Exhibit No.:
Issues: Commitment to Provide Low or No Cost Weatherization Assistance to Aquila Natural Gas Low-Income Customers and Energy Efficiency Services to Residential and Commercial Customers.
Witness: Anita C. Randolph
Sponsoring Party: Missouri Department of Natural Resources' Outreach and Assistance Center, Missouri Energy Center
Type of Exhibit: Testimony
Case No.: GR-2004-0072

AQUILA NETWORKS NATURAL GAS RATE CASE

DIRECT TESTIMONY

OF

ANITA C. RANDOLPH

MISSOURI DEPARTMENT OF NATURAL RESOURCES

ENERGY CENTER

January 2, 2004

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI
TESTIMONY OF
ANITA C. RANDOLPH
DIRECTOR
MISSOURI DEPARTMENT OF NATURAL RESOURCES
ENERGY CENTER

CASE NO. GR-2004-0072

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Q. Please state your name and address.

A. My name is Anita C. Randolph. My business address is Missouri Department of Natural Resources, Energy Center, 1659 East Elm Street, P.O. Box 176, Jefferson City, Missouri 65102-0176.

Q. By whom and in what capacity are you employed?

A. I am employed by the Missouri Department of Natural Resources as the director of the Missouri Energy Center, a division of state government with its executive office located in Jefferson City, Missouri.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Missouri Department of Natural Resources, an intervenor in these proceedings.

Q. Please describe your educational background and business experience.

A. I attended the University of Missouri and received a Bachelor of Journalism degree in 1974. In addition, I attended the University of Oklahoma and received a Master's in Public Health degree in 1988 with a specialty in environmental management. I have worked as a research analyst in the Missouri House of Representatives' House Research office. In this capacity, I developed legislative approaches for environmental, energy and natural resource issues for the Energy and Environment, State Parks, and Mining legislative committees. Prior to becoming the director of the Missouri Energy Center, I was employed by the Missouri Department of Transportation in its Office of Transportation Planning and Policy Development. In this position I worked directly with Missouri's Congressional Delegation, the Missouri Governor's Office and the Missouri General Assembly on legislative and appropriation issues affecting Missouri's transportation system. On July 13, 1998, I was

appointed director of the Energy Center, formerly the Division of Energy, by Mr. Stephen Mahfood, director of the Missouri Department of Natural Resources (MDNR).

Q. What is the purpose of your direct testimony in these proceedings?

A. The purpose of my direct testimony is to focus on the proposed $6.43 million annual natural gas rate increase by Aquila, Inc., d/b/a Aquila Networks – MPS and Aquila Networks – L&P and its relationship to the following issues:

- Low-income residential customers served by Aquila Inc.;
- The need for the company to implement a low-income residential weatherization assistance program consistent with federal weatherization assistance guidelines; and,
- The need to promote utility-based energy efficiency services for residential and commercial customers in Aquila, Inc.'s service territory.

The MDNR is seeking commitment by Aquila Inc. to provide funding for weatherization assistance for its low-income natural gas residential customers, and funding to provide utility-based energy efficiency services and programs for the company's residential and commercial customers.

Q. Please compare the funding levels of Aquila, Inc.'s current commitment to low-income weatherization assistance and energy efficiency services for residential and commercial customers with the amount of the proposed rate increase.

A. Aquila, Inc. is proposing an annual natural gas rate increase totaling $6.43 million for its two divisions that operate in Missouri; Aquila Networks – MPS and Aquila Networks – L&P. Aquila Networks – MPS is seeking a $5.619 million annual revenue increase while Aquila L&P is seeking a $0.81 million annual revenue increase. In both divisions, the largest

portion of the proposed rate increase is directed toward residential and small general use customers, including small commercial customers.

Of the $5.691 million annual revenue increase proposed for Aquila Networks – MPS, $4.4 million, or 78 percent is targeted toward residential customers and $791,456 or 14 percent is targeted toward small general use customers, including small commercial customers. Combined, this represents $5.2 million or nearly 93 percent of the revenue increase.

Of the $0.81 million annual revenue increase proposed for Aquila Networks – L&P, $526,363, or 64.9 percent is targeted toward residential customers and $210,439 or 25.9 percent is targeted toward general use customers, including small commercial customers. Combined, this represents $736,802 or nearly 91 percent of the revenue increase.

As described by the company's filing, Aquila, Inc. is seeking approval by the Missouri Public Service Commission to increase natural gas annual revenues to recover system improvement and operating costs for its two divisions operating in Missouri; Aquila Networks – MPS and Aquila Networks – L&P. Recognizing, to some extent, the adverse financial impact this $6.43 million annual rate increase will have on the poorest households within the company's service territories, Aquila, Inc. is offering annually $115,000, a portion of the savings achieved through the merger of Aquila and St. Joseph Light & Power Company, for low-income residential utility billing assistance – for both MPS and L&P gas customers.

Aquila, Inc. does not offer energy efficiency programs or products to their natural gas customers, including a low-income residential weatherization assistance program. Further, Aquila, Inc. does not offer new energy efficiency services or products through the current rate filing that would assist low-income residential, residential or small commercial

customers in reducing their consumption of natural gas or their monthly utility bill, through improved efficiency, in light of potentially higher energy bills as a result of this general rate filing and future Purchased Gas Adjustments.

Q. Please describe the format and content of your direct testimony as it relates to this natural gas rate case.

A. My direct testimony will first address low-income energy issues and the difficulties low-income customers face in paying their utility bills, the need for weatherization assistance for the company's low-income residential customers and the benefits of weatherization to low-income households as well as other rate-payers and the utility company. Following the low-income issue, residential and commercial energy efficiency and the opportunity to help customers in using energy more efficiently to help reduce the economic impact of rising energy costs ultimately passed on to all customers through higher energy rates will be addressed. And lastly, a summary of these issues will be presented along with proposed actions and funding amounts to support the proposals offered in my filed direct testimony.

Q. Please describe the relationship between home heating bills and low-income residential utility customers in Missouri.

A. Winter home heating bills in Missouri impose significant burdens on low-income households. In a report prepared by Fisher, Sheehan & Colton, Structuring a Public Purpose "Distribution Fee" For Missouri, July 1997, the authors noted that "According to the U.S. Department of Housing and Urban Development (HUD), a household that faces a shelter burden exceeding 30 percent of income is over-extended. Shelter burdens include rent or mortgage payments and all utility payments other than telephone. A household that is paying 20 to 25 percent of its income simply toward home heating (not taking into account non-heat

electric burdens) will not be able to stay below this 30 percent limit." (Structuring a Public Purpose "Distribution Fee" For Missouri, July 1997, page 6)

Q. Please describe the significance of home heating burdens on low-income households.

A. The significance of home heating burdens was also identified by Structuring a Public Purpose "Distribution Fee" For Missouri. "The significance of home heating burdens imposed on low-income households is very apparent when one considers the full range of incomes at which low-income residents of Missouri live. The 1997 study reported that most households that qualify for the Low-Income Home Energy Assistance Program (LIHEAP) in Missouri by living at or below 150 percent of poverty lived below the ceiling rather than at the ceiling. (Current LIHEAP eligibility is 125 percent of federal poverty guidelines) The report sets forth the actual distribution of winter heating burdens for Missouri LIHEAP recipients by income category using an average winter heating (natural gas) bill of $210.94 (Table 4, Winter Gas Bill As Percentage of Income LIHEAP Recipients By Income Range, Source: R. Colton and M. Sheehan, On the Brink of Disaster: A State-by-State Analysis of Natural Gas Winter Home Heating Bills). The report notes that a household with an annual income of $2,000 or less will have winter heating burdens of nearly 85 percent. Households living with annual incomes of $2,000 to $4,000 will have winter heating burdens of nearly 30 percent; and households living with annual incomes of $4,000 to $6,000 will have winter heating burdens of more than 16 percent." (Structuring a Public Purpose "Distribution Fee" For Missouri, July 1997, page 6 and 7 and Table 4, Winter Gas Bill As Percentage of Income LIHEAP Recipients By Income Range, page 30).

"The number of households with these extremely low levels of annual incomes (and thus high heating burdens) is significant." (Source: Structuring a Public Purpose "Distribution Fee" for Missouri", July 1997, page 7)

Q. Is there additional evidence that identifies the need for weatherization assistance?

A. Yes. An April 2003 report titled "On the Brink: The Home Energy Affordability Gap in Missouri" (Fisher Sheehan & Colton, April 2003), it was found that home energy is a crippling financial burden for low-income Missouri households. As noted in the report, "Missouri households with incomes of below 50% of the Federal Poverty Level pay 38% or more of their annual income simply for their home energy bills." And home energy unaffordability was not an exclusive characteristic of the very poor. "Bills for households between 50% and 100% of Poverty take up 13% of income. Even Missouri households with incomes between 150% and 185% of the Federal Poverty Level often have energy bills above the percentage of income generally considered to be affordable."

"Existing sources of energy assistance (utility billing assistance) do not adequately address the energy affordability gap in Missouri. Actual low-income energy bills exceeded affordable energy bills in Missouri by nearly $273 million at 2001/2002 winter heating fuel prices. In contrast, Missouri received a gross allotment of federal energy assistance funds of $38.7 million for Fiscal Year 2003." During the 2002/2003 winter heating season, the unaffordability gap (Missouri statewide) increased to more than $321 million.

The Missouri Department of Social Services, Division of Family Services reports that during the heating months of November 2002 through March 2003, Aquila, Inc. received utility bill assistance payments funded through LIHEAP totaling $915,464 that helped 4,692 low-income households to pay a portion of their utility bill. Of the 4,692 households helped by

LIHEAP during this period, 3,295 low-income households, or 70 percent of these LIHEAP recipients used natural gas provided by Aquila, Inc. to heat their homes.

Utility billing assistance funding has great merit, but does very little to address the need for long-term and sustainable benefits for low-income households. Despite utility billing assistance for Aquila, Inc. low-income natural gas customers, from January 2002 through March 2003, the average number of accounts in arrearage remained virtually unchanged; in January, 1,313 natural gas accounts were in arrearage, in February, 1,338 accounts were in arrearage and in March, 1,221 accounts were in arrearage (Data Request, MDNR-55, ER-2004-0034, Dawn Hall, Aquila, Inc., November 25, 2003). Weatherization improvements help low-income households to use energy more efficiently resulting in long-term benefits to both the customer and to the utility by reducing utility bills and potentially reducing arrearages.

Q. Do a large number of low-income homes in Missouri still need to be weatherized?

A. Yes. A significant number of low-income households in Missouri are in need of energy-efficiency improvements.

Information gathered from the state Weatherization Assistance Program (WAP) which is administered by the MDNR Energy Center, shows that from 1978 (beginning of the program in Missouri) through June 30, 2003, approximately 143,000 homes were weatherized in Missouri. The Energy Center estimates that approximately 450,000 eligible homes remain (as identified by the U.S. Census Bureau, Table P93. Ratio of Income in 1999 to Poverty Level by Household Type – Missouri). (In Missouri State Fiscal Year 2001, the eligibility was increased from 125% to 150% of the poverty level in response to the 2000 – 2001 heating crisis, resulting in approximately 100,000 additional homes meeting the eligibility

criteria.) Clearly, on-going and additional sources of low-income energy-efficiency services are needed.

Q. What is the estimated number of Missourians currently on weatherization waiting lists?

A. Statewide, more than 3,000 families are currently on weatherization waiting lists.

Q. How many new clients are added to that list annually?

A. On average, more than 2,300 households are added to that waiting list annually.

Q. At the current rate, how long would it take the state's weatherization program to meet the needs of eligible clients in the Aquila, Inc. service territory?

A. According to the 2000 U.S. Census Bureau, 458,416 Missouri low-income households are eligible to receive weatherization assistance statewide. Approximately 9 percent or 40,755 households (150 percent of poverty as of 2000 census data, all fuel types including electric and/or natural gas heated homes, including both Aquila and non-Aquila utility customers) are located in counties within Aquila, Inc. natural gas service territory. At current resource levels, and assuming no additional homes are identified as eligible to receive weatherization assistance, it is estimated that it would take approximately 20 years to serve those low-income households located within the natural gas service territory of Aquila Networks – MPS and Aquila Networks – L&P.

Q. What are some of the general benefits of low-income residential weatherization?

A. As noted earlier in my testimony, home heating is a high cost for individuals with low income. Overall, low-income households that qualify for weatherization spend more of their income on energy needs compared to non-low-income households. The decision and ability to pay one's utility bill often compete with other necessities. Many low-income individuals

live in older homes equipped with older, less-efficient heating systems and generally lack energy-efficiency items such as insulation.

Weatherization reduces space heating fuel consumption by an average (including all heating fuels) of 18.2 percent. Specifically for homes using natural gas for heat, weatherization reduces space heating fuel consumption by 33.5 percent. For homes using electricity for heat, annual space heating fuel consumption is reduced by 35.9 percent. (Source: "Progress Report of the National Weatherization Assistance Program," Oak Ridge National Laboratory, September 1997.)

Weatherization is a cost-effective means to help low-income individuals or families pay their energy bills year after year for the life of the energy-efficiency product. Weatherization reduces the amount of state and federal assistance needed to pay higher utility bills, keeps money in the local economy, results in a positive impact on the household's promptness in paying utility bills, reduces arrearages and helps to reduce environmental pollution through energy efficiency.

Q. Are there utility benefits from low-income energy efficiency services?

A. Yes. In addition to looking at energy-efficiency from a household perspective, it is beneficial to examine the benefits of a low-income energy-efficiency program from the perspective of energy service providers. Extensive research has found that low-income energy-efficiency programs result in substantial non-energy savings to utilities. These non-energy savings include reductions in working capital expense, uncollectible accounts, credit and collection expenses, and others.

The Pennsylvania Low-Income Usage Reduction Program (LIURP) for all Pennsylvania utilities is an example of benefits derived for low-income households to whom energy

efficiency was delivered. A payment of less than 100 percent means the specified low-income household did not completely pay the current month's utility bill. In contrast, a payment exceeding 100 percent means the low-income household not only paid the current bill, but paid off its arrears as well. For every Pennsylvania utility but one, the installation of energy efficiency products substantially improved the payment patterns of the treated low-income households. Indeed, the delivery of energy efficiency generally caused a substantial increase in the payment coverage of the household energy bill. In most cases, the low-income household moved from falling further and further behind by failing to pay the current bill, to paying the entire current bill and beginning to retire the arrears. (Source: "Structuring a Public Purpose 'Distribution Fee' for Missouri", Fisher, Sheehan & Colton, Public Finance and General Economics consultants, July 1997.)

Q. Do you have information regarding the success of utility-based weatherization assistance programs?

A. Yes. Pursuant to the terms and conditions of a stipulation and agreement filed and approved in AmerenUE's (UE) Case No. GR-97-393, UE implemented an experimental weatherization program for a two-year period ending on March 31, 2000 that was funded at $150,000 per year. In accordance with UE's natural gas rate case, Case No. GR-2000-512, the Missouri Public Service Commission supported and approved on October 17, 2000 a continuation of the weatherization program, funded by UE at an annual rate of $125,000 per year.

The UE experimental weatherization program was modeled after the federal Low-Income Weatherization Program administered on a statewide basis by the MDNR Energy Center. Weatherization services were provided through community action agencies, which the

MDNR Energy Center also contracts with to provide weatherization services in the administration of the federal weatherization program.

The East Missouri Action Agency, Inc. (EMAA) located in Park Hills, Missouri participated in the UE experimental weatherization project. The EMAA weatherized 72 homes. Based on the U.S. Department of Energy's National Energy Audit (NEAT) procedure, the 72 homes weatherized had an average benefit-to-cost ratio of 3.37 to 1; $3.37 saved for each dollar invested.

Q. Can you provide additional examples of utility-based weatherization assistance programs?

A. Yes. Since 1994, the Kansas City, Missouri, Department of Housing & Community Development (KCDHCD) and Missouri Gas Energy (MGE) have administered a joint low-income weatherization assistance program. In May 1999, TecMRKT Works, an independent consulting firm with offices in Oregon and Wisconsin, issued an evaluation of the MGE weatherization program.

The evaluation titled An Impact Evaluation of Missouri Gas Energy Low-Income Weatherization Program provided a detailed analysis on the effectiveness and value of the KCDHCD and MGE low-income weatherization program. The evaluation noted the following benefits:

(1) Customer's improved ability to pay their gas bill and significant dollar savings as a result of the program;

(2) High customer satisfaction with the program;

(3) Reduced arrearages; and

(4) Reduced collection costs.

By reducing arrearages, the number of utility service shutoffs and utility billing collection costs, there was a direct benefit to all residential ratepayers. This effective energy-efficiency program also reduced the amount or need for fuel payment assistance provided by federal and private resources.

The report noted that "Between its inception and March 1999, the Missouri Gas Energy Low-Income Weatherization Assistance Pilot Program served 343 clients providing an estimated savings of $61,720 a year in 1997 dollars or $1,167,540 in 1997 dollars over the 20 year life of the installed measures." Since energy costs are now higher in 2003 as compared to 1997, actual savings would be higher when adjusted for inflation and other cost variables such as Purchased Gas Adjustments.

On average, households using natural gas for space-heating, domestic hot water and cooking reduced their consumption by 34.4 million BTUs annually, or 20.9 percent of ***total gas consumption***, for a program-wide savings of 296 billion BTUs over the 20 year life of the installed measures. This gas savings was provided through a 28.2 percent reduction in ***space-heating- related*** gas consumption and an 8.5 percent increase in *baseload* consumption and provided each customer with annual savings of $155 dollars.

In addition, the program provided electric savings of 500 kWh per year per customer, or about $35.00 per year off the average bill. The benefit-to-cost ratio for the program was 1.62 to 1; $1.62 saved for each dollar invested.

