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Factors to Consider in Designing Initial Block of Inverted Block Rates for Electricity

NOTE TO READERS

ON-LINE DELIVERY

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Fisher, Sheehan & Colton
Public Finance and General Economics
34 Warwick Road, Belmont, MA 02478
(voice) 617-484-0597 *** (fax) 617-484-0594
(e-mail) roger@fsconline.com

INVERTED BLOCK RATES FOR ELECTRICITY HARM LOW-INCOME CUSTOMERS WHEN INITIAL BLOCK NOT WELL-DESIGNED

Increasingly, inverted block rates are being proposed by electric utilities and environmental advocates as a mechanism through which to provide incentives for customers to conserve power. Making electricity made more expensive as consumers use more, the reasoning goes, not only reflects the higher cost of the high usage, but will reward small users not only through lower bills, but also through lower per-unit prices.

Recent testimony filed by Fisher, Sheehan & Colton (FSC) in a Public Service Company of New Mexico electric rate case, however, finds that such an inverted block rate structure will harm low-income consumers if the initial block is not appropriately structured.

In testimony presented on behalf of Community Action New Mexico (CANM), Roger Colton considered the reasonableness of the Company's proposed inverted block rate structure. More specifically, he reviewed the reasonableness of the proposal to provide a three-tiered inverted block rate with the first consumption tier being limited to only 200 kiloWatt hours ("kWh") of usage. The testimony explained why the first tier of consumption in the Company's proposed inverted block rate structure should instead be set at 500 kWh.

PNM's Proposed Initial Block.

The analysis of the initial block rate was provided within the context of a proposal by Public Service Company of New Mexico to move to a three-tier inverted block rate structure for its electric rates. According to PNM "Rates Manager" John Olmstead, the Company seeks to offer seasonal block rates.

- The first block of usage is proposed to be set at 200 kWh, with a summer rate of 7.9168 cents per kWh and a winter rate of 7.0987 cents per kWh.

- The second block captures the next 500 kWh usage.

- The third block captures all consumption above 700 kWh.

According to the Company, its proposed inverted block rate design would "provide significant encouragement for residential customers to reduce consumption while preserving the load-shifting benefits of the [time of use] rates."

The Company conceded that there was no cost basis for setting its first block of consumption at 200 kWh. According to one utility witness, "this value represents electricity consumption consisting of a refrigerator plus additional usage for lighting and cooking, which can be considered a minimum amount of electricity usage for a house."

The CANM Challenge.

FSC challenged the electric utility's testimony on two grounds.

- First, a monthly consumption of 200 kWh will not cover the consumption associated with a refrigerator plus additional usage for lighting and cooking.

- Second, even if it did, electricity consumption for a refrigerator, lighting and cooking cannot reasonably be considered "a minimum amount of electricity usage for a house."

In crafting the CANM challenge, FSC drew upon the considerable work it performs in reviewing utility allowances for public and assisted housing units operated by public housing authorities with financial subsidies provided by the U.S. Department of Housing and Urban Development (HUD). Utility allowances involve determining usage amounts for these residential customers such that HUD can provide a utility subsidy designed to cover the reasonable utility consumption of these households. Energy consumption is determined by fuel type and energy end use.

FSC noted, for example, HUD's *Utility Allowance Guidebook* as an authoritative source for consumption estimates.

- **Cooking consumption:** The consumption requirements for cooking included in this *Guidebook* for a three-bedroom housing unit was 71 kWh per month.

- **Lighting consumption:** The lighting allowances recommended in that *Guidebook* provided for consumption of 1,260 kWh per year (105 kWh per month) for a three-bedroom unit.

- **Refrigeration consumption:** The refrigerator consumption was variable. With the *Guidebook* reporting that consumption can range between 500 kWh to over 2,000 kWh per year. Taking a warm weather mid-range of 1,400 kWh yields a consumption allowance of 120 kWh per month.

As can be seen, FSC concluded, the PNM calculation of a monthly 200 kWh consumption for lighting, refrigeration and cooking is significantly low. These three end-uses, standing alone, would yield a consumption of 300 kWh per month for a three-bedroom unit.

A Side Note

It is appropriate to use a three-bedroom unit as a standard sized unit for New Mexico. Occupied housing units in New Mexico have an average of 2.5 bedrooms per unit. Nearly 55% of all occupied housing units in New Mexico have three or more bedrooms; more than 12% of New Mexico occupied housing units have four or more bedrooms. If one limits the occupied housing units only to those where the occupant pays his or

her own utility bill, the average number of bedrooms per unit increases even further.

