ("[T]he statute maker typically invokes the public interest or public convenience and necessity without saying what he means.").

¹³⁴ See *Hope*, 320 U.S. at 602 ("The rate-making process . . . i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests.).

The fourth key concept—*i.e.*, the “regulatory compact”—encompasses the other three discussed above. Like the term “public interest,” “regulatory compact” lacks a universally accepted definition; it is commonly misunderstood.¹³⁵ This paper uses that term to describe the relationships, burdens, rights, and obligations among the various interests that are implicated by the economic regulation of public utilities.¹³⁶ That is, the regulatory compact recognizes the utility’s obligation to provide reliable electric service in exchange for government authorization to charge rates that allow the utility to recover the costs incurred to meet that obligation.¹³⁷

The Hawaii PUC eloquently explained these interrelated concepts in its “Inclinations” paper:

Investor-owned electric utilities in Hawaii, and in most U.S. mainland states, operate under a utility-customer regulatory compact that has existed for a century and requires the utility to fulfill public interest obligations, and in return, receive certain financial compensation. These obligations and benefits stem from legal and regulatory determinations that an electric utility is a business that is necessary and exists to serve the public interest.¹³⁸

While this Appendix discusses these concepts in more detail below, we introduce them here because they are critical in understanding ratemaking standards and methodologies.

¹³⁵ See Hempling, Scott, *The “Public Interest”: Who Has a Definition?* (September 2017) (asserting that the regulatory compact “requires the utility to satisfy the regulator’s standards for performance at ‘lowest feasible cost,’ to use ‘all available cost savings opportunities’; and to pursue its customers’ legitimate interests free of conflicting business objectives. In return, the regulator must establish compensation that is commensurate with the utility’s performance.”).

¹³⁶ Bonbright at 33 (“It is a general doctrine of American law, almost universal in its application to public utility companies operating under special franchises or ‘certificates of convenience and necessity,’ that these companies are under a duty to offer adequate service at ‘reasonable’ (or ‘just and reasonable’) rates.”).

¹³⁷ We use the term “agreement” loosely to describe the nature of the obligations, burdens, and benefits associated with economic regulation of public utilities. See Lazar at 6 (explaining that this “agreement” is often referred to as the “regulatory compact” even though “there is in fact no binding agreement between a utility and the government that protects utility ownership from financial accountability”); see generally Bonbright at 1-25 (discussing the “public utility concept”).

¹³⁸ See Hawaii Pub. Utils. Comm’n, Docket No. 2012-0036, *Integrated Resource Planning*, Order No. 32052 at 26, Exhibit A (April 28, 2014) (“Inclinations”).

C. The Standards that Govern Ratemaking Determinations

In *Munn v. Illinois*, the Supreme Court rejected the notion that government regulation of prices was *per se* unconstitutional. Yet, it provided no guidance as to the standard courts should apply to determine whether a rate was impermissibly confiscatory under the Fifth or Fourteenth Amendments.¹³⁹ It was not until 1898 that the Supreme Court provided guidance as to the rate level necessary to satisfy “the constitutional guarantees for the protection of [private] property.”¹⁴⁰

Smyth v. Ames, 169 U.S. 466, 544 (1898) involved a challenge to state laws that regulated the rates charged by railroad companies for transportation of freight. In *dicta*, *Smyth v. Ames* explained that a regulated “company is entitled to ask [for] a fair return upon the value of that which it employs for the public convenience.”¹⁴¹ Note, *Smyth v. Ames* applied the fair return to value of the utility’s property, whereas COSR applies the return to the cost of providing service. The key takeaway for this discussion is that the fair return concept articulated in *Smyth v. Ames* serves as the bedrock for determining whether a rate violates Constitutional safeguards.

In *Bluefield Waterworks & Improvement Company v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) (“*Bluefield*”), the Supreme Court expanded on what it means for a return to be fair. The return must be “equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties[.]”¹⁴² This pronouncement is commonly

¹³⁹ *Munn v. Illinois*, 94 U.S. at 133-34.

¹⁴⁰ *Smyth v. Ames*, 169 U.S. at 544.

¹⁴¹ *Smyth v. Ames*, 169 U.S. at 547 (emphasis added). The principal issue in *Smyth v. Ames* involved judicial review on the question of due process. Nonetheless, courts and regulators took the view that *Smyth v. Ames* established the standard of review for ratemaking decisions. See *Duquesne Light*, 488 U.S. at 308.

