

# **A Regulatory Guide for Affordable Utility Service**

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This paper starts with the premise that the affordability of electricity and natural gas to all households demands some form of energy assistance (EA) funded by utilities and their non-poor customers. Although taxpayer-funded programs to help low-income households are more economically justified, the political reality is that legislatures and executive branches of government may require utilities along with regulatory support to assume this responsibility. Utility-funded programs, for example, are common in the U.S. While economic efficiency pays little attention to income distribution (e.g., the allocation of economic surplus between firms and their customers and within customer groups), public policy elevates it to a high importance.

Smart regulation demands that EA initiatives have favorable benefit-cost ratios. Regulators should strive to assure that each dollar expended returns the highest possible dividend, and that EA initiatives interfere minimally with other regulatory objectives; for example, minimal adverse effect on economic efficiency.

This paper emphasizes that governmental policy requiring utilities to provide monetary assistance to low-income households must address several questions, including: (1) How much assistance should a utility provide in view of governmental and non-utility private assistance (e.g., the number of dollars offered to eligible households)? (2) Who should pay for this assistance (e.g., residential customers, all customers, utility shareholders)? (3) How should the utility collect the money in rates? (4) What constitutes an appropriate financial effect on subsidizing customers? and (5) How should the utility distribute the assistance to eligible households (e.g., discount rate, lump-sum payment)?

This paper identifies criteria that public utility regulators can apply to assess the effectiveness of EA initiatives. It discusses features of EA actions that are likely to make them successful from both a regulatory and societal perspective. Overall, the paper recommends that regulators review EA actions to determine whether they are achieving the regulatory goal of utility-service affordability: (1) most effectively and (2) with minimal adverse effects on other stated goals.

## **I. First-Order Issues for Regulators**

### **A. The rationale for affordable utility service**

Whether public utility regulators should assure the affordability of utility service for low-income customers is a question that has occupied regulation since its earliest days. Political pressures and legislative mandates have compelled energy utilities with the support of their regulators to implement programs that protect low-income households from unaffordable utility bills. What some observers view as “taxation by regulation” requires slightly higher rates to the majority of customers to pay for EA that benefits a smaller, target group of customers. The “tariff effect” that makes the majority minimally worse off to make a small minority substantially better off has definite political appeal.<sup>1</sup>

“Affordability”—a term regulators like to use—refers to a state of affairs in which, after paying their energy utility bills, customers have enough money left to pay for other goods and services essential to their livelihood (e.g., housing, telephone service, insurance, transportation, clothing, food, and medical care). Affordability links to the meaning of “equity”; namely, it is unfair to charge customers more for utility service than they can afford. Unfairness, in this sense, would result in customers falling so far behind on their utility bills that over time they accumulate an unpaid account that they cannot possibly pay. The inevitable outcome is service disconnection for those customers and severe obstacles in service restoration.

Energy assistance in the form of rate relief reflects a pricing principle based on customers’ “ability to pay.” Utility regulators have frequently approved a form of discriminatory pricing called “value of service” pricing. Under this pricing scheme, prices to different customers depend on the value that each customer places on the service (i.e., on their “willingness to pay.”) Yet if regulators can legally set prices based on “willingness to pay,” why can they not then apply the same pricing principle to “ability to pay,” since “ability to pay” is really a sub-component of “willingness to pay”? If a utility is able to offer a rate discount to industrial customers, for example, who would otherwise bypass the utility if required to pay the full embedded rate, why could it not offer a rate discount to low-income households? The so-called anti-bypass rate would benefit all of the utility’s customers as long as the price allows the utility to earn some margin above variable cost and prevent bypass.

Rate relief to low-income households could also benefit all customers if in its absence the utility would have disconnected low-income households or those customers would have accumulated large bad debt or costs associated with service reconnection. (It is assumed that other customers would compensate the utility for lost revenues and the bad debt.) Some regulators and legislatures might, however, perceive a distinction between “willingness to pay” and “ability to pay” that limits their legal capability to implement both.

#### **B. How affordable service can benefit utilities**

Some utilities consider EA a good business strategy because it increases net revenues by offering discriminatory prices and other assistance to low-income households. A utility is likely to receive only partial bill payments from some low-income households. In trying to collect unpaid amounts, the utility would incur additional costs. If the unpaid amount becomes uncollectible, the utility would write off this amount as bad debt. The utility might even disconnect the customer. It might be able to avoid collection, disconnection, and other costs by discounting the customers’ bills. These cost reductions can more than offset the lost revenues from discounting and thereby increase the utility’s net revenues. Such an outcome probably explains why some public utilities have initiated EA actions to help low-income households. These utilities might find more certainty and ease in recovery of revenue shortfalls from their regulators.

### **C. Achieving affordability with minimal compromise of other regulatory objectives**

In advancing the public interest, regulators would strive to achieve the “affordability” goal with minimal impediment of other goals such as economic efficiency and minimal subsidies. Efficiency losses can result from: (1) recipients over-consuming energy when the subsidized price lies below the utility’s marginal cost, and (2) an “excessive” gap between the actual benefits to targeted participants and the subsidy cost absorbed by the utility or general ratepayers; for example, utility customers pay \$10 million to subsidize low-income households, who benefit by only \$7 million.

