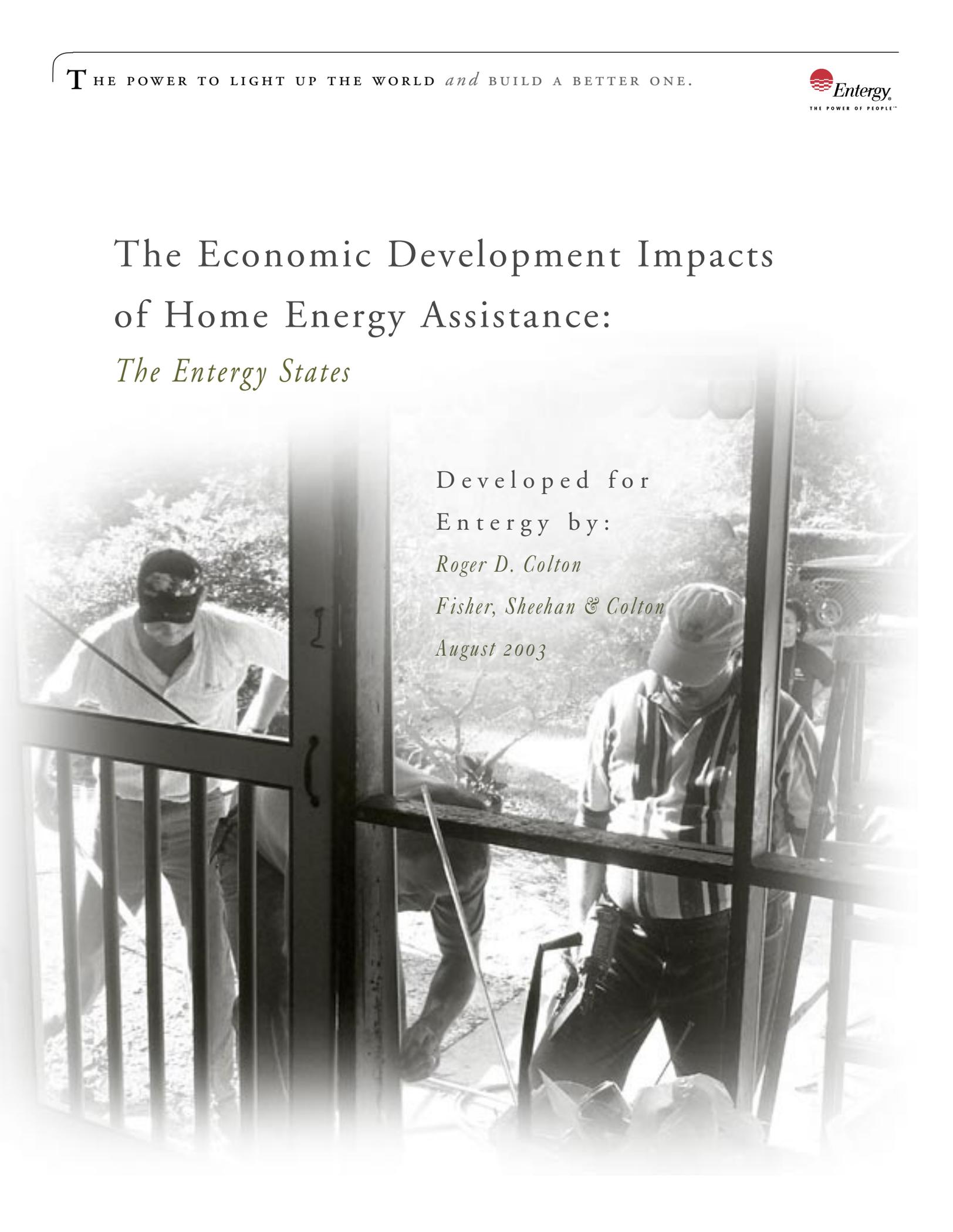


The Economic Development Impacts of Home Energy Assistance:

The Entergy States



Developed for

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Contents

<u>EXECUTIVE SUMMARY</u>	<u>ES - i</u>
<u>CHAPTER ONE- Introduction</u>	<u>1</u>
<u>Energy and Weatherization in the Entergy States</u>	<u>1</u>
<u>Defining the Economic Impacts of Energy Assistance</u>	<u>3</u>
<u>CHAPTER TWO - The Economic Development Impacts of Cash Energy Assistance</u>	<u>5</u>
<u>The Benefit Impacts of Cash Energy Assistance</u>	<u>5</u>
<u>The Payment Impacts of Cash Energy Assistance</u>	<u>6</u>
<u>Changes in Payment Patterns</u>	<u>7</u>
<u>Household Level Impacts of Improved Payment Patterns</u>	<u>9</u>
<u>Statewide Impacts of Improved Payment Patterns</u>	<u>11</u>
<u>Summary of Payment Impacts</u>	<u>12</u>
<u>The Behavior Impacts of Cash Energy Assistance</u>	<u>13</u>
<u>Changes in Behavior Patterns</u>	<u>13</u>
<u>Household Level Impacts of Changed Behavior Patterns</u>	<u>15</u>
<u>Statewide Impacts of Changed Behavior Patterns</u>	<u>15</u>
<u>Summary of Behavior Impacts</u>	<u>16</u>
<u>Summary of Cash Assistance Economic Development Impacts</u>	<u>17</u>
<u>CHAPTER THREE - The Economic Development Impacts of Weatherization Assistance</u>	<u>18</u>
<u>The Benefit Impacts of Weatherization Assistance</u>	<u>18</u>
<u>The Payment Impacts of Weatherization Assistance</u>	<u>20</u>
<u>Process Issues with Quantifying Payment and Behavior Impacts</u>	<u>21</u>
<u>Quantifying the Weatherization Impacts</u>	<u>22</u>
<u>Summary of Payment Impacts</u>	<u>23</u>
<u>The Behavior Impacts of Weatherization Assistance</u>	<u>24</u>
<u>Summary of Behavior Impacts</u>	<u>25</u>
<u>Summary of Weatherization Assistance Economic Development Impacts</u>	<u>27</u>
<u>CHAPTER FOUR - The Particular Economic Development Benefits to the</u>	
<u>Low-Income Community</u>	<u>28</u>

On the Cover: Entergy employees volunteer their weekends to help senior citizens with safety and energy efficiency improvements.

