

# Advanced Energy Perspectives

## How Do Electric Utilities Make Money?

POSTED BY COLEY GIROUARD

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The times they are a-changin'. There have been a lot of discussions around the country of late about the regulatory changes needed to create a 21st century electricity system. New business models are needed to integrate higher levels of distributed energy resources, take advantage of new technologies, meet environmental goals, and address changing customer needs and expectations. In an industry that has been slow to change historically, there is a lot at stake for utilities, advanced energy companies, and consumers. In order to understand what transformations are needed, it's first necessary to understand how electric utilities make money today.



It's not the way most companies do. Electric utilities are monopolies, so they have to be carefully regulated in order to protect the interests of their captive customers.

Public Utility Commissions (PUCs) or their equivalent in each state serve as a replacement for the competitive market. In exchange for granting the exclusive right to sell electricity in a given service

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territory, PUCs determine how much the utility is allowed to invest and in what, how much it can charge, and what its profit margin can be. This is called the “regulatory compact,” and it was first laid out in the [Binghamton Bridge Supreme Court case of 1865](#). The court stated, “if you will embark, with your time, money, and skill, in an enterprise which will accommodate the public necessities, we will grant to you, for a limited time period or in perpetuity, privileges that will justify the expenditure of your money, and the employment of your time and skill.”

PUCs determine a utility's total revenue requirement in what is known as a rate case. The revenue requirement represents the amount of money a utility must collect in order to cover its costs and make a reasonable profit. Individual utilities file rate cases, usually every few years, but sometimes less frequently. The PUC decides what the revenue requirement will be based on a number of factors, including the value of a utility's assets, the cost of debt and equity financing, and operating and administrative expenses. The simplified formula looks like this:

$$\text{Total Revenue Requirement} = \text{Rate Base} \times \text{Allowed Rate of Return} + \text{Expenses}$$

The “rate base” is the value of the company's assets minus accumulated depreciation. The allowed rate of return (return on assets) drives a utility's profitability. Expenses are simply passed through, including fuel in cases where regulated utilities own power plants. [Historically, critics have said](#) that so-called “rate of return regulation” does not properly motivate utilities to operate efficiently. By having a set rate of return, utilities essentially are incentivized to make unnecessary investments in order to increase their rate base and therefore, their profits – called the [Averch-Johnson effect](#). They also have limited incentive to keep expenses in check if those costs are simply passed through to customers.

On the flip side, having a set rate of return ensures that utilities are able to raise sufficient capital to make improvements to their infrastructure and provide reliable service to all customers. Moreover, because this lowers the risk to investors, utilities have usually been able to secure a lower cost of capital than other businesses. The rate of return is a combination of the cost of paying back its debt holders with interest and the return utilities provide to their equity shareholders. Not surprisingly, the most controversial part of this formula is calculating the utility's allowed return on equity (ROE) – this is the only portion of the revenue requirement that a utility ultimately keeps as profit.

Because utilities are regulated, their allowed ROE is set by PUCs. The average ROE across 93 industries and almost 8,000 firms for the [US market is 14.49%](#). As one might expect, utility companies – [with an average of 10.13%](#) – are on the lower end of the spectrum because they are viewed as less risky investments.

Rate of return varies significantly from state to state, as each PUC has exclusive authority to regulate utility operations as they choose. In [AEE's Power Portal database](#), which tracks ROE for over 100 investor-owned utilities across the country, the highest allowed ROE belongs to [Alabama Power Co.](#), at 13.75% while the lowest belongs to [United Illuminating Co. \(CT\)](#) at 9.15%. Alabama Power has a significantly higher return on equity than any other utility, which has [led critics to wonder](#) whether the Alabama Public Service Commission is properly balancing the interests of consumers and shareholders.

Despite generally being a lower risk investment, utilities do face risks that can be quite dramatic. [The California Energy Crisis, a case of industry restructuring gone wrong](#), led to the bankruptcy of Pacific Gas and Electric. Also, the ROE allowed by a utility's PUC is no guarantee. There are [many factors that come into play](#) for utilities to turn an allowed ROE into actual profits.

As market conditions and policy priorities have changed, various regulatory mechanisms and tweaks to the basic formula have been implemented over the last couple of decades, such as fuel cost adjustments, surcharges, riders, future test years, cost trackers, and revenue decoupling. These measures help to reduce risks that utilities face and drive desired outcomes, like encouraging utilities to invest in energy efficiency instead of pushing for higher sales.

A number of trends now gaining momentum threaten to undermine the utility business model and the existing regulatory compact. In the past, retail sales rose as marginal production costs fell,

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leading to growing profits for utilities and falling prices for consumers. Today, the need to reinvest in an aging and outdated grid is running up against flat or declining retail sales due to energy efficiency improvements and distributed generation, mainly rooftop solar, which has become increasingly popular. In response, [utilities across the country are trying to raise fixed charges](#) for solar owners as well as for basic service to try to stabilize their revenue stream and reduce their risk. Arizona Public Service and Tucson Electric Power both [recently received approval for pilot programs](#) in which they would own customer rooftop solar themselves. By [entering the competitive distributed generation \(DG\) market](#) these utilities are seeking a revenue stream to offset falling revenues from retail sales.

In this rapidly changing environment, PUCs around the country are starting to grapple with the fact that rate of return regulation, an approach that has worked well for decades, may not remain viable going forward. Flat to declining load growth, new investments needed to modernize the grid, changing customer needs, and government policies supporting new energy choices are prompting a reconsideration of how utilities make a profit. At a more fundamental level, these changes pose basic questions about what constitutes a natural monopoly today and what is the appropriate role for the utility in the future - giving rise to proceedings like New York's on-going [Reforming the Energy Vision](#) docket. The grid is not going away anytime soon, but it is certainly changing. So, too, must utility business models.

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**Jonathan Livingston** 4/23/2015, 7:08:34 AM

Thanks, Coley. A valuable follow-up for the AEE audience would be some coverage of utility revenue decoupling as a mechanism to enable energy efficiency program funding. I'm unsure if I can send attachments in this comment field, so here are some useful web links for your consideration: <http://www.raponline.org/search/site/?q=decoupling>  
<http://switchboard.nrdc.org/blogs/rcavanagh/decouplingreportMorganfinal.pdf>  
<http://www.livingston-ei.com/wp-content/uploads/Utility-Decoupling-Demystified.pdf>

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