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Inverted block rates can serve dual functions of hardship alleviation and cost-based rates

NOTE TO READERS

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INVERTED BLOCK "LIFELINE" RATES CAN ALLEVIATE HARDSHIP WHILE IMPROVING COST-REFLECTIVITY

While Lifeline rates can take many forms, a recent FSC report for an electric distribution utility considered issues involved with the implementation of a "Lifeline" rate through adoption of a universal, non-means-tested, rate directed toward the initial block of energy consumption by a residential electric customer. The FSC report designated the inverted block rate structure as the form of Lifeline that would be assessed.

This work did *not*, in other words, define a Lifeline rate as a discounted rate for targeted demographic groups (e.g., low-income, the elderly, the disabled). Instead, any reference to a "Lifeline rate" throughout this discussion should be considered to be a reference to an inverted block rate structure, and vice versa, unless the context clearly denotes otherwise.

TWO ALTERNATIVE LIFELINE FORMS

In turn, an inverted rate structure may take one of two primary forms.

- A utility may use an "inverted block tariff" (IBT). Under an IBT, the utility charges a higher price for each unit of energy as consumption increases. The block of consumption between 501 kWh and 1,000 kWh in a month under an IBT is priced higher than the block of consumption between 1 kWh and 500 kWh.
- A utility may use a volume differentiated tariff (VDT). Under a VDT, the utility prices are again based on the amount of consumption by the customer. If the customer moves into a higher consumption block, beyond the

limits of the Lifeline rate, however, rather than simply charging the additional consumption at a higher rate, the *entire* amount of consumption is re-priced at the higher rate.

The focus of this discussion is on the inverted block tariff (IBT) Lifeline form.

LIFELINE RATE OBJECTIVES

In considering whether to use a Lifeline rate as an integrated part of a utility's rate structure, the first critical task to perform involves articulating the objectives to be achieved through such a decision. In many jurisdictions, these objectives are—or are at least argued to be—determinative of the outcome to challenges to whether such a rate structure is lawful under jurisdictional rate-making constraints. In other jurisdictions, the objectives have substantial political implications, providing reasons for who might support and who might oppose the Lifeline proposal.

In *all* jurisdictions, the specific objectives sought to be attained should, and often do, have a direct impact on how the rate is actually structured.

Finally, of course, without articulating the objectives sought through a Lifeline rate, it is not possible to assess after-the-fact whether the rate is “effective” in achieving its desired outcomes. The question “was the Lifeline effective” must, of course, be met with the further question “effective at doing what?” Stakeholders, low-income advocates and utility rate designers alike, should have an answer to that question.

ESTABLISHING LIFELINE OBJECTIVES

In discussing Lifeline rates, it is important to directly address, at the front-end of any deliberation, several fundamental policy questions. The first question involves articulating the basic objective(s) of the Lifeline rate. Several competing objectives can be articulated. The primary set of competing objectives is whether the Lifeline rate is designed to alleviate low-income

hardships or whether it is primarily a conservation tool.

Efforts to alleviate low-income hardship and to incentivize energy conservation may, but are not necessarily, compatible. Pursuing the goal of “hardship alleviation” arises by reducing “the utility bills of low-income households [. . .] to a level where ‘essential energy needs’ can be met within the household’s limited budget.”¹ In contrast, pursuing the goal of “energy conservation” generally involves providing lower rates in the first rate block and higher rates in the tail blocks.

Increasing rates in the tail block will not impede an objective of alleviating low-income hardship if certain conditions exist. “If one makes the assumption that low-income households generally use smaller amounts of electricity and limit their monthly consumption so as not to exceed the first block, conservation rate breaks or inverted rates are compatible with alleviating the special problems of low-income individuals.”

However, some (but not all) analysts argue that there is no basis for this assumption. Indeed, if low-income customers do *not* have lower consumption, or even have higher consumption than average, there will be a direct conflict between the two goals.

THE CALIFORNIA EXPERIENCE: A CHANGE IN TERMINOLOGY

A utility need not even address, let alone resolve, this issue of whether the level of household income, and the level of household electricity consumption, are associated with each other sufficiently to justify using a non-targeted “universal” Lifeline as a mechanism to deliver low-income energy assistance. Sometimes, the difference between the objective of hardship al-

¹Cleveland State University (1980). *Lifeline Electric Rates and Alternative Approaches to the Problems of Low-Income Ratepayers: A Cross-Program Analysis*, DOE/RG/1006-003, at 9 – 10, National Technical Information Service: Washington D.C.

leviation and the objective of energy conservation is viewed as being largely semantic. “Sometimes the concept of lifeline rates has gained acceptance simply by changing its label to something else such as ‘conservation rate breaks.’”²

In California, for example, Lifeline advocates generated support for their Lifeline rate proposal by emphasizing its conservation impact rather than its social implications. In California, this semantic solution was proposed by a group called Toward Utility Rate Normalization (TURN). After failing in its efforts to obtain low-income discount rates for many years, TURN sought to dispel the notion that unjustified subsidies or welfare considerations were involved. TURN proposed to correct this “misunderstanding” by changing the term “Lifeline” rate to “baseline” rate.