Executive Summary

The delivery of low-income home energy assistance in the states served by Entergy operating companies provides a wide range of economic benefits to those states. Frequently thought of exclusively as a way to prevent unpaid utility bills, and to preserve service against termination for nonpayment, in fact, low-income energy assistance can also be viewed as a strategy to promote economic development and employment (particularly in low-income communities). The economic impacts that low-income energy assistance provides to the Entergy states are quantified below. For purposes of this analysis, the Entergy states include Arkansas, Louisiana, Mississippi and Texas. The Entergy jurisdictions within these states cannot be isolated. As a result, each of the states will be viewed as a single entity.

The economic impact of energy assistance extends well beyond the dollars of benefits that are distributed to low-income households. Energy assistance benefits induce economic activity in three aspects of a state's economy, each of which can be separately assessed. The three areas include:

- **Earnings**
As energy assistance recipients spend the benefits they receive, the institutions providing the goods and services being purchased will, in turn, hire employees (and thus pay wages), as well as buy goods and services (which require those suppliers to hire employees). The additional wages that are paid to employees as a result of these ripple effects are captured in the “earnings” component of the induced economic impact.
- **Employment**
As energy assistance increases economic activity in the Entergy states, more workers are required to produce and deliver the goods and services comprising that activity. As with the underlying economic output, the employment impacts of energy assistance include not only those jobs that are directly created as a result of the delivery of energy assistance (e.g., outreach workers, secretarial support), but the jobs that are indirectly supported as well. Indirect job creation occurs when, for example, the LIHEAP outreach worker (the direct job) buys groceries with the grocer hiring staff; that grocery staff then buys clothing with the clothing store hiring staff.
- **Economic activity**
The total activity created by the consumption of goods and services includes the complete addition to gross domestic product (GDP) resulting from energy assistance. As with earnings and employment, the total activity is captured through a “multiplier analysis” that considers not only the direct activity created, but considers the additional activity that is induced by that direct activity as well.

The distribution of energy assistance first creates economic activity for the Entergy states through the direct delivery of benefit dollars. In addition to the dollars of cash benefits, however, the delivery of energy assistance will also free up household dollars that would have been devoted to the costs arising from the payment and behavior consequences of energy bill unaffordability. These dollars,

too, can then instead be spent (and circulated) in the local economy. The full range of activity added to the economies of the Entergy states as a result of energy assistance, therefore, includes three distinct types of economic impacts:

- **The benefit impacts**
The benefit impacts of energy assistance are those impacts associated with the distribution of the energy assistance dollars themselves. If \$1.0 million in LIHEAP assistance is distributed in Arkansas, in other words, that \$1.0 multiplies throughout the economy creating more than \$1.0 million in economic activity.
- **The payment impacts**
The payment impacts of energy assistance are those economic benefits that arise from changes in payment practices of low-income customers attributable to the distribution of energy assistance benefits. If \$1.0 million in LIHEAP assistance helps 100 customers avoid utility shutoffs, in other words, and thus helps those customers avoid the need to miss a day of work (and thus a day of wages) to have their service reconnected, the wages that are preserved for those customers ($\$8.63/\text{hour} \times 8 \text{ hours per household} \times 100 \text{ households} = \$6,904 \text{ total}$) will remain in the economy and multiply into more than \$6,904 in economic activity.
- **The behavior impacts**
The behavior impacts of energy assistance are those economic benefits that arise from a change in behavior patterns of low-income customers attributable to the distribution of energy assistance benefits. If \$1.0 million in LIHEAP assistance helps 100 customers avoid the need to relocate in their search for more affordable energy bills, and miss 32 hours of work in the process of relocation, the wages that are preserved for those customers ($\$8.63/\text{hour} \times 32 \text{ hours per household} \times 100 \text{ households} = \$27,616 \text{ total}$), will remain in the economy and multiply into more than \$27,616 in economic activity.

While the discussion of the economic impacts of energy assistance looks at economic benefits on a statewide basis, in fact, the economic impacts provide particular advantage to low-income communities. Existing research indicates that low-income households tend to shop at local retail establishments. For food in particular, low-income households tend to shop at small, local food stores. Moreover, not only are low-income *households* more likely to shop locally, but the *businesses* serving low-income households are more likely to shop locally as well. It is clear, therefore, that not only will the provision of energy assistance provide income and employment to low-income households, but the earnings and employment that are delivered to such households will likely be spent, retained and recirculated within the low-income community as well.

The delivery of energy assistance in the four Entergy states accomplishes far more for those states than simply helping low-income residents avoid arrears on home energy bills and preventing the potential loss of home energy service due to nonpayment. The delivery of home energy assistance also serves as a substantial economic stimulant for the economies of the Entergy states. Energy assistance creates economic activity, generates additional earnings, and supports jobs.

Total Economic Impact: Entergy States	Impact on the Economy from		
	Low-Income Fuel Assistance		
	Output	Earnings	Jobs
Benefit impacts	\$175,404,168	\$57,787,802	4,014
Payment impacts	\$76,702,627	\$28,626,505	1,954
Behavior impacts	\$57,743,271	\$21,455,693	1,439
Total	\$309,850,066	\$107,870,000	7,407

After accounting for the full range of economic impacts of energy assistance, it is possible to conclude that in total, the FY2002 distribution of \$87.5 million in LIHEAP and fuel fund energy assistance in the four state region including Arkansas, Louisiana, Mississippi and Texas:

- Created nearly \$310 million in economic activity;
- Generated nearly \$110 million in added earnings for workers; and
- Supported more than 7,400 new jobs.

In addition to these impacts generated by cash fuel assistance in the Entergy states, weatherization assistance generates economic development benefits as well. The delivery of weatherization assistance in the four Entergy states also serves as a substantial economic stimulant for the economies of the Entergy states. Weatherization assistance creates economic activity, generates additional earnings, and supports jobs.

Total Economic Impact: Entergy States	Impact on the Economy from		
	Low-Income Weatherization Assistance		
	Output	Earnings	Jobs
Benefit impacts	\$71,132,370	\$45,801,718	2,756
Payment impacts	\$4,921,706	\$1,796,669	114
Behavior impacts	\$19,540,124	\$7,125,546	449
Total	\$95,594,200	\$54,723,933	3,319

As can be seen, in total, the FY2002 distribution of weatherization assistance in the four state region including Arkansas, Louisiana, Mississippi and Texas:

- Created nearly \$96 million in economic activity;
- Generated nearly \$55 million in added earnings for workers; and
- Supported more than 3,300 new jobs in the four Entergy states.

