The Electricity Journal 31 (2018) 1–6

Contents lists available at ScienceDirect

The Electricity Journal

journal homepage: www.elsevier.com/locate/tej

Measuring distribution performance? Benchmarking warrants your attention

Paul Alvarez[a,*], Sean Ericson[b]

[a] The Wired Group, United States
[b] National Renewable Energy Laboratory, United States

ARTICLE INFO

Keywords:
Grid modernization
Infrastructure improvement
Distribution utility
Investor-owned utility
IOU
Performance-based compensation
Performance metrics
Performance benchmarking
Performance targets
Target setting
Distribution rate base
Distribution O&M
Reliability
Customer satisfaction
Demand-side management
2017 customer value ranking

ABSTRACT

Identifying, designing, and measuring performance metrics is critical to securing customer value, but can be a difficult task. This article examines the use of benchmarks based on publicly available performance data to set challenging, yet fair, metrics and targets.

Regulatory commissions in multiple states are considering how best to incorporate performance measures for electric distribution IOUs' compensation determination, whether as part of "grid of the future" proceedings (including Illinois' "Next Grid," Ohio's "Power Forward," and Rhode Island's "Power Sector Transformation"), or as part of utility-specific cases (including Eversource in Massachusetts, Xcel Energy in Minnesota, and National Grid and Central Hudson in New York). As these dockets progress, regulators must identify which aspects of performance to measure; design metrics to measure them; and establish fair but challenging targets for each metric. Each of these presents challenges, which are compounded by IOU proposals for process measures (as opposed to outcomes measures), easier-to-achieve targets, and ill-defined calculation specifics. Stakeholder concerns regarding the opportunity for shareholders to earn rewards without commensurate shareholder risks (asymmetry) are also valid and must be addressed.

This article examines the use of publicly available IOU financial and operating performance data to address these challenges through benchmarking. Benchmarking – the comparison of one organization's performance to that of other organizations on the same metric – has been a staple of U.S. industry for decades. Airlines are benchmarked on-time departure ratios; mobile phone networks are benchmarked on percent of geography covered, and automobiles are benchmarked on miles per gallon, to name just a few. In the electric industry, both the American Public Power Association and the Edison Electric Institute are known to conduct private benchmarking for their members' benefit. Public performance benchmarking programs are utilized by utility regulators in Australia, Finland, the Netherlands, New Zealand, and the United Kingdom – all of which are restructured markets (competitive generation) in which investor-owned utilities serve the monopoly distribution function. These benchmarking programs focus primarily on cost and reliability.[1]

Many IOUs argue that IOU-specific characteristics render benchmarking untenable and unreliable. The authors have researched this issue thoroughly, comparing multiple performance metrics to various

* Corresponding author at: The Wired Group, United States.
E-mail address: palvarez@wiredgroup.net (P. Alvarez).

[1] Smith, G and Wood, B. Performance Benchmarks Electricity Distribution Companies s in South Asia. Concept Paper prepared by Nexant for USAID contract 386-C-00-03-00135-00. November 2004. Pages 2–3 to 2–5.

https://doi.org/10.1016/j.tej.2018.03.003

characteristics from 131 U.S. IOUs over six years using econometric analyses.[2] This research indicates that most expectations regarding the impact of various IOU characteristics on various IOU performance metrics to be unsupported by the data. Only a few commonly held beliefs are supported by statistically significant correlations between characteristics and performance, though in all such cases the correlations were weak. For those characteristics that do appear to have a limited impact on certain types of performance, peer group definitions can be used to segregate the performance of "like" IOUs for comparison and credible benchmarking.

This article examines the use of benchmarking as an input to, and/or method for, performance measurement. This article does not address other significant issues in performance-based compensation, from symmetry (penalties as well as rewards), and the proportion of compensation determined by performance, to the weighting of rewards/penalties for various metrics within in a cohort, and the timeframes for target attainment. However, it should be noted that performance measurement methods impact each of these complex issues, and vice-versa. As a result, the methods used for identifying, designing, and measuring performance metrics merits attention earlier in the compensation reform process than most commissions seem to appreciate.

1. Accountability for the performance of distribution investments is long overdue

The primary goal of performance-based compensation, and associated performance measurement, is to ensure customers receive commensurate value from increases in rates. As examples, customers might expect to receive reliability improvements, O&M cost reductions, or a better customer experience in exchange for an increase in distribution rate base (and, of course, corresponding rate increases). IOUs are increasingly labeling large increases in distribution rate base as "grid modernization," "infrastructure improvement," or "reliability and resilience" programs. Despite falling usage and peak demand per customer, IOU distribution rate bases are growing dramatically as indicated in Fig. 1.

