WRONG-WAY STREET:
REVERSING THE SUBSIDY FLOWING *FROM* LOW-INCOME CUSTOMERS IN A COMPETITIVE ELECTRIC INDUSTRY

By:

Roger D. Colton
Fisher, Sheehan & Colton
Public Finance and General Economics
34 Warwick Road, Belmont, MA 02178
617-484-0597 * 617-484-0594 (FAX)**
rcolton101@aol.com

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For years now, utilities and utility regulators have opposed the grant of rate discounts to low-income consumers as a mechanism to make rates affordable. The argument has been that utility rates are required by law to be "non-discriminatory" and that rates which are explicitly based on "affordability" rather than "cost" considerations are unduly preferential and thus contrary to law. One of the most commonly cited appellate court decisions articulating this principle is the *Mountain States Legal Foundation* decision by the Colorado supreme court, which held:

> While efforts to provide economic relief to such needy persons are laudatory, the PUC has limited authority to implement a rate structure which is designed to provide financial assistance as a social policy to a narrow group of utility customers, especially where that low rate is financed by its remaining customers. . .[T]he PUC's authority to order preferential utility rates to effect social policy has, in fact, been restricted by the legislature's enactment of [the statute which requires the PUC to prevent unjust discriminatory rates]. . .In this instance, the discount rate benefits an unquestionably deserving group, the low-income elderly and the low-income disabled. This, unfortunately, does not make the rate less preferential.\1\

In recent years, utility commissions have begun to recognize a separate cost-basis for adopting low-income rates. These commissions have found that it is less expensive for the utility, and thus for ratepayers as a whole, to provide affordable rates to low-income customers\2\ than it is to charge "full" rates and then incur the expenses associated with non-payment. Those expenses may include credit and collection, working capital associated with arrears, uncollectibles, and the like.\3\

\1\ ***Mountain States Legal Foundation vs. Colorado Public Utilities Commission***, 590 P.2d 495, 497 - 498 (Colo. 1979).

\2\ *See generally*, Roger Colton (1995). ***Models of Low-Income Utility Rates***, Fisher, Sheehan and Colton, Public Finance and General Economics: Belmont, MA.

\3\ *See generally*, Roger Colton (1994). ***Identifying Savings Arising from Low-Income Programs***, Fisher, Sheehan and Colton, Public Finance and General Economics: Belmont, MA; Roger Colton (1994). ***Low-Income Programs and their Impact on Reducing Utility Working Capital Allowances***, Fisher, Sheehan and Colton, Public Finance and General Economics: Belmont, MA.

A NEW BASIS FOR AFFORDABLE LOW-INCOME RATES

This paper introduces a second new basis for developing affordable rates for low-income consumers. The analysis below presents a framework for concluding, and documenting, that fully-allocated cost-of-service studies that have historically been performed for the residential customer class as a whole have systematically and substantially *over*-assigned costs to low-income consumers. As a result, under existing rate structures, substantial rate subsidies have been flowing *from* low-income consumers *to* consumers of more moderate means. Affordable rate programs are a reasonable mechanism to redress this rate burden that has, to this point, been shouldered by low-income consumers and the inability-to-pay problems to which the over-assignment contributes.

The new analysis was developed for a Minnesota community-based organization. As a result, the information and data presented below concerns Minnesota and the Minneapolis/St. Paul metropolitan area in particular.

Overview of the Over-Allocation of Costs to Low-Income Consumers

Electric utility rates today are almost universally based upon some type of allocated cost-of-service study. That allocated cost of service study over-allocates costs to low-income residential customers in the following ways:

- **Capacity costs:** One cost which the company allocates amongst the customer classes involves demand (kW) costs. Demand costs are allocated amongst customer classes using a methodology which has as one of its primary inputs a customer class' peak demand. Based upon this methodology, the residential customer class is assigned a substantial portion of overall capacity costs because the residential class as a whole generally contributes significantly to company peak demand. Assuming a summer peaking utility, the residential peak contribution arises because of the heavy amount of weather-sensitive air conditioning load within the residential class. Because low-income residential consumers tend *not* to have and use air conditioning, however, they tend not to be part of the residential class which contributes to the peak demand. To the extent that these customers pay the higher capacity costs, therefore, low-income consumers are paying a subsidy to higher income consumers who use air conditioning.