Chapter One - Introduction

The delivery of low-income home energy assistance in the states served by Entergy operating companies provides a wide range of economic benefits to those states. Frequently thought of exclusively as a way to prevent unpaid utility bills,¹ and to preserve service against termination for nonpayment, in fact, low-income energy assistance can also be viewed as a strategy to promote economic development and employment (particularly in low-income communities). The financial and economic impacts that low-income energy assistance provides to the Entergy states are quantified below.

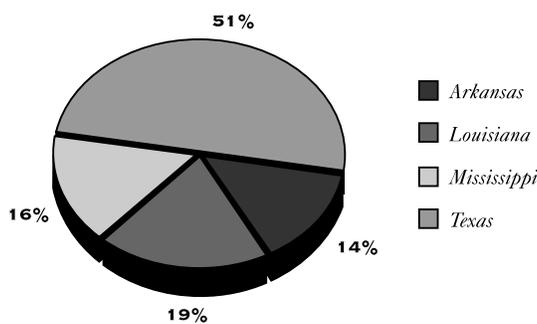
For purposes of this analysis, the Entergy states include Arkansas, Louisiana, Mississippi and Texas. The Entergy jurisdictions within these states cannot be isolated. As a result, each of the states will be viewed as a single entity.

Energy and Weatherization Assistance in the Entergy States

Low-income energy assistance in the Entergy states is provided primarily through the federal Low-Income Home Energy Assistance Program (LIHEAP) and through private fuel funds. While other sources of public and private energy assistance may exist in the Entergy states, LIHEAP and fuel funds provide the bulk of cash assistance to help pay home energy bills.

In FY2003,² the federal LIHEAP program distributed \$79.8 million in the four Entergy states.³ According to data provided by the national LIHEAP clearinghouse, \$53 million (66.5%) of these funds was spent on cash assistance, including home heating assistance, home cooling assistance and crisis assistance.⁴ In addition, LIHEAP spent \$9.35 million on weatherization services. LIHEAP programs devoted \$13.1 million to administrative services, such as outreach, program administration, financial literacy training, and the like.

FY 2003 ENERGY ASSISTANCE DISTRIBUTION (BY STATE)



In addition to these federal fuel assistance dollars, LIHEAP leveraging reports filed with the federal government⁵ report that the four Entergy states generated \$7.740 in fuel fund contributions. Detailed data on the uses of these funds is not available. Based on broad national experience, 7% of these funds are assumed to be used for program administrative purposes in this analysis. These fuel fund dollars are used almost exclusively as shutoff prevention funds.

The LIHEAP program provided more than 260,000 total households with cash assistance in the four Entergy states.⁶ These cash benefits might take the form of home heating assistance, home cooling assistance, or crisis assistance.

The four state programs have different income eligibility criteria. While the states of Louisiana

¹ Throughout this analysis, “utility bills” will be deemed also to include, unless otherwise explicitly noted, bills for bulk fuels such as fuel oil and propane as well.

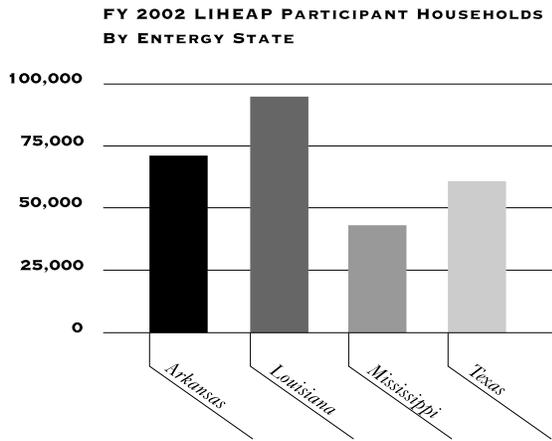
² For the program year October 1, 2002 through September 30, 2003.

³ Arkansas: \$11,538,907. Louisiana: \$15,460,066. Mississippi: \$12,943,222. Texas: \$39,807,774. Because contingency funds are released in response to specific emergency situations, they are not included in this analysis.

⁴ Arkansas: \$6,577,177. Louisiana: \$11,598,140. Mississippi: \$7,377,637. Texas: \$27,467,364.

⁵ “Leveraged” dollars are those sources of non-federal dollars that are generated to supplement the federal fuel assistance dollars. State LIHEAP offices are required annually to report on the leveraged resources in their respective states.

⁶ Arkansas: 70,000. Louisiana: 92,100. Mississippi: 40,000. Texas: 61,705.



and Mississippi both provide benefits to households with incomes at or below 150% of the Federal Poverty Level, Arkansas and Texas both provide benefits only to households with incomes at or below 125% of the Federal Poverty Level. In 2002, 100% of the Federal Poverty Level for a household of three persons was \$15,020.

In addition to this cash assistance, various public programs fund weatherization assistance in the Energy states.⁷ Three primary sources of funding exist to support weatherization activities:

- The U.S. Department of Energy’s Weatherization Assistance Program (DOE WAP);
- Transfers from the Low-Income Home Energy Assistance Program (LIHEAP); and
- Petroleum overcharge funds.

According to the National Association for State Community Services Programs (NASCS), in FY2002, the following numbers of housing units were weatherized using these sources of funds in the Energy states:

FY2002 Estimated Weatherization Production In the Four Energy States	
State	Units of Weatherization Production
Arkansas	1,361
Louisiana	383
Mississippi	647
Texas	4,256

National Association of State Community Services Programs, U.S. Department of Energy Weatherization Assistance Program, Funding Survey for Program Year 2002, at 6, NASCSP: Washington D.C.

The economic impacts of the energy assistance and weatherization assistance programs in the four Energy states are examined separately as follows.

⁷ Privately funded weatherization programs, such as those funded with utility dollars or system benefit charge funds, are not included in this analysis.