In making this change, TURN sought to affirm that the purposes of the Lifeline legislation were “conservation and economic equity.” Unchanged, under the TURN proposal, would be the discount for energy purchased in the first, or “baseline” block. Under the new legislation, the baseline amount was defined to be 50% to 60% of the average residential consumption. The “essential needs” covered by this baseline amount included space heating, water heating, lighting, cooking and food refrigeration. The new “baseline” rate was adopted in California.

What the California experience teaches us is that, in considering a universal Lifeline rate structure, the *motivation* for the universal Lifeline rate (e.g., to deliver low-income rate affordability assistance) may well be different from the *regulatory justification* for the rate (e.g., to deliver conservation price signals).

FRAMING THE LOW-INCOME “HARDSHIP ALLEVIATION” OBJECTIVE.

² Heather Parmesano and Catherine Martin, “The Evolution in U.S. Electric Utility Rate Design,” 1983 *Annual Review of Energy* 45, 81 (1983),

A universal Lifeline rate can be used to alleviate the rate affordability hardships posed by household electric bills. Rate relief in pursuit of this objective is provided by pricing initial blocks of electricity at lower rates, with the resulting revenue shortfall made-up through price increases for usage at high blocks. While not a “universal” Lifeline rate as defined above, the objective articulated for the Los Angeles senior Lifeline rate nonetheless captures the underlying purpose of the hardship alleviation objective:

In Los Angeles, it was widely felt that the senior citizens, many of whom live on meager fixed incomes, should receive some protection against rising energy costs. Although escalating energy prices were the focus, the basic problem of the elderly was poverty. Their fixed incomes contrast sharply with the rising cost of living. Unlike many other poor groups, their age excludes them from many jobs and they can do little to change their situation. An energy assistance plan should seek to meet the basic objective of improving the economic well-being of low-income senior citizens.

Typical approaches to pursuing this hardship alleviation objective include either pricing an initial block of “essential” service at the lower rate; or pricing an initial block of “average” service at the lower rate.

Articulating the objective for a universal Lifeline rate in this manner, however, does not end the discussion. This is true for several reasons:

- Articulating this “hardship alleviation” objective has certain facts implicit within it. Using a universal Lifeline to deliver affordability assistance, for example, carries with it certain assumptions about the relationship between the level of a household’s income and the level of usage that might be expected to result from that low income.
- Articulating one specific objective may, or may not, be consistent with articulat-

**THE INTERRELATIONSHIP
OF “HARDSHIP ALLEVIATION”
WITH “MEETING ESSENTIAL NEEDS”**

ing a different objective or pursuing a particular design for the Lifeline rate. The objective to provide a certain minimum level of “essential” electricity needs at a low-cost may be consistent with the use of a targeted Lifeline rate. It is, however, also consistent with a universal Lifeline rate, since the essential nature of a minimum level of electricity does not depend on the income of the household.

- Articulating the hardship alleviation objective may or may not fully reconcile the overall motivation for pursuing a universal Lifeline rate with the regulatory *justification* for the rate. The *motivation* for a Lifeline rate may, for example, be to deliver rate affordability assistance to low-income households. This motivation, however, need not detract from the fact that the specific regulatory objective might nonetheless be to increase the ability of rates to reflect the lower costs that low-use customers impose on a utility system.

In addition to considering the use of a universal Lifeline rate to help alleviate the ability-to-pay hardships of low-income customers, any discussion of the use of Lifeline rates should examine the extent to which such a “hardship alleviation” objective is consistent with the use of a universal Lifeline to provide for essential needs for *all* customers; to mitigate the reverse subsidy that generally flows *from* small consumers *to* large consumers through normal utility ratemaking; and to promote conservation and energy efficiency through price signals.

The desire to use a universal Lifeline rate as a means of pursuing a “hardship alleviation” objective does not detract from the need to understand the interrelationships and interplay with these other potential Lifeline objectives.