Additional Data

FSC cited other data, also, to document the fallacy behind setting an initial block at 200 kWh. The U.S. Department of Energy (DOE) publishes information from its Residential Energy Consumption Survey (RECS).

- **Refrigeration:** According to the DOE's most recently published data, the average refrigerator consumption to be expected in New Mexico (as part of the Mountain Census Division) is 1,455 kWh. This data is consistent with the HUD data cited above.

- **Cooking:** The U.S. Department of Energy reports that electric consumption for cooking needs should be divided into two different appliance uses. The combined annual consumption for an electric range top and electric oven is 976 kWh. Use of a microwave oven adds 209 kWh a year to the household's consumption, with a toaster oven adding 50 kWh more per year.[1] The total cooking consumption for a household is, therefore, 1,235 kWh per year, or about 105 kWh per month.

- **Lighting:** DOE reports annual lighting consumption to be 940 kWh per year, or roughly 80 kWh per month.

Overall, the total annual DOE minimum consumption for lighting, cooking and refrigeration is more than 3,600 kWh per year (1,435 (refrigeration) + 1,235 (cooking) + 940 (lighting) = 3,630 kWh per year), or in excess of 300 kWh per month.

[1] Using microwaves are generally considered to be more efficient than the use of electric range tops for cooking. If microwave consumption is *ex*cluded, therefore, an annual consumption in excess of the microwave usage would need to be added to the range top for cooking.

The Usage to be included in an Initial Block

Nor is it reasonable to set an initial block limited to lighting, cooking and refrigeration, FSC said.

According to multiple PNM witnesses, FSC noted, the purpose of the tiered block rate structure is to provide price signals so that customers will receive an incentive to reduce consumption. If higher rates are imposed on basic consumption, the resulting bills will only be punitive rather than providing a price signal. Electric consumption for lighting, refrigeration and cooking does *not* represent an irreducible minimum below which customers will not respond to price signals.

Basic electric usage within a home should be included within the initial tier of PNM's block rate structure. Certain basic household appliances should be included in the initial block of consumption. Including electric usage for basic appliances such as clocks, stereo/radios, telephones, vacuum cleaners, televisions, and clothes washers (without dryers) would add more than 200 kWh usage a month to a household's basic energy consumption.

FSC recommended that the the first block of PNM's three tiered inverted block rate structure be set at 500 kWh. This consumption provides for basic household electricity usage and provides an incentive for households to conserve without being punitive. The Company would need to restructure its second tier to make this change in the initial block revenue neutral.

The Conservation Incentive.

An initial block of 500 kWh creates an incentive for residential customers to conserve electricity. According to the U.S. Department of Energy (DOE), the average per-household electricity consumption in the Mountain States census division is 10,654 kWh per year. Setting an initial block at 60% of this average in order to provide an incentive to conserve yields an initial consumption tier of 533 kWh per month. As is evident, therefore, an initial tier of 500 kWh will

provide for basic household consumption while at the same time preserving the price signal function sought by PNM. Using the consumption identified in PNM's own bill frequency table yields a similar result.

Impact on Low-Income Customers

Unquestionably low-income customers will benefit from a higher initial block. Low-income and fixed-income senior households tend to be the lowest consumers of electricity. The consumption of electricity for appliances is directly related to income. In the Mountain States census division, 41% of electric customers with income below the Federal Poverty Level use less than 6,000 kWh of electricity, compared to only 27% of electric customers with income over 100% of the Federal Poverty Level.

The distinction between low-income and non-low-income households occurs between 400 kWh and 500 kWh consumption. While 82% of non-low-income electric customers use more than 4,800 kWh each year, 77% of low-income electric customers do, a difference of only 5%. In contrast, while 73% of non-low-income electric customers use more than 6,000 kWh each year, only 59% of low-income customers do, a difference of 14%. The initial block of consumption in the PNM rate structure should be set at 500 kWh.

SUMMARY

For a copy of FSC's testimony in the PNM electric rate case, including its data tables, readers may contact FSC directly at:

Roger[at]fsconline.com

Fisher, Sheehan and Colton, Public Finance and General Economics (FSC) provides economic, financial and regulatory consulting. The areas in which *FSC* has worked include energy law and economics, fair housing, affordable housing development, local planning and zoning, energy efficiency planning, community economic development, poverty and telecommunications policy, regulatory economics, and public welfare policy.