¹⁴² *Bluefield*, 262 U.S. at 692.

referred to as the “comparable earnings standard.”¹⁴³ *Bluefield* further explained that the return “should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.”¹⁴⁴ This pronouncement is commonly referred to as the “capital attraction standard.”

Building on *Bluefield*, the Supreme Court provided further clarification as to the Constitutionally required return in its 1944 *Hope* decision.¹⁴⁵

[T]he investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.¹⁴⁶

Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid¹⁴⁷

Notably, the Hawaii PUC and reviewing courts recognize the applicability of the standards set forth in *Bluefield* and *Hope*.¹⁴⁸

¹⁴³ In establishing this standard, the Supreme Court explained that a regulated enterprise “has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures.” *Id.* at 692-93.

¹⁴⁴ *Id.* at 693.

¹⁴⁵ As explained herein, *Hope* overturned *Smyth v. Ames* as to the methodology required to be used in utility ratemaking. However, *Hope* built on both *Smyth v. Ames* and *Bluefield* as to the standard governing ratemaking determinations.

¹⁴⁶ *Hope*, 320 U.S. 603 (citations omitted).

¹⁴⁷ *Id.* at 605.

¹⁴⁸ See Hawaii Pub. Utils. Comm’n Docket No. 2011-0092, *For Approval of Rate Increases and Revised Rate Schedules and Rules*, Order No. 31288, at 97-98 (May 31, 2013); see also *In re Hawaii Elec. Light Co., Inc.*, 594 P.2d

D. Evolution of Accepted Ratemaking Methodologies

As explained above, many of the earliest electric utilities were not regulated at all. Their rates were set by contract or market forces. Or, rates were set by the municipalities in which the utilities provided service. Regardless of the cause—*i.e.*, the failure of competition to protect consumers, problems with municipal regulation, etc.¹⁴⁹—regulation by state commissions (or federal agencies in relation to interstate commerce) became the norm as the industry matured. Over time, the Supreme Court had occasion to opine on the Constitutionality, as well as the merits and demerits, of a number of different ratemaking methodologies. The following subsections discuss the evolution of ratemaking methodologies, with particular emphasis on the Supreme Court's guidance.

1. The Fair Value Method

In addition to establishing that a private company that is subject to rate regulation is entitled to a fair return, *Smyth v. Ames* is notable for another reason; it endorsed the “fair value” approach as the methodology to be used in ratemaking.¹⁵⁰ Though it equally applied to public utility rates, the Supreme Court, speaking in the context of rates to be charged by a private company that maintained a public highway, explained that “the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be

612, 618 (1979) (“A fair return is the percentage rate of earnings on the rate base allowed a utility after making provision for operating expenses, depreciation, taxes and other direct operating costs . . . In determining a rate of return, the [Hawaii PUC] must protect the interest of a utility’s investors so as to induce them to provide the funds needed to purchase plant and equipment and protect the interests of the utility’s consumers so that they pay no more than is reasonable.”).

¹⁴⁹ See the discussion of Glaeser and Geddes above.

¹⁵⁰ As explained above, *Smyth v. Ames*, involved judicial review and due process, and the discussion of rates was *dicta*.

the fair value of the property being used by it for the convenience of the public.”¹⁵¹ The Supreme Court explained how regulators should calculate the fair value of that property as follows.

[I]n order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case.¹⁵²

After considering these elements, the regulator would establish the value of the utility and its property. Rates were computed by establishing the fair return on that value. For example, if the fair value was deemed to be \$1,000,000 and a fair return was deemed to be 10percent, rates would be designed to allow the utility to recover \$100,000.

The fair value rule “derives from principles of eminent domain.”¹⁵³ “[W]hen property is taken under the power of eminent domain the owner is ‘entitled to the full money equivalent of the property taken, and thereby to be put in as good position peculiarly as it would have occupied if its property had not been taken.’”¹⁵⁴ In other words, the fair value of the utility’s property is the *present* fair value at the time rates are being set; that value fluctuates over time. In theory, the fair value approach to ratemaking “mimics the operation of the competitive market.”¹⁵⁵

In practice, the fair value method proved difficult to apply. Whereas earnings are relevant in valuing property that is taken by eminent domain, it is a difficult consideration in the context of

¹⁵¹ *Smyth v. Ames*, 169 U.S. at 546-47 (emphasis added).

¹⁵² *Id.* at 547. Despite focusing on these specific cost elements, the Supreme Court went on to state “that there may not be other matters to be regarded in estimating the value of the property.” *Id.*

¹⁵³ *FPC v. Natural Gas Pipeline Co.*, 315 U.S. at 602 (Black, J., concurring).