Closely related to the hardship alleviation objective, but nonetheless distinguishable, is the belief that Lifeline rates should achieve the objective of providing electricity for a certain level of basic needs at a minimum price. This Lifeline rate objective posits not only that some minimum level of electricity consumption is needed by *any* household for “essential needs,” but also that this level of consumption should be available at an affordable price irrespective of who is consuming.

The focus of this objective is on the nature of the use of electricity rather than on the economic hardship that arises when a household cannot afford to pay for such electricity. A higher level of income, in other words, does not detract from the essential nature of the specified minimum electricity consumption deemed to be essential to a household. Note that in this formulation of the Lifeline objective, it is the “essential” nature of electricity, standing alone, not the essential nature of electricity in combination with the likelihood of deprivation due to inability-to-pay, which forms the basis for the articulation of the objective.

Formulating the Lifeline rate objective in this regard simplifies any consideration of a universal Lifeline rate. One need not consider income. One need not consider the relationship between usage and income. One need not consider at what point inability-to-pay will result in deprivation of the service required for essential needs. One need not consider whether the poor are included in the rate while the non-poor are excluded. As one commentator said:

If electricity is an “essential need” (such as water), then the rationale for lifeline is not the indirect redistribution of income, but a natural outcome of a philosophical and moral position. Lifeline rates based on es-

sential need would be universally applied to all residential customers.”³

Under the “essential needs” objective of a Lifeline rate, this commentator concluded, “the only empirical question concerning Lifeline is to model the household sources of electricity demand such that the size of the Lifeline or ‘essential need’ block can be established.”

Other commentators, however, do not agree that the issue is quite so simple. Indeed, opposition to inverted rates has been predicated on the burdens such rates would impose on high users. One analyst argued, for example, that “the use of inverted rates for a class of customers such as residential appears to be based on the assertion that certain uses characterized by customer requirements up to a particular level are necessary and should have a lower rate, while usage beyond that point are luxuries or are less necessary and therefore should be charged a higher price.”⁴

This analyst noted that would “result in homes that use electricity for water or space heating being especially hard hit.”

Indeed, the need to establish an appropriate consumption level for the initial block of an inverted block rate has been discussed in a prior issue of *FSC Insights*.⁵

³ Michael Hennessy, “The Evaluation of Lifeline Electricity Rates: Methods and Myths,” 8 *Evaluation Review* 327, 329 (1984), citing, H. Petersen (1982). “Gainers and losers with lifeline electricity rates,” *Public Utilities Fortnightly*, November 25, 1982.

⁴ Robert Sarikas and Henry Herz (1976). *Electric Rate Concepts and Structures: A Report to the Bonneville Power Administration*, at 1, National Technical Information System: Washington D.C.

⁵ Roger Colton (2007). “Inverted Block Rates for Electricity Harm Low-Income Customers When Initial Block Not Well-Designed,” *FSC Law and Economics Insights*, Issue 2007:5 (September/October 2007).

THE INTERRELATIONSHIP OF “HARDSHIP ALLEVIATION” WITH “IMPROVING COST REFLECTIVITY” FOR LOW-USERS

One important finding of recent research on inverted block tariff/Lifeline rates is that historic concerns about the legality of providing rate relief to low-income customers may no longer be well-founded.⁶ Indeed, the association between the contribution of high usage customers to high demand, and the contribution of high usage customers to high utility generation costs, provides a strong justification for universal Lifeline rates independent of the “hardship alleviation” objective regarding low-income customers.

Rather than providing the initial reduced-price consumption block “below cost,” in other words, the impact of a universal Lifeline rate is to remove the implicit subsidies flowing from low-users to high-users when rates do not reflect the difference in peak load utilization.

In this respect, Lifeline rates (inverted block rates) are not only beneficial in delivering rate affordability assistance, they are also *needed* to improve the cost-reflectivity of residential rate structures. As a result, a utility may help alleviate the low-income hardship associated with inability-to-pay without needing to create a rate subsidy flowing to these small users.

Integral Energy, an Australian electric distribution utility, framed the issue like this: “in general, current network tariffs do not provide customers with the right price signals and are not equitable. At present, customers who are not contributing to the network peak are bearing the costs associated with those that are.”⁷ The in-

⁶ In reaching this conclusion, it may no longer be necessary to determine whether arguments over whether the legality of universal Lifeline rates were “right” or “wrong” under traditional discrimination law.

⁷ Independent Pricing and Regulatory Tribunal of New South Wales (IPART) (June 2003). *Inclining Block Tariffs for Electricity Network Services: Sec-*

clining block tariff proposal of Australia's electric suppliers was "aimed at improving the cost reflectivity and . . . equity in network tariffs for residential and small business customers."