Also in 1999, Oak Ridge National Laboratory completed a comprehensive evaluation of the national Weatherization Assistance Program and found the federal program to have a benefit-to-cost ratio of 1.51 to 1; $1.51 saved for each dollar invested.

Q. Please describe utility billing arrearage for Aquila, Inc. for the prescribed test year ending December 31, 2002.

A. According to Aquila, Inc., customers receiving natural gas service from the company have had difficulty in meeting their monthly utility bill.

Aquila, Inc. reports that approximately 12,406 natural gas accounts were in arrears each month during calendar year 2002 with an outstanding monthly average balance in excess of $1.14 million. (Data Request, MDNR-2, MDNR-3, Dawn Hall, Aquila, Inc., December 1, 2003; MDNR-27, Carl Turner, Aquila, Inc., December 1, 2003; MDNR-28, Carl Turner, Aquila, Inc., December 1, 2003; MDNR-55, ER-2004-0034, Dawn Hall, Aquila, Inc., November 25, 2003 and MDNR-56, ER-2004-0034, Dawn Hall, Aquila, Inc., November 25, 2003).

During calendar year 2002, Aquila – MPS experienced an average monthly arrearage balance of $1.035 million with over 11,000 customers unable to fully pay their natural gas bill. The monthly average number of accounts in arrearage grew dramatically from January 2002, the height of the heating season, through May 2002 – averaging approximately 11,557 accounts per month with an average outstanding balance of $1.4 million during this period. By May 2002, the average monthly outstanding balance grew to $1.5 million with 12,607 accounts in arrearage.

During calendar year 2002, Aquila – L&P experienced an average monthly arrearage balance of $100,911 per month with over 1,220 customers unable to fully pay their natural gas bill. Much like Aquila Networks – MPS, the monthly average number of accounts in arrearage grew to its highest levels from January 2002 through May 2002 with a monthly average of 1,306 accounts with an outstanding monthly average balance of $135,577. The highest

arrearage period for Aquila Networks – L&P occurred in February 2002 when total arrearage was $164,225.09, over 300% higher than their lowest arrearage month of October 2002 when arrearage was $53,023.87. Clearly, natural gas customers were having greater difficulty in meeting their winter heating utility bills.

Assuming a low-income annual heating bill in Missouri is estimated at $354 (at 2001/2002 winter heating prices) or 27.8 percent of an annual total household utility bill, as noted by the April 2003 report "On the Brink: The Home Energy Affordability Gap in Missouri", a savings of 33.5 percent due to weatherization improvements could help reduce space heating demand. The improved efficiency in natural gas space heating could result in annual savings of approximately $119 per year ($354 x .335 = $118.59). Over the life of such improvements, typically 20 years, the accrued savings would be approximately $2,372 for the low-income household ($118.59 x 20 = $2,371.80 at 2001/2002 winter heating prices), assuming no further increase in space heating cost. Such savings have been shown to help the low-income household meet its monthly utility bill and help reduce arrearage collections for the utility.

Q. Please describe the relationship between Aquila, Inc.'s billing arrearage and utility service disconnects for the prescribed test year ending December 31, 2002.

A. During calendar year 2002, 1,740 residential natural gas-only customers experienced service disconnects due to billing arrearage (Data Request, MDNR-7, Carl Turner, Aquila, Inc., December 1, 2003). During this period, Aquila Networks – MPS disconnected 1,655 residential natural gas-only customers due to utility billing arrearage. However, 1,818 residential customers receiving both natural gas and electric service from Aquila Networks – MPS were disconnected (Data Request, MDNR-32 & MDNR 60, ER-2004-0034, Carl

Turner, Aquila, Inc., December 1, 2003) with another 9,000 electric-only customers experiencing disconnects with nearly 3,000 of these disconnects occurring during the months of September and October – just prior to the 2002/2003 winter heating season (Data Request, MDNR-32, ER-2004-0034, Carl Turner, Aquila, Inc., December 1, 2003).

During this same period, Aquila Networks – L&P disconnected 85 residential natural gas-only customers due to utility billing arrearage (Data Request, MDNR-7, Carl Turner, Aquila, Inc., December 1, 2003). However, 162 residential customers receiving both natural gas and electric service from Aquila Networks – L&P were disconnected (Data Request, MDNR-32 & MDNR 60, ER-2004-0034, Carl Turner, Aquila, Inc., December 1, 2003) with another 162 electric-only customers experiencing disconnects (Data Request, MDNR-32, ER-2004-0034, Carl Turner, Aquila, Inc., December 1, 2003).

Q. Please describe Aquila, Inc.'s gross uncollectible revenues from their residential customers for the prescribed test year ending December 31, 2002.

A. During the 12-month period ending December 31, 2002, Aquila, Inc. reported uncollectible revenue from their natural gas-only customers at over $1.1 million (Data Request, MDNR-4, MDNR-29, Dawn Hall, Aquila, Inc., December 1, 2003; Data Requests, MDNR-29, MDNR-57, ER-2004-0034, Dawn Hall, Aquila, Inc., November 25, 2003). Low-income residential weatherization may have helped to reduce the amount of uncollectible revenues by reducing energy demand and thereby lowering monthly utility bills.

Q. Please describe natural gas expense increases and the impact on both residential electric and natural gas customers.

A. The patterns of natural gas price volatility and its impact on all consumers started several years ago. The volatility of natural gas supply and price has impacted consumers that rely on

gas to heat their homes and businesses and energy utilities that generate electricity through natural gas combustion units. This new demand for natural gas places additional pressure on natural gas supplies and prices. Missouri's electric utilities used about 7 billion cubic feet (Bcf) of natural gas in 1997, 16 Bcf in 1998, 19 Bcf in 1999 and 30 Bcf in 2000 – an average increase of 23 percent per year. (Governor's Energy Policy Council, June 2003 report, pg. 6). Beginning with the summer of 2000, natural gas prices began rising across the country. As we entered the 2000-2001 winter heating period, natural gas spot market prices had increased from approximately $2.00 per Mcf (1,000 cubic feet) to over $10. According to the Missouri Public Service Commission, the effects of the coldest November and December (2000) in Missouri history were still being felt in July 2001 by Missourians struggling to pay high heating bills from the winter of 2000-2001. Information presented in Chairman Simmons' July 2001 letter to Missouri's Congressional delegation indicated many of the investor-owned energy utilities reported higher numbers of residential customers (79,000 natural gas heated households) unable to fully pay for their energy bills. Although Chairman Simmons' concerns were focusing on natural gas heated households, this situation also occurs in electric heated households. Weatherization can help customers to use energy more efficiently and reduce their winter heating bills.

Wholesale natural gas prices spiked 287 percent higher during the winter of 2002-2003 than during the winter of 2001-2002, moving from $2.36 to $9.13 per million Btu (MMBtu) (Missouri Energy Bulletin, March 6, 2003). The natural gas spot price has remained high in historical terms. Throughout most of 2003, the average spot price for natural gas was above $4.00 per MMBtu, reaching a peak of over $9.00 per MMBtu in late February 2003. As of this writing, the price of natural gas was approximately $6.58 per MMBtu.

Q. Please describe the current weatherization program administered by Aquila, Inc.

A. The weatherization program offered by Aquila, Inc. is limited to eligible residential *electric* customers and was initiated on July 1, 1999. The program is not offered to residential natural gas customers served by either Aquila Networks – MPS or Aquila Networks – L&P. The program offers a limited number of energy conservation measures including compact fluorescent lamps (light bulbs), electric water heater tank wrap, electric water heater pipe wrap, low flow shower-head, kitchen aerator, floor insulation, attic insulation, wall insulation and duct repair. The program is funded through rates and was provided a budget of $23,840 during calendar year 2002. From July 1, 1999 through October 2002, Aquila, Inc. reports that 28 customers participated in this program with only 2 participating during the 12-month period ending December 31, 2002. Of the $23,840 budgeted, only $1,894 was expended. Clearly, the current "weatherization" program offered by Aquila, Inc. has not had the intended impact nor the potential participation rate given the current number of low-income residential customers served by the company (Data Requests, MDNR-33 through MDNR-38, Mathew Daunis, Aquila, Inc., November 25, 2003 and Data Requests, MDNR-47, MDNR-61, MDNR-62, MDNR-66, MDNR-74 and MDNR-75, ER-2004-0034, Matthew Daunis, November 25, 2003, Aquila, Inc.).

Q. Please describe the funding level required to support a low-income weatherization assistance program by Aquila, Inc.

A. Aquila, Inc. currently provides service to approximately 45,977 residential natural gas customers in 20 Missouri counties (Aquila, Inc. Application – Natural Gas General Rate Increase, Dennis L. Odell, Aquila, Inc., August 1, 2003) and a total of 52,277 natural gas customers in both Aquila Networks – MPS and Aquila Networks – L&P service territories.

According to the community action agencies currently providing weatherization services within Aquila, Inc.'s service territories, approximately 319 Aquila, Inc. low-income households are on waiting lists to receive weatherization services. In order to meet these customers' needs and additional Aquila, Inc. customers that may be added to the weatherization assistance waiting list in future months, MDNR requests annual funding of $151,200 for low-income weatherization. This utility-based weatherization assistance fund would supplement federal weatherization program funds and allow approximately 112 Aquila, Inc. low-income natural gas households to receive weatherization assistance (most current estimate available from the community action agencies providing Weatherization Assistance services to low-income households within Aquila, Inc. natural gas service area). This is based on a leveraging amount of $1,350 per household from Aquila, Inc.'s weatherization fund (this represents approximately a 50/50 cost share between Aquila, Inc. and federal weatherization assistance funds that would be provided to an eligible low-income household receiving electric service from Aquila, Inc.). It is requested that funds should be used to exclusively weatherize Aquila, Inc.'s low-income natural gas heated homes.

Q. How should the program be designed?

A. This program should be designed to be consistent with federal guidelines for the federal Low-Income Weatherization Assistance Program so that federal and utility-based low-income weatherization assistance programs will complement one another to maximize benefits.

Q. Please describe the need for residential energy efficiency.

A. Investments in residential energy efficiency help to improve the efficient use of energy by consumers. Energy efficiency recognizes the truism that Missouri households do not seek to

consume energy. Instead, what they seek is to have light, hot water, refrigeration and heating and cooling. If these end uses can be delivered using less energy, the needs of Missouri consumers will have been satisfied.

U.S. Department of Housing and Urban Development (HUD) 1990 data showed that roughly one of every six Missouri units of housing that are affordable to households living above 80 percent of median income were constructed before 1940. Moreover, of the total of roughly 550,000 units affordable at that income level, nearly 90,000 have some type of "physical problem" under HUD's definitions. Finally, nearly 55,000 households living above 80 percent of median income pay more than 30 percent of their income for shelter costs, and roughly 5,000 pay more than 50 percent (Source: "Structuring a Public Purpose 'Distribution Fee' for Missouri", Fisher, Sheehan & Colton, Public Finance and General Economics consultants, July 1997.)

In its August 29, 2001, final report, the Missouri Public Service Commission's Natural Gas Commodity Price Task Force recognized the need for energy efficiency programs by its recommendation that "the (Missouri Public Service) Commission should pursue incentive measures for encouraging energy efficiency." The report included this explanation of the need for efficiency programs: "Effective energy efficiency programs can address the barriers that inhibit customers from making investments in energy efficiency improvements – lack of money or competing demand for available funds, the perception that up-front costs are more important than long-term savings and lack of technical expertise."

Q. Briefly describe the benefits of residential and commercial utility-based energy-efficiency services.

A. The Missouri Energy Policy Task Force recommended in its October 16, 2001 final report, that "Missouri pursue incentives funded through various sources to encourage the increased development of energy efficiency and renewable energy to provide for a more secure energy future." The Task Force report cited the following benefits to customers, utilities, the economy and the environment: "Missourians would benefit greatly from investments in energy efficiency and renewable resource programs. Efficiency programs provide assistance to customers by helping to reduce their energy usage and utility bills, which is particularly important when energy prices are high and volatile. System reliability and resilience are improved by reducing vulnerability to disruptions in energy supplies through efficiency and a diversified fuel mix. Long-term costs can be lowered by reducing expenditures by gas and electric utilities to upgrade their infrastructure to meet increasing demand. Investments in energy efficiency and the resulting lower energy costs coupled with the development of domestic renewable energy will improve the ability of businesses to compete, keep energy dollars closer to Missouri, increase customers' discretionary income, preserve natural resources and reduce pollution."

Well-designed energy-efficiency programs have been shown to produce substantial economic benefits for local and state economies. *The Missouri Statewide Energy Study (1992)* prepared by Missouri's Environmental Improvement and Energy Resources Authority concluded that energy efficiency would "sustain more employment opportunities than either the continued current level of energy use or the development of new energy supplies." (Source: *The Missouri Statewide Energy Study*, Volume I: Summary Report, May 1992, pg. I-33).

In addition to these benefits, state investment in energy-efficiency tends to protect households against "insurable events." In August 1996, Lawrence Berkeley Laboratory released findings showing that energy-efficiency investments in housing often lead to the correction of conditions that place buildings at risk. Such conditions include fire, carbon monoxide poisoning, and the like.

Energy-efficiency investments can also promote the affordability of homeownership in Missouri. A study by Fisher, Sheehan and Colton, Public Finance and General Economics, released in November 1996, documented how energy-efficiency investments affect the affordability of first-time home ownership. The study found that, in the Census Division of which Missouri is a part, a $3,000 energy- efficiency investment made at the time of home purchase, financed at 9 percent interest, would yield an effective reduction in the price of the home of 6 percent and an effective interest-rate discount of 0.48 percent. In other words, in order to generate the same dollar savings as the energy efficiency investment, the interest rate charge on the home mortgage would need to be reduced by 0.48 percent.

A study completed by Lawrence Berkeley Laboratories for the U.S. Department of Energy addressed the economic benefits of commercial efficiency programs. In a comprehensive review of evaluations for 40 large commercial programs that accounted for one-third of 1992 utility demand side management spending, the majority of the programs reviewed, which accounted for 88 percent of utility and consumer spending on programs included in the study, were cost-effective. For all the programs analyzed, the savings weighted average ratio of total resource benefits to total resource costs was 3.2 to 1 (Source: The Cost and Performance of the Largest Commercial Sector DSM Programs, Lawrence Berkeley National Laboratory,

December 1995). Lawrence Berkeley Laboratories found that overall, utilities demonstrated a capability to undertake highly cost-effective energy-efficiency programs.

Q. Briefly describe utility-based energy-efficiency services available today.

A. Several utilities throughout the nation continue to offer energy efficiency services and programs to their customers. These energy efficiency measures include residential and commercial energy audits, consumer education, and rebates or low-interest loans for the purchase of new products such as efficient water heaters, lights, showerheads, air conditioners, and heat pumps. Energy savings of approximately 40% can be realized through energy efficiency improvements. (Source: U.S. Department of Energy.)

Missouri energy utilities including Springfield's City Utilities, City of Independence Power & Light Department, Columbia Water and Light, Kansas City Power & Light and Missouri Gas Energy offer energy efficiency services to their customers as described above (Source: Utility Energy Efficiency and Renewable Energy Programs Survey, Missouri Department of Natural Resources, Outreach and Assistance Center, Energy Center, August 2002). Similar programs are offered by other utilities in other states, Wisconsin Public Service Corporation, Portland General Electric, and Northern State Power, to name just a few. Affiliates of Aquila, Inc. including *People's Natural Gas (Iowa), a division of Aquila Networks; Northern Minnesota Utilities and Peoples Natural Gas, divisions of Aquila Networks*, also offer such programs.

Q. What are some of the statistics related to energy efficiency investments and potential in Missouri?

A. The Alliance to Save Energy, a nationally recognized coalition of prominent business, government, environmental, and consumer leaders who promote the efficient and clean use

of energy worldwide to benefit consumers, the environment, economy and national security, issued a report in 1998 addressing energy-efficiency improvements to homes. It was found that residential energy-efficiency improvements could reduce energy consumption in Missouri by an estimated 567 billion Btu's, or the equivalent of approximately 100,000 barrels of crude oil each year. The Alliance reported that, of the 34 states studied that had not adopted the 1993 Model Energy Code, Missouri ranked 5th highest in terms of potential total energy savings and 5th highest in potential energy savings per home.

In a report to the Missouri Legislature pursuant to House Concurrent Resolution 16 titled "Economic Opportunities Through Energy Efficiency and the Energy Policy Act of 1992", Missouri specific opportunities and benefits of commercial energy efficiency programs were addressed. The report found that if Missouri had met its mandatory obligation set forth in the Energy Policy Act of 1992 (to adopt a state-wide commercial building efficiency standard by 1995), the result would have been a reduction in the cumulative consumption of energy by new commercial buildings built between 1995 and 2000 by 4 trillion BTUs, the equivalent of nearly 700,000 barrels of oil per year. The cumulative operating cost savings for Missouri commercial building owners would have been nearly $68 million by the year 2000. The report goes on to say that this potential is "dwarfed by the energy consumption of the pre-1995 standing commercial building stock." This existing commercial building stock would benefit from energy efficiency programs.

Q. Does Aquila, Inc. offer residential and commercial energy efficiency services or products to their residential or commercial natural gas customers?

A. No. Aquila, Inc. reports the company provides a limited number of energy efficiency services or products for their residential or commercial *electric* customers (Data Requests,

MDNR-8, MDNR9, MDNR-10, MDNR-11, MDNR-12, MDNR-13, MDNR-21, MDNR-22, MDNR-33, MDNR-34, MDNR-35, MDNR-36, MDNR-37, MDNR-38, MDNR-46 and MDNR-47, Mathew Daunis, Aquila, Inc., November 25, 2003; Data Requests, MDNR-33, MDNR-34, MDNR-35, MDNR-36, MDNR-37, MDNR-38, MDNR-46, MDNR-47, MDNR-61, MDNR-62, MDNR-63, MDNR-64, MDNR-65, MDNR-66, MDNR-74 and MDNR-75, ER-2004-0034, Matthew Daunis, Aquila, Inc., November 25, 2003). Aquila offers the following energy efficiency programs: Residential Financing, Residential Mail In Energy Audits, Small Commercial and Industrial Energy Audits, Large Commercial and Industrial Energy Audits, Residential Lighting Program. Aquila also reports that they have joined a utility coalition to promote energy efficiency in the Greater Kansas City marketplace through energy education, resources and actions.

