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EXECUTIVE SUMMARY

A First-Rate Solution: Electricity Rate Structures Can Work for Low-Income Iowans and Promote Conservation

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High costs of home energy might only inconvenience some, but they can be devastating for low-income Iowans. Home energy bills are a function both energy costs and also the quantity of energy consumed. Needed policies to respond to climate change are likely to increase energy costs in the near future, so linking conservation and low-income affordability is more important than ever.

This report looks at just one component of home energy use: electricity.[1] To reduce Iowans' electricity use and encourage conservation, increasing electric rates seems to be an easy answer: Make it expensive so that people cut back where possible. But that can disproportionately affect low-income Iowans.

It is possible to structure rates that encourage conservation while at the same time helping low-income Iowans to more easily afford their energy bills. Electric utilities can promote conservation by strategically constructing electric rates. Those same utilities can help make electricity more affordable for low-income consumers using a variety of discounts or modified rate structures. The inverted block rate structure is the best way to meet these twin goals via a single mechanism.

Harder to afford home energy costs

Home energy is becoming less affordable. In 2007, the average Iowan's monthly residential home electricity bill was $83.65, compared to $67.50 in 2000 (nominal dollars). Additionally, over the past several years, Iowans have used a steadily increasing portion of their income to pay for home energy, which means that bills have risen faster than incomes. In 2003, Iowans earning incomes between 50 percent and 185 percent of the federal poverty level spent between 6.9 percent and 18.2 percent of their income on home energy, but by 2007 these costs were between 9.6 percent and 25.3 percent of these Iowans' incomes — and 6 percent of income is considered an affordable energy bill.

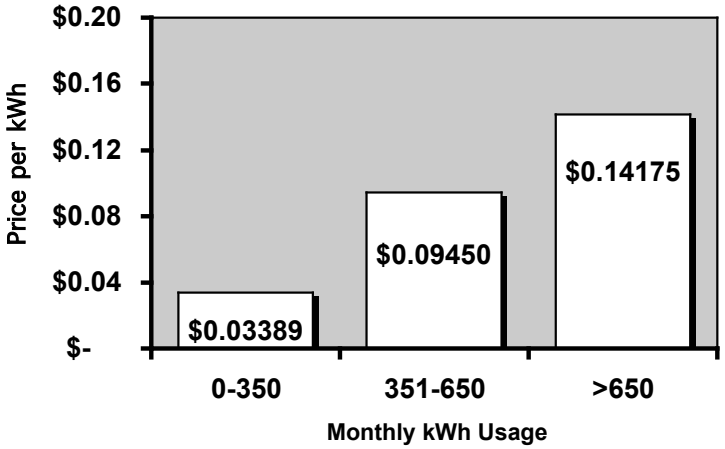
Rate Structure Options

Goals of encouraging conservation and making electricity more affordable for low-income consumers are compatible precisely because of the way consumers pay for electricity. Residential consumers' monthly electricity bills consist of several different elements. First, there is the monthly charge, which is a flat fee charged to all consumers for the service. Next, there is a price per kWh of electricity used. Utilities often charge different fees for different amounts of electricity used and for use at different times. According to the Department of Energy's Energy Information Administration, Iowa's average price per kWh was 9.45 cents in 2007.[2] In addition, taxes and fees are charged, such as sales tax, any applicable local-option sales tax, franchise fees, energy efficiency cost recovery, alternate energy producer charges and, occasionally, cost recovery adjustments. A block rate structure is common in the industry, and traditionally prices decrease as electricity consumption increases.. However, because energy becomes *cheaper* as more is consumed, this structure does not encourage conservation — if anything, it rewards consumption through lower prices.

Inverted Block Rates Based on Present Costs

The inverted block rate is a common rate structure used to promote conservation. This rate structure sets an initial block of a set number of kilowatt hours at a low price, and subsequent blocks get progressively more expensive. The pure inverted block rate promotes conservation through its pricing structure. Though the degree varies according to amount of use and type of rate change implemented, studies suggest that electricity is somewhat price elastic.[3] In other words, as prices increase, electricity use decreases. This means inverted rate structures could cause a decrease in electricity use, with the strength of the relationship between price increase and usage decrease increasing in the long run.[4] Because the pure inverted block rate structure treats all consumers the same, it does not specifically address the concerns of low-income consumers, though all consumers can benefit from this structure if they decrease their monthly electricity use. The figure at left shows how an inverted block rate structure could price electricity.

Inverted Block Rates: Price Promotes Conservation



Note: IPP sample inverted block rate structure. Middle block represents statewide average price per kWh. Source: U.S. Department of Energy.

