# Utility Pricing and Public Policy

*Most utilities find that electricity rate design is a blunt instrument if the goal is to provide a safety net for low-income families. Alternative strategies to providing this safety net while securing cost-effective energy efficiency include identifying and targeting low-income customers for lower rates and, in the absence of an external carbon price, assigning an internal carbon price to retail sales.*

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## I. Introduction

Utilities providing electric service are often expected to meet a number of public policy objectives including supporting low-income families, maintaining equity among consumer classes, encouraging energy efficiency and renewables, and reducing peak consumption. Many utilities pursue these objectives through their rate structure while at the same time attempting to recover their costs. The result is usually a complicated set of prices that has raised questions as to whether it is in fact the best way to achieve these goals. Can we be sure that all low-income families are benefitting from lower rates and that current rates are encouraging optimum levels of investment in energy efficiency and renewables?

Some public policy goals such as supporting low-income families are appropriately pursued by the government and private charities and indeed the federal government does offer two important programs: the Low Income Home Energy Assistance Program (LIHEAP) and the Weatherization Assistance Program. And yet these efforts do

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not come close to meeting the needs of all low-income families, thus opening the door for help from utilities. We also know that because of various barriers and market shortcomings some intervention is necessary to secure all cost-effective energy efficiency and renewables. But this raises the question: how well does rate design achieve these goals?

## II. Microeconomics

Before reviewing the current rate structure, it is helpful to have a basis for comparison. Microeconomics provides a useful benchmark for this purpose because it represents an efficient strategy in the absence of additional policy objectives. While it may not always be the ''best'' all-around approach, it is useful to assess the impacts of competing strategies to achieve policy goals.

Electric utilities essentially provide two services: a physical connection to the electric power grid and energy. The first entails a more or less fixed cost to the utility, which allows it to deliver power to customers as needed and could be paid for by a fixed charge independent of the amount purchased. The second service creates costs to produce or purchase power and could be paid by an energy rate applied to the load. A price structure based on microeconomics would look something like **Figure 1**, where the total bill ($B_1$) for a customer

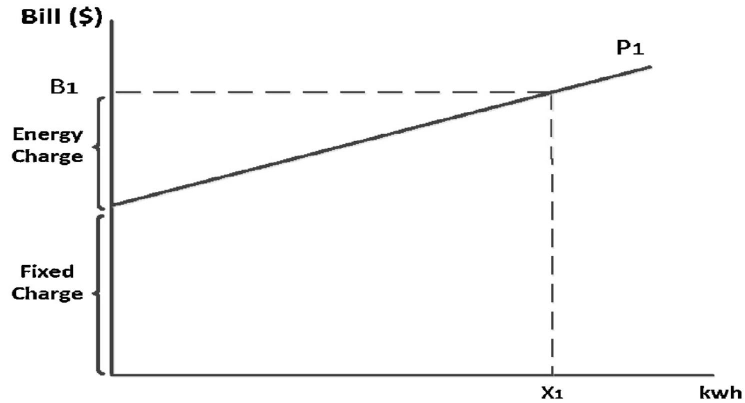


**Figure 1:** Simple Microeconomic Pricing Model.

that consumes $X_1$ is comprised of two components: a fixed charge and an energy charge. The energy charge is based on the variable energy cost ($P_1$) and the fixed charge includes all other costs required to deliver power.

More than other approaches, microeconomics ensures alignment between costs and prices. For example, even if customers don't purchase any power from a utility they still impose a cost as long as they remain connected to the grid. Consumers with rooftop solar systems have an additional reason to remain connected if they want to sell surplus power back to the utility. In this model, customers pay a fixed charge sufficient to cover the costs of securing access to a functional power grid whether or not they actually buy power.

Another important feature of this pricing model is that any change in load, up or down, will leave a utility's financial situation essentially unchanged. This has direct application to energy efficiency and distributed generation because a utility that sells less energy will have lower revenue but also proportionately lower costs, leaving its net revenue unchanged. These rates are in a sense neutral: there is neither an incentive nor disincentive for a utility to promote energy efficiency or distributed generation.

It is interesting to note that under this system, net billing for rooftop solar will have less of a negative effect on utility finances. This is because retail rates—which are essentially what the utility pays for power delivered under net billing—are equal to variable energy costs. In fact this rate design would resolve many of the objections to net billing raised by Brown and Bunyan (2014).[1]

This model can be expanded to reflect the fact that energy is more expensive at certain times and in certain places. In general, price signals tied to actual costs are more valuable because they reward behavior that lowers overall costs. Theoretically, rates based on actual costs should do a

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