Q. Do you request any changes to these programs?

A. Yes. MDNR commends Aquila, Inc. for their involvement in offering energy efficiency services. MDNR has suggestions for ways to improve participation levels in these programs, however, to make them more effective in achieving energy savings benefits for their customers.

MDNR requests that Aquila, Inc. replace its Residential Mail-In Energy Audit Program with a web-based residential energy audit program. The web-based energy audit program should be available to both MPS and L&P natural gas residential customers. Aquila, Inc. began implementation of the mail-in energy audit program (electric only) on April 1, 1999. From inception through May 2003, Aquila, Inc. reports there have been 10,840 requests for audit services and only 4,447 audits, 41 percent, have been completed and returned to customers. Upon receipt of the audit form, MPS combines the survey results with the customer's billing

data to generate an audit report to send to the customer. The report provides an estimate of energy usage by appliance and end-use and a list and description of energy efficiency measures that are relevant to the customer's home. To be able to meet their residential customers' requests for energy audits and to provide this service to both MPS and L&P residential customers, MDNR requests that Aquila develop and implement a web-based residential energy audit that links to a customer's billing data to quickly and accurately provide energy-saving recommendations and information. This would reduce the staff time to manually complete the energy audits that are now done by Aquila for its MPS customers (Data Request, No. MDNR-33, ER-2004-0034, Attachment: Demand Side Analysis Report dated November 26, 2002, Matthew E. Daunis, November 30, 2003).

A similar program is under development by AmerenUE as part of the Residential and Commercial Energy Efficiency Collaborative established in the Stipulation and Agreement in Case No. EC-2002-1. Based on the projected cost to implement this online residential energy audit program, MDNR requests that $250,000 in one-time costs and $125,000 in annual costs be allocated to develop and implement this program. This online audit program can serve both Aquila – MPS and Aquila – L&P gas and *electric* customers because energy efficiency measures identified in the audit will relate to both electric and gas measures. As a result, the cost to establish this program could be allocated among Aquila – MPS and Aquila – L&P *electric and gas* customers. The cost allocation could be based on the number of customers in each service territory. The MDNR has included a similar proposal in the Aquila, Inc. electric rate case, ER-2004-0034.

Q. Do you request other changes to Aquila's energy efficiency programs?

A. Yes. In addition to implementing an online residential energy audit program and offering this service to both Aquila Networks – MPS and Aquila Networks – L&P customers, MDNR requests that the Small Commercial and Industrial Energy Audit Program also be offered to L&P customers, to include both electric and natural gas customers. This audit program is currently offered to MPS customers only. (Data Request, MDNR-46, Mathew Daunis, Aquila, Inc., November 25, 2003). The program should be structured to provide incentives for commercial customers to implement the energy efficiency measures identified in the energy audit. A similar program is being implemented by AmerenUE as part of the Residential and Commercial Energy Efficiency Collaborative established in the Stipulation and Agreement in Case No. EC-2002-1. MDNR requests $50,000 annually to make this program available to both MPS and L&P commercial customers (including natural gas and electric commercial customers) and to include incentives to encourage implementation of energy efficiency measures identified in the energy audit.

This program can serve both MPS and L&P gas and *electric* customers because energy efficiency measures identified in the audit will relate to both electric and gas measures. As a result, the cost to establish this program could be allocated among Aquila – MPS and Aquila – L&P *electric and gas* customers. The cost allocation could be based on the number of customers in each service territory.

Based on the number of customers served by Aquila, Inc., participation rates are low for many of these programs. MDNR also requests that the current programs be marketed more extensively to increase customer participation.

Q. What funding level would be required to adequately support energy efficiency programs for Aquila, Inc.'s residential and commercial electric customers presented by your testimony?

A. As noted earlier in my testimony, Aquila, Inc. is targeting the largest proportion of this rate increase to its residential and small commercial electric customers. In order to help Aquila, Inc.'s residential and commercial natural gas customers face these rising energy costs, they should be offered the opportunity to improve the way they use energy and help to reduce their energy expense.

In total, Aquila, Inc. currently serves approximately 52,277 natural gas customers that include 45,977 residential customers and about 6,228 small commercial customers.

Aquila Networks – MPS currently provides natural gas service to approximately 46,146 customers; approximately 40,693 are residential customers and 5,405 are general service customers that include small commercial.

Aquila Networks – L&P serves approximately 6,131 natural gas customers; approximately 5,284 are residential customers and 823 are general service customers that include small commercial.

The MDNR requests that Aquila, Inc. implement the proposed residential and commercial energy efficiency programs annually as follows:

Low-Income Residential Weatherization Assistance

Annually fund through rates, $151,200 to implement low-income residential weatherization assistance consistent with federal weatherization guidelines through local community action agencies operating within Aquila, Inc.'s natural gas service territory. Presuming an average savings to investment ratio of 1:2.5 (the average savings to investment ratio for the weatherization assistance programs administered by AmerenUE and MGE (3.37 + 1.62 / 2 = 2.5)), Aquila, Inc. low-income natural gas households could realize a net benefit of $378,000

per year or $7.56 million dollars over the life of this investment ($151,200 x 2.50 x 20 years = $7,560,000).

Residential Energy Efficiency

Fund through rates $250,000 in one-time costs and $125,000 in annual costs for an online residential energy audit for Aquila Networks – MPS and Aquila Networks – L&P electric and natural gas customers. This is a similar proposal offered through my direct testimony in Aquila, Inc. electric rate case ER-2004-0034 and is not intended to be duplicate funding. Costs would be allocated based on the proportional number of electric and natural gas customers.

Commercial Energy Efficiency

Fund through rates $50,000 in annual costs for a commercial energy audit program with incentives for implementation of energy efficiency measures. This is a similar proposal offered through my direct testimony in Aquila, Inc. electric rate case ER-2004-0034 and is not intended to be duplicate funding. Costs would be allocated based on the proportional number of electric and natural gas customers.

Q. Please explain the estimated cost per natural gas customer to implement these energy efficiency programs.

A. First year costs related to the proposed energy efficiency programs total $576,200: The costs are presented by program and by yearly and monthly costs for natural gas and electric customers.

Proposed Program	Funding Amount	Yearly	Monthly	Customer
• Weatherization Assistance	$151,200 annual	$2.89	$0.24	Gas
• Residential Efficiency	$250,000 one-time*	$1.12*	$0.09*	Gas/Elec.

	$125,000 annual*			
• Commercial Efficiency	$ 50,000 annual	$0.15	$0.01	Gas/Elec.
Total	$576,200	$4.16	$0.34	

*The cost of the residential efficiency proposal ($250,000 and $125,000 have been combined and allocated at a rate of 15.6%, based on the proportional share between the number of Aquila, Inc. electric and gas customers)

These efficiency programs are intended to serve both natural gas and electric customers. By allocating these costs on a proportional basis between Aquila, Inc. electric and gas customers, the first-year cost to natural gas customers to implement these programs would be approximately **$217,500** (Weatherization Assistance - $151,200 x 100% = $151,200; Residential Efficiency - $375,000 x .156 = $58,500; Commercial Efficiency - $50,000 x .156 = $7,800 for a total first year cost of $217,500). Based on allocation, the cost to an Aquila gas customer would be estimated at $4.16 per year or $0.34 per month.

Aquila, Inc. serves approximately 334,477 customers; 282,200 electric customers (84.3%) and approximately 52,277 natural gas customers (15.6%). The percentage allocation is 99.9 percent due to rounding.

After the first year, the total cost to implement these programs is estimated at $326,200 per year or **$178,500** for natural gas customers. Based on allocation, the estimated cost per natural gas customer is estimated at $3.41 per year or $0.28 per month:

Proposed Program	Funding Amount	Yearly	Monthly	Customer
• Weatherization Assistance	$151,200 annual	$2.89	$0.24	Gas
• Residential Efficiency	$125,000 annual	$0.37	$0.03	Gas/Elec.
• Commercial Efficiency	$ 50,000 annual	$0.149	$0.01	Gas/Elec.

Total		$326,200 annual	$3.41	$0.28

Following the first year, the MDNR requests annual funding in the amount of $178,500 to support Weatherization Assistance ($151,200 – 100 percent from natural gas rates), Residential Efficiency ($19,500 – 15.6 percent from natural gas rates) and Commercial Efficiency ($7,800 – 15.6 percent from natural gas rates) until the company's next rate filing. In order to prevent any further contribution to increased natural gas rates for customers served by Aquila Inc., the MDNR requests a reduction in Aquila, Inc.'s natural gas rate filing by a total of no less than $931,500 over a five-year period, to support the proposed energy efficiency programs for a period of no less than five years through natural gas rates (Yr. 1 $217,500 + Yr. 2 $178,500 + Yr. 3 $178,500+ Yr. 4 $178,500 = Yr. 5 $178,500 = $931,500)

Q. Does this conclude your testimony?

A. Yes. Thank you.

STATE OF MISSOURI
PUBLIC SERVICE COMMISSION

In the Matter of Aquila, Inc. d/b/a Aquila Networks L&P and Aquila Networks MPS, and Its Tariff Filing to Implement a General Rate Increase for Natural Gas Service	))))	Case No. GR-2004-0072

AFFIDAVIT OF ANITA RANDOLPH

FILED
JAN 0 6 2004
Missouri Public Service Commission

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

Anita Randolph, being duly sworn on her oath, hereby states that she has participated in the preparation of the foregoing Testimony in question and answer form; that the answers in the foregoing Testimony were given by her; that she has knowledge of the matters set forth in such answers; and that such matters were true and correct to the best of her knowledge, information and belief.

Anita C Randolph
Anita Randolph

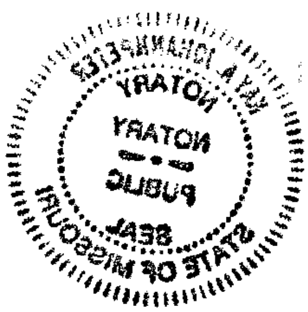
Kay A Johannpeter
Notary Public

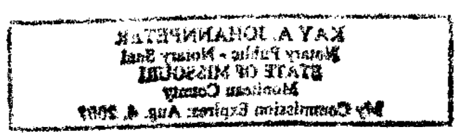
KAY A. JOHANNPETER NOTARY NOTARY PUBLIC SEAL STATE OF MISSOURI

My commission expires:

KAY A. JOHANNPETER
Notary Public - Notary Seal
STATE OF MISSOURI
Moniteau County
My Commission Expires: Aug. 4, 2007

Subscribed and sworn before me this 2nd day of January 2004.




KAY A. JOHANNPETER
Notary Public - Notary Seal
STATE OF MISSOURI
Moniteau County
My Commission Expires: Aug. 4,

Home Energy Affordability Gap

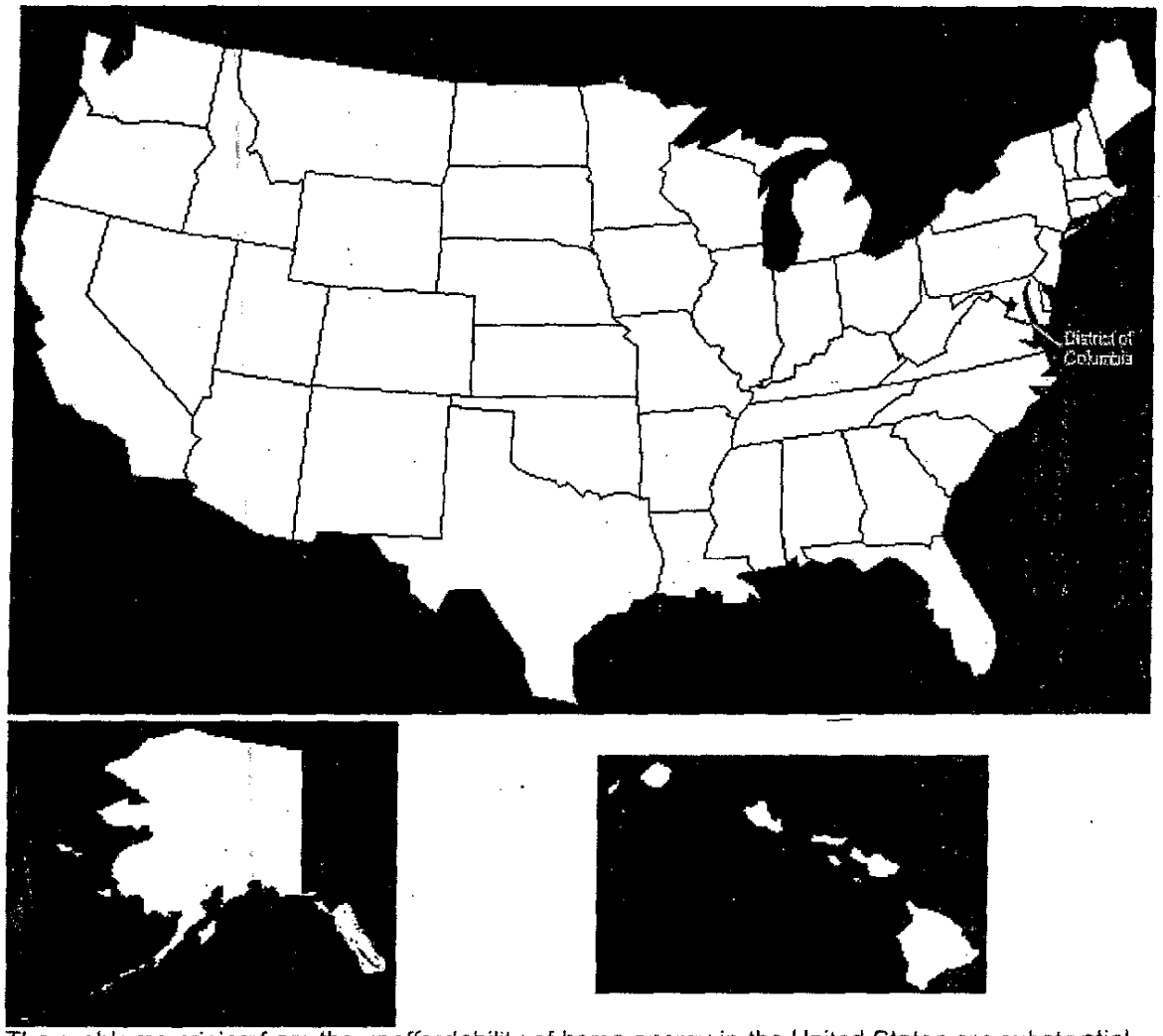
In an effort to quantify the gap between "affordable" home energy bills and "actual" home energy bills, Fisher, Sheehan & Colton (FSC) has developed a model that estimates the "home energy affordability gap" on a county-by-county basis for the entire country. FSC found that the annual "affordability gap" for 2002 reached roughly $18.2 billion and that federal fuel assistance provided *through the Low-Income Home Energy Assistance Program (LIHEAP) covered just a fraction of* that gap.

Based on this county-specific data, FSC has prepared state-by-state Home Energy Affordability Gap Fact Sheets. The Fact Sheets available through this Affordability Gap analysis will provide you with the following state-level information:

- Home energy burdens broken down by Poverty Level;
- Number of households broken down by Poverty Level;
- Home Energy Affordability Gap given winter 2002 heating prices (and normal weather), broken down by Poverty Level;
- Projected Home Energy Affordability Gap given estimated 2003 heating prices (and normal weather), broken down by Poverty Level;
- Low-income home energy bills, broken down by end use (heating, cooling, hot water, electricity);
- Average per-household Home Energy Affordability Gap for households below 185% of Poverty (state ranking amongst 50 states plus D.C.);
- Average total home energy burden for households below 50% of Poverty (state ranking amongst 50 states plus D.C.);
- Percentage of individuals below 100% of Poverty Level (state ranking amongst 50 states plus D.C.); and
- Combined heating/cooling affordability gap covered by federal energy assistance (state ranking amongst 50 states plus D.C.).

Simply click on the state for which you wish information.

Exhibit (Schedule) 1



The problems arising from the unaffordability of home energy in the United States are substantial. A June 2001 report by the National Fuel Funds Network, and other national organizations, found that at the end of the 2000/2001 winter heating season, at least 4.3 million low-income households were at risk of having their utility service cut off because of an inability to pay their winter home energy bills. While natural gas prices moderated after the 2001/2002 winter heating season, recent increases in natural gas and fuel oil prices are again creating crisis situations for utility customers. These households are disproportionately low-income households.

That payment-troubled customers are disproportionately low wage households is commonly accepted. National data reported by the U.S. Census Bureau indicates that the proportion of households in arrears at any given point in time is substantially higher for the low-income population than for the population as a whole. One 1995 Census study reported that while 9.8% of non-poor families could not pay their utility bills in full, 32.4% of poor families could not do so. According to the Census Bureau, while 1.8% of non-poor families had their electric and/or natural gas service disconnected for nonpayment, 8.5% of poor families suffered this same deprivation.

It is not merely the nonpayment of bills that is of concern, however. One impact, but only one impact, of the unaffordability of home energy service is the nonpayment of bills. Previous research by the Iowa Department of Human Rights (DHR) found that bill nonpayment is perhaps not even the most significant of the adverse impacts of unaffordable home energy bills. A DHR study of Iowa LIHEAP recipients found that:

- Over 12 percent of Iowa LIHEAP recipients went without food to pay their home heating bill.
- More than one-in-five went without medical care to pay for heating bills. This included not

seeking medical assistance when it was needed, not filling prescriptions for medicine when a doctor had prescribed it, and/or not taking prescription medicines in the dosage ordered by the doctor.