Defining the Economic Impacts of Energy Assistance

The distribution of energy assistance adds dollars of direct economic activity to the economies of the four states served by Entergy. In FY2003, the combined LIHEAP/Fuel Fund cash benefit distribution⁸ will add nearly \$61 million directly to the economy through the payment of cash assistance.⁹ In addition, the combined LIHEAP/Fuel Funds assistance programs added nearly \$13.7 million in economic output through their administrative services.¹⁰

The Combined Expenditures of LIHEAP and Fuel Funds By Cash Assistance and Administrative Dollars In the Four Entergy States

	Cash Assistance	Administrative Expenditures
LIHEAP	\$53,020,318	\$13,130,855
Fuel Funds	\$7,740,272	\$541,819
Combined	\$60,760,590	\$13,672,675

The *complete* economic impact of energy and weatherization assistance, however, extends well beyond these direct impacts. Energy assistance benefits induce economic activity in three aspects of a state's economy, each of which can be separately assessed. The three areas include:

Earnings

As energy assistance recipients spend the benefits they receive, the institutions providing the goods and services being purchased will, in turn, hire employees (and thus pay wages), as well as buy goods and services (which require *those* suppliers to hire employees). The additional wages that are paid to employees as a result of these ripple effects are captured in the “earnings” component of the induced economic impact. These impacts are measured in terms of additional earnings paid to households for each dollar of output directly added to the economy. Given a hypothetical earnings multiplier of 0.72, for example – actual earnings multipliers are discussed below -- each one million dollars (\$1,000,000) of energy assistance would create \$720,000 in earnings in the economies of the states served by Entergy.

Employment

As energy assistance increases economic activity in the Entergy states, more workers are required to produce and deliver the goods and services comprising that activity. As with the underlying economic output, the employment impacts of energy assistance include not only those jobs that are directly created as a result of the delivery of energy assistance, but the jobs that are indirectly supported as well. Indirect job creation occurs as the directly-created employees, in turn, spend their incomes and consume additional goods and services. The employment impacts are measured in terms of the number of jobs that are created per \$1.0 million in direct economic activity. Given a hypothetical employment multiplier

⁸ For purposes of this analysis, the FY2003 fuel fund distributions are assumed to be the same as those dollars appearing on the FY2002 LIHEAP leveraging reports for the respective states.

⁹ \$53 million in LIHEAP benefits and \$7.7 million in fuel fund benefits.

¹⁰ Again, “administrative activities” are defined to include non-cash services, including outreach, budget counseling, financial literacy training, and the like. Weatherization services are excluded.

of 12.3, for example, each one million dollars of energy assistance delivered in Arkansas supports 12.3 new jobs in the Arkansas economy. Actual employment multipliers are discussed below.

Economic activity

The total activity created by the consumption of goods and services includes the complete addition to gross domestic product (GDP) resulting from energy assistance. As with earnings and employment, the total activity is captured through a “multiplier analysis” that considers not only the direct activity created, but considers the additional activity that is induced by that direct activity as well. The economic activity is measured in terms of dollars of economic output created by each dollar of direct expenditure. Given a hypothetical economic multiplier of 1.60, for example, each one dollar (\$) of energy assistance benefits would create \$1.60 of total economic activity.¹¹

The multiplier data that is used in the analysis below was obtained for each of the four Energy states from the Bureau of Economic Analysis of the U.S. Department of Commerce.

¹¹ A comprehensive review of the total net economic impacts would need to assess not only the impacts of the fuel assistance expenditures, but consider also the offsetting impacts of the expenditures that this money would have been spent on had it not been spent on fuel assistance. This analysis does not consider these net impacts, but rather only the gross impacts of fuel assistance. Considering gross impacts is widely accepted as an appropriate analysis of the economic impacts of designated expenditures. See, e.g., Skip Laitner and Michael Sheehan (1995). “Environment and Jobs: The Employment Impact of Federal Environmental Investments”, National Commission for Employment Policy: Washington D.C.; Kathleen Stoll (January 2003). “Medicaid: Good Medicine for California’s Economy,” Families USA: Washington D.C.; Center for Community Change (2001). “Home Sweet Home: Why America Needs a National Housing Trust,” Center for Community Change: Washington D.C.; Colorado Business Committee for the Arts (October 2002). “Culture Counts: The Economic and Culture Impact of Metro Denver Culture,” Colorado Business Committee for the Arts: Denver (CO).

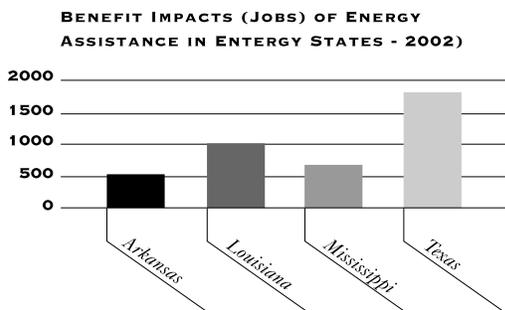
Chapter Two - The Economic Development Impacts of Cash Energy Assistance

The distribution of energy assistance first creates economic activity for the Entergy states through the direct delivery of benefit dollars. In addition to the dollars of cash benefits, however, the delivery of energy assistance will also free up household dollars that would have been devoted to the costs arising from the payment and behavior consequences of energy bill unaffordability. These dollars, too, can then instead be spent (and circulated) in the local economy.

The full range of activity added to the economies of the Entergy states as a result of energy assistance includes three distinct types of economic impacts:

- The benefit impacts;
- The payment impacts; and
- The behavior impacts.

The Benefit Impacts of Cash Energy Assistance



The benefit impacts of energy assistance are those impacts associated with the distribution of the energy assistance dollars themselves. These impacts arise irrespective of whether the dollars of benefits have any impact on customer payment practices or behavior patterns. This analysis separately considers those energy assistance dollars distributed as benefits to customers and those dollars used for services.¹²

In total, the distribution of energy assistance in the Entergy states (along with the attendant expenditures on services) created \$175 million in economic activity, generated \$57.8 million in increased earnings, and supported 4,014 jobs. The payment impacts and behavior impacts are in addition to these benefit impacts.

These benefits arise because, to the extent that the LIHEAP program provides energy assistance to low-income households, those benefits free up funds to buy other household necessities.¹³ Household expenditures arising as a result of the distribution of energy assistance are assumed to follow the same expenditure patterns that low-income consumers¹⁴ exhibit with respect to other variable household expenditures.¹⁵ These additional household expenditures will occur in the retail trade sector of the economy. The distribution of energy assistance dollars will increase total economic activity in the Entergy states, increase total employee earnings, and create additional jobs.