- **Service drops:** Company investment in distribution equipment is placed into rates on an average cost basis. Assume, for example, that there are some individual service drops that are 20 years old, on the one hand, and other individual service drops that are 20 months old on the other hand. Despite the difference in age, all service drops are placed into rates at the *average* cost of the two groups. For several reasons, however, the older service drops create a lesser revenue requirement for a utility. On the one hand, these service drops were purchased at earlier dates and thus had a lower initial cost. On the other hand, the older service drops have also been depreciated. Their original cost is, therefore, no longer the expense which is included in rates. As a class, low-income consumers tend to live in older homes. As a result, because service drops are placed into rates on an average cost basis, low-income consumers living in older homes are paying a subsidy to higher income consumers who live in newer homes.

- **New developments:** The converse to the observation regarding low-income homes involves an examination of the new homes served by a utility. The new homes which a utility serves are not owned or rented by low-income households. Because the infrastructure which serves these new homes goes into rate base on an average cost basis, however, there is a subsidy flowing to the residents of these newer homes.

- **Older neighborhoods:** The same rationale applies on a neighborhood basis. Because the distribution network servicing older (low-income) neighborhoods has a lower original cost, which has been depreciated over the years, the revenue requirement attributable to those older (low-income) neighborhoods would be lower than the revenue requirement attributable to newer (higher-income) neighborhoods. Because rates are offered on an average cost basis, however, the residents of older neighborhoods are paying a subsidy to the newer housing developments.

THE EMPIRICAL DATA REGARDING LOW-INCOME HOUSING

A close examination of the housing characteristics of low-income customers reveals that those customers, as a class, live without air conditioning, in older homes, in older neighborhoods. Each of these conclusions is examined in more detail below.

Air Conditioning and the Over-Allocation of Capacity Costs

Low-income consumers tend to be non-users of air conditioning. Table 1 below[4] presents data on the use of air conditioning by income and Poverty Level. This Table addresses two questions: (a) whether low-income households use air conditioning; and (b) if so, to what extent they use air conditioning. Table 1 (page 1) shows that while only 32% of all households report that they do not use air conditioning, almost 52% of households at or below 100% of Poverty report that they do not use air conditioning at all.[5] Table 1 (page 2) shows the discrepancy in the number of rooms air conditioned by income and Poverty Level. While 44% of all households report air conditioning all rooms, only 24% of low-income households report air conditioning all rooms.[6] Finally, Table 1 (page 3) shows that the amount of air conditioned space is smaller for lower income households. Page 3 also indicates that even amongst low-income households who have air conditioners, their use of air conditioning is quite small (with more than 50% saying they use it "only a few times" or "not at all").

Age of Housing and Over-Allocation of Capital Costs

Low-income consumers tend to live in older housing than the population as a whole. Table 2 below shows this result from two different perspectives. On the one hand, as Table 2 (page 1) shows, in the Minneapolis/St.Paul SMSA, the average age of housing is older as incomes decrease. As Table 2 (page 2) shows, the median income of housing residents increases as the average age of the housing decreases.

Moreover, we know that new construction is not lived in by low-income households. Of the 63,000 homes built in the last four years in the Minneapolis/St.Paul SMSA, only 1,100 were lived in by households with incomes of at or below 100% of the Poverty Level.

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[4] All Tables are included in the Appendix to this paper.

[5] The 32% figure would thus be even lower for non-low-income households, since all of the low-income households saying "no" would pull the average up.

[6] Again, the 44.2% figure would be higher simply for non-low-income households, since it includes the low-income households.

Age of Neighborhoods and the Over-Allocation of Capital Costs

Not only do low-income customers tend to live in older individual homes, they tend to live in older neighborhoods as well. We know, for example, that in the Minneapolis/St. Paul SMSA, for example, of the 74,800 low-income households, only 2,900 live in housing with other housing around them being newer. Indeed, 46,400 of these low-income households said that the housing around them was either about the same age or older.

More specific results can be obtained through a comparison of new residential dwelling units authorized by building permits. Confining the inquiry to the urban area involving Minneapolis and St. Paul respectively, Table 3 shows that the more wealthy communities in the Minneapolis/St. Paul urban area have a substantial portion of their homes which have been built in the time period 1980 - 1990. Nearly 70 percent of the housing units in Eden Prairie, and nearly 50 percent of the units in Plymouth were constructed in the 1980 - 1990 time period, with an additional 10 percent added in the time period 1990 through 1992. In contrast, the lower income parts of the metropolitan area see only five to seven percent of their homes built during the 1980 to 1990 period and only a fraction of a percent of the new homes built in the period 1990 - 1992.