- Almost 30 percent reported that they did not pay other bills, but did not elaborate as to which bills were not paid.
- In addition to not paying other bills, many low-income households incurred debt in order to pay both their home heating bills and other basic necessities. They borrowed from friends and/or neighbors, used credit cards to pay for food and other necessities, or did not pay the heating bill.

A summary presentation of the FSC Home Energy Affordability Gap, made to the June 2003 National Fuel Funds Network (NFFN) annual conference, can be obtained by clicking on this link:

- NFFN Home Energy Affordability Gap presentation

A summary presentation of the uses to which FSC's Home Energy Affordability Gap can be put can be obtained by clicking on this link:

- NFFN Home Energy Affordability Gap - Uses of Data

Contact us for county-specific information (available on a fee-for-service basis).

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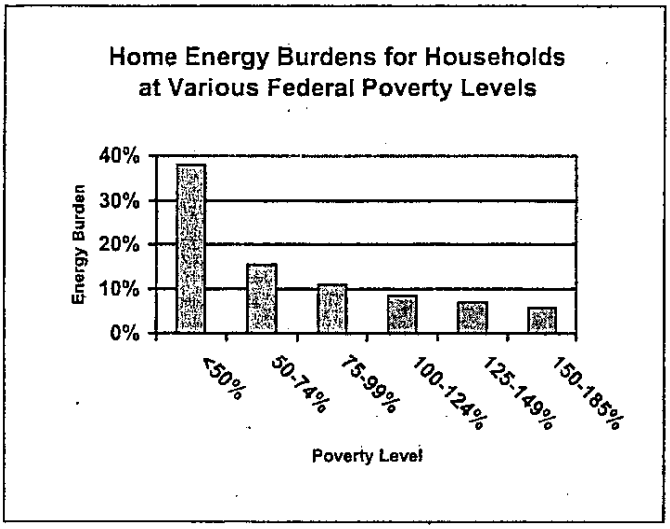
ON THE BRINK

The Home Energy Affordability Gap in **MISSOURI**

APRIL 2003

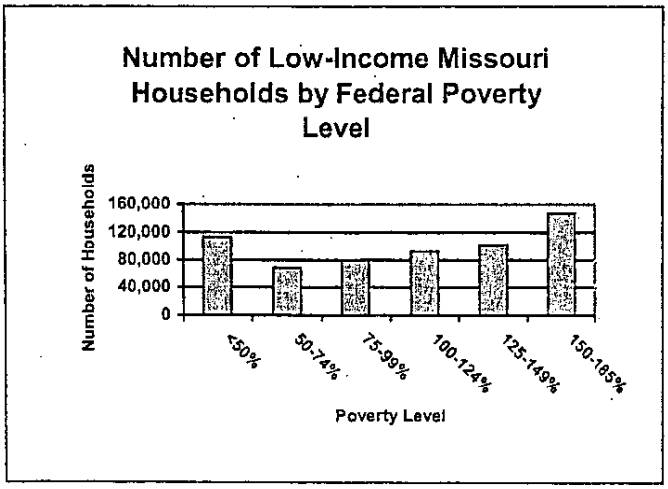
Finding #1



Home energy is a crippling financial burden for low-income Missouri households. Missouri households with incomes of below 50% of the Federal Poverty Level pay 38% or more of their annual income simply for their home energy bills.

Home energy unaffordability, however, is not simply the province of the very poor. Bills for households between 50% and 100% of Poverty take up 13% of income. Even Missouri households with incomes between 150% and 185% of the Federal Poverty Level often have energy bills above the percentage of income generally considered to be affordable.

Finding #2

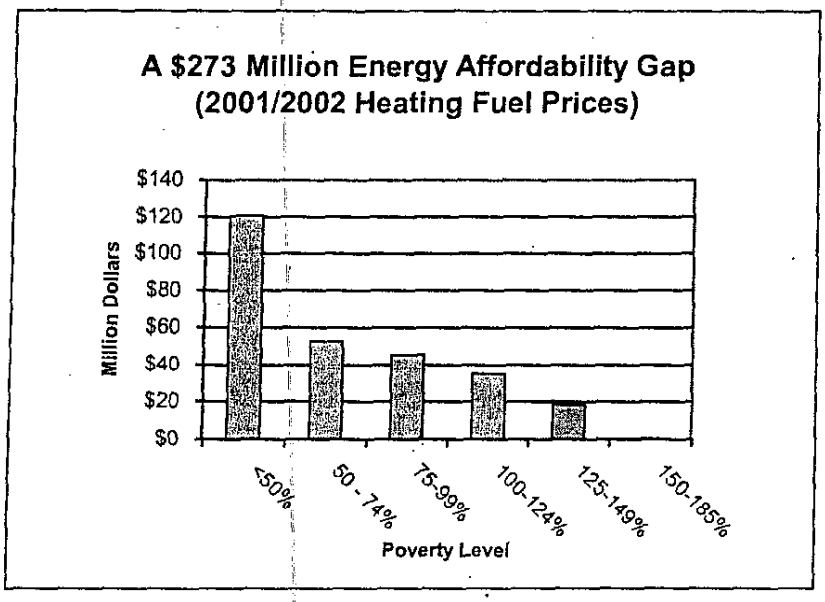


The number of households facing these energy burdens is staggering. More than 115,000 Missouri households live with income at or below 50% of the Federal Poverty Level and thus face a home energy burden of 38% of income or more.

70,000 additional Missouri households live with incomes between 50% and 74% of Poverty (home energy burden of 15%).

80,000 *more* Missouri households live with incomes between 75% and 99% of the Federal Poverty Level (home energy burden of 11%).

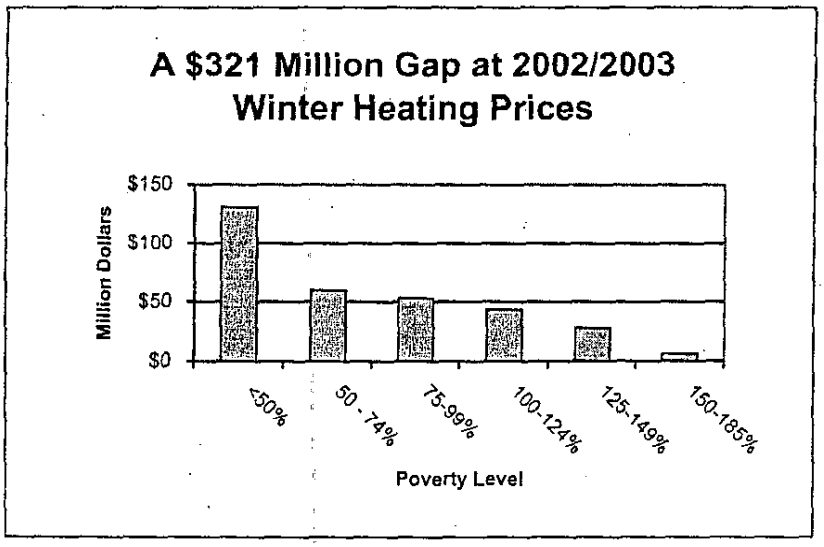
Finding #3



Existing sources of energy assistance do not adequately address the energy affordability gap in Missouri. Actual low-income energy bills exceeded affordable energy bills in Missouri by nearly $273 million at 2001/2002 winter heating fuel prices.

In contrast, Missouri received a gross allotment of federal energy assistance funds of $38.7 million for Fiscal Year 2003. Some of those funds will be used for administrative costs, weatherization, and other non-cash assistance.

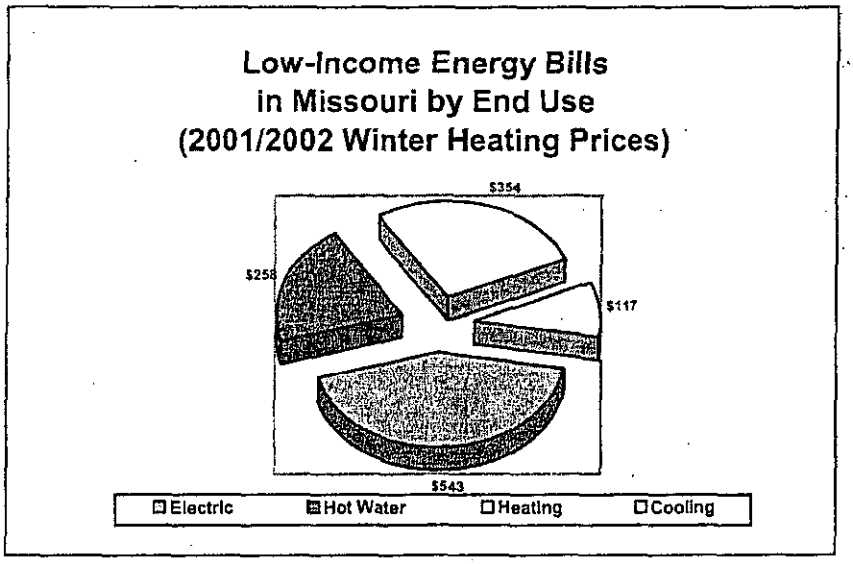
Finding #4



Increases in the prices of natural gas, propane and fuel oil during the 2002/2003 winter heating season drive the unaffordability gap up to more than $321 million.

While the gap for the lowest income households (0-50% of Poverty) increases by nearly 9% (from $121 million to $131 million), the gap for the highest income households (150-185% of Poverty) increases by more than 1700% (from $0.3 million to $6.4 million).

Finding #5



The energy affordability gap in Missouri is not created exclusively, or even primarily, by home heating and cooling bills.

At 2001/2002 winter heating prices, while home heating bills were $354 of a $1,273 bill (27.8%), electric bills (other than cooling) were $543 (42.7%). Annual cooling bills represented $117 in expenditures (9.2% of the total bill), while domestic hot water represented $258 in expenditures (20.2%).

Finding #6

The unaffordability of home energy bills frequently causes low-income households to take drastic actions that are detrimental to their health, safety and welfare. A survey of energy assistance recipients by the Iowa Department of Human Rights found that:

- Over 12 percent of the surveyed energy assistance recipients went without food to pay their home heating bill.
- More than one-in-five went without medical care to pay for heating bills, including not seeking medical assistance when it was needed, not filling prescriptions for medicine when a doctor has prescribed it, and/or not taking prescription medicines in the dosage ordered by the doctor.
- Almost 30 percent reported that they did not pay other bills, but did not elaborate as to which bills were not paid.
- In addition to not paying other bills, many low-income households incurred debt in order to pay both their home heating bills and other basic necessities: borrowed from friends and/or neighbors; used credit cards to pay for food and other necessities, or did not pay the heating bill.

A publication of
FISHER, SHEEHAN & COLTON
PUBLIC FINANCE AND GENERAL ECONOMICS
Belmont, Massachusetts
April 2003

MISSOURI Energy Gap Rankings
(scale of 1 – 51)

AVERAGE DOLLAR AMOUNT BY WHICH ACTUAL HOME ENERGY BILLS EXCEEDED AFFORDABLE HOME ENERGY BILLS FOR HOUSEHOLDS BELOW 185% OF POVERTY LEVEL. $453 per household RANK: #7	AVERAGE TOTAL HOME ENERGY BURDEN FOR HOUSEHOLDS BELOW 50% OF POVERTY LEVEL. 38.0% of household income RANK: #8
PERCENT OF INDIVIDUALS BELOW 100% OF POVERTY LEVEL. 11.7% of all individuals RANK: #28	COMBINED HEATING/COOLING AFFORDABILITY GAP COVERED BY FEDERAL HOME ENERGY ASSISTANCE. 33.0% of gap is covered RANK: #13

DEFINITIONS AND EXPLANATIONS

Each state (along with the District of Columbia) has been ranked (from 1 to 51) in terms of four separate measures of the extent of the energy affordability gap facing its low-income customers:

(1) The percent of individuals with annual incomes at or below 100% of the Federal Poverty Level. This data is obtained directly from the 2000 U.S. Census.

(2) The average total home energy burden for households with income at or below 50% of the Federal Poverty Level shows the percentage of income which households with these incomes spend on home energy. "Total home energy" includes all energy usage, not merely heating and cooling. A home energy bill is calculated on a county-by-county basis. The statewide average is a population-weighted average of county-by-county data.

(3) The average affordability gap (in dollars per household) for all households with income at or below 185% of Poverty is the dollar difference between actual total home energy bills and bills that are set equal to an affordable percentage of income. Affordability for total home energy bills is set at 6% of household income.

(4) The extent to which federal energy assistance covers the combined heating/cooling affordability gap for each state. The combined heating/cooling affordability gap is the difference between actual heating/cooling bills and bills that are set equal to an affordable percentage of income. Affordability for combined heating/cooling bills is set at 2% of income. This measure thus examines the proportion of the heating/cooling gap that is covered by the gross federal Low-Income Home Energy Assistance Program (LIHEAP) allocation to the state assuming that the entire LIHEAP allocation is used for cash benefits.

In the state's rankings, a higher ranking indicates better conditions while a lower ranking indicates worse conditions relative to other states. Thus, for example:

(1) The state with the rank of #1 has the lowest percentage of individuals living in households with income at or below 100% of the Federal Poverty Level while the state with the rank of #51 has the highest percentage.

(2) The state with the rank of #1 has the lowest average home energy burden for households with income below 50% of the Federal Poverty Level while the state with the rank of #51 has the highest average home energy burden.

(3) The state with the rank of #1 has the lowest average affordability gap (dollars per household) while the state with the rank of #51 has the highest dollar gap.

(4) The state with the rank of #1 has the highest percentage of its heating/cooling affordability gap covered by federal energy assistance while the state with the rank of #51 has the lowest percentage of its heating/cooling gap covered.

All references to "states" include the District of Columbia as a "state." Low-income home energy bills are calculated using average residential revenues per unit of energy. State financial resources and utility-specific discounts are not considered.

STRUCTURING A PUBLIC PURPOSE "DISTRIBUTION FEE" FOR MISSOURI

Prepared For:

Division of Energy
Department of Natural Resources
State of Missouri
Jefferson City, MO

Prepared 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 (e-mail)

July 1997

Exhibit (Schedule) 2

Roger Colton (M.A., J.D.) is a principal in the firm Fisher, Sheehan & Colton, Public Finance and General Economics (FSC) of Belmont, MA. In 1995, Colton was hired by the National Council on Competition and the Electric Industry (a joint undertaking of the National Conference of State Legislatures and the National Association of Regulatory Utility Commissioners) to prepare an evaluation of the impacts of restructuring on small users. The results of that research were published as the paper *Electric Competition and the Small User: Its Impacts on Small Commercial, Residential and Low-Income Consumers*.

In 1997, Colton undertook electric restructuring research for Oak Ridge National Laboratory. His Oak Ridge research was published as the paper *The Obligation to Serve and a Competitive Electric Industry*.

In addition, Colton has authored four books on low-income energy policy, including *On the Brink of Disaster: A State-by-State Analysis of Low-Income Natural Gas Winter Heating Bills*; *The Other Part of the Year: Low-Income Households and Their Need for Cooling: A State-by-State Analysis of Low-Income Summer Electric Bills*; *Energy Efficiency and the Low-Income Consumer: Planning, Designing and Financing*; and *Funding Fuel Assistance: State and Local Strategies to Help Pay Low-Income Home Energy Bills*.

Each of these publications is available from FSC Publications, 34 Warwick Road, Belmont, MA, 02178.

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INTRODUCTION

This report considers a public purpose distribution fee for the State of Missouri. Prepared at the request of the Missouri Department of Natural Resources, the research presents a detailed analysis, using Missouri-specific data, of a charge through which the State may generate revenues for:

- o residential energy efficiency efforts generally;[1] and
- o cost-effective energy affordability assistance, including both cash assistance and low-income energy efficiency investments.

The discussion below will concentrate on documenting: (1) the need for a public purpose distribution fee in the State of Missouri; and (2) the rate implications of various scenarios through which distribution fee revenues might be generated. The discussion is not intended to address the broader issues of how activities such as research and development (R&D) and other "public purposes" might be funded in a restructured electric industry.

Clearly, subsumed within these broader issues are other important discussions. How can a distribution fee be made competitively neutral? On what basis should a distribution fee be imposed? These other issues are considered in the text below. Tables setting forth the data discussed in the text are included in Appendix A.

The Distinction Between Types of Fees Arising in "Restructuring"

One condition that many states are placing on "restructuring" the electric industry today involves the imposition of a "system benefits charge" or a "distribution fee." Different fees have been proposed under different names. While they may seem quite similar, in fact, they serve quite different purposes and are based upon different policy justifications.

On the one hand, there are charges called "system benefits charges." A system benefits charge is designed to fund certain "public benefits" that are placed at risk of being "stranded" in a more competitive industry. These benefits include, but are not limited to, assistance for low-income consumers, renewable energy, research and development, energy efficiency, and the like. On the other hand, there are broader "distribution fees." These fees recognize a need for energy efficiency investments and low-income assistance beyond that currently offered by the electric industry. From the low-income perspective, these fees are predicated upon the observation that a move from a monopoly-regulated to a competitive, market-driven industry fundamentally changes the risks to which low-income consumers are subjected. Whether or not the industry has previously provided "benefits" that may be "stranded" is not the issue. From an energy efficiency perspective, these fees are predicated on the observation that a move to a market-

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[1] Throughout this discussion, the term "energy efficiency" or "energy efficiency investment" is intended to incorporate investments in renewable energy as well.

driven industry places the energy efficiency industry at risk of being stymied by past market failures that have still not been remedied.