Wasteful EA actions reduce benefits to targeted utility customers. Excessive cost expenditure in the administration and implementation of EA actions is one example of waste. Another source is non-poor households receiving EA, thereby subtracting from assistance going to the most financially needy households. A non-targeted lifeline rate or a discount rate with broad eligibility rules that includes non-needy customers are examples of this kind of inefficiency. A third source of inefficiency stems from EA not going to the neediest low-income households (e.g., the poorest of the poor). These households are more likely to set their thermostats at an unhealthy level or use their stove or oven for heat. They generally face the most severe unaffordability problems, making debt write-offs and disconnections more imminent.

Regulators need to balance various regulatory goals in determining the socially optimal level of affordability. The conflicting nature of some objectives requires a societal judgment when it comes to weighing their tradeoffs. As an illustration, regulators must consider the compromising effects that advancing affordability has on economic efficiency and discriminatory-free rates.

Unlike the goal of economic efficiency, affordability concerns itself with how regulation affects the economic well-being of individuals or individual groups in market exchanges. Economic efficiency becomes relevant, however, for determining how regulators and other policymakers are able to achieve the goal of affordability most effectively and at minimum cost. In making utility services more affordable, regulators unavoidably need to deviate from strict cost-based, non-discriminatory pricing; but regulators through their policies and practices should strive to minimize the size of efficiency losses.

### **D. What are the good features of EA initiatives**

Part IV identifies criteria that public utility regulators apply to assess the effectiveness of EA actions. Effectiveness has several dimensions, including: (1) the ability to reach the poorest households, (2) the share of the subsidy that directly benefits the poor, (3) minimal unintended consequences, and (4) low administrative costs.

Smart regulation requires that EA actions funded by utilities and their customers provide adequate benefits to the intended targets, namely, eligible low-income households. Because EA actions typically fall short in adequately meeting the needs of all low-income households, regulators should try to assure that each dollar expended returns the highest possible dividend. Increased effectiveness has the same effect as an increase in the number of dollars for EA.

## **II. Six Primary Questions**

If regulators contemplate a review of current utility-funded EA, they must ask themselves a number of broad questions. Answers to these questions would permit regulators to make better decisions on the design, administration, and implementation of EA actions.

Regulators can start by asking the following six general questions:

1. *What is the rationale for utilities offering EA to low-income customers?* The combination of outside assistance, such as the Low Income Home Energy Assistance program (LIHEAP), fuel funds, and federal and state weatherization programs, could provide adequate support to low-income households. A regulator might find a utility-based program redundant if adequate outside assistance for energy and other essentials is available to low-income households. Yet the regulator might still require utilities to assume a role, such as educating customers on the availability of this assistance, determining who is eligible, and establishing application procedures.
2. *What primary objectives should EA have?* They should include keeping existing low-income households on the utility system and reconnecting service for others. Affordable utility service to low-income households should mean that those customers are able to enjoy the comforts of space heating and other energy services without the fear of disconnection by the utility.
3. *What should be the dollar amount of assistance?* The answer depends upon the energy burden of poor households, after accounting for outside assistance. The energy burden measures the affordability of energy to households in fully paying their utility bills and having discretionary income to buy other necessities. Another question relates to the allocation of a fixed amount of dollars for assistance. Assume that funding is inadequate to meet the total needs of low-income households. Should funds go to households on a first-come, first-served basis? Alternatively, should funds go first to those households with seniors, children, or customers with serious medical problems? Should the objective be to maximize the number of eligible households receiving assistance? Should assistance go to fewer households so that each household can have more funds to make utility service affordable?

4. *Who should provide the funding?* Alternatives include charging all utility customers and only residential customers. Funding from a broader group of utility customers lessens the cost per customer and may better reflect the general societal benefits of EA initiatives.
5. *What mechanism(s) should fund EA?* A utility can recover costs through a system benefit charge, a cost tracker, or an increase in the customer charge or volumetric rate. A system benefit charge is a fixed monthly fee designed to fund designated social programs such as EA. Mechanisms have varying effects on: (a) energy consumption by low-income households, (b) economic efficiency, (c) the bills of funding customers, and (d) cost-recovery risk for the utility.
6. *What should be the specific assistance actions (or mechanisms), keeping in mind other regulatory objectives?* Options include a change in rate design, a rate discount, a bill cap based on income, a lump-sum payment, a cost waiver, and no-cost weatherization and other forms of energy efficiency. Specific assistance actions have varying effects on low-income households, other customers, and the utility. Complementary EA mechanisms applied individually or in concert with each can provide greater flexibility for meeting specific low-income customers' needs.

### **III. Forms of EA**

#### **A. Overview**

In dealing with an “energy affordability” problem, regulators and other policymakers can apply one of three broad approaches: (1) increasing the incomes of poor households, (2) lowering the share of the utility bill for which the customer is responsible for paying, and (3) reducing the customer’s energy usage. EA actions (i.e., in-kind assistance) focus on the latter two approaches while cash supplements with no strings attached falls under the first approach. With each approach, energy becomes more affordable, either by increasing a household’s income or by reducing the amount a household has to spend on energy. In either instance, the household spends a lower percentage of its income on energy.