Table 3 shows the converse is true as well. While one-half (50%) or more of the homes in the lower income parts of the urban area were constructed before 1940, only fractions of a percent to two percent of the homes in areas such as Eden Prairie (2.1%) and Plymouth (0.5%) were.

Finally, Table 3 shows that these housing characteristics closely follow the income attributes of households in the respective communities.

LOW-INCOME SUBSIDIES AND A COMPETITIVE ELECTRIC INDUSTRY

It can be fully expected that the adverse impacts of rate subsidies flowing *from* low-income consumers as identified above will be magnified and exacerbated in a competitive electric industry.

At least two factors go into the adverse impacts resulting from an inability-to-pay. First, there are the causes of the inability-to-

pay. These causes include the ways in which a utility's actions contribute to low-income bills being higher than they need (or ought) to be. Second, there are the responses to the inability-to-pay. These responses would help alleviate (or eliminate) the adverse consequences of inability-to-pay. Impacts on either set of factors might result in exacerbation of the adverse consequences of inability-to-pay. If the causes increase or if the responses decrease, the adverse consequences will be exacerbated and harms to low-income customers will result. In many cases, both results can be shown.

In this regard, this paper does not seek to reach too far. There is no contention here that increased electric competition will *exacerbate* the factors described above. Thus, for example, the coming of competition may not increase the disparity in demand costs allocated to low-income customers, nor may it increase the disparity in costs allocated between residential customers living in older and new housing units. What this paper does conclude, however, is that competition in the electric industry will result in detrimental *impacts* to low-income consumers by increasing or exacerbating the problems caused by the factors identified above. Adverse *impacts* can be exacerbated or magnified by competition whether or not they are *caused* by that competition.

The adverse impacts of the rate subsidy flowing *from* low-income customers will be exacerbated in at least four ways:

- *Reduced energy efficiency spending* will provide a reduced opportunity for low-income customers to avoid the subsidy by reducing overall energy consumption;

- *Cost-shifting* from more competitive customers to captive customers will add costs on top of the subsidy, thus pushing total energy bills to even more unaffordable levels;

- *Reduced customer services* such as the number of bill payment centers, the number of customer service personnel, and the number of community bill payment stations will make it more difficult for payment-troubled customers to make personal contact with a utility and thus work out payment problems;

- *Stricter collections* such as Southern California Edison's recent decision to triple its service terminations for nonpayment will make it more likely that low-income customers who are having trouble paying their bills (which include the subsidy) will lose their service and will lose their service for longer periods of time.

SUMMARY AND CONCLUSIONS

Low-income consumers have traditionally been hampered in their efforts to obtain affordable utility rates by utility regulatory commission decisions holding that such rates represent unlawful "preferences" which are thus discriminatory in nature. When some of the underlying determinants of utility rates are considered, however, what becomes evident is that there is a direct and substantial subsidy flowing *from* low-income customers to higher income customers. When low-income customers pay for the demand costs associated with residential air conditioning which they do not use, as well as for the recent investment in service drops and distribution plant the need for which they have not caused, they are paying a subsidy to customers who have greater incomes and greater wealth.

While a move toward a competitive electric industry will not necessarily increase the causes of this subsidy --increased electric competition will not increase new construction in high income suburbs for example-- such competition can be expected to exacerbate the impacts of this subsidy. As utilities reduce the ability of low-income customers to respond to their inability-to-pay caused (in part) by these wrong-way subsidies --reduced energy efficiency, stricter collections, reduced customer service-- an increasing number of low-income customers will face more severe consequences in terms of payment problems and loss of service.

Designing utility rates that explicitly take affordability considerations into account would be an appropriate response to this set of circumstances. Along with the finding that affordable rates can be cost-justified as a mechanism to maximize the collection of revenue from low-income customers, the finding of a need to remedy the subsidy flowing from low-income customers represents another alternative justification for affordable rates for this class of customers.

TABLE 1 (PAGE 1 OF 3)
PERCENTAGE OF HOUSEHOLDS USING AIR CONDITIONING
BY INCOME AND POVERTY LEVEL

Use of Air Conditioning?	Total	1990 Family Income			Below Poverty Level	
		Less than $5,000	$5,000 - 9,999	$10,000 - 14,999	Below 100%	Below 125%
No	32.2%	52.8%	44.1%	37.5%	51.7%	49.0%
Yes	67.7%	47.2%	55.9%	62.4%	48.3%	50.9%

SOURCE:

RECS: Table 22

TABLE 1 (PAGE 2 OF 3)
USE OF AIR CONDITIONING BY INCOME AND POVERTY LEVEL

Number of Rooms Air Conditioned	Total	1990 Family Income			Below Poverty Level	
		Less than $5,000	$5,000 - $9,999	$10,000 -$14,999	Below 100%	Below 125%
All	44.2%	25.9%	29.3%	36.2%	24.2%	26.8%
Some	23.4%	21.3%	26.3%	26.3%	23.9%	24.1%
None	32.3%	52.8%	44.4%	37.5%	51.9%	49.2%

SOURCE:

RECS: Table 22

TABLE 1 (PAGE 3 OF 3)
USE OF ROOM AIR CONDITIONERS BY HOUSEHOLD INCOME

	Cooled Floorspace (Square Feet)	Number of Cooling Degree Days		Air Conditioner Use in Summer 1990 (percent of households)				
		1990	Normal	Total	Not at All	Only a Few Times	Quite a Bit	All Summer
Family Income								
Less than $5,000	553	1860	1702	100%	7.5%	48.2%	18.3%	25.4%
$5000 - $9,999	641	1511	1379	100%	7.5%	49.6%	18.4%	24.3%
$10,000 - $14,999	690	1393	1293	100%	11.7%	51.6%	20.0%	16.3%
Poverty Level								
Below 100 percent	592	1713	1582	100%	6.5%	46.5%	20.7%	25.8%
Below 125 percent	635	1643	1514	100%	7.0%	48.6%	18.3%	25.5%

SOURCE:

RECS: Table 54

TABLE 2 (PAGE 1 OF 2)
MEDIAN YEAR OF DWELLING UNIT CONSTRUCTION BY HOUSEHOLD INCOME
(MINNEAPOLIS/ST. PAUL)

	Household Income										
	$1 to $4999	$5000 to $9999	$10,000 to $14,999	$15,000 to $19,999	$20,000 to $29,999	$30,000 to $39,999	$40,000 to $59,999	$60,000 to $79,999	$80,000 to $99,999	$100,000 to $119,999	$120,000 or more
Median Year	1963	1962	1961	1963	1962	1966	1967	1972	1976	1977	1970

TABLE 2 (PAGE 2 OF 2)
MEDIAN INCOME BY YEAR DWELLING UNIT CONSTRUCTED
(MINNEAPOLIS/ST. PAUL)

	Year Structure Built										
	1990 - 1994	1985 - 1989	1980 - 1984	1975 - 1979	1970 - 1974	1960 - 1969	1950 - 1959	1940 - 1949	1930 - 1939	1920 - 1929	Before 1920
Median Income	$54,381	$48,580	$43,662	$43,999	$35,294	$32,040	$37,231	$32,981	$30,113	$32,345	$29,006

TABLE 3:
INCOME, HOUSING AGE AND RECENT NEW HOUSING CONSTRUCTION
IN MINNEAPOLIS/ST. PAUL URBAN AREA

City	Density (Housing Units per Square Mile)	Households				Pct New Residential Homes Authorized by Bldg Permits 1990 - 1992
		Median Income	# W/ Income <$15,000	Percent Built 1980 - 1990	Percent Built Before 1940	
Eden Prairie	1,330	$59,482	5.7%	66.1%	0.5%	9.0%
Plymouth	1,788	$59,421	6.4%	47.4%	2.1%	9.8%
Minnetonka	1,849	$57,395	6.8%	38.5%	3.6%	2.7%
Maplewood	1,851	$43,154	14.7%	27.2%	6.9%	5.4%
Burnsville	2,158	$50,275	8.9%	38.1%	0.2%	5.5%
Brooklyn Park	2,208	$45,435	12.8%	28.6%	1.1%	5.5%
Bloomington	2,399	$48,608	22.3%	20.0%	1.7%	1.8%
Roseville	2,523	$47,077	13.6%	8.9%	3.6%	1.5%
Coon Rapids	2,629	$44,827	9.3%	43.7%	0.8%	13.1%
Fridley	2,729	$41,809	13.4%	12.1%	1.7%	0.3%
Edina	2,946	$64,127	11.6%	13.6%	7.5%	2.2%
Brooklyn Center	3,545	$38,818	14.6%	8.6%	2.8%	0.2%
St. Louis Park	3,996	$43,178	13.6%	15.0%	8.8%	0.2%
St. Paul	5,081	$33,818	27.4%	7.0%	46.9%	0.2%
Richfield	5,113	$39,977	15.9%	5.0%	4.3%	0.2%
Minneapolis	6,606	$32,998	29.6%	6.1%	53.2%	0.6%