Despite dramatic increases in distribution investment, reliability does not seem to be improving (Fig. 2). Nor do O&M costs appear to be decreasing, as would be expected if IOUs are making such investments at least in part to replace labor with capital (Fig. 3).

These data points appear to indicate that increased IOU performance accountability regarding distribution investment is long overdue. The challenge for regulators is to help ensure grid investments are optimized such that only the most valuable (relative to cost) capabilities are implemented, and that these investments deliver the greatest improvements in customer priorities for the least amount of cost. As regulators must meet this challenge despite deficits in information, resources, and technical experience, it is reasonable that they attempt to do so through outcomes-based performance compensation and metrics for distribution utilities. When identifying, designing, and measuring performance metrics, regulators will need to balance the goal of maximizing benefits for customers (the level of challenge a metric/target represents) against the goal of providing a reasonable opportunity for an IOU to secure incentives or avoid penalties (the level of fairness a metric/target represents).

What attributes will help ensure performance metrics and measurement methods appropriately balance challenge against fairness? This article addresses several such attributes expressed as capabilities, including the capabilities to (1) reflect best practices performance in targets; (2) accommodate changing circumstances; (3) improve relevance through comparisons to performance of "like" peer groups, and (4) reduce opportunities for IOUs to manipulate performance measurement processes. Regulators generally add a fifth attribute: administrative efficiency. This article will discuss how benchmarking can help deliver these five attributes, comparing benchmarking to the use of an individual IOU's historical performance for metric identification, design, and target-setting. The article concludes with a 2017 Customer Value Ranking of U.S. IOUs that considers four potential performance metrics: capital investment per customer; O&M spending per customer; reliability (system average interruption duration index, or SAIDI, without Major Event Days); and customer satisfaction (from J.D. Power and Associates' annual survey of U.S. residential electric distribution customers).

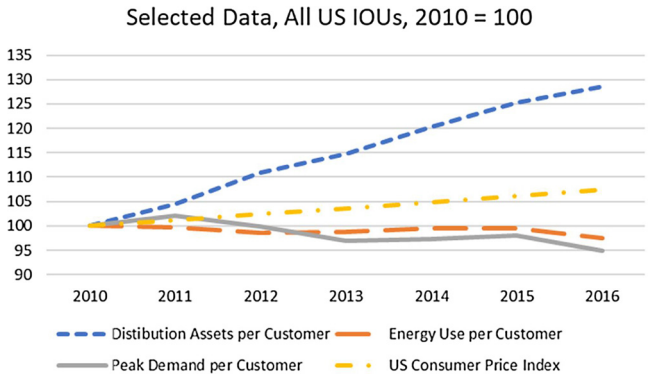

Fig. 1. Electric distribution plant per customer is growing rapidly despite falling consumption and demand.

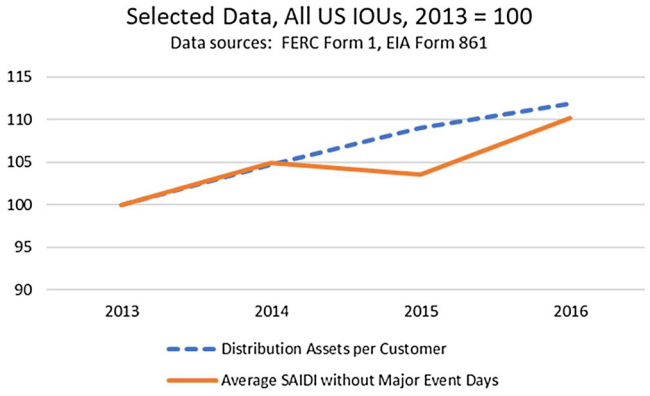

Fig. 2. Reliability is deteriorating despite rapidly growing investment in distribution plant.

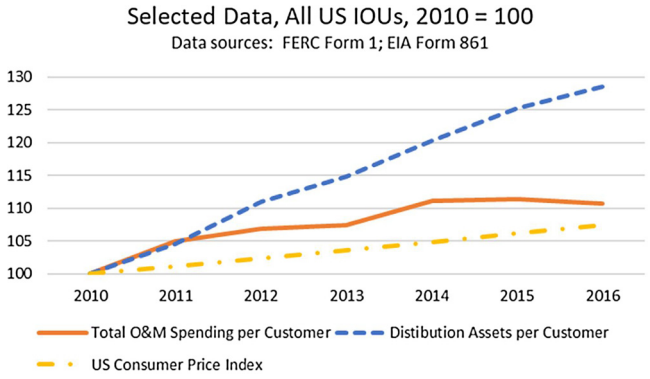

Fig. 3. O&M spending is outpacing inflation despite rapidly growing investment in distribution plant.

[2] Alvarez and Leonard. *Busting Myths: IOU Performance Can Be Credibly Benchmarked.* The Electricity Journal 30 (2017) 45–48.