Various forms of EA have differing effects on the recipients, non-targeted utility customers, and utility shareholders, as well as on society in general. Most EA actions reduce energy bills for eligible households either by lowering the effective price of utility service or by reducing energy consumption. Households have therefore more money to purchase other goods and services, some of which are as essential as utility service.

EA can also involve the utility giving customers more leniency and flexibility in making payments for overdue accounts. The utility might absolve a customer’s arrearages or forgive reconnection charges. Regulatory policy affects both how and when utility customers must pay

overdue accounts. Fair and effective policy is critical for preventing some low-income households from having their utility service disconnected.

## **B. Numerical Examples of EA Mechanisms**

The following arithmetical expression shows the standard two-part tariff for residential customers of energy utilities:

$$B_i = C + p \cdot q_i,$$

where the total bill for customer  $i$  ( $B_i$ ) equals the sum of the customer charge ( $C$ ) and the volumetric charge ( $p$ ) times the amount of gas consumed ( $q_i$ ). Assume that the volumetric charge includes actual purchased gas costs and fuel costs.

Using a numerical example, let us assume the following tariff for a gas utility:

$$B_i = \$5 \text{ per month} + \$6.50 \cdot q_i,$$

If a low-income customer uses 20 Mcf of gas in December, her gas bill would be \$135. Without any EA, the customer would be responsible for paying this amount.

Considering different EA mechanisms aimed at lowering the gas bill of a low income household for this gas utility, the subset of those mechanisms examined next in this paper are: (1) lifeline rates, (2) rate discounts, (3) lump-sum assistance payments, (4) percentage-of-income plans, (5) waivers of the customer charge, and (6) weatherization programs. We will focus on the above hypothetical customer for the month of December.

The hypothetical EA mechanisms are as follows:

### **1. Lifeline rate<sup>2</sup>**

The utility sets a volumetric charge of \$5 per Mcf for the first 15 Mcf of gas consumed and \$7.50 per Mcf for any additional amount. In our example above, the customer would pay the customer charge of \$5 plus \$75 for the first 15 Mcf of gas consumed and \$37.5 for the last 5 Mcf consumed. The customer's bill would be \$117.50, which is 13 percent below the bill without the lifeline rate. For another low-income household who consumes 40 Mcf, under the lifeline rate its bill would slightly increase from \$265 to \$267.50. Assume that the utility offers the lifeline to any residential customer and that a non-poor customer with a highly energy-efficient condominium used as a second home consumes 15 Mcf. His gas bill would decrease by \$22.50 or 22 percent. In this example, the high-income customer benefits the most in terms of the percentage decline in his gas bill.

## 2. Rate discount

The utility offers a 30 percent reduction in the volumetric charge, which reduces it from \$6.50 to \$4.55. (The discount applies only to eligible low-income households.) Our customer's December gas bill would fall from \$135 to \$96, a reduction of almost 30 percent.

With a substantial decrease in the rate, a customer is likely to consume more natural gas. Assuming a short-run price elasticity of demand of -0.2, a 30 percent decrease in the rate translates into a 6 percent increase in energy usage, or 1.2 Mcf. The household would then consume 21.2 Mcf and his bill after the discount would be \$101.46, still a large reduction from his undiscounted bill. The elasticity effect results in the rate discount requiring a higher subsidy from general ratepayers compared to a lump-sum payment that yields the same benefit to a low-income household.

Assume, as we did above, that the utility offers a 30-percent rate discount (i.e., the volumetric charge decreases from \$6.50 to \$4.55). The subsidy cost to the utility and non-targeted customers would be \$41.34  $[(\$6.50 - \$4.55) \cdot 21.2]$ . If, instead, the utility charges the full rate of \$6.50, the customer would consume 20 Mcf. The decrease in consumer surplus (- $\Delta$ CS) to the customer from having to pay the full price instead of the discount rate would equal the sum of: (a) the higher gas bill from consuming 20 Mcf, and (b) the net benefit loss from consuming 20 Mcf instead of 21.2 Mcf. Mathematically,  $\Delta$ CS =  $(\$6.50 - \$4.55) \cdot 20 + \frac{1}{2}(21.2 - 20) \cdot (\$6.50 - \$4.55) = \$40.17$ .

This result, where the recipient's economic welfare increases by the same amount, shows a lower subsidy cost from compensating a low-income household with a lump-sum payment of \$40.17 than with offering a rate discount (which costs the utility and the non-targeted customers \$41.34). Although the difference, which reflects what economists call a "deadweight loss," seems small (around 3 percent), it illustrates that two EA mechanisms with the same benefits to recipients can have different "subsidy" costs. Studies have estimated the long-run price elasticity of demand for energy to be much higher than the short-run elasticity—as much as four to five times higher. The "deadweight loss," in our example, could be as high as 15 percent over time. What this outcome means is that the same benefits to low-income households would require a 15-percent higher level of funding by general ratepayers. This example also illustrates the different effects on economic efficiency: The rate discount induces recipients to over-consume in that the additional benefit to them is less than the incremental cost associated with the higher consumption.