The table below is a hypothetical example of potential price changes under a straight inverted block rate structure. The cost of average consumption is kept constant in order to simulate a revenue-neutral proposal. The initial block in the inverted block rate below is 350 kWh, which represents basic monthly electricity use in Iowa's Census division.

Monthly Electricity Costs: Current Rate Structure vs. Inverted Block Rate

	Average Consumption	*Change*	Conservation Consumption	*Change*	High Consumption	*Change*
Current Structure	$ 79.66		$ 37.80		$ 89.78	
Inverted Block Rate	$ 79.66	0.00%	$ 22.59	-40.25%	$ 110.00	22.53%

Inverted Block Rates Based on Future Costs

Another option is to create an inverted block rate that accounts for the future costs of building new plants that will cost more than the present depreciated plants now in use. This would lead to more expensive prices and, thus should lead to lower use and delay the need for expensive new infrastructure. Such a rate structure prices the final (highest-use) block based on the long-run marginal cost (LRMC) of the last kWh used in the system — the discrete cost of producing each additional unit.

Rates are higher when based on LRMC rather than when based on the average cost of producing all units. This is because the cost of adding generation capacity in order to produce additional electricity is built into the per unit cost of electricity. In other words, a fraction of the cost to build a new plant is included in each kWh of use in that final block. Rates built on LRMC pricing would produce higher revenues for utilities. An important caveat: As Iowa's regulated utilities are statutorily prohibited from earning excessive profits, any rate structure proposed must yield only the approved return. Adjustments may be needed to balance out utilities' bottom lines and adhere to state statute. One option would be for utilities to simply cut rates for the initial blocks of electricity used and needed by all consumers. Any

excess revenues that would be generated from implementing LRMC-based pricing could actually be used to make electricity more affordable for low-income consumers.

Revenue-balancing approaches utilities can use that assist low-income consumers include:

■ Establishing a parallel rate structure with a larger initial block for qualifying low-income consumers. This would allow those consumers to pay the cheapest rate for a larger quantity of their electricity consumption. This does make energy cheaper for low-income consumers, but removes or decreases at least some portion of the conservation incentive for low-income consumers.

■ Applying a percentage discount to the total electricity bill or creating a parallel rate track for qualifying low-income consumers are other options. Both options preserve the conservation incentive for consumers at all income levels while increasing the affordability of electricity for low-income consumers.

■ Waiving the fixed charges associated with electricity use, such as the monthly service charge, for qualifying low-income consumers. This would cut low-income consumers' bills while eliminating a disproportionate burden on low-income consumers and would keep the conservation incentive.

Combining parallel inverted block rates with waiver of the monthly charge for low-income consumers is the best rate structure to achieve the twin goals of promoting conservation while making residential electricity prices more affordable for conserving low-income consumers. Having parallel rate structures, rather than one inverted block rate, has other advantages. The use of a separate track for low-income consumers removes the potential punitive impact when higher energy use by low-income households is a result of inefficient dwelling spaces, rather than over-consumption. Further, waiving the monthly service charge decreases low-income consumers' bills without removing the conservation incentive. It also removes the flat-fee portion of the bill, which affects low-income consumers disproportionately.

States and individual utilities have tried several options to achieve the goals of assisting low-income consumers or encouraging conservation through the design of rate structures. See the full report for examples from New Mexico, California, Minnesota and Iowa.

Additional Considerations

■ No rate structure alone can fully meet the needs of low-income consumers whose homes are not energy-efficient. Additional weatherization assistance for low-income households would help.

■ Any separate program administered by the utilities to income-qualified consumers has the potential for a "cliff effect," in which going even one dollar over the income eligibility level can make someone ineligible for assistance and create a financial hardship.

■ Another potential limitation of utility-administered programs for low-income consumers is that it can be difficult to reach certain renters. A carefully drafted proposal could minimize these risks.

Conclusion

The interests of all in a healthy environment and affordability of basic needs can be reconciled. A carefully constructed inverted block rate can keep prices down for low-income consumers while encouraging conservation for high users through gradually increasing per kWh prices.

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[1] The inverted block rate structure proposed in this paper could work for other utilities as well.

[2] United States Department of Energy. Energy Information Administration. Electric Sales, Revenue, and Average Price 2007. Table 5 U.S. Average Monthly Bill by Sector, Census Division, and State 2007, available at http://www.eia.doe.gov/cneaf/electricity/esr/backissues.html.

[3] Faruqui, Ahmad. Inclining Toward Efficiency. Public Utilities Fortnightly. Arlington: Aug 2008. Vol. 146, Iss. 8, p. 22-27. *Citing* Price Elasticity of Demand for Electricity: A Primer and Synthesis. EPRI, Palo Alto, CA: 2007, 1016264.

[4] Ibid.