¹⁵⁴ *Id.* at 603 (Black, J., concurring).

¹⁵⁵ *Duquesne Light*, 488 U.S. at 308.

ratemaking because earnings themselves are at issue. In addition, utility property loses value as it ages. Yet, the fair value method considered the original cost and the cost of reproducing the property at the time rates were being set. In 1909, the Supreme Court issued two decisions that modified the considerations articulated in *Smyth v. Ames* to address these issues. In one case, it rejected use of figures derived from earnings as a measure of fair value.¹⁵⁶ In another, it held that the fair value must be reduced to account for depreciation.¹⁵⁷

In addition to these difficulties, it was not clear how the various considerations were to be weighted in determining fair value. The Supreme Court addressed that matter in *Missouri v. Southwestern Bell Telephone Company* by endorsing reproduction cost as the dominant factor to be considered when establishing fair value.¹⁵⁸ In that case, the Supreme Court reviewed a ratemaking decision by the Missouri Public Service Commission, which rejected the utility's argument that increasing costs should be considered when setting rates for a future period.¹⁵⁹ The utility challenged the rate decision "as confiscatory and in conflict with the Fourteenth Amendment."¹⁶⁰ In overturning the state's ratemaking determination, the Supreme Court held:

It is impossible to ascertain what will amount to a fair return upon properties devoted to public service without giving consideration to the cost of labor, supplies, etc., at the time the investigation is made. An honest and intelligent forecast of probable future values made upon a view of all the relevant circumstances, is essential.

¹⁵⁶ *Willcox v. Consolidated Gas Co.*, 212 U.S. 19, 47 (1909).

¹⁵⁷ *Knoxville v. Knoxville Water Co.*, 212 U.S. 1, 9 (1909).

¹⁵⁸ *Missouri v. Southwestern Bell Telephone Co.*, 262 U.S. 276, 287-88 (1923).

¹⁵⁹ *Id.* at 287.

¹⁶⁰ *Id.* at 282.

Subsequent decisions followed this approach, establishing value as reproduction cost less depreciation.¹⁶¹

Despite providing guidance as to how to calculate fair value, critics continued to condemn the fair value method. Though Justice Brandeis concurred with the reversal in the aforementioned *Missouri v. Southwestern Bell Telephone Company* case, he published a scathing dissent that criticized the fair value method.¹⁶² In relevant part, Justice Brandeis opined that “[t]he rule of *Smyth v. Ames* sets the laborious and baffling task of finding the present value of the utility”¹⁶³ which was impossible to determine due to the fact that “utilities, unlike merchandise or land, are not commonly bought and sold in the market.”¹⁶⁴ Justice Brandeis also explained that ascertaining the value of the various considerations identified by *Smyth v. Ames* (e.g., the amount and market value of the utility’s bonds and stock, future costs, etc.) required exercises of judgement that were inherently subjective and prone to dispute.¹⁶⁵ Moreover, Justice Brandeis explained that the true value of the utility’s property cannot be a composite of each of the various considerations.

They are very different; and must, when applied in a particular case, lead to widely different results. The rule of *Smyth v. Ames*, as interpreted and applied, means merely that all must be considered. What, if any, weight shall be given to any one, must practically rest in the judicial discretion of the tribunal which makes the determination. Whether a desired result is reached may depend upon how any one of many elements is treated. It is true that the decision is usually rested largely upon records of financial transactions, on statistics and calculations. But as stated in *Louisville v. Cumberland Telegraph & Telephone Co.*, 225 U.S. 430, 436, “every figure . . . that we have set down with delusive exactness” is “speculative.”¹⁶⁶

¹⁶¹ See, e.g., *McCardle v. Indianapolis Water Co.*, 272 U.S. 400 (1926).

¹⁶² Notably, Justice Brandeis incorporated his dissent by reference into a separate opinion issued in conjunction with the *Bluefield* decision that is discussed above.

¹⁶³ *Missouri v. Southwestern Bell Telephone Co.*, 262 U.S. at 292 (Brandeis, J., dissenting).

¹⁶⁴ *Id.* (Brandeis, J., dissenting).

¹⁶⁵ *Id.* at 293-94 (Brandeis, J., dissenting).

¹⁶⁶ *Id.* at 295-96 (Brandeis, J., dissenting).