## 3. Bill-assistance payment<sup>3</sup>

The utility offers an eligible low-income household assistance in the form of a \$50 refund. In our example, this assistance reduces the customer's portion of the bill to \$85 (i.e., \$135 - \$50). The benefit to the customer corresponds to the subsidy cost incurred by the utility and general ratepayers (assuming no administrative and other implementation costs).



A cash subsidy with no strings attached of less than \$50 would produce the same benefit. Assume that a cash subsidy of \$35 produces the same benefits to a recipient as \$50 in energy in-kind money. The waste associated with the energy assistance relative to the cash assistance is then \$15, or 30 percent. It derives from customers being allowed under cash assistance to allocate the money to both energy and non-energy goods and services so as to maximize their economic well-being. EA causes households to consume more energy and less of other goods and services compared to a lower-cost cash subsidy yielding the same benefit.<sup>4</sup> One benefit of a lump-sum payment over a rate discount is that it avoids price signals that encourage customers to over-consume energy.

#### **4. Percentage-of-income plan<sup>5</sup>**

Under this plan, the eligible low-income customer's gas bill is capped at a specified percentage of his income. In other words, the customer pays a flat amount to the utility that entitles him to continued service. Assume that the customer's monthly income is \$800 and that the percentage-of-income plan calls for eligible low-income households not to pay more than 10 percent of their income for natural gas service. In our example, the customer's bill would decrease from \$135 to \$80, a decrease of 40 percent. The benefits to customers would depend upon both their income and gas bill. Both lower-income customers and customers with higher gas bills benefit the most, which makes this aspect of the mechanism desirable.

One problem with this mechanism is that the customer pays nothing to consume additional natural gas. In our example, the customer could increase his December gas usage from 20 Mcf without incurring any additional cost. One way to eliminate this "waste" would be to calculate a customer's energy usage in the same month for the previous year and then adjust it for changes in weather, household size, and other relevant factors. For consumption beyond the adjusted usage, the utility would require the customer to pay the standard rate (in our example, \$6.50). While this provision might be difficult to administer, it has the benefit of reducing both the cost to subsidizing customers and the inefficiency from excessive consumption of energy. Recovery of revenue shortfalls to the utility (i.e., the difference between the energy bill and the bill cap specified by the plan) can come from: (a) other customers, (b) LIHEAP funds and other EA programs, and (c) the revenue surpluses from recipients during off-peak periods (e.g., non-winter periods for gas customers when the percentage-of-income payment exceeds energy bills).

#### **5. Customer-charge waiver**

An eligible low-income household would not pay the \$5 customer charge. By itself, this would have only a minimal benefit for customers; the customer would still have a bill of \$130, or a 3.7 percent savings. As some energy utilities have increased substantially their customer charge to residential customers (e.g., from \$5 to \$20), a waiver would have a greater effect on reducing energy bills. Until this practice becomes commonplace, a waiver on the customer charge by itself would have only a minimal effect on helping low-income households.

Cost waivers can help low-income households stay current on their bills and either avoid disconnection by the utility or have utility service restored. They include arrearage forgiveness for customers who make timely payments of their utility bill over an extended period and a customer-charge waiver. Cost waivers can also apply to service reconnections, late payment charges, and deposits for low-income households who have a poor credit rating or history. A disconnected customer might find it financially impossible to pay all of these costs and have service restored. On the downside, a cost waiver might make customers less responsible for paying future utility bills (i.e., create a moral-hazard incentive). Less responsibility would come from customers who have less incentive for paying their bills on time and in full to avoid service disconnection. A waiver also means that the utility must either absorb the costs or pass them on to the general ratepayers.

## **6. Weatherization program<sup>6</sup>**

The utility weatherizes the customer's house at no cost and reduces his energy usage by 30 percent. In our example, gas consumption decreases from 20 Mcf to 14 Mcf. The customer saves \$39 on his December gas bill ( $\$6.50 \cdot 6$  Mcf). The lower bill may allow the customer to pay his full bill without additional assistance. What is particularly attractive about weatherization and other energy-efficiency actions is that after a one-time investment the customer continuously receives benefits over several years. These actions can also benefit the utility and general ratepayers by avoiding costs relating to fuel or purchased gas, additional capacity, debt write-offs, collection costs, and other costs related to delinquent accounts. One study showed that the collection cost incurred by a utility for each customer in arrears averages between \$20 and \$28 depending on the type of utility.<sup>7</sup>

With increasing concern over global warming and the likely rise in energy prices, weatherization and other energy-efficiency actions will take on greater importance. Many experts consider energy efficiency a low-cost near-term strategy for greenhouse gas mitigation. The commercialization of carbon-constrained technologies such as nuclear power, carbon capture and storage from coal plants, and renewable energy will have more of a long-term effect. In the interim, energy efficiency can play a key role in meeting carbon dioxide targets, helping low-income households decrease their energy burden while reducing expenditures for EA funded by utility customers and taxpayers.

## **IV. Seven Criteria for Determining Effectiveness**

Regulators and other policymakers should identify the criteria for socially desirable EA initiatives. No single EA action comes out favorably in meeting all criteria. Some actions perform superbly in satisfying certain criteria while satisfying others less well.