These fees further recognize that "restructuring" (with competition being increasingly relied upon to replace direct regulation) is coming not only to the electric industry but to the natural gas industry as well. A distribution fee tends to be placed on a broader range of fuel sources than the electric-only system benefits charge. It is intended to represent a device to preserve public programs that may not be recognized by a competitive market more than a means simply to continue the status quo. It is for this reason that the discussion below focuses not simply on what programs currently exist in Missouri, but rather on what the need is for: (1) residential energy efficiency investments generally, and (b) cost-effective affordability assistance.

THE NEED FOR A PUBLIC PURPOSE DISTRIBUTION FEE IN MISSOURI

Given this introduction, the analysis below turns its attention to a consideration of the need for a public purpose distribution fee in Missouri. The need for residential energy efficiency generally is considered first. The need for bill affordability assistance is considered next.

Residential Energy Efficiency Investments

A Missouri distribution fee should help fund investments in energy efficiency for residential consumers generally. Without such funding, the state loses substantial opportunities to contribute to cleaner air, a healthier economy, more affordable housing, and a host of other impacts that benefit all Missouri residents. A need exists for energy efficiency investments for both heating and non-heating residential energy.

The Need for Residential Energy Efficiency Investments

Investments in residential energy efficiency help deliver efficient end-uses to consumers. Energy efficiency recognizes the truism that Missouri households do not seek to consume energy. Instead, what they seek is to have light, hot water and space heating. If these end uses can be delivered using less energy, the needs of Missouri consumers will have been satisfied.

Residential Heating Consumption: It is difficult, if not impossible, to perform a complete inventory of energy inefficient homes in Missouri. To do so is not the purpose of this analysis. It *is* possible, however, to determine whether there is a significant, or an insignificant, number of homes that may even *potentially* benefit from the installation of energy efficiency improvements for home heating purposes. Surrogates for energy inefficiency are used, which include: (1) the age of the home; (2) the presence of physical problems with the home; and (3) the affordability of total shelter costs (which include the costs of all utilities except telephones). For purposes of analysis here, a non-low-income home involves any consumer living above 80 percent of median income as defined by the U.S. Department of Housing and Urban Development (HUD).

HUD data shows that roughly one-in-six Missouri units of housing that are affordable to households living above 80 percent of median income were constructed before 1940. Moreover, of the total of roughly 550,000 units affordable at that income level, nearly 90,000 have some type of "physical problem" under HUD's definitions. Finally, nearly 55,000 households living above 80% of median income pay more than 30 percent of their income for shelter costs; roughly 5,000 pay more than 50 percent. This data is set forth in Table 1 (pages 1 - 3 respectively).[2]

Residential Non-Heating Consumption: Focusing attention only on heating bills generally results in inadequate attention being devoted to the impacts of *electric* policy on residential consumers. This focus is misplaced. As shown in Table 2, electric *non*-heating consumption represents roughly 45 percent of residential usage and nearly 70 percent of residential bills. What happens to the price of electricity is thus important to residential consumers. An energy efficiency policy focused exclusively on home heating would address less than half of the energy dollars consumed in the state of Missouri.

Solar Hot Water and Domestic Space Heating: In addition to considering space heating and non-space heating separately, energy efficiency programs should consider the potential for investing in renewable energy for Missouri consumers. There is little question but that electricity is one of most expensive fuels to use for space heating and domestic hot water heating in the State of Missouri. According to 1995 Department of Energy (Energy Information Administration) data, the 1993 price of electricity in Missouri --the last year for which data is available-- was roughly $21.29/mmBtu. In contrast, the 1993 price for natural gas was $5.35/mmBtu and the price for LPG was $7.29/mmBtu.

Despite these relatively high prices, a substantial number of Missouri households use electricity for space and domestic hot water heating while a negligible number of consumers rely upon distributed technologies such as solar. On the one hand, as of the time of the 1990 Census, nearly one-in-five (18%) of all Missouri consumers use electricity for space heating. On the other hand, only three-hundredths of one percent (520) used solar energy for space heating.

Statewide figures are not available for fuel use for hot water. Regional data from the U.S. Department of Energy's *Residential Energy Consumption Survey* indicates that for the Census division of which Missouri is a part (West North Central), one-in-four (24.6%) of all households use electricity for their domestic hot water heating.

Without quantifying precisely how big the potential for increased penetrations of solar space and domestic water heating, it is possible to conclude that the market has barely been tapped. There is substantial potential for an expansion of distributed technologies in Missouri.

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[2] All Tables are set forth in Appendix A.

Advantages to Residential Energy Efficiency Investments

Funding residential energy efficiency investments in the State of Missouri will generate substantial benefits for all sectors of the state. In addition to generating environmental benefits such as cleaner air and water, energy efficiency will promote economic development, increase housing affordability, and reduce the risk of insurable events.

Well designed energy efficiency programs have been shown to produce substantial economic benefits for local and state economies. Electric and gas utilities are poor performers in terms of their ratios of: (1) in-state jobs to sales, and (2) sales to in-state income generation. By comparison, the industry that does most of the home energy efficiency work --the maintenance and repair construction industry-- has almost four times the jobs-to-sales ratio of the utility industry, and a 20 percent higher ratio of in-state income generation per dollar of sales. In addition, energy efficiency programs produce additional economic benefits in terms of jobs in proportion to the extent that they are designed to be cost effective.[3] It is not surprising that the *Missouri Statewide Energy Study* concluded that energy efficiency would "sustain more employment opportunities than either the continued current level of energy use or the development of new energy supplies."[4]

In addition to these economic impacts, state investment in energy efficiency tends to protect households against "insurable events." In August, 1996, Lawrence Berkeley Laboratory released findings showing that energy efficiency investments in housing often lead to the correction of conditions that place buildings at risk. Such conditions include fire, carbon monoxide poisoning, and the like.[5]

Finally, energy efficiency investments can promote the affordability of homeownership in Missouri. A study of how energy efficiency investments affect the affordability of first time home ownership[6] found that, in the Census Division of which Missouri is a part, a $3,000

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[3] Thus, for example, if an energy efficiency measure has a cost/benefit ratio of 1.10, it returns $110 of benefits for every $100 of expenditures. Additional economic activity and jobs will be associated not only with the $100 of expenditures, but with the $10 savings as well.

[4] *Missouri Statewide Energy Study -- Volume 1: Summary Report*, Environmental Improvement and Energy Resource Authority, Jefferson City, MO, 1992, page I-9.

[5] Evan Mills (1996). *Energy Efficiency: No-Regrets Climate Change Insurance for the Insurance Industry*, Lawrence Berkeley Laboratory: Berkeley, CA. Available at: http:\\eande.lbl.gov\CBS\reports.html. A review of the full complement of Lawrence Berkeley Laboratory, Center for Building Science, initiatives on *Energy Efficiency as an Insurance Loss-Prevention Strategy*, can be found at: http:\\eande.lbl.gov\CBS\Climate-Insurance\ci.html.

[6] Roger Colton (November 1996). *Energy Efficiency as a Credit Enhancement: Public Utilities and the Affordability of First-Time Homeownership*, Fisher, Sheehan and Colton, Public Finance and General Economics: Belmont, MA.

energy efficiency investment made at the time of home purchase, financed at nine percent interest, would yield an effective reduction in the price of the home of 6.0%,[7] and an effective interest rate discount of 0.48%.[8]

As can be concluded, there is a significant potential for investment in energy efficiency and renewable energy in Missouri. In addition, the benefits from making these investments are great.

THE NEED FOR COST-EFFECTIVE ENERGY AFFORDABILITY ASSISTANCE

A Missouri distribution fee seeking to provide cost-effective energy affordability assistance should seek to meet two needs: (1) the need for cash fuel assistance; and (2) the need for energy efficiency improvements. Both of these needs will be considered below.

The Need for Cash Fuel Assistance

Missouri has a significant number of low-income households, most of whom experience unaffordable home energy burdens. A home energy burden is the home energy bill as a percentage of income. In determining the need for fuel assistance, it is appropriate to look at low-income energy burdens. This is the approach now incorporated into the federal statute creating the Low-Income Home Energy Assistance Program (LIHEAP). That statute mandates that LIHEAP benefits be targeted to households who have the lowest incomes and the highest bills in relation to income taking into account household size. Moreover, in 1994, Congress described "highest home energy needs" as taking into consideration energy burdens and defined "energy burden" as "the expenditures of the household for home energy divided by the income of the household."

A consideration of home energy burdens should focus on *total* home energy bills for low-income households. While public policy traditionally has focused attention on home *heating* needs, this policy is too narrow. Instead, two aspects of home energy should be considered: (1) home heating on the one hand; and (2) home electric usage (including home cooling) on the other hand. National figures, as well as state-specific studies by FSC, find that while low-income heating *consumption* is greater than non-heating consumption, low-income heating *bills* represent

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[7] For the average sales price of a home supported by the state's first time homebuyer program, in order to generate the same dollar savings as a $3,000 investment in energy efficiency, financed at nine percent interest, the original sales price of the home would need to be six percent lower.

[8] In order to generate the same dollar savings as the energy efficiency investment, in other words, the interest rate charged on the home mortgage would need to be reduced by 0.48%.

a smaller percentage of total low-income energy bills.[9] Any determination of the need for cash assistance should take both heating and non-heating bills into account.

Home Heating Bills in Missouri

Winter home heating bills in Missouri impose unaffordable burdens on low-income households. Several populations will be used for purposes of demonstrating this conclusion: (a) households who receive LIHEAP benefits; (b) households who receive benefits through Aid to Families with Dependent Children (AFDC);[10] (c) households who receive Supplemental Security Income (SSI); and (d) households who receive Social Security (retired widows and widowers).[11]

As Table 3 demonstrates, each of these populations of households experiences a winter home heating burden --these figures do not include winter non-heat electric burdens-- which are beyond "affordable" levels. LIHEAP and AFDC recipients both experience winter home heating burdens of from 15 to 25 percent of income. Social Security recipients have burdens which are marginally lower.

These home heating burdens can be compared to the "shelter" burdens which the U.S. Department of Housing and Urban Development (HUD) has defined to be "affordable." According to HUD, if a household faces a *shelter* burden exceeding 30 percent of income, that household is over-extended. Shelter burdens include rent/mortgage payments plus all utility payments other than telephone.[12] A household that is paying 20 or 25 percent of its income simply toward home heating --again, not taking into account electricity as well-- will not be able to fall below this 30 percent limit.

The significance of the home heating burdens imposed on low-income households is even more apparent when one considers the full range of incomes at which low-income residents of Missouri live. Most households who qualify for LIHEAP in Missouri by living at or below 150 percent of Poverty live *below* the ceiling rather than *at* the ceiling. Table 4 sets forth the actual distribution of winter heating burdens for Missouri LIHEAP recipients. While it is a simple matter of arithmetic that energy burdens as a percentage of income will increase as dollar incomes decrease, the *magnitude* of the burden at the lower income levels is nonetheless

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[9] *See e.g.*, Roger Colton, Michael Sheehan, *et al.* (1995). ***An Assessment of Low-Income Energy Needs in Washington State***, Fisher, Sheehan & Colton, Public Finance and General Economics: Scappoose, OR; Roger Colton (1996). ***Home Energy Assistance Review and Reform in Colorado***, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA.

[10] AFDC is what most people think of as "welfare." Under recent Congressional welfare reforms, the program is now called TANF (Temporary Aid to Needy Families).

[11] Thus, not included in Social Security are disability recipients.

[12] Hence, for example, the utility payments would include home heating, electricity, water/sewer, and garbage and/or trash pick-up where appropriate.

stunning. As Table 4 shows, a household with an annual income of $0 to $2000 will have winter heating burdens[13] of nearly 85 percent; households living with annual incomes of $2000 to $4000 will have winter heating burdens of nearly 30 percent; and households living with annual incomes of $4000 to $6000 will have winter heating burdens of more than 16 percent.

The number of households with these extremely low levels of annual incomes (and thus high heating burdens) is not small. Table 5 shows that amongst the roughly 125,000 Missouri LIHEAP participants, more than 71,000 (roughly 60 percent) live with incomes of less than $6,000.

Non-Heating Home Energy Bills in Missouri

Non-heat electric bills can be just as unaffordable to low-income households as winter heating bills are. As Table 6 shows, non-heating electric bills (500 kWh/month) for Missouri's six largest electric companies impose burdens as a percentage of income ranging from 10 percent to 20 percent of income for public assistance recipients.[14]

The conclusions from this data are several fold *vis a vis* a distribution fee for Missouri. The need for cash fuel assistance is great in Missouri, both in terms of dollars and in terms of the number of households in need. Second, with many of these households, the need for cash assistance cannot be alleviated through reduced bills generated by improvements in energy efficiency. No matter how low the bills go for these households, they will be unaffordable. Third, given the income of these households, virtually *any* energy bill will impose unaffordable burdens. Fourth, the energy problems of these households are not household budgeting problems. There is, instead, an absolute mismatch between household resources and expenses. Finally, given the energy burdens facing low-income households, there will be an inevitable need for a crisis intervention fund to prevent the loss of service due to inability-to-pay.

The Need for Low-Income Energy Efficiency Assistance

In addition to the need for cash fuel assistance to be funded through a distribution fee, a significant number of low-income households in Missouri are in need of energy efficiency improvements. It is difficult, if not impossible, to quantify the precise number of low-income units in Missouri that are in need of energy efficiency improvements. Some rough estimates can

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[13] Remember, these do *not* include electric bills in addition to heating bills. Taking electric bills into account would drive burdens even higher.

[14] Again, according to HUD, if total shelter costs exceed 30 percent, a household is financially overextended.

be made, however. In 1995, there were roughly 450,000 low-income households in Missouri.[15] According to state Weatherization Assistance Program (WAP) officials, Missouri has weatherized roughly 31,000 homes from 1989 through 1997.[16] Due to decreased funding levels, however, the number of units per year has dropped in recent years. In fact, all weatherization production funded through non-DOE dollars was eliminated in Fiscal Year 1995. By Fiscal Year 1996, the number of low-income units weatherized each year in Missouri had dropped to only 40 percent of its 1989 level (2,593 / 6,040 = 42.9%).

Low-Income Units Weatherized in Missouri:
Total and DOE-Funded

	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total /a/	6,040	3,693	4,051	4,744	2,738	2,615	2,894	2,593	1,346
DOE	2,334	1,223	2,298	2,765	2,238	2,322	2,894	2,593	1,346 /b/

NOTES:

/a/ These totals do not include dollars that did not come through the state weatherization program.
/b/ Some quarterly data missing.

In addition to units weatherized through WAP, there will be some low-income households who live in homes that are newly constructed. Even though Missouri has no state building code, and state analysis of new construction has found substantial energy savings to be found in this new construction,[17] for ease of analysis here, these homes are excluded from the calculation of homes in need of weatherization. Assuming no unduplicated fully weatherized homes treated by utilities in that time, roughly 420,000 low-income housing units remain to be weatherized in Missouri.[18]

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[15] This is a calculated number. In 1990, there were roughly 435,000 households at or below 150% of the federal poverty level in Missouri. According to HUD, Missouri experiences roughly 20,000 new housing units per year authorized by building permits, of which approximately 15 percent (3,000/year) are likely to be inhabited by low-income households. There will be some duplicated households here, since some of the inhabitants of the new housing will come from the 435,000 existing low-income households. Nonetheless, a rough estimate equal to 435,000 + (3,000/year x 6 years) = 453,000 (rounded to 450,000) seems appropriate.

[16] Due to changes in technology and program requirements, homes weatherized prior to 1988 are assumed to be in need of re-weatherization. Homes weatherized with funds that were not administered by the state weatherization program are not included in these figures.

[17] Economic Research Associates. (December 1995). *A Reevaluation of Economic Opportunities through Missouri Building Codes and Energy Efficiency Improvements*, Missouri Division of Energy, Missouri Department of Natural Resources.

[18] This is calculated as follows: 450,000 minus 31,000 weatherized homes. This yields roughly 420,000 units.

If WAP production levels continue at roughly 2,500 units per year, if no weatherized house ever needs to be re-weatherized,[19] and if no expansion in Missouri's low-income population occurs, these un-weatherized homes will all be treated with energy efficiency improvements by the year 2165, roughly 168 years. Clearly, an additional source of low-income energy efficiency funding is needed.

Age of Low-Income Housing Units in Missouri

Two additional ways exist to develop a surrogate for energy efficiency needs in low-income housing in Missouri. While, as mentioned above, no direct measurement exists of the number of energy *in*efficient low-income housing units in Missouri, some correlation can be drawn between energy inefficiency and the age of housing units. Table 7 sets out the number of Missouri households, at different levels of "being poor," distributed by the age of the housing units in which they live. As can be seen, while it is impossible to conclude with any specificity the actual *extent* of energy inefficiency, it *is* possible to see the potential that hundreds of thousands of low-income Missouri households live in old, and presumptively energy inefficient, housing units. Roughly 210,000 households living at or below 50 percent of median income live in housing that was constructed before 1940. Roughly 315,000 households living at or below 80 percent of median income live in housing that was constructed before 1940, more than 55 years ago.

Moreover, these figures do <u>not</u> refer to <u>all</u> housing units, but rather simply to housing units that are <u>affordable</u> (i.e., yield total shelter burdens at or below 30 percent of income) at those income levels.

Affordability of Housing Units

A different surrogate to be used to identify the need for energy efficiency improvements involves shelter burden. The starting point again is HUD's rule that a household which devotes in excess of 30 percent of income toward shelter costs is over-extended.[20] Table 8 presents the number of Missouri households who are called upon to pay either more than 30 percent of their income or more than 50 percent of their income toward their shelter costs. As this Table shows, more than 350,000 Missouri households living at or below 80 percent of median income pay more than 30 percent of their income, and nearly 160,000 households at those income levels pay more than 50 percent of their income toward their total shelter costs.