In sum, Justice Brandeis' criticism centered on his determination that "[t]he thing devoted by the investor to the public use is not specific property, tangible and intangible, but capital embarked in the enterprise."¹⁶⁷ According to Brandeis, it is that capital, not the specific utility property, that "the Federal Constitution guarantees to the utility the opportunity to earn a fair return."¹⁶⁸ Significantly, by linking capital to "[t]he compensation which the Constitution guarantees an opportunity to earn," Justice Brandeis introduced the concept of "cost of service" ratemaking.

[C]ost of conducting the business . . . includes not only operating expenses, but also capital charges. Capital charges cover the allowance, by way of interest, for the use of the capital, whatever the nature of the security issued therefor; the allowance for risk incurred; and enough more to attract capital. The reasonable rate to be prescribed by a commission may allow an efficiently managed utility much more. But a rate is constitutionally compensatory, if it allows to the utility the opportunity to earn the cost of the service as thus defined.¹⁶⁹

As the utility industry expanded in the 1930's, the difficulty of applying the fair value method became more apparent and Justice Brandeis' minority view began to gain traction. In *Los Angeles Gas*, the Supreme Court looked at a ratemaking determination by the economic regulator in California that was based on historical cost as opposed to reproduction cost. Focusing on the Constitutional underpinnings of economic regulation, the Supreme Court declined to overturn the state's determination.¹⁷⁰ In a 1934 decision, the Supreme Court noted the perverse results

¹⁶⁷ *Id.* at 290 (Brandeis, J., dissenting).

¹⁶⁸ *Id.* (Brandeis, J., dissenting).

¹⁶⁹ *Id.* at 291 (Brandeis, J., dissenting) (emphasis added).

¹⁷⁰ *Los Angeles Gas & Elec. Corp. v. Railroad Comm'n*, 289 U.S. 287, 304-05 (1933); *see also id.* at 305-06 ("We have said that the judicial ascertainment of value for the purpose of deciding whether rates are confiscatory "is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts.").

produced by using reproduction cost to ascertain value.¹⁷¹ In addition, in his 1939 treatise, *The Valuation of Property*, Professor Bonbright explained that “[t]he attempt to regulate rates by reference to a periodic or occasional reappraisal of the properties has now been tested long enough to confirm the worst fears of its critics.”¹⁷²

Though it did not expressly overturn *Smyth v. Ames*, the Supreme Court’s 1942 *Federal Power Commission v. Natural Gas Pipeline Company* decision held that “[t]he Constitution does not bind rate-making bodies to the service of any single formula or combination of formulas.”¹⁷³ In a concurring opinion, three justices criticized the principles underlying *Smyth v. Ames*’ fair value method as having “no place in rate regulation.”¹⁷⁴ Relating back to Brandeis’ discussion of the “vicious circle,” the concurring opinion explained that “[t]he present fair value rule creates, but offers no solution to, the dilemma that [fair] value depends upon the rates fixed and the rates upon value . . . We know, without attempting any valuation, that if earnings are reduced the value will be less.”¹⁷⁵ While they believed the majority opinion freed rate regulators “from the compulsion of admitting evidence on reproduction cost or of giving any weight to that element of ‘fair value,’”¹⁷⁶ they implored their colleagues to definitively “lay the ghost of *Smyth v. Ames* [that] has

¹⁷¹ In one case, the lower court found the rates to be grossly confiscatory despite the fact that the company expanded and paid dividends during the period in which the rates were in effect. See *Lindheimer v. Illinois Bell Tel. Co.*, 292 U.S. 151, 161-164 (1934).

¹⁷² Bonbright, James C., *The Valuation of Property* (New York: McGraw-Hill Book Co., Inc., 1937) at 1190.

¹⁷³ *FPC v. Natural Gas Pipeline Co.*, 315 U.S. at 586.

¹⁷⁴ *Id.* at 603 (Black, J., concurring); see also *id.* at 605 (opining that rate regulation “has become so cumbersome and so ineffective that it may be said, with only slight exaggeration, to have broken down”). Justice Frankfurter, who concurred with the majority, expressed his views on the fair value rule in the 1944 *Hope* decision. See *Hope*, 320 U.S. at 627 (Frankfurter, J., dissenting) (referring to “the hodge-podge of the rule in *Smyth v. Ames*”).

¹⁷⁵ *FPC v. Natural Gas Pipeline Co.*, 315 U.S. at 603 (Black, J., concurring).