The following list contains seven criteria for evaluating the effectiveness of EA actions. Regulators should consider any action that satisfies the vast majority of these criteria as

positive. They should be wary of actions, on the other hand, that fall short in meeting most of the criteria.

**A. Benefits should accrue only to low-income households.**

Program “leakage,” in which some of the benefits go to non-targeted customers, has the unintended consequence of distributing money from non-recipient low-income households to customers whose incomes are many times higher. If utilities rely on rates discounts or other special rates, regulators should make sure that only eligible low-income households benefit (e.g., household income  $\leq$  150 percent of the poverty guidelines established by the Department of Health and Human Services).

Within the category of low-income households, more EA should go to the poorest of the poor. These households have less income to pay for energy and, compared to other households, their energy burden is excessively high, making utility service particularly unaffordable. Because of this condition, the poorest customers likely face high unpaid bills and are most susceptible to service disconnections.

**B. The recipients of EA should receive maximum benefits relative to the dollars spent.**

There are at least four different measures of economic benefits. They include:

1. The value recipients place on additional consumption of non-energy goods and services made possible by the effect of EA in reducing their energy bills;
2. The change in the net benefit that recipients receive from consuming energy, what economists call “consumer surplus;”
3. The amount recipients would be willing to pay to stay in an EA program, what economists label “compensating variation;” and
4. The amount recipients would be willing to accept not to participate in an EA program, what economists label “equivalent variation.”

As an illustration of the last measure, a low-income household might be willing to accept \$50 per month in lieu of receiving energy assistance; the \$50 cash subsidy then equals the value the household places on energy assistance. These measures are theoretically sound and they all correlate closely to, but in some instances fall short of, the recipients’ energy-bill savings.<sup>8</sup> The largest benefit to a recipient is ostensibly the lowering of her energy bill, but there are other benefits as well. That is, recipients would tend to value assistance above the energy-bill savings that comprise the major part of “consumer surplus.” A customer might realize annual bill savings of \$500 from EA, for example, but value the assistance much higher. She might feel less stress from the threat of losing utility service or the accumulation of large

due unpaid bills. The assistance may cause a household to increase (decrease) indoor temperatures in the winter (summer), or stop using the stove or oven for heat, making the indoor environment safer and healthier. EA also may offer arrearage forgiveness as long as the recipient makes timely payments of current bills. Although most of these benefits are beyond quantification, they represent a real benefit that regulators and other policymakers should include in evaluating EA initiatives.

**C. Consumer education should make eligible households aware of available assistance and how to reduce their energy bills.**

Any action would inevitably fail if eligible households do not know that they qualify for assistance. Households should also know how they can reduce their energy usage so that over time they can rely less on rate or bill discounts. Outreach should place special emphasis on reaching those low-income households most in need of EA. They include households who: (1) have the largest arrearages, (2) frequently receive collection notices from their utility, or (3) are currently disconnected from utility service.

Good information requires collaboration among the different entities jointly responsible for EA. These entities include the public utility regulator, utilities, social service agencies, charitable groups, and low-income households themselves.

**D. EA should avoid large efficiency losses or cross-subsidization.**

Efficiency losses primarily result from incorrect price signals to recipients, causing the overuse of energy. Losses can also stem from subsidizing customers paying higher prices at the margin to fund recipients. A loose definition of cross-subsidization is: subsidized customers pay less for utility service than the cost of serving them while subsidizing customers pay more.

The goal of controlling efficiency losses gives support to lump-sum payments over rate discounts. The preferable action might be simply to charge cost-based rates to all customers and then to transfer some of the revenues to eligible low-income households; the level of refund can link to a specified income-percentage formula (e.g., eligible households should not have to pay more than 10 percent of their monthly income to heat their homes in the winter).

**E. EA should have reasonable administrative and implementation costs.**

By reducing administrative and other implementation costs, more of the money for EA would go directly to needy recipients. Federal statute restricts the percentage of LIHEAP funds that grantees can use for planning and administration to 10 percent.

Customers should not have to expend inordinate time enrolling in or renewing enrollment for utility assistance. One option is to automatically enroll customers for utility programs if they previously applied for LIHEAP funds. Another alternative is self-certification by households that wish to sign up for a utility program. Households can also save time with “one-

stop shopping,” where they are able to go to one entity to enroll in different assistance programs and receive information on how to reduce their energy bills.

**F. Funding should have a tolerable financial effect on individual subsidizing customers.**

The principle of “spreading the burden” among many utility customers reduces the financial cost on each payer. Questions arise as to: (1) which utility customers should fund the subsidies (e.g., all utility customers, non-poor residential customers) and (2) at what point the “subsidy” cost becomes unreasonable. The last question requires regulators to know the tradeoff between adequate funds to assist low-income households and tolerable costs to subsidizing customers. The objective of reducing low-income households’ energy burden to the level of other households, for example, might require an excessive increase in general rates that violates equity and other regulatory goals.