The staff of the Australian utility regulatory body overseeing regulated residential rates in New South Wales (Australia) agreed. In its "Secretariat Discussion Paper" examining inverted block rates, the Staff of the New South Wales Independent Pricing and Review Tribunal (IPART) articulated the cost-reflectivity issue as follows:

The current single flat rate energy charge structure for residential and small business customers means that customers contribute to the cost of providing capacity in proportion to their energy consumption. Larger customers pay a larger share of costs by virtue of their higher consumption. Underlying this charge structure is an implicit assumption that if a customer consumes say 20 percent of total energy then they utilize 20 per cent of system capacity. If this were the case, then the single rate structure would likely be cost-reflective. . .

The current charge structure is therefore likely to lead to cross-subsidies across different kinds of residential and small business customers. Customers that impose demands on system capacity that are disproportionately less than indicated by their energy consumption will tend to cross subsidize those with disproportionately greater demand for capacity. . . For example, a customer may represent around 2 per cent of total energy but because they have a need for this energy during peak time, might represent around 5 per cent of system capacity. Under the current system, ignoring the impact of fixed service availability (access) charges, that customer would be facing only 2 per cent of costs. The remainder would be spread across other cus-

tomers that utilize capacity disproportionately less.

The cross-subsidy from small users to large users can be substantial. One Australia utility found that "the cross-subsidy is in the range [of] \$80 to \$110 million –or one-third of total sales to the residential and small business sectors. If this subsidy is smeared across all of the remaining consumption by these groups, it equates to 1.5 cents/kWh to 2.0 cents/kWh relative to a marginal rate of 4.85 cents/kWh."

These observations were confirmed in the context of a Canadian province as well. An analysis by the Energy Research Group, a research institute within the Department of Electrical and Computer Engineering (Dalhousie University, Halifax, Nova Scotia), presented to the Nova Scotia Utility and Review Board (UARB), explained:

The customer's price per unit of energy is obtained, in part, from the costs associated with the different types of generation. If the energy supplier meets the non-peak demand with low-cost, base-load energy and the system peak with a combination of base-load and expensive peak load energy, the price per unit of energy must be a combination of the two. Although both customers pay the same price per unit of energy, the first customer pays disproportionately more per unit because the second customer consumes more energy generated during the (expensive) system peak. In short, one finds that:

- ◆ Customers with a large portion of their demand that is not coincident with the system peak are overcharged for the price of a unit of energy.
- ◆ Customers with a large portion of their demand that is coincident with the system peak are undercharged for the price of a unit of energy.

retariat Discussion Paper, Discussion Paper DP64, at 6.

In other words, the flat rate structure does not reflect the cost of generation and can result in cross-subsidies.⁸

Historically, one primary objection to the use of Lifeline rates –be they a universal Lifeline rate or a targeted Lifeline rate—has been based on the argument that providing an initial block of low-cost usage would conflict with principles of cost-causation. Such a low-cost initial block, the argument went, would be, at best, bad public policy and, at worst, a violation of laws prohibiting “discrimination” in ratemaking.

The argument against providing a low-cost block of initial consumption gained further credence as the electric industries in North America, Europe and Australia became more competitive. On the one hand, providing such non-cost-based rates would impede competition for the small user, when competitive service providers would be unable to compete against the artificially low “subsidized” rate. On the other hand, providing such non-cost-based rates would impede competition for the larger user when competitive service providers could cherry-pick large-user customers, who were being charged higher rates than would be charged by companies that did not bear the same social obligations as the public utilities.

The research cited above alleviates those concerns. Rather than creating a subsidy flowing to small users, the universal Lifeline/inverted block tariff rate would eliminate the cross-subsidy and improve cost reflectivity.

SUMMARY AND CONCLUSIONS

The adverse impact of high, non-cost-based rates on low-income customers makes the ability to achieve a “hardship alleviation” objective, while at the same time serving the public purpose of

⁸ Larry Hughes (2004). *The Inverted Block Rate: An Alternative to Flat Billing*, at 6 - 7, Energy Research Group, Department of Electrical and Computer Engineering, Dalhousie University: Halifax (Nova Scotia).

improving cost-reflectivity, even more compelling from a policy perspective.

If low-income customers cannot afford to pay their bills, and some portion of those bills is related to costs they did not cause the utility to incur, the design of a Lifeline (inverted block) rate would serve both the objective of improving price reflectivity and the objective of alleviating low-income hardships.⁹

For more information on the structure of Lifeline rates, and for a copy of the final report discussed above, readers may contact FSC directly at:

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⁹ One should note, again, of course, the discussion above regarding the interrelationship between low-income status and low-user status.