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[19] This is a clearly unreasonable assumption. Not only will technologies improve and the process of weatherization become more sophisticated, the existing weatherization measures will ultimately reach the end of their useful lives and need to be replaced as well.

[20] As discussed above, shelter costs include rent/mortgage payments plus all utilities except telephone service.

Given the discussion above as to home energy burdens, it is clear that home energy bills contribute to the lack of shelter affordability. A review of monthly Fair Market Rents (FMRs),[21] and the extent to which utility bills contribute to those monthly shelter costs, is set forth in Table 9.[22] This Table shows utility bills in relation to total shelter costs in the two major Missouri cities for which data is available. These bills represent roughly 35 to 40 percent of total shelter costs. In contrast, Fannie Mae[23] has reported that utility bills should represent no more than 20 percent of total shelter costs. To the extent that energy efficiency can reduce these bills, overall shelter affordability will improve.

Finally, Table 10 presents the number of Missouri units that are "affordable" but which have some type of physical problem associated with them. As can be seen, more than one-in-four affordable units for Missouri households at 0 - 30 percent of median income (26%), three-in-ten affordable units for Missouri households at 31 - 50 percent of median income (30%), and one-in-four affordable units for Missouri households at 51 - 80 percent of median income (23%) have some type of physical problem. If one engages in the assumption that households with "physical problems" are likely to have energy efficiency problems as well, the extent of the acute need for low-income energy efficiency improvements in Missouri is evident.

Again, these households do not refer to all housing units, but rather simply to housing units that are affordable (*i.e.*, yield total shelter burdens at or below 30 percent of income) at those income levels.

Utility Benefits from Low-Income Energy Efficiency

In addition to looking at energy efficiency from the household perspective, it is beneficial to examine the benefits of a low-income energy efficiency program from the perspective of energy service providers. Extensive research has found that low-income energy efficiency programs result in substantial non-energy savings to utilities. These non-energy savings include reductions in working capital expense, uncollectible accounts, credit and collection expenses, and the like.[24] The results of one of the most recent studies are summarized in Table 11. Table 11

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[21] FMRs concededly do not include mortgage payments. FMRs set by HUD are based on area rents at the 40th percentile.

[22] Roger Colton (1994). *The Role of Utility Costs in Setting Fair Market Rents For Section 8 Housing*, presented in, *Section 8 Housing Assistance Payments Program--Fair Market Rent (FMR) Schedules for Use in the Rental Certificate Programs, Loan Management and Property Disposition Programs, Moderate Rehabilitation Program and Rental Voucher Program*, HUD Docket No. N-94-3754 (October 1994) (presented on behalf of ten Legal Services Corporation offices) (looking at data from 100 cities in 38 states and the District of Columbia).

[23] The Federal National Mortgage Association (FNMA).

[24] Roger Colton (1995). *Energy Efficiency and the Low-Income Consumer: Planning, Designing and Financing*, at Chapter 7, Fisher, Sheehan & Colton. Public Finance and General Economics: Bel mont, MA (summarizing existing utility research examining non-energy benefits).

shows the results of the Pennsylvania Low-Income Usage Reduction Program (LIURP) for all Pennsylvania utilities. The Table presents pre-treatment and post-treatment payment patterns for the low-income households to whom energy efficiency was delivered. A payment of less than 100 percent means that the low-income household was not even paying the current month's utility bill. In contrast, a payment *exceeding* 100 percent means that the low-income household was not only paying the current bill, but was paying off its arrears as well.

As Table 11 shows, for every Pennsylvania utility but one, the delivery of energy efficiency substantially improves the payment patterns of the treated low-income households. Indeed, the general impact of the delivery of energy efficiency was a *substantial* increase in the payment coverage of the household energy bill. In most cases the low-income household moved from a situation where that customer was falling further and further behind by failing to pay the current bill to a situation where the household was paying the entire current bill and beginning to retire the arrears.

Summary

A distribution fee is necessary to fund two types of programs in Missouri. First, there is a need for residential energy efficiency initiatives, including distributed technologies. Not only will these energy efficiency investments reduce energy waste and help clean-up the environment, they will generate economic benefits and promote affordable homeownership as well. Second, there is a need to provide cost-effective energy affordability assistance. This assistance will include the provision of cash assistance as well as the provision of low-income energy efficiency investments.

THE COST OF A PUBLIC PURPOSE DISTRIBUTION FEE IN MISSOURI

Having documented the need for a "distribution fee" in Missouri, the next question to be addressed is the cost which creating such a charge would impose on Missouri ratepayers. Three different sets of assumptions are used in the Tables below. Tables 12 and 13 are based on the assumption that a "distribution fee" is imposed on end-use consumption involving electricity and natural gas. Table 14 is based on the assumption that a distribution fee is imposed only on end-use consumption involving electricity. Finally, Tables 15 and 16 are based on the assumption that a "distribution fee" is based on all fuels. In each of these three sets of assumptions, the impacts are assessed of levying a distribution fee: (1) on residential consumption alone, and (2) on residential, commercial and industrial consumption combined.

Overview of the Alternative Scenarios

Tables 12, 13, 15 and 16 below are each set forth in four parts. The four parts assume differing levels of funding. Tables 12 through 16 begin with a base case funding scenario of roughly $80 million. In addition to this base case scenario, alternative funding levels of $100, $120 million, and $160 million are considered. Table 14, the Table which includes the electric-only analysis, has a fifth part that examines a $40 million funding scenario. More particularly:

- o Table 12 assumes that an electric/natural gas distribution fee in Missouri is imposed only on residential ratepayers.

- o Table 13 assumes that, in the alternative, an electric/natural gas distribution fee in Missouri is imposed on all end-use consumption for industrial, commercial and residential customers.

- o Table 14 assumes that an electric-only distribution fee is imposed in Missouri. The Table considers a charge on residential consumption alone as well as a charge on all end-use electric consumption for industrial, commercial and residential customers.

- o Table 15 assumes that a distribution fee in Missouri is imposed on residential consumption for all fuels.

- o Table 16 assumes that a distribution fee in Missouri is imposed on all fuels for residential, commercial and industrial customers.

The Tables are intended to generate three pieces of data on a state-specific basis for Missouri: (a) the per unit of energy cost of a distribution fee of the specified amounts for each fuel type; (b) the *total* cost allocated to each fuel type arising out of a distribution fee of the specified amounts; and (c) the difference caused by allocating program costs only to residential versus allocating program costs to aggregate residential, commercial and industrial end-use.

The Basis of the Funding Levels

Four funding levels are considered in this analysis. A scenario based on 100 percent of the LIHEAP/WAP appropriation is used as the base case. Two specific program elements, however, are included in the distribution fee which makes reliance on this federal low-income assistance program inappropriate as the exclusive funding touchstone:

- o Non-low-income residential energy efficiency program are recommended to be funded through the distribution fee; and

- o Non-heating bill affordability assistance is recommended to be funded through the distribution fee.

To test the impacts of increasing dollars to fund these additional program components,[125] three additional scenarios were added. Because the ability to deliver energy efficiency is limited by

[125] In contrast, the electric-only analysis adds a fifth scenario to provide a basis for evaluating the impacts should the assistance provided through an electric-only distribution fee be scaled back to reflect a decision to limit the use of the funds only to electric energy efficiency measures or electric bill affordability assistance.

the capacity of the existing network of weatherization service providers, it was deemed appropriate to use multipliers of the LIHEAP/WAP appropriation as the means to test the rate impact of different levels of a distribution fee.\26\ The use of LIHEAP/WAP as the basis from which to make funding estimates should not detract from the observation that, as explained in detail above, the wires charge revenue considered in this report is to be used for the following three purposes:

- o Residential energy efficiency generally, including renewable energy strategies;
- o Cost-effective bill affordability programs, including efforts directed toward both heating and non-heating bill components; and
- o Low-income energy efficiency.

Methodology

The methodology employed in Tables 12 through 16 begins by estimating the funds desired to be generated through the distribution fee. The estimates flow from employing the LIHEAP/WAP multiplier described above.\27\

The funds estimated through these various scenarios are then distributed via an allocator. In the scenario where the funds are distributed solely to the residential class, the funds are divided by the total number of mmBtu consumed by the residential customer class in Missouri to derive a cost per Btu. That cost per Btu is then multiplied by the Btu's per unit of fuel to derive a per unit of fuel cost (*e.g.*, cost per MCF, cost per kWh). The cost per Btu is further multiplied by the number of Btu consumed within each fuel class at the end-use level to determine the total dollars to be derived from each fuel source. The effect of this methodology is to assign a responsibility to each fuel source equal to the proportion of end use residential energy supplied by that fuel source on a per Btu basis.

The same process is used for the section that distributes the cost over all residential, commercial and industrial end-use consumption. The total dollars desired are divided by the total end use consumption from those three customer classes. The per Btu cost is then multiplied by the number of Btu in each type of fuel unit to derive a per unit of fuel cost, and multiplied by the

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\26\ Given the spread between the high and low dollar figure studied, clearly no funding *recommendation* is being made by this report. Instead, the purpose of the report is to consider the rate impacts assuming different levels of funding. The purpose is present illustrations of potential high, low and intermediate funding levels.

\27\ The 1986 LIHEAP appropriations was the highest appropriation for the nation as a whole. In 1986, Missouri received $89,335,293 in LIHEAP funds. U.S. Department of Health and Human Services, *Low Income Home Energy Assistance Program, Report to Congress for Fiscal Year 1986*, at Table C-4, page 67 (July 1987). The highest Missouri WAP appropriation occurred in 1996, when Missouri received $5.778 million. (Correspondence, Missouri Department of Natural Resources to FSC).

total number of Btu consumed at the end use level to derive the total contribution which each fuel type would make to the bottom line. This results in an allocation based not on the proportion of end use fuel type within only the residential class, but by the proportion of end use fuel type within all customer classes combined.

The $80 million scenario is set forth in Tables 12A, 13A, 14A, 15A and 16A; the $100 million scenario is set forth in Tables 12B, 13B, 14B, 15B and 16B; the $120 million scenario is set forth in Tables 12C, 13C, 14C, 15C and 16C; and the $160 million scenario is set forth in Tables 12D, 13D, 14D, 15D and 16D. Table 14E reflects the electric-only $40 million scenario.[28]

Results

Allocating Costs Only to Residential Natural Gas and Electric Customers

A distribution fee designed to generate $80 million[29] imposed only on the residential natural gas and electric customer class would result in a price increase of the following for natural gas and electric users in Missouri:

- roughly 3.9 cents per CCF for natural gas users. Assuming a consumption of roughly 1,100 CCF per year, this results in an annual bill increase of roughly $43, or about $3.60 per month.

- roughly 13.2 one-hundredths of a cent per kWh for electricity users. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of $12, or about 98 cents per month.

In contrast, a distribution fee designed to generate $160 million[30] imposed only on the residential class would result in a price increase of the following for natural gas and electricity in Missouri:

- roughly 7.8 cents per CCF for natural gas users. Again, assuming an annual consumption of roughly 1,100 CCF, this results in an annual bill increase of roughly $86, or about $7.10 per month.

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[28] There is no corresponding Table E in other sets of Tables.

[29] For all of the reasons outlined in the text above, the $80 million is calculated as 100 percent of the highest historical LIHEAP/WAP appropriations in Missouri (1997S).

[30] For all of the reasons outlined in the text above, the $160 million is calculated as 200 percent of the highest historical LIHEAP/WAP appropriations in Missouri (1997S).

- roughly 2.6 tenths of a cent per kWh for electricity. Again, assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of about $23.40, or roughly $1.95 a month.

Clearly, the costs of generating $100 and $120 million[31] from the residential class alone fall somewhere in between. The precise costs for these two scenarios are set forth in Tables 12B and 12C respectively.

Allocating Costs to Residential, Commercial and Industrial Natural Gas and Electric Customers

A distribution fee designed to generate $80 million imposed on the combined residential, commercial and industrial customer base would result in a price increase of the following for natural gas and electric residential fuel users in Missouri:

- roughly 1.7 cents per CCF for natural gas users. Assuming a consumption of roughly 1,100 CCF per year, this results in an annual bill increase of roughly $19, or about $1.60 per month for the average residential consumer.

- roughly 5.8 one-hundredths of a cent per kWh for electricity users. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of $4.50, or about 38 cents per month for the average residential customer.

In contrast, a distribution fee designed to generate $160 million imposed on the combined residential, industrial and commercial classes would result in a price increase of the following for residential natural gas and electricity users in Missouri:

- roughly 3.4 cents per CCF for natural gas users. Assuming an annual consumption of roughly 1,100 CCF, this results in an annual bill increase of roughly $38, or about $3.15 per month for the average residential customer.

- roughly 11.7 hundredths of a cent per kWh for electricity. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of about $9.90, or just over 80 cents a month for the average residential consumer.

Clearly, the costs of generating $100 and $120 million from the combined residential, commercial and industrial classes fall somewhere in between. The precise costs for these latter two scenarios are set forth in Tables 13B and 13C respectively.

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[31] These are the 125% and 150% scenarios respectively.

Allocating Costs only to Electric Consumption

A distribution fee designed to generate $80 million imposed only on electric consumption would result in a price increase of the following for residential electric users in Missouri:

- roughly 1.3 tenths of one cent per kWh if spread over all electric classes (residential, commercial, industrial). Assuming an annual consumption of roughly 9000 kWh, this results in an annual bill increase of roughly $11.70, or about 98 cents per month.

- roughly 3.3 tenths of a cent per kWh if spread over only residential consumption. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of $29.70 or about $2.50 per month.

In contrast, a distribution fee designed to generate $160 million imposed only on electric consumption would result in a price increase of the following for residential electric users in Missouri:

- roughly 2.7 tenths of one cent per kWh if spread over all electric classes (residential, commercial, industrial). Assuming an annual consumption of roughly 9000 kWh, this results in an annual bill increase of roughly $23.40, or about $1.95 per month.

- roughly 6.6 tenths of a cent per kWh for electricity. Again, assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of about $59.40, or roughly $4.95 a month.

Clearly, the costs of generating $100 and $120 million from electricity consumption alone fall somewhere in between. The precise costs for these two scenarios are set forth in Tables 14B and 14C respectively.

In addition, this analysis examines the impact of generating only $40 million. A distribution fee designed to generate $40 million imposed only on electric consumption would result in a price increase of the following for residential electric users in Missouri:

- roughly 6.7 one-hundredths of one cent per kWh if spread over all electric classes (residential, commercial, industrial). Assuming a consumption of roughly 9000 kWh per year, this results in an annual bill increase of roughly $5.40, or about 45 cents per month.

- roughly 17 one-hundredths of a cent per kWh if spread over only residential consumption. Again, assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of about $14.40, of roughly $1.20 a month.

This analysis is set forth in Table 14E. This Table considers costs for a residential only scenario as well as for a scenario involving combined residential, industrial and commercial consumption.

Allocating Costs Only to Residential Customers: All Fuels

A distribution fee designed to generate $80 million imposed only on the residential customer class (all fuels) would result in a price increase of the following for natural gas and electric users in Missouri:

- roughly 3.5 cents per CCF for natural gas users. Assuming a consumption of roughly 1,100 CCF per year, this results in an annual bill increase of roughly $38.50, or about $2.30 per month.

- roughly 11 one-hundredths of a cent per kWh for electricity users. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of $9.90, or about 85 cents per month.

In contrast, a distribution fee designed to generate $160 million imposed only on the residential class (all fuels) would result in a price increase of the following for natural gas and electricity in Missouri:

- roughly 7.0 cents per CCF for natural gas users. Again, assuming an annual consumption of roughly 1,100 CCF, this results in an annual bill increase of roughly $77, or about $6.40 per month.

- roughly 24 one-hundredths of a cent per kWh for electricity. Again, assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of about $20.70, or roughly $1.75 a month.

Clearly, the costs of generating $100 and $120 million from the residential class alone fall somewhere in between. The precise costs for these two scenarios are set forth in Tables 15B and 15C respectively.

Allocating Costs to Residential, Commercial and Industrial Customers: All Fuels

A distribution fee designed to generate $80 million imposed on the combined residential, commercial and industrial customer base (all fuels) would result in a price increase of the following for natural gas and electric residential fuel users in Missouri:[32]

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[32] Price impacts for bulk fuels are set forth in the corresponding Tables below.

- roughly 1.5 cents per CCF for natural gas users. Assuming a consumption of roughly 1,100 CCF per year, this results in an annual bill increase of roughly $16.60 or about $1.40 per month for the average residential consumer.

- roughly 5.1 one-hundredths of a cent per kWh for electricity users. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of $4.50, or about 40 cents per month for the average residential customer.

In contrast, a distribution fee designed to generate $160 million imposed on the combined residential, industrial and commercial classes would result in a price increase of the following for residential natural gas and electricity users in Missouri:

- roughly 3.0 cents per CCF for natural gas users. Assuming an annual consumption of roughly 1,100 CCF, this results in an annual bill increase of roughly $33, or about $2.80 per month for the average residential customer.

- roughly one tenth of a cent per kWh for electricity. Assuming a consumption of 9,000 kWh per year, this results in an annual bill increase of about $9.00, or roughly 75 cents a month for the average residential consumer.

Clearly, the costs of generating $100 and $120 million from the combined residential, commercial and industrial classes fall somewhere in between. The precise costs for these latter two scenarios are set forth in Tables 16B and 16C respectively.

A Proposed Structure for a Missouri Distribution Fee

A proposed structure for a Missouri distribution fee should address four issues:

(1) What benefits should the distribution fee pay for;

(2) Who should bear the cost of the distribution fee;

(3) What should the value of the distribution fee be; and

(4) How can the distribution fee be made immune to bypass.