A survey of utility EA actions across states shows that the burden on funding customers is generally, but not always, minimal.<sup>9</sup> States that limit the amounts of the “tax” paid to support EA initiatives place a cap that represents a small percentage of customers’ bills or the utility’s revenues. In Wisconsin, legislation requires that surcharges to fund EA actions cannot exceed 3 percent of a customer’s bill. Rate assistance programs in Maine constitute only one-half percent of an electric utility’s annual revenues. Most Pennsylvania energy utilities spend less than one percent of their annual revenues on EA programs. Additional EA programs in Illinois will increase surcharges to residential customers of energy utilities from 40 cents to 48 cents per month. Maryland’s electric EA program requires residential customers to pay a surcharge of 40 cents per month.<sup>10</sup>

The financial burden on utility customers in the future, however, could increase substantially as EA programs expand to meet growing demand. Some utility programs have grown dramatically since the beginning of this century, with customers having to absorb most of the additional costs.<sup>11</sup> In those areas with a high incidence of poverty, funding for assistance programs is potentially high.

**G. EA should result in reduced collection costs, service disconnections, arrearages, and debt write-offs.**

EA should motivate disconnected customers to pay their arrearages and get reconnected; and delinquent customers to pay their arrearages and stay connected. These outcomes would reduce utility costs and the effect on customers who would otherwise absorb those costs. EA should reduce a utility’s debt write-offs. (Write-offs are the total dollars the utility determines are uncollectible and, therefore, deducted from revenue.) One consulting firm’s evaluation of EA programs, for example, calculated that after the implementation of the Oregon Energy Assistance Program, past due amounts per low-income household declined by \$340 and costs incurred to collect bad debt declined by \$190,000.<sup>12</sup>

Some evidence suggests that the collections problem is more severe for gas utilities than for electric and combination utilities. NRRI analysis showed that the most serious problem lies with customers accumulating large arrearages on their gas bills during the winter heating season. Survey responses from state utility regulators indicated, for example, that during the winter of 2005-2006 the average arrearage of gas utilities grew by about 50 percent. The same survey showed that arrearage rates (i.e., the portion of residential customers with unpaid due accounts) in some states were as high as 45 percent for electric utilities and over 50 percent for gas utilities. Average arrearages for gas utilities in several states were in the \$600-\$900 range.<sup>13</sup>

## **V. What Regulators Can Do to Improve the Effectiveness of EA**

To say whether a particular EA action has been successful depends on the criteria applied to evaluate it, which the last section identified. Because different actions have varying effects, it is difficult to say unequivocally that regulators should impute greater value to some actions than others. Weatherization, for example, is attractive as a long-term remedy for the affordability problem, yet its effect might not help those customers who are in immediate need of assistance to help pay past unpaid bills. Even in the long run, weatherization might not sufficiently reduce the energy bills of low-income households. Those households might therefore still require supplemental assistance, although perhaps at a lower level than in the absence of weatherization.<sup>14</sup>

Appendix A lists questions that regulators can ask about both proposed and existing EA actions. By asking these questions and receiving answers, regulators can: (1) take no action, satisfied that additional action is unwarranted; (2) require utilities to take drastic actions; or (3) take incremental actions to improve the benefits to low-income households and minimize the adverse effects.

Regulators inevitably have to make tradeoffs between different regulatory goals. A higher participation rate might require more money funded by general ratepayers. Cost waivers might create a moral-hazard incentive: customers who fall behind in paying their utility bills might have less incentive to avoid late and partial payment of their utility bills in the future. This behavior translates into higher costs and lower revenues for the utility, which ultimately falls on the shoulders of other customers or utility shareholders, or both. Customers receiving rate discounts would tend to consume additional energy, which over time might require higher subsidies.

The paper identifies only a sampling of how undesirable, and sometimes unintended, consequences, might result from well-intentioned actions designed to make utility service more affordable to low-income customers. Partially for this reason, regulators should periodically assess whether EA actions are producing the intended results and not seriously jeopardizing other goals. The important goals are the advancement of cost-of service rates, energy efficiency, and equity. Appendix B lists several performance indicators for EA initiatives.

Regulators might want to require utilities to compile this information as part of a review of current actions. The performance indicators link to the criteria that were identified in Part IV.

## **VI. Conclusion**

Regulators should review utility EA initiatives to determine whether they are achieving the regulatory goal of utility-service affordability: (1) most effectively and (2) with minimal adverse effects on other goals. An important dimension of effectiveness is to maximize the benefits to targeted households given the dollars funded by other utility customers. Minimal adverse effects mean that in funding and executing EA, regulators should mitigate distortions in pricing, energy consumption, and recipient behavior from moral-hazard incentives. This paper should help public utility regulators in evaluating whether those EA initiatives of interest are meeting those goals.