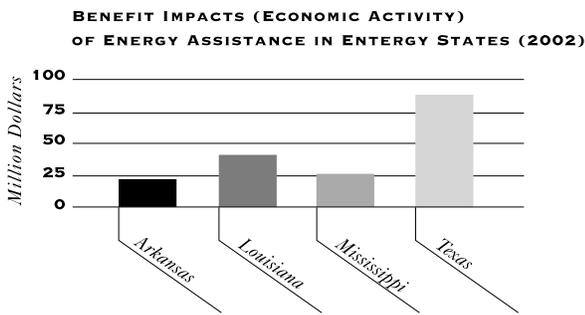
Through this multiplier effect, not only does energy assistance support the creation of jobs in the economies of the Entergy states, but it creates economic activity that far exceeds the number of

¹² Throughout this discussion, “services” will refer not only to administration of the program, but to services such as outreach, budget counseling and the like.

¹³ Energy assistance benefits, in other words, are not used to pay for increased energy consumption.

¹⁴ In assessing patterns of low-income consumer expenditures, two different definitions of “low-income” were considered. First, households with incomes of between \$10,000 and \$15,000 were examined. Second, households with incomes in the lowest quintile of income were considered. Consumer expenditures patterns were considered based on information from the U.S. Department of Labor’s Consumer Expenditure Survey.

¹⁵ Some expenditures will not change as a result of the receipt of LIHEAP. Household expenditures on shelter, new car expenses, insurance, and other fixed household costs are considered not to be variable expenditures.



dollars distributed as direct benefits. The distribution of LIHEAP benefits in the four Entergy states multiplies into more than \$175 million in economic activity.

Energy assistance provided \$60.8 million in cash assistance to households in Arkansas, Louisiana, Mississippi and Texas in FY2002. In addition to the dollars of cash benefits distributed, energy assistance contributed to economic output in the state not only through its own administrative and outreach activities, but through other services which it provided in addition to cash assistance.

LIHEAP and fuel funds spent \$13.7 million on these administrative activities and other services.

The breakdown of the economic benefits generated for each state, solely from the distribution of this cash assistance (and the associated services) is presented in the table below:

Energy Assistance	Added Economic Output	Added Earnings	Added Jobs
Arkansas	\$20,775,372	\$7,371,515	544
Louisiana	\$41,159,455	\$14,414,171	1,015
Mississippi	\$25,862,761	\$8,759,240	685
Texas	\$87,606,580	\$27,242,876	1,771
Total	\$175,404,168	\$57,787,802	4,014

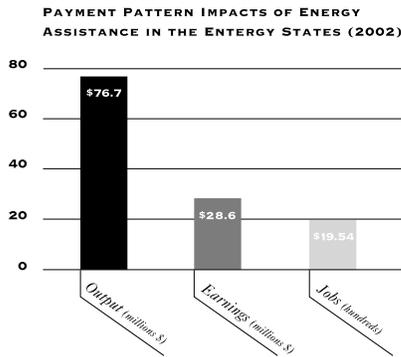
The Payment Impacts Of Cash Energy Assistance

The payment impacts of energy assistance in the Entergy states are those economic benefits that arise from changes in payment practices of low-income customers attributable to the distribution of energy assistance benefits. These changes will, in turn, have dollar consequences to the customers that will ramify throughout the economies of the Entergy states.

The impacts that household earnings have on a regional economy are not based on the earnings *received* by the household, but rather upon earnings *spent* by the household. To the extent that energy assistance can change the level of household expenditures through modifications in utility payment patterns, the local economy will be enhanced. The benefit impacts, as well as the behavior impacts discussed in other parts of this analysis, are in addition to these payment impacts.

Providing energy assistance to low-income customers helps those customers change payment patterns and practices that cost the household money. Through these payment practice changes, energy assistance will generate \$76.7million in economic activity, create \$28.6 million in earnings, and support 1,954 jobs.

By helping low-income residents change their prior payment practices, the energy assistance frees up household income to be spent (and circulated) within the local economy. As with the household income spent in response to the receipt of energy assistance, these dollars of expenditures are assumed



to reflect the overall expenditure patterns of low-income residents of the four Entergy states. The expenditures will occur in the retail trade sector of the economy and will ramify throughout the economy.

Changes in Payment Patterns

Two changes in payment practices are considered in this analysis:

- Reductions in the extent to which energy assistance recipients carry arrears; and
- Reductions in the extent to which energy assistance recipients are subject to service terminations.

Consideration of the economic impact of changes in payment patterns will focus exclusively on customers that use natural gas or electricity as their primary heating source. While it is reasonable to expect changes to occur in the payment practices of bulk fuel customers as well, the extent of changes within that population of customers is not as well documented. Nor can the financial consequences of nonpayment (and of service terminations) be as easily generalized. Energy assistance participants are assumed to be in proportion to the percentage of primary fuel users in the population as a whole. Roughly 90% of all customers in the Entergy states use either electricity or natural gas as their primary heating fuel.

Neither the LIHEAP programs nor the energy providers in the Entergy states collect and maintain data on the incidence or the extent of arrearages and/or service terminations among energy assistance recipients. Estimates based on other reliable data thus underlie this analysis.

Changes in arrears

The distribution of energy assistance reduces the amount of arrears carried by low-income customers. Unfortunately, systematic information on the arrears of low-income customers is not collected on a state level basis. It is, therefore, not possible to directly measure the extent to which energy assistance reduces arrears.

We can develop a starting point, however, by determining the extent of arrears in the *absence* of fuel assistance. National data published by the U.S. Census Bureau reports 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.¹⁶ Information from various states corroborates this national data. While one 1998 Illinois report indicated that 44.5% of low-income natural gas customers were in arrears,¹⁷ an analysis by the staff of the New Hampshire Public Utilities Commission estimated that roughly 35% of the low-income *electric* customers entering that state's Electric Assistance Program (EAP) entered the program with arrears.¹⁸ After an extensive empirical review, the Pennsylvania Public Utilities Commission estimated that 40% of all low-income

¹⁶ U.S. Census Bureau, "Extended Measures of Well-Being: 1992," P70-50RV (November 1995).

¹⁷ Department of Energy and Community Affairs, "Residential Energy Costs and Assistance in Illinois: The 1997 - 98 Winter," at 6, Springfield (IL).