¹⁷⁶ *Id.* at 606 (Black, J., concurring). In the concurring justices’ view, the majority opinion allowed FERC to “adopt, if it chooses, prudent investment as a rate base — the base long advocated by Mr. Justice Brandeis.” *Id.*

haunted utility regulation since 1898.”¹⁷⁷ A majority of the Supreme Court would heed that call two years later in *Hope*.

2. The End Results Doctrine

Hope involved review of a ratemaking decision by the Federal Power Commission (the predecessor to the Federal Energy Regulatory Commission) involving a natural gas utility in West Virginia. Customers filed a complaint with the Federal Power Commission, arguing that the utility’s rates were excessive. In support of its rates, the utility applied the fair value method and presented evidence of the cost of reproducing the assets that were used in providing service. The Federal Power Commission rejected the utility’s analysis and evidence and ordered the utility to reduce its rates to the level produced by a COSR-based methodology. The utility appealed the decision to the United States Court of Appeals for the Fourth Circuit, which overturned the Federal Power Commission’s determination on the grounds that it failed to establish rates using the fair value method. The Federal Power Commission and the customers petitioned the Supreme Court to review the Fourth Circuit’s decision.¹⁷⁸

In overturning the Fourth Circuit’s decision, the Supreme Court stated:

We held in *Federal Power Commission v. Natural Gas Pipeline Company* . . . that the [Federal Power] Commission was not bound to the use of any single formula or combination of formulae in determining rates . . . Under the statutory standard of “just and reasonable” it is the result reached and not the method employed which is controlling . . . ” It is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unreasonable, judicial inquiry . . . is at an end. The fact that the method employed to reach that result may contain infirmities is not then important.¹⁷⁹

¹⁷⁷ *Id.* at 602 (Black, J., concurring).

¹⁷⁸ *Hope*, 320 U.S. at 596-600.

¹⁷⁹ *Id.* at 602. Even in his dissenting opinion, Justice Jackson criticized the Fourth Circuit decision. *See id.* at 628 (Jackson, J., dissenting) (“Certainly the theory of the court below that ties rate-making to the fair-value-of-

In affirming the Federal Power Commission's ratemaking decision, the Supreme Court applied its new rule and concluded that "the end result in this case cannot be condemned under the [Natural Gas] Act as unjust and unreasonable from the investor or company viewpoint."¹⁸⁰ The Supreme Court also considered the ratemaking decision in light of the Constitutional protections discussed herein. "Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid"¹⁸¹

Hope's "end result" doctrine, which has been upheld on numerous occasions,¹⁸² is practical.¹⁸³ As the Supreme Court explained in a later opinion:

The economic judgments required in rate proceedings are often hopelessly complex and do not admit of a single correct result. The Constitution is not designed to arbitrate these economic niceties. Errors to the detriment of one party may well be canceled out by countervailing errors or allowances in another part of the rate proceeding. The Constitution protects the utility from the net effect of the rate order on its property. Inconsistencies in one aspect of the methodology have no constitutional effect on the utility's property if they are compensated by countervailing factors in some other aspect.¹⁸⁴

Practical though it may be, the end results doctrine "does not dispense with all of the constitutional difficulties when a utility raises a claim that the rate which it is permitted to charge

reproduction-cost formula should be overruled as in conflict with *Federal Power Commission v. Natural Gas Pipeline*.").

¹⁸⁰ *Id.* at 603.

¹⁸¹ *Id.* at 605. As discussed in the preceding subsection, *Hope* built on *Bluefield* to establish the comparable earnings and capital attraction standards.

¹⁸² See *In re Permian Basin Area Rate Cases*, 390 U.S. at 767 (explaining that FERC's predecessor "has discretion regarding the methodology by which it determines whether a rate is just and reasonable"); *S.C. Pub. Serv. Auth. v. FERC*, 762 F.3d 41, 55 (D.C. Cir. 2014) (stating that FERC has "considerable latitude in developing a methodology responsive to its regulatory challenge"). *Jersey Central*, 810 F.2d at 1187-88 (discussing *Hope* and affirming that FERC "is not precluded from employing 'used and useful,' or any other specific rate-setting formula").

¹⁸³ *Hope*, 320 U.S. at 602 ("[R]ate-making . . . involves the making of 'pragmatic adjustments.'").

¹⁸⁴ *Duquesne Light*, 488 U.S. at 314.

is so low as to be confiscatory[.]”¹⁸⁵ Hopefully, this ratemaking overview can be helpful to the PUC as it considers the move from COSR to PBR.

¹⁸⁵ *Id.* at 310.