## **Appendix A: Questions for Regulators to Ask about Energy Assistance**

1. How are the utilities responding to low-income households with bill-payment problems? Specifically, how should they treat customers who make a good-faith effort to pay their utility bill but are financially unable to make full payment?
2. Do existing EA actions maximize the benefits to low-income households relative to the dollars being spent? If not, what are the major reasons?
3. Would a re-shifting of EA monies from some initiatives to others improve results?
4. What goals and objectives should underlie EA?
5. What essential attributes should EA actions have?
6. Who should be eligible for EA? Who should determine eligibility? Should financial assets in addition to income be a determinant of eligibility?
7. How much money should a utility and its customers spend on EA? What should be the maximum negative financial effect on subsidizing customers and utility shareholders? How can regulators minimize this financial effect, assuming a predetermined level of energy assistance?
8. How should regulators define and measure “energy affordability”? What is its relationship to “energy burden”?
9. What role should utilities have in designing, administering, and funding EA?
10. How should utilities coordinate their activities with other entities, such as local community service agencies and private charities, involved with EA?
11. How does EA affect arrearages, disconnections, reconnections, debt write-offs, and collection costs? To what extent would these effects offset the direct subsidies to low-income households?
12. How should regulators define, conceptualize, and measure EA benefits?
13. How can a utility structure and implement EA actions to minimize the negative effects on other regulatory objectives? Examples of these objectives are economic efficiency, the absence of undue price discrimination, equity or fairness, energy efficiency, efficient consumption, and the minimization of waste.
14. What specific EA actions seem most effective in benefiting low-income households?



## Appendix B: Examples of Performance Indicators for Energy Assistance

1. *Participation rate* (e.g., the percentage of eligible households that receive direct bill assistance is 40 percent)
2. *Amount of dollar benefits per EA recipient, by income category* (e.g., the average benefit per recipient for households with an income between \$10,000 and \$20,000 is \$400; between \$20,001 and \$30,000 the average benefit is \$500)
3. *Reduction in the energy burden of recipients, by income category* (e.g., recipients with incomes between \$10,000 and \$20,000, on average, see their energy burden drop from 15 percent to 8 percent)
4. *Estimated reductions in total utility arrearages, collection costs, debt write-offs, and disconnections attributable to EA actions* (e.g., the decrease in the disconnection rate for eligible low-income households falls by 30 percent and total arrearages decrease by 20 percent)
5. *Estimated changes in household energy consumption, adjusted for weather and other quantifiable factors, attributable to EA actions* (e.g., weatherization of low-income households, on average, reduces energy consumption by 25 percent)
6. *Percentage of funds collected for EA disbursed to recipients* (e.g., the utility collects \$5 million from customers, of which \$4.5 million or 90 percent benefits low-income recipients)
7. *Percentage reduction in EA recipients' utility bills* (e.g., the average monthly gas bill of recipients without EA is \$100; with assistance the recipient pays \$40, yielding a 60-percent reduction)
8. *Percentage change in utility bills of funding customers, after adjusting for reduced utility costs from mitigation of recipient bill-payment problems* (e.g., funding for direct bill assistance is \$6 million, reduced costs for bill-payment problems are \$4 million, and the utility's total cost allocated to residential customers is \$100 million; the bills of residential customers would therefore increase by roughly 2 percent)

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## Endnotes:

<sup>1</sup> This paper later discusses the possibility and desirable outcome of non-targeted customers being no worse off, and even better off, because of lower collection, disconnection, and other costs that can result from EA. If regulators, as an alternative, require utility shareholders to fund EA, the price of utility service to non-targeted customers would not have to increase. The taxation would then fall upon the utility and its shareholders.

<sup>2</sup> Lifeline rates have been adopted by regulators to encourage energy efficiency and provide customers with lower marginal prices for “essential” electricity and gas use. Lifeline rates are volumetric rates that apply an inverted tiered rate structure in which consumers pay higher marginal prices at higher tiers of energy consumption. These rates provide even greater benefits, when compared with standard volumetric rates, to low-income households when they consume low amounts of energy relative to other customers. Lifeline rates, like volumetric rates, increase the risk that a utility will under-recover its fixed cost, because it disproportionately collects those costs through the higher rate tiers where the greatest amount of usage volatility occurs.

<sup>3</sup> Bill-assistance programs as a rule distribute lump-sum cash payments to pay down a customer’s utility bill. The income-eligible customer pays the same rates as other residential customers, but receives a discount on his total bill. If a customer’s utility bill was \$200, an assistance payment of \$50 would reduce what the customer pays to \$150. Some programs determine the amounts distributed based on a household’s income, the number of persons in the household, and a household’s utility bill. Because they do not affect a customer’s decision to consume energy at the margin, bill-assistance programs tend to minimize distortions in energy usage. They commonly provide a one-time-only benefit, which is a drawback when low-income households have an acute ongoing need.

<sup>4</sup> One criticism of in-kind programs such as EA is that they produce lower benefits to low-income households than the benefits from distributing the same amount of dollars to the same households without any strings attached. Assume that a household receives \$100 restricted to reducing the utility bill. If, as an alternative, the government gives the same household \$100 to use as it sees fit, economic theory (supported by empirical studies) says that the households would receive higher benefits. Cash subsidies with no string attached, in other words, can increase the benefits to recipients for each dollar funded by utility customers or taxpayers compared with in-kind subsidies such as EA that require the recipient to use the money to pay his or her utility bill. This outcome derives from the premise that households would not use the entire cash assistance to reduce their utility bill. Instead, they would rationally allocate some of the cash to different goods and services so as to maximize their “utility” (measured in “utils”) or economic well-being. In-kind subsidies, in contrast, are paternalistic in nature, requiring recipients to allocate the financial assistance to a designated good or service, such as home energy. For a theoretical discussion of in-kind and cash programs, see L.S. Friedman, *The Microeconomics of Public Policy Analysis*. Princeton, NJ: Princeton University Press, 2002, pp. 94-98.