What Initiatives Should the Distribution Fee Pay For

For all of the reasons discussed in the first section of this paper, a distribution fee should be developed to pay for residential energy efficiency as well as cost-effective bill affordability programs. Residential energy efficiency should include renewable energy strategies. Cost-effective bill affordability measures should include: (a) low-income basic cash fuel assistance; (b) low-income crisis intervention assistance; and (c) low-income energy efficiency programs.

Energy efficiency programs should include not only direct investment programs involving partnerships with local Community Action Agencies (or other WAP sub-grantees),[33] they should include innovative partnerships involving housing,[34] financial institutions,[35] community development financial institutions,[36] and other public and private housing programs.[37]

Deciding on the Level of Distribution Fee Revenues

The value of the distribution fee to be collected should be based on the total amount of funds desired by the state. The cost per Btu, and thus the per unit of energy charge, should flow from this broader decision. Hence, for example, the state should decide whether it wishes to generate funding at the $80, $100, $120, or $160 million levels, rather than deciding whether to increase rates by 0.5%, 1.0%, 1.5% or some other factor. One difficulty with increasing rates by a uniform percentage is the inherent unfairness of the distribution of the levy. As shown by the Tables discussed above, a one percent increase in natural gas rates is not equal in burden to a one percent increase in electric rates on a per unit of energy basis. Moreover, it seems most reasonable to decide what end result is desired before addressing the mechanism (*i.e.*, the per unit of energy charge) to be used to achieve that result. This is not to say, of course, that the final dollar figure desired should not always be tempered by the impact which such fundraising has on rates. It is merely to state that the state should have an end-in-view as to total dollars desired before beginning the cost allocation process.

The value of a state's distribution fee depends upon several underlying decisions. The first issue was addressed above. The distribution fee should be sufficient to generate funds for residential energy efficiency generally (including distributed technologies) as well as cost-effective bill

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[33] *See e.g.*, Roger Colton (1994). *Energy Efficiency and the Low-Income Consumer: Planning, Designing and Financing*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA; Roger Colton (1994). *Securitizing Utility Avoided Costs: Creating an Energy Efficiency "Product" for Private Investment in WAP*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA.

[34] *See e.g.*, Roger Colton (1995). *Funding Minority and Low-Income Energy Efficiency Programs in a Competitive Electric Industry*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA.

[35] *See e.g.*, Roger Colton (1995). *Energy Efficiency as a Credit Enhancement: Public Utilities and the Affordability of First-Time Homeownership*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA.

[36] *See e.g.*, Roger Colton and M.Sheehan (1994). *"Linked Deposits" as a Utility Investment in Energy Efficiency for Low-Income Housing*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA.

[37] *See e.g.*, Roger Colton (1996). *Changing Paradigms for Delivering Energy Efficiency to the Low-Income Consumer by Competitive Utilities: The Need for a Shelter-Based Approach*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA.

affordability programs. Both initiatives should be directed toward heating and non-heating energy use.

The Level of Energy Efficiency Revenues

The energy efficiency program funded through a distribution fee should involve both adequate scope and funding. Adequate "scope" of the energy efficiency program means that the state should seek to serve a wide-range of constituencies. Adequate "funding" means that the energy efficiency budget should increase until the program exhausts the available cost-effective measures, or until it exhausts the institutional capacity to deliver cost-effective measures, whichever comes first.

Determining the funding of energy efficiency programs (including solar investments) presents somewhat of a problem. While, in theory, a program should continue to fund energy efficiency measures until the marginal costs of those measures equal the marginal benefits, in reality, no such "full" funding is ever provided. In light of this, there seems to be no principled basis upon which to set an energy efficiency budget. Why should the State of Missouri, in other words, spend $8.0 million a year and not $9.0 million? Why should the State serve 5,000 households rather than 6,000 households?

One principle does seem appropriate to guide energy efficiency funding decisions. The extent of energy efficiency funding should be sufficient to ensure that there are no lost opportunities in any given year. Lost opportunities arise when the accomplishment of some given task precludes the future accomplishment of additional work at that same dwelling. Some of the lost opportunities involved with existing programs include:

> **WAP weatherization:** To the extent that WAP invests $1,800 in a home that has the potential for $3,000 of cost-effective conservation, there is a lost opportunity. It is highly unlikely that the home will be revisited to subsequently "finish" the remaining $1,200 of conservation improvements. Moreover, federal regulations generally prohibit WAP from retrofitting a home in which WAP dollars have previously been invested.
>
> **Housing developments:** Decisions made by housing developers represent decisions that will hold for the useful life of the measures. Accordingly, if a developer installs a relatively inefficient furnace or hot water heater, or fails to install the most cost-effective level of insulation, it is not likely that the state or a utility will soon revisit that home to install more energy efficient measures. The opportunity to install high efficiency measures is lost at the time of the developer's initial decision.
>
> **Unused institutional capacity:** Assume the institutional capacity of energy efficiency service providers is 8,000 homes per year in Missouri. These service providers might include local contractors, CAAs, CDCs and other profit or non-profit institutions. If the combined budget of energy efficiency programs funds only 6,000 homes a year, there is a lost opportunity to increase the energy efficiency in 2,000 homes. By assumption,

the maximum capacity is 8,000 homes per year. That capacity thus cannot be pushed to 10,000 for a year to "make-up" the earlier lost opportunity.

The institutional capacity for delivering energy efficiency, of course, should include the capacity of the state's utilities in addition to the private non-utility contractors.

As can be seen, one component of an energy efficiency program funded through a distribution fee is a periodic inventory of the institutional capacity to deliver energy efficiency measures. The inventory should cover the planning period of the entity administering the distribution fee funds. If that entity develops three year energy efficiency plans, in other words, its inventory should include the existing and projected capacity to deliver energy efficiency services over that three year period. The budget for energy efficiency should thus be sufficient to fund full utilization of the inventoried capacity.[38]

In sum, the upper limit on the budget for delivering energy efficiency measures through a Missouri distribution fee should be the point at which the marginal costs of such measures equal the marginal benefits. In reality, however, energy efficiency programs rarely, if ever, spend to the margin. A substitute principle thus needs to be developed as a decision rule for the extent of energy efficiency funding. The proposed decision rule is that funding through the distribution fee[39] should be of sufficient magnitude to ensure that there is no unused institutional capacity to deliver cost-effective energy efficiency services.

The Level of Bill Affordability Revenues

The amount of money needed to provide cost-effective bill affordability assistance should consider the need for basic cash fuel assistance grants, as well as crisis intervention. The necessary level of revenue depends upon four factors:

- o <u>Defining the "energy bill" to be covered</u>: For all of the reasons outlined in the first section of this paper, a distribution fee should address both heating and non-heating components of low-income bills. This focus supplants and replaces the current focus on heating bills with a new focus on total home energy bills (excluding transportation).

- o <u>Defining "low-income"</u>: The state must next define what it means by "low-income." Historically, the cap for LIHEAP participation has been established by federal statute as being either 150 percent of the federal Poverty Level *or* 60 percent of median income, at the state's discretion. In contrast, most HUD

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[38] The entity which administers the distribution fee then needs to make commitments to fully fund the institutional capacity over an announced time frame. This type of commitment is necessary for energy efficiency service providers to plan and develop their own capacity.

[39] Combined with WAP and other sources of revenues.

programs define "low-income" as extending up to 80 percent of median income. Table 17 below presents statewide figures on how this decision affects the number of families[40] deemed to be "low-income" in Missouri. Based on the historical inadequacy of 150 percent of Poverty as an indicator of inability-to-pay,[41] the definition of "low-income" should be set at 200 percent of the federal Poverty Level.

- o **Making assumptions as to participation levels:** The third factor that affects a determination of how much money to raise through a distribution fee involves the participation rate from amongst the eligible population. Nationwide, LIHEAP participation rates range from roughly 20 percent to roughly 40 percent of the eligible population. An assumed participation rate of 30 to 35 percent in low-income fuel assistance programs funded through a Missouri distribution fee would not be unreasonable.

- o **Targeting assistance:** The final factor that affects how much money to raise through a distribution fee in Missouri involves the decision rule for targeting assistance. The most commonly used benchmark is to establish lowering low-income energy burdens (*i.e.*, energy bills as a percent of income) to the total population average as the "ideal." This goal, however, often involves expenditures beyond a magnitude that would be politically acceptable. Lowering total energy burdens to a range of 10 - 12 percent allows for reasonable success in making payments by low-income households while staying within reasonable budgetary constraints.[42]

As part of the decision on how much money to raise through a distribution fee, it would be appropriate, also, to establish a cap on administrative expenses for both the fuel assistance and energy efficiency components of the program. A cap based on existing LIHEAP statutory restrictions (10 percent) is not unreasonable.

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[40] "Families" and "households" are not synonymous.

[41] While not having space to document the discussions in the literature, it should be noted that 150 percent of Poverty does not reach many of the "working poor" who do not qualify for public assistance, but who nonetheless lack the financial ability to pay ongoing household expenses. In addition, many Social Security recipients also fall over (not far over, but nevertheless over) the 150 percent of Poverty Level ceiling.

[42] It would be reasonable, also, to vary the target energy burden by household size. Ten percent of income is more important to a household with eight persons than it is to a household with two persons. Thus, a matrix that sets the payment level for households at or below 50% of Poverty at 5%, for households at 50 - 99% of Poverty at 7%, and for households at 100% or more of Poverty at 9%, may well be reasonable.

How to Make the Distribution Fee Immune to Bypass

The recommendation inherent in this analysis is that a distribution fee be imposed "at the meter." This recommendation stands in contrast to some recommendations that propose to impose the distribution fee at the provider level. The primary goal of such proposals, it appears, is to try to force responsibility for some portion of the distribution fee back on the shareholders, as competitive energy providers choose not to pass on the charge in retail rates. That goal, standing alone, represents an insufficient reason to impose a distribution fee at the provider level.

Moreover, full responsibility for a distribution fee should not be subject to bypass, in whole or in part, by a customer switching fuels. For this reason, the distribution fee should not be imposed on a flat percentage of revenue (or a flat per unit of energy charge) basis. As the Tables discussed above show, imposing the distribution fee on a per Btu basis is not only "equitable" in that it assigns cost responsibility based on the proportion of fuel consumed, it creates the situation where a customer switching from one fuel to another does not change the proportionate responsibility he or she bears as a user of that fuel.

Proposals for a flat per customer charge are somewhat summarily rejected. Under such a scheme, each unit in a 50-unit multi-family building that is individually metered (50 customers) would pay the same distribution fee as the entire 50-unit building which is master-metered (one customer). There is little equity in such a proposal.

How to Make the Distribution Fee Competitively Neutral

The proposed distribution fee for Missouri is competitively neutral. In this sense, the term "competitively neutral" means that the imposition of the distribution fee does not change the competitive position of fuels that would otherwise exist in the absence of such a charge. This competitive neutrality is enforced by imposing the distribution fee on a per Btu basis. As a result, there is no greater or lesser incentive to purchase one fuel rather than another because of the distribution fee. Nor is there any incentive to purchase from one supplier rather than another (within the same fuel type) as a result of the distribution fee.

Creation of a State Leveraging Incentive Fund

As part of the process of establishing a distribution fee, the state legislature should create and fund a state leveraging incentive fund akin to the LIHEAP leveraging incentive fund created at the national level. This incentive fund would encourage local communities to bring local resources to bear on energy efficiency and energy affordability issues. Whether through energy efficiency programs through volunteer house repairs,[143] crisis assistance initiatives such as

[143] The "Florida Fix" program coordinated and promoted by the Florida Housing Coalition (Tallahassee) is an excellent example of such a volunteer partnership. Florida Fix involves local groups of volunteers working to repair low-income housing.

utility fuel funds, or some other mechanisms), the state should commit to encouraging (and rewarding) local initiatives.[44]

SUMMARY AND CONCLUSIONS

For all of the reasons outlined in this paper, a distribution fee is a necessary and appropriate public policy in Missouri. A summary of the various decisions that might comprise the design of a Missouri distribution fee is set forth in Appendix C below.

[44] A broad ranging discussion of state and local fundraising initiatives can be found at Roger Colton (1996). *Funding Fuel Assistance: State and Local Strategies to Help Pay Low-Income Home Energy Bills*, Fisher, Sheehan & Colton, Public Finance and General Economics: Belmont, MA. A listing of the programs described in that publication is attached as Appendix B.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 1 (PAGE 1 OF 3)
UNITS OF HOUSING AFFORDABLE AT DIFFERENT LEVELS OF HUD-ADJUSTED MEDIAN FAMILY INCOME (HAMFI)
BY YEAR OF CONSTRUCTION

Year of Construction	81%+ Median Income		
	Renter	Owner	Total
Before 1940	24,157	65,411	89,568
1940 - 1949	1,578	24,910	26,488
1950 - 1959	2,574	54,978	57,552
1960 - 1979	13,483	224,640	238,123
1980 - 1990	12,560	137,638	150,198

SOURCE: CHAS Data Base: HUD: 1990.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 1 (PAGE 2 OF 3)
MISSOURI HOUSING AFFORDABILITY AT DIFFERENT LEVELS OF HUD-ADJUSTED MEDIAN FAMILY INCOME

Income Range	Housing Burden > 30%			Housing Burden > 50%		
	Renter	Owner	Total	Renter	Owner	Total
81 - 95% HAMFI	3,550	14,378	17,928	268	1,765	2,033
95% + HAMFI	2,673	33,741	36,414	174	2,996	3,170

Source: CHAS Data Base: HUD: 1990.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 1 (PAGE 3 OF 3)
UNITS OF HOUSING AFFORDABLE AT DIFFERENT LEVELS OF HUD-ADJUSTED MEDIAN FAMILY INCOME
WITH PHYSICAL PROBLEMS

	81%+ HAMFI		
	Renter	Owner	Total
Total Units	34,352	507,397	541,749
Units With Physical Problems	15,962	73,682	89,644
Source: CHAS Data Base: HUD: 1990			

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 2
HEATING USAGE AS PERCENT OF TOTAL HOME ENERGY USAGE AND
HEATING BILLS AS PERCENTAGE OF TOTAL HOME ENERGY BILLS
NATIONAL DATA

	Usage (mmBtu)			Bills ($$$)		
	Total	Heating	Percent	Total	Heating	Percent
All Households	103.9	56.5	54.4%	$1,255	$406	32.4%
Low-Income Households	90.9	50.6	55.7%	$1,062	$364	34.3%
LIHEAP Recipients	98.7	59.9	60.7%	$1,067	$412	38.6%

SOURCE:

Low-Income Home Energy Assistance Program Report to Congress for FY 1993, at 17 and 20 (Oct. 1994).

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 3
AVERAGE WINTER NATURAL GAS HEATING BURDENS
VARIOUS MISSOURI LOW-INCOME POPULATIONS

	Average Winter Income	Average Winter Gas Bill	Bill as Income Percent
LIHEAP Recipients	$1,537	$210.94	13.7%
AFDC Recipients	$ 826	$210.94	24.1%
SSI Recipients	$1,221	$210.94	17.3%
Social Security:	$1,767	$210.94	11.9%

SOURCE:

R.Colton and M.Sheehan (1995). ***On the Brink of Disaster: A State-by-State Analysis of Natural Gas Winter Home Heating Bills.***

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 4
WINTER GAS BILL AS PERCENTAGE OF INCOME:
LIHEAP RECIPIENTS BY INCOME RANGE

	AVERAGE WINTER NATURAL GAS BILL	INCOME $0-1,999	INCOME $2-3,999	INCOME $4-5,999	INCOME $6-7,999	INCOME $8-9,999	INCOME $10-11,999	INCOME $12-14,999	INCOME $15,000+
Missouri	$210.94	84.4%	28.1%	16.9%	12.1%	9.4%	7.7%	6.3%	5.6%

SOURCE:

R.Colton and M.Sheehan (1995). *On the Brink of Disaster: A State-by-State Analysis of Natural Gas Winter Home Heating Bills.*

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 5
NUMBER OF LIHEAP RECIPIENTS BY INCOME RANGE

	TOTAL STATE LIHEAP RECIPIENTS	INCOME $0-1,999	INCOME $2-3,999	INCOME $4-5,999	INCOME $6,-7,999	INCOME $8-9,999	INCOME $10-11,999	INCOME $12-14,999	INCOME $15,000+
Missouri	124,360	8,083	19,276	43,899	24,375	14,674	7,213	4,874	1,990

SOURCE:

R Colton and M.Sheehan (1995). *On the Brink of Disaster: A State-by-State Analysis of Natural Gas Winter Home Heating Bills.*

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 6
UTILITY-BY-UTILITY NON-HEATING ELECTRIC BILL (500 KWH)
AS PERCENT OF INCOME, PUBLIC ASSISTANCE RECIPIENTS

State	Utility	Largest City Served	Typical Non-Htg Electric Bill (500 kWh)	Avg Public Assistance Income	Avg Non-Htg Electric Bill as Pct of Income	No. of Public Assistance HHs in Largest Community
Missouri	Citizens Electric Corp.	Perryville	$143.46	$703	20.4%	188
	Empire District Electric	Joplin	$105.60	$808	13.1%	1,812
	Kansas City Power and Light	Kansas City	$148.53	$824	18.0%	13,931
	Missouri Public Service	Raytown	$137.50	$1,434	9.6%	441
	St. Joseph Light & Power	St. Joseph	$102.93	$804	12.8%	2,286
	Union Electric	St. Louis	$151.47	$856	17.7%	22,417

SOURCE:

R.Colton, *The Other Part of the Year: Low-Income Households and their Need for Cooling, A State-by-State Analysis of Low-Income Summer Electric Bills* (1995).