¹⁸ Colton, R. (2002). "Payment-Problems, Income Status, Weather and Prices: Costs and Savings of a Capped Bill Program," at 4, Fisher, Sheehan & Colton: Belmont (MA).

gas and electric customers are in arrears at any given time.¹⁹

Using this data to bracket a range of expected arrears (33% on the low end and 45% on the high end), the analysis below estimates that 40% of LIHEAP recipients in the Entergy states will use their LIHEAP dollars to help retire arrears.

While it is unreasonable to expect fuel assistance payments to reduce the incidence of low-income arrears to zero, it is reasonable to expect fuel assistance payments to reduce the incidence of low-income accounts in arrears. Estimating the impact of LIHEAP in the Entergy states is based on other energy assistance programs in the country.

A reduction in the incidence of arrears from 40% to 20% is used in this analysis. This reduction falls within the mid-range of reductions found in similar programs around the country.

Pennsylvania's experience with its energy assistance programs²⁰ indicates that a reduction in the incidence of arrears to 20% of the total population – a 50% reduction in the 40% incidence of arrears identified above – is a reasonable expectation. Other information supports this conclusion as well. According to the Columbia Gas (Ohio) evaluation of its income-based Customer Assistance Program (CAP),²¹ CAP customers had 53% fewer *new* payment agreements and 67% fewer credit hold requests.

In addition, the Columbia Gas (OH) impact evaluation found that, for CAP customers, cancellation of payment plans was reduced by 69% and termination notices declined by 48%. Similarly, the Clark County (Washington) Public Utility District offers its low-income customers an income-based rate. According to the Clark County PUD, its discount rate reduced delinquencies for program participants from 74% to 18%. Niagara-Mohawk Power Company (New York) also offers its low-income customers a rate discount program. According to the evaluation of the Niagara-Mohawk program, program participants almost doubled the total number of payments to the utility during the post-treatment period compared to the pre-treatment period while untreated low-income customers “actually decreased the number of payments made.”²²

A reduction in the incidence of arrears from 40% to 20% amongst LIHEAP recipients is the basis for this economic analysis. This reduction falls within the mid-range of reductions found by similar programs in other parts of the country.

Changes in service terminations

In addition to a reduction in the incidence of arrears, the distribution of fuel assistance funds will reduce the incidence of service terminations due to nonpayment as well. This will occur first because the rate at which customers in arrears ultimately have their service terminated will be reduced. In addition, the number of customers to which that termination rate applies will be reduced as well.

According to the Census Bureau, while 1.8% of non-poor families had their electric and/or

¹⁹ Bureau of Consumer Services (1992). “Final Report on the Investigation into the Control of Uncollectible Balances,” at 33 - 34, Docket NO. I-900002, Pennsylvania Public Utilities Commission: Harrisburg (PA).

²⁰ The Pennsylvania Customer Assistance Programs (CAPs) involve rate discounts reducing bills to an affordable percentage of income. According to the Bureau of Consumer Services (Pennsylvania Public Utilities Commission) (BCS), on average, 82% of all program participants statewide make full and timely payments each month.

²¹ Ramos, K. *et al.* (November 1996). “Final Pilot Evaluation, Columbia Gas (PA) Customer Assistance Program (CAP),” at 13, A&C Enercon: Columbus (OH).

²² Harrigan, M. (1992). “Evaluating the Benefits of Comprehensive Energy Management for Low-Income, Payment-Troubled Customers,” at 47 - 48, Alliance to Save Energy: Washington D.C.

natural gas service disconnected for nonpayment, 10.5% of public assistance recipients suffered this same deprivation.²³ The Census Bureau's 10.5% figure is adopted for purposes of this analysis.

As with the overall incidence of arrears, the provision of energy assistance dramatically reduces these energy shutoffs. The Clark County PUD reports that its program reduced disconnections for program participants by 64%. The impact evaluation of the National Fuel Gas (Pennsylvania) Low-Income Rate Assistance program (LIRA) reported that the number of service disconnections decreased by "slightly over 80%."²⁴ Columbia Gas found that shutoff orders were printed 74% less often within its Customer Assistance Program (CAP). Using this data to bracket the reasonable expectations for energy

The Clark County Public Utility District reduced disconnections by 64%. National Fuel Gas reported a reduction of service disconnections by more than 80%. Columbia Gas printed shutoff orders 74% less often.

assistance recipients in the Entergy states, and adopting the low-end of the range to take into account the warm weather status of these states, results in an expected reduction in the rate of service disconnections of 65% from what would have existed without energy assistance. A reduction in the rate at which energy assistance recipients experience service disconnections due to nonpayment, from 10.5% to 3.7% (65%), is reasonable for purposes of this analysis. This reduction applies only to gas and electric customers.

In addition, much LIHEAP assistance is explicitly targeted to households in "crisis." While crisis is defined differently in different states, it is generally built around the danger of utility terminations due to nonpayment. Of the 265,000 LIHEAP recipients in the Entergy states, an estimated 30,000 will receive LIHEAP assistance as a mechanism to retire arrears in the face of an imminent termination of utility service for nonpayment.

The Household-Level Impacts of Improved Payment Patterns

Determining the economic impacts of improved payment patterns consists of two steps:

- **Determining the per-household (per customer) impact of the improved payment patterns; and**
- **Determining the incidence of the effects.**

The product of these two factors yields the total direct dollars of economic impact.²⁵ The impacts that have been identified above are limited to those impacts that will result in creating ripples of induced economic effects as well. The direct economic impacts are thus subjected to a multiplier analysis to determine the total effect on the economies of the Entergy states.

The improved payment patterns identified above provide energy assistance recipients with the opportunity to retain additional income and spend that income on household necessities rather than diverting that income to the household costs associated with nonpayment. These expenditures then ramify throughout the economies of the Entergy states.

²³ "Extended Measures of Well-Being," *supra*.

²⁴ Barakat & Chamberlin (March 1999). "National Fuel Gas (PA) Low-Income Rate Assistance (LIRA) Program," at 23, National Fuel Gas Distribution Corporation: Buffalo (NY).

²⁵ This approach is modeled on the approach for calculating Non-Energy Benefits (NEBs) introduced by Lisa Skumatz. *See e.g.*, Lisa Skumatz and Chris Ann Dickerson (1998). "Extra! Extra! Non-Energy Benefits Swamp Load Impacts for PG&E Program!," Proceedings of American Council for an Energy Efficient Economy 1998 Summer Studies Program 8.301, at 8.306, ACEEE: Washington D.C.