<sup>5</sup> States with percentage-of-income plans include Illinois, New Hampshire, New Jersey, Ohio, and Pennsylvania. An evaluation of the New Jersey plan found positive results: (a) the subsidy was about 40 percent of the total energy bill for recipients (i.e., it produce substantial benefits to recipients); (b) it reduced the energy burden of recipients to a level more comparable with the energy burden of non-poor customers; (c) about 40 percent of recipients had incomes not exceeding \$10,000 (i.e., the program reached the poorest of the poor); (d) after the subsidy, two-thirds of the recipients were able to pay their annual utility bills in full; (e) pre-program arrearages of recipients decreased by about 90 percent; and (f) disconnection rates of recipients decreased below the average rate for LIHEAP customers located in the Northeast. (See Concentric Energy Advisors, “A Review of Low Income Energy Assistance Measures Adopted in Other Jurisdictions,” prepared for the Ontario Energy Board, pp. 55-56, September 4, 2008.)

<sup>6</sup> These programs include federal, state, and utility low-income weatherization assistance programs, and other utility energy-efficiency initiatives. A number of states mandate supplementary utility-funded no-cost

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weatherization services to low-income households. In Minnesota, for example, all state-jurisdictional gas utilities must spend at least 0.5 percent of their gross operating revenues on conservation improvement programs, such as energy audits and weatherization, and on rebates toward the purchase of energy efficient appliances. A utility must spend a portion of this money on residential conservation improvement programs for renters and low-income consumers.

<sup>7</sup> See American Gas Association, "2002-2004 Credit Collection Data for Energy Utilities," EA 2006-03, February 27, 2006.

<sup>8</sup> Three common definitions of benefits defined in economic studies are consumer surplus, compensating variation, and equivalent variation. One study has shown that under most circumstances when the income effect is small, these three measures are roughly equal. (See R.D. Willig, "Consumer's Surplus without Apology," *American Economic Review*, vol. 66, no. 4, pp. 589-597, September 1976.) According to the economic concept the Slutsky equation, the income effect is the product of the income elasticity of energy and the share of income spent on energy. The Slutsky equation expresses the price elasticity of demand as the sum of the substitution effect and the income effect. Compared to other residential customers, low-income households have a lower substitution effect (e.g., poor households are less able to buy energy-efficient appliances when price rises) but a higher income effect, as they spend a larger share of their incomes on home energy. The income effect can be more than minimal when either the income elasticity or the share of energy in a household's budget is large, as is true for low-income households. (See, for example, K.W. Costello, "A Welfare Measure of a New Type of Energy Assistance Program," *The Energy Journal*, vol. 9, no. 3, pp. 129-142, July 1988.) Consumer surplus measures the difference between the economic value of the assistance received by a low-income household and the "time" and "aggravation" cost (i.e., transaction cost) in applying for assistance. The economic value is equal to the reduced outlays by the low-income household for the energy consumed prior to assistance plus the net benefit from consuming additional energy because of the household's greater real income (i.e., the income effect) or the lower price of energy (i.e., the substitution effect), or both. For some low-income households, the transaction cost may overwhelm the benefits, causing them to reject energy assistance.

<sup>9</sup> See, for example, LIHEAP Clearinghouse, at <http://liheap.ncat.org/dereg.htm>.

<sup>10</sup> See the link in the previous endnote.

<sup>11</sup> See LIHEAP Clearinghouse, at <http://liheap.ncat.org/dereg.htm>.

<sup>12</sup> See Quantec LLC, "Draft Utah HELP Evaluation Comments," memo, January 30, 2004.

<sup>13</sup> National Regulatory Research Institute, "Analysis of Responses to Collections Surveys," NRRI memorandum to the NARUC Staff Subcommittee on Consumer Affairs, March 14, 2007.

<sup>14</sup> Initially, it seems these households would still require cash assistance to continue receiving service from the utility; it is doubtful whether weatherization would ultimately reduce energy usage sufficiently for low-income households to fully pay their utility bills without any additional assistance. Assume, for example, that a low-income household spends 20 percent of its income on home energy and that weatherization reduces energy usage by 25 percent. The household's energy burden would then fall to 15 percent. This decline seems inadequate to eliminate the need for all energy assistance to that household. This example suggests that policymakers cannot assume that weatherizing the homes of low-income households, especially the poorest ones, will rule out the need for additional energy assistance in the form of rate or bill discounts; it would only reduce the assistance needed to reduce the household's energy burden to a tolerable level. As another example, a household has an income of \$10,000 and pays \$1,500 in annual utility bills. Assume that it receives EA in the amount of \$400, which reduces its annual utility payment to \$1,100. Assume also that an "affordability" standard would limit this household's energy burden to 7 percent or \$700 annually. Assuming, as we did above, that weatherization reduces energy usage by around 25 percent, the utility bills would now total \$1,125 [ $\$1500 \cdot (1 - 0.25)$ ]. With \$400 of EA, the household's utility payments would fall to \$725, which is slightly above the "affordable" cap of \$700. The policy implication is

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that, even with weatherization, the reduction in low-income households' energy bills might fall short of affordable levels. The absolute dollar amount of needed EA might therefore not decrease.