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 7
UNITS OF HOUSING AFFORDABLE AT DIFFERENT LEVELS OF HUD-ADJUSTED MEDIAN FAMILY INCOME (HAMFI)
BY YEAR OF CONSTRUCTION

Year of Construction	0 - 30% Median Income			31 - 50% Median Income			51 - 80% Median Income		
	Renter	Owner	Total	Renter	Owner	Total	Renter	Owner	Total
Before 1940	28,803	55,378	84,181	55,662	67,488	123,150	37,384	70,482	107,866
1940 - 1949	9,617	16,453	26,070	22,523	31,702	54,225	18,759	39,198	57,957
1950 - 1959	13,372	18,205	31,577	27,274	48,221	75,495	29,391	93,814	123,205
1960 - 1979	45,276	63,937	109,213	75,564	61,245	136,809	1-5,580	179,985	164,405
1980 - 1990	18,921	28,416	47,337	27,185	18,142	45,327	62,760	48,311	111,071

Source: CHAS Data Base: HUD: 1990

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 8
MISSOURI HOUSING AFFORDABILITY AT DIFFERENT LEVELS OF HUD-ADJUSTED MEDIAN FAMILY INCOME

Income Range	Housing Burden > 30%			Housing Burden > 50%		
	Renter	Owner	Total	Renter	Owner	Total
0 - 30% HAMFI	101,021	63,640	164,661	76,075	38,030	114,105
31 - 50% HAMFI	65,458	41,996	107,454	16,624	14,301	30,925
51 - 80% HAMFI	34,883	44,501	79,384	2,410	8,093	10,503

Source: CHAS Data Base: HUD: 1990

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 9
CONTRIBUTION OF UTILITY COSTS TO TOTAL SHELTER COSTS: SELECTED MISSOURI CITIES

State	City	FMR /a/	Monthly Winter Utility Bills for Selected Missouri Cities			Monthly Winter Utility Bill /b/	Percent of FMR Devoted to Utilities
			Natural Gas	Electricity	Water/Sewer		
Missouri	Kansas City	$489	$79	$60	$24	$163	33%
Missouri	St. Louis	$476	$98	$50	$26	$174	37%

SOURCE:

R.Colton (1994). *The Role of Utility Costs in Setting Fair Market Rents For Section 8 Housing*, presented in, *Section 8 Housing Assistance Payments Program–Fair Market Rent (FMR) Schedules for Use in the Rental Certificate Programs, Loan Management and Property Disposition Programs, Moderate Rehabilitation Program and Rental Voucher Program*, HUD Docket No. N-94-3754.

NOTES:

/a/ Fair Market Rents (FMRs) include contract rent plus all utilities. Determined and published by HUD on annual basis.
/b/ May have minor differences from sum of individual columns due to rounding.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 10
UNITS OF HOUSING AFFORDABLE AT DIFFERENT LEVELS OF HUD-ADJUSTED MEDIAN FAMILY INCOME
WITH PHYSICAL PROBLEMS

	0 - 30% HAMFI			31 - 50% HAMFI			51 - 80% HAMFI		
	Renter	Owner	Total	Renter	Owner	Total	Renter	Owner	Total
Total Units	116,069	182,757	298,826	208,208	226,769	434,977	253,844	431,810	685,654
Units With Physical Problems	31,837	44,957	76,794	88,918	42,683	131,601	97,868	62,084	159,952
Source: CHAS Data Base: HUD: 1990									

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 11
BILL PAYMENT IMPACT FOR CUSTOMERS WITH ARREARAGES: LIURP: PENNSYLVANIA

1992 LIURP	Heating Jobs		Water Heating Jobs		Baseload Jobs	
	Percent of Bill Paid Pre-Period	Percent of Bill Paid Post-Period	Percent of Bill Paid Pre-Period	Percent of Bill Paid Post-Period	Percent of Bill Paid Pre-Period	Percent of Bill Paid Post-Period
Duquesne	Not Applicable		91%	100%	78%	106%
Met Ed	78%	107%	79%	107%		
Pennelec	92%	95%	96%	99%		
Penn Power	Not Applicable		95%	93%		
PP&L	51%	95%	55%	105%		
PECO Electric	74%	118%	78%	109%		
UGI Electric	95%	105%	Not Applicable			
West Penn	126%	102%	129%	106%		
Columbia Gas	69%	133%				
Equitable	Not Applicable					
NFG	96%	125%				
PECO Gas	68%	133%				
PG&W	96%	106%				
Peoples	99%	106%				
T.W. Phillips	Not Available					
UGI Gas	89%	115%				

SOURCE: Pennsylvania PUC Evaluation of 1992 LIURP Program Results (1995).

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 12A
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $80 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$47,829,385	$31,847,465	$79,676,850
Price per Fuel Unit /a/	$0.38886	$0.00132	
Average Annual Residential Bill Impact /b/	$42.77	$11.70	
Average Monthly Residential Bill Impact	$3.56	$0.98	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 12B
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $100 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$59,786,731	$39,809,332	$99,596,063
Price per Fuel Unit /a/	$0.48607	$0.00165	
Average Annual Residential Bill Impact /b/	$53.46	$14.40	
Average Monthly Residential Bill Impact	$4.46	$1.20	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 12C
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $120 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$71,744,077	$47,771,198	$119,515,275
Price per Fuel Unit /a/	$0.58329	$0.00199	
Average Annual Residential Bill Impact /b/	$64.15	$17.10	
Average Monthly Residential Bill Impact	$5.35	$1.43	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 12D
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $160 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$95,658,769	$63,694,931	$159,353,700
Price per Fuel Unit /a/	$0.77771	$0.00265	
Average Annual Residential Bill Impact /b/	$85.55	$23.40	
Average Monthly Residential Bill Impact	$7.13	$1.95	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 13A
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $80 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$44,827,856	$34,848,994	$79,676,850
Price per Fuel Unit /a/	$0.17175	$0.00058	
Average Annual Residential Bill Impact /b/	$18.89	$4.50	
Average Annual Residential Bill Impact	$1.57	$0.38	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 13B
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $100 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$56,034,820	$43,561,242	$99,596,062
Price per Fuel Unit /a/	$0.21469	$0.00073	
Average Annual Residential Bill Impact /b/	$23.61	$6.30	
Average Monthly Residential Bill Impact	$1.97	$0.53	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf..
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 13C
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $120 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$67,241,784	$52,273,491	$119,515,275
Price per Fuel Unit /a/	$0.25763	$0.00088	
Average Annual Residential Bill Impact /b/	$28.34	$7.20	
Average Monthly Residential Bill Impact	$2.36	$0.60	

NOTES:

/a/ Fuel unit: electricity = Kwh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 13D
CHARGE NEEDED ON MISSOURI RESIDENTIAL CONSUMPTION
TO GENERATE $160 MILLION

	Natural Gas	Electricity	Total
Total Dollars	$89,655,712	$69,697,988	$159,353,700
Price per Fuel Unit /a/	$0.34351	$0.00117	
Average Annual Residential Bill Impact /b/	$37.79	$9.90	
Average Monthly Residential Bill Impact	$3.15	$0.83	

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 14A
CHARGE NEEDED ON MISSOURI ELECTRIC CONSUMPTION
TO GENERATE $80 MILLION

	All Classes	Residential Only
Total Dollars	$79,676,850	$79,676,850
Price per Fuel Unit /a/	$0.00133	$0.00331
Average Annual Residential Bill Impact /b/	$11.70	$29.70
Average Monthly Residential Bill Impact	$0.98	$2.48

NOTES:

/a/ Fuel units: electricity = kWh.
/b/ Assumed annual electric consumption: 9,000 kWh.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 14B
CHARGE NEEDED ON MISSOURI ELECTRIC CONSUMPTION
TO GENERATE $100 MILLION

	All Classes	Residential Only
Total Dollars	$99,596,063	$99,596,063
Price per Fuel Unit /a/	$0.00167	$0.00414
Average Annual Residential Bill Impact /b/	$14.40	$36.90
Average Monthly Residential Bill Impact	$1.20	$3.08

NOTES:

/a/ Fuel units: electricity = kWh.
/b/ Assumed annual electric consumption: 9,000 kWh.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 14C
CHARGE NEEDED ON MISSOURI ELECTRIC CONSUMPTION
TO GENERATE $120 MILLION

	All Classes	Residential Only
Total Dollars	$119,515,275	$119,515,275
Price per Fuel Unit /a/	$0.00200	$0.00497
Average Annual Residential Bill Impact /b/	$18.00	$44.10
Average Monthly Residential Bill Impact	$1.50	$3.68

NOTES:

/a/ Fuel units: electricity = kWh.
/b/ Assumed annual electric consumption: 9,000 kWh.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 14D
CHARGE NEEDED ON MISSOURI ELECTRIC CONSUMPTION
TO GENERATE $160 MILLION

	All Classes	Residential Only
Total Dollars	$159,353,700	$159,353,700
Price per Fuel Unit /a/	$0.00267	$0.00662
Average Annual Residential Bill Impact /b/	$23.40	$59.40
Average Monthly Residential Bill Impact	$1.95	$4.95

NOTES:

/a/ Fuel units: electricity = kWh.
/b/ Assumed annual electric consumption: 9,000 kWh.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 14E
CHARGE NEEDED ON MISSOURI ELECTRIC CONSUMPTION
TO GENERATE $40 MILLION

	All Classes	Residential Only
Total Dollars	$39,838,425	$39,838,425
Price per Fuel Unit /a/	$0.00067	$0.00166
Average Annual Residential Bill Impact /b/	$5.40	$14.40
Average Monthly Residential Bill Impact	$0.45	$1.20

NOTES:

/a/ Fuel units: electricity = kWh.
/b/ Assumed annual electric consumption: 9,000 kWh.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 15A
CHARGE NEEDED ON ALL RESIDENTIAL CONSUMPTION IN MISSOURI
TO GENERATE $80 MILLION

	Natural Gas	Electric	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$42,975,309	$28,615,352	$731,940	$34,854	$7,319,396	$79,676,850
Price per Fuel Unit /a/	$0.34939	$0.00119	$0.04937	$0.03458	$0.03020	
Average Annual Residential Bill Impact /b/	$38.42	$9.90				
Average Monthly Residential Bill Impact	$3.20	$0.83				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 15B
CHARGE NEEDED ON ALL RESIDENTIAL CONSUMPTION IN MISSOURI
TO GENERATE $100 MILLION

	Natural Gas	Electric	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$53,719,136	$35,769,190	$914,924	$43,568	$9,149,245	$99,596,063
Price per Fuel Unit /a/	$0.43674	$0.00149	$0.06171	$0.04322	$0.03775	
Average Annual Residential Bill Impact /b/	$48.04	$12.60				
Average Monthly Residential Bill Impact	$4.00	$1.05				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 15C
CHARGE NEEDED ON ALL RESIDENTIAL CONSUMPTION IN MISSOURI
TO GENERATE $120 MILLION

	Natural Gas	Electric	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$64,462,963	$42,923,027	$1,097,909	$52,281	$10,979,094	$119,515,275
Price per Fuel Unit /a/	$0.52409	$0.00178	$0.07403	$0.05187	$0.04530	
Average Annual Residential Bill Impact /b/	$57.64	$15.30				
Average Monthly Residential Bill Impact	$4.80	$1.28				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 15D
CHARGE NEEDED ON ALL RESIDENTIAL CONSUMPTION IN MISSOURI
TO GENERATE $160 MILLION

	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$85,950,618	$57,230,703	$1,463,879	$69,709	$14,638,791	$159,353,700
Price per Fuel Unit /a/	$0.69879	$0.00238	$0.09874	$0.06916	$0.06040	
Average Annual Residential Bill Impact /b/	$76.86	$20.70				
Average Monthly Residential Bill Impact	$6.41	$1.73				

NOTES:

/a/ Fuel unit: electricity = kWh, natural gas = mcf, fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 16A
CHARGE NEEDED ON ALL CUSTOMER CLASS CONSUMPTION IN MISSOURI
TO GENERATE $80 MILLION

	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$39,469,202	$30,683,198	$4,430,678	$45,211	$5,048,582	$79,626,850
Price per Fuel Unit /a/	$0.15122	$0.00051	$0.02098	$0.02243	$0.01306	
Average Annual Residential Bill Impact /b/	$16.63	$4.50				
Average Monthly Residential Bill Impact	$1.39	$0.38				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 16B
CHARGE NEEDED ON ALL CUSTOMER CLASS CONSUMPTION IN MISSOURI
TO GENERATE $100 MILLION

	Natural Gas	Electricity	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$49,305,542	$38,329,929	$5,534,872	$56,478	$6,306,742	$99,533,563
Price per Fuel Unit /a/	$0.18891	$0.00064	$0.02620	$0.02802	$0.01631	
Average Annual Residential Bill Impact /b/	$20.78	$5.40				
Average Monthly Residential Bill Impact	$1.73	$0.45				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 16C
CHARGE NEEDED ON ALL CUSTOMER CLASS CONSUMPTION IN MISSOURI
TO GENERATE $120 MILLION

	Natural Gas	Electric	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$59,166,650	$45,995,914	$6,641,846	$67,774	$7,568,090	$119,440,275
Price per Fuel Unit /a/	$0.22669	$0.00077	$0.03145	$0.03362	$0.01958	
Average Annual Residential Bill Impact /b/	$24.93	$6.30				
Average Monthly Residential Bill Impact	$2.08	$0.53				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 16D
CHARGE NEEDED ON ALL CUSTOMER CLASS CONSUMPTION IN MISSOURI
TO GENERATE $160 MILLION

	Natural Gas	Electric	Fuel Oil	Kerosene	LPG	Total
Total Dollars	$78,938,404	$61,366,396	$8,861,356	$90,422	$10,097,123	$159,353,700
Price per Fuel Unit /a/	$0.30245	$0.00103	$0.01495	$0.04485	$0.02612	
Average Annual Residential Bill Impact /b/	$33.26	$9.00				
Average Monthly Residential Bill Impact	$2.77	$0.75				

NOTES:

/a/ Fuel unit: electricity = kWh. natural gas = mcf. fuel oil, kerosene, LPG = gallons.
/b/ Assumed annual electric consumption: 9,000 kWh. Assumed annual natural gas consumption: 1,100 therms.

APPENDIX A:
MISSOURI DISTRIBUTION FEE DATA AND TABLES

TABLE 17
NUMBER OF LOW-INCOME HOUSEHOLDS IN MISSOURI
AT DIFFERENT MEASURES OF "LOW-INCOME"

Number of Families					
Percent of federal Poverty Level /a/			Percent of Median Income /b/		
0 - 100%	0 - 150%	0 - 200%	0 - 30%	0 - 50%	0 - 80%
254,052	531,809	630,233	237,752	464,629	813,121

APPENDIX B:
SUMMARY OF FUNDRAISING INITIATIVES DISCUSSED IN
FUNDING FUEL ASSISTANCE: STATE AND LOCAL STRATEGIES TO HELP PAY LOW-INCOME HOME ENERGY BILLS

Table of Program Suggestions

1. Utility bill checkoffs for fuel funds
2. Electronic funds transfer (EFT) billing
3. Early payment agreements
4. Contributions of utility refunds
5. Recapture of unclaimed deposits
6. Recapture of unclaimed utility refunds
7. Ratepayer assistance trust fund
8. Franchise fees--rental payments
9. Rate discounts
10. "One Church--One Family"
11. Contributions in lieu of taxes
12. Universal Service Fund
13. Earned Income Tax Credit promotion
14. State Earned Income Tax Credit

APPENDIX B:
SUMMARY OF FUNDRAISING INITIATIVES DISCUSSED IN *FUNDING FUEL ASSISTANCE: STATE AND LOCAL STRATEGIES TO HELP PAY LOW-INCOME HOME ENERGY BILLS*

15. Promotion of circuit breaker property tax relief
16. State tax credits
17. Sales tax relief on home energy
18. Title IV-A: Emergency Assistance/Special Needs
19. Utility allowances in assisted housing: annual
20. Utility allowances in assisted housing: monthly
21. Bulk fuels: cash prices
22. Bulk fuels: across-the-board discount
23. Bulk fuels: margin over rack program
24. Bulk fuels: summer fill program
25. Bulk fuels: winter shutoff protections

APPENDIX C:
SUMMARY OF RECOMMENDATIONS
STRUCTURE OF DISTRIBUTION FEE IN MISSOURI

1. A DISTRIBUTION FEE SHOULD FUND THREE INITIATIVES.

   a. Low-income cash fuel assistance.

   b. Low-income energy efficiency assistance.

   c. Non-low-income energy efficiency, including investments in distributed technologies such as solar space and water heating.

2. WHO PAYS FOR THE DISTRIBUTION FEE.

   a. All customer classes (residential, industrial, commercial) should pay the distribution fee.

   b. The "distribution fee" should be imposed on all fuel sources.

      i. Natural gas, electricity, propane, fuel oil, propane.

      ii. The responsibility should be apportioned in proportion to usage of each fuel.

3. THE VALUE OF A DISTRIBUTION FEE SHOULD CONSIDER THREE FACTORS.

   a. A "distribution fee" should include a component for both:

      i. Low-income fuel assistance

         (1) Define who is poor;

         (2) Determine percent who will participate;

         (3) Targeting assistance: affordable percentage of income.

      ii. Non-low-income energy efficiency, including solar investments.

         (1) Exhaust the institutional capacity;

         (2) Eliminate lost opportunities.

b. A "distribution fee" should fund assistance directed toward total home energy bills, including non-heat electric, not simply home heating.

c. There should be an administrative dollar cap.

4. HOW TO MAKE THE DISTRIBUTION FEE NON-BYPASSABLE.

a. The distribution fee should be imposed "at the meter," not at the provider level.

b. The charge should be calculated on a per Btu basis.

i. Not a flat percentage basis.

ii. Not on a flat per customer basis.

5. MISCELLANEOUS "OTHER" ISSUES.

a. There should be a state-funded leveraging incentive fund.

i. Akin to federal LIHEAP leveraging incentive fund.