The discussion below considers the household impacts of payment patterns changes first.

Utility collection and reconnection fees

Energy assistance payments have been shown to reduce both the rate and number of utility service terminations.²⁶ Subsequent to the disconnection of service, a customer would be required to pay a reconnect fee along with all collection fees as a condition of service reinstatement. Preventing the service termination will also prevent the incursion of those fees for the proportion of disconnected customers reconnecting to the system. The cost of collection and reconnection is deemed to be \$75 on average.

Utility cash security deposits

One prerequisite to reinstatement of service after a service termination for nonpayment is for the customer to pay all required deposits. Pursuant to typical state public utility commission (PUC) regulations, a utility may require a deposit of two times the maximum monthly bill. A cash security deposit of \$300 would remove that amount of money from the customer's spendable income.

Wages lost to service reconnections

The reconnection of service does not "just happen" after service has been terminated for nonpayment. The actions a customer must take to find money, contact the utility, make payment arrangements, and await the physical reconnection all take time. The lost work time devoted to the reconnection of service represents lost wages to the household. Previous studies of the lost work time devoted to the reconnection of service after a disconnection have found that households lose eight hours of work time.²⁷ Each hour of lost work time is valued at the average wage for working poor households (\$8.63/hour).²⁸

Rental security deposits

Not every customer that has service disconnected for nonpayment has their service reconnected. Rather than reconnecting utility service, these customers choose to move to a new housing unit. This process of changing residences, unto itself, imposes a cost on the household. One major expense will be posting a new rental security deposit at the new location. For this analysis, the value of this new rental security deposit is set at one month of the Fair Market Rent (FMR) established by the U.S. Department of Housing and Urban Development (HUD). FMRs are set at the 40th percentile of rent and are used in calculating rental subsidies for affordable housing programs. An examination of 2002 FMRs for the four Entergy states supports a one-month rental security deposit of \$400.²⁹ Prepayment of future months of rent is not included in this figure.

Wages lost to relocation search time

More than one-in-three utility service disconnections results in the customer moving to a new housing location. Even assuming that such relocation does not result in the loss of the customer's job, the process of finding new housing and arranging for the move costs the customer time. Because low-wage workers

²⁶ Only one cycle of terminations will be affected.

²⁷ Lisa Skumatz (March 2001). "Non-Energy Benefits (NEBS): Recognizing and Measuring All Net Program Benefits," at 81, Skumatz Economic Research Associates (SERA): Superior (CO).

²⁸ Other studies of lost wages have valued lost work time at minimum wage. This approach undervalues low wage employment. Given the low incidence of minimum wage employees, it is more appropriate to value lost work time at the average wage for working poor employees.

²⁹ This somewhat understates the rental deposits required in urban areas, but is deemed to be reasonable for statewide application.

overwhelmingly do not have leave time to devote to this housing search,³⁰ the relocation will directly result in lost wages. Previous research into the lost wages attributable to housing searches after utility service terminations has found that customers devote 32 hours to the search.³¹ While previous research has valued each hour at minimum wage,³² for the reasons discussed above, this analysis instead values lost wages at the average wage for a working poor household (\$8.63/hour).³³

The Statewide Impacts of Improved Payment Patterns

The second step of the process of quantifying the economic impacts of payment pattern changes is to aggregate the household level changes into statewide figures. The discussion below explains that aggregation.

Avoided reconnect and collection fees

Utility service that has been disconnected for nonpayment is assumed to be reconnected in the absence of the household vacating the premises. One study conducted in Philadelphia found that 32% of homes were abandoned in the first year after electric service was disconnected and 22% of homes were abandoned in the first year after natural gas service was disconnected. Similarly, 42% of all homes in Maine were vacated within 1 to 11 months after service terminations.

Using a mid-range figure from this data, we find that 35% of service disconnections will result in household mobility. Conversely, this data yields a 65% reconnection rate.

Energy assistance prevents terminations in two distinct ways. On the one hand, there are customers for whom energy assistance directly intervenes to prevent the imminent termination of service. On the other hand, the payment of energy assistance reduces the rate at which service terminations occur in the energy assistance population for which no direct intervention has occurred. Preventing service terminations in these two ways will have the combined effect of creating \$9.6 million in economic activity, \$3.6 in additional earnings, and 245.4 new jobs.

Avoided cash security deposits

Public utilities have the legal right to require customers that have had service terminated for nonpayment to post a cash security deposit upon their reconnection. Neither the Entergy states nor the utilities serving those states track data on the number of energy assistance households from whom post-reconnection deposits are required. Using a conservative estimate that 50% of energy assistance deposits will be avoided, preventing service terminations in these two ways will have the combined effect of creating \$19.2 million in economic activity, \$7.2 million in additional earnings, and 488.9 new jobs.

Avoided lost wages due to reconnections

As documented above, previous research has found that each disconnected customer that has

³⁰ National Fuel Funds Network (2002). "SA Fragile Income: Deferred Payment Plans and the Ability to Pay of Working Poor Utility Customers," at 4 – 5, National Fuel Funds Network: Washington D.C.

³¹ "Measuring All Net Program Benefits," *supra*, at 86.

³² See e.g., Riggert, J. et al. (November 1999). "An Evaluation of the Non-Energy Impacts of Vermont's Weatherization Assistance Program," at 55, TecMRKT Works: Arlington (VA) (relying on "Measuring All Net Program Benefits").

³³ The average wage for a low-wage employee in 1996 was \$7.55. Gregory Acs, Katherin Ross Phillips, and Daniel McKenzie (May 2000). "Playing by the Rules but Losing the Game: America's Working Poor," at Table 6, Urban Institute: Washington D.C. In 2002 dollars, this wage is \$8.63.

service reconnected loses, on average, eight (8) hours of wages to the process of reconnection. According to the National Fuel Funds Network (NFFN), 80% of all low wage workers lack leave time to perform these types of household chores.³⁴ Reducing the number of avoided reconnections to account for the percentage of low wage workers with no leave time results in a finding that preventing service terminations will have the combined effect of creating \$7.1 million in economic activity, \$2.6 million in additional earnings, and 180.7 new jobs.

Avoided rental security deposits

The converse of having utility service reconnected is the forced relocation of households for whom service has been disconnected for nonpayment. As documented above, an estimated 35% of households will relocate subsequent to a utility service termination. Preventing this need to relocate attributable to utility service terminations will have the combined effect of creating \$30.0 million in economic activity, \$11.2 million in additional earnings, and 764.4 new jobs.

Avoided lost wages to relocation search

Lost work devoted to the search time associated with housing relocation represents lost wages to a low wage worker without leave time. Applying the factors identified above regarding avoided service terminations, relocation rates, and lack of leave time, preventing utility service terminations will have the combined effect of creating \$10.8 million in economic activity, \$4.0 million in additional earnings, and 274.6 new jobs.

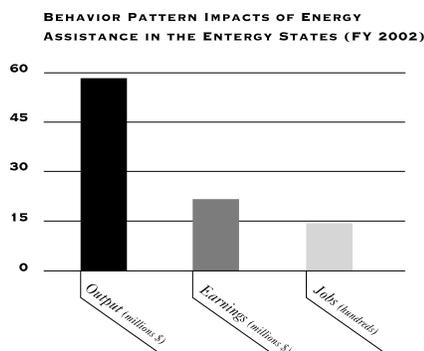
Summary of Payment Impacts

Improved payment patterns attributable to energy assistance will create economic impacts throughout the economy. These payment impacts, standing alone (without the benefit impacts described above or the behavior impacts identified below), will yield \$76.7 million in economic activity, generate \$28.6 million in increased earnings, and support 1,954 new jobs. The breakdown of these benefits by payment practice is presented in the table below.

Payment pattern impact	Impact on the Economy by		
	Payment Pattern Change		
	Output	Earnings	Jobs
Avoided collection and reconnect fees	\$9,637,823	\$3,597,54	245.4
Avoided new deposits	\$19,208,728	\$7,169,829	488.9
Avoided lost wages—reconnect	\$7,097,550	\$2,649,326	180.7
Avoided rental security deposit	\$29,954,366	\$11,178,631	764.4
Avoided lost wages—rent search	\$10,804,161	\$4,031,177	274.6
Total	\$76,702,627	\$28,626,505	1,953.9

³⁴ National Fuel Funds Network (March 2002). “A Fragile Income: Deferred Payment Plans and the Ability to Pay of Working Poor Utility Customers,” at 5, NFFN: Washington D.C., citing, Jody Heymann (October 2001). “The Widening Gap: A New Book on the Struggle to Balance Work and Caregiving,” at 3, Institute for Women’s Policy Research: Washington D.C.

The Behavior Impacts of Cash Energy Assistance



The behavior impacts of energy assistance in the Entergy states are those economic benefits that arise from a change in behavior patterns of low-income customers attributable to the distribution of energy assistance benefits. As with changes in payment practices, these changes in behavior patterns will, in turn, have dollar consequences that ripple throughout the economies of the states. As with payment impacts, the benefit impacts discussed above are in addition to these behavior impacts.

Providing energy assistance to low-income residents helps these residents change behavior patterns and practices that cost the household money. Through these behavior pattern changes, energy assistance will create \$57.7 million in economic activity, \$21.5 million in added earnings, and 1,439 new jobs.

By helping low-income residents change their prior behavior patterns, the energy assistance both increases household resources and frees up resources to be spent (and circulated) within the local economy. As with the analyses above, these dollars of expenditures are assumed to reflect the overall expenditure patterns of low-income residents generally. The expenditures will occur in the retail trade sector of the Entergy states and will ramify throughout the economy.

Changes in Behavior Patterns

Three behavior patterns are considered in this analysis:

- Reductions in the extent to which low wage workers miss days of work due to the illness of the wage earner attributable to unaffordable energy;
- Reductions in the extent to which low wage workers miss days of work due to family care responsibilities attributable to unaffordable energy; and
- Reductions in the “forced mobility” of low-income households attributable to unaffordable home energy.

Unlike the payment pattern impacts discussed above, a consideration of the economic impacts of these behavior changes need not be limited to customers that use electricity or natural gas as their primary heating fuels.

Avoided work lost to illness of wage earner

Previous research regarding the non-energy benefits of low-income weatherization programs has identified the prevention of illness as one primary non-energy benefit generated. One researcher reports that “households with sufficient and continuous heating may tend to experience fewer colds and other illnesses per year.”³⁵ While the issue had not been previously well-documented in the literature, this researcher found that “one in 14 households may have had one fewer sick day per year” after participating in a low-income weatherization program. We adopt this reduction of one sick day per year by one-in-14 wage earners as the basis for the calculations that follow.³⁶

³⁵ “Measuring All Program Net Benefits,” *supra*, at 95.

³⁶ No adjustment is made for the fact that the Entergy states are warm rather than cold weather states.

Avoided work lost to family care responsibilities

The discussion of improved health in the documentation of lost sick days in prior literature explicitly excludes the consideration of lost wages due to family care responsibilities. This exclusion is unmerited. According to the National Fuel Funds Network, “home energy crises contribute to lower nutrition for children and high rates of illness that contribute to the conflict between work and family care. One of the most significant causes of employee absenteeism and turnover is the inability to find child care.”³⁷

A study of Niagara-Mohawk’s low-income assistance program confirms the role that energy assistance can play in preventing this conflict between work and family care responsibilities. The Niagara-Mohawk program evaluation considered the reduction of customer-reported health problems associated with the home being too cold in the wintertime.³⁸ The evaluation reported a 69% reduction in the number of persons who perceived having health problems caused by their house being too cold (from 36% to 11%). In addition, the evaluation of the Indiana REACH³⁹ program found that the energy assistance provided through that program resulted in an 18% increase in the children’s school attendance.⁴⁰ The Indiana REACH evaluation found that the program reduced the number of school days missed by the children of participating households.

An adjusted Niagara-Mohawk finding is adopted for purposes here. To use a reduction from 36% to 11% as the basis for calculating lost work due to family care responsibilities may possibly capture some or all of the lost work due to the illness of the wage earner as well. Accordingly, to avoid the possibility of duplication, the incidence of illness amongst the workers, themselves, has been extracted and the beginning point of analysis has been reduced from 36% to 29%.⁴¹

Avoided forced mobility

One frequent impact of unaffordable home energy is the forced mobility of households. One study of Head Start families in Missouri found that 40% of all Head Start families were “frequently mobile.”⁴² Of these frequently mobile households, 50% cited unaffordable home energy bills as being an important factor in their most recent move.

Similarly, Skumatz⁴³ reported survey data indicating that 16% of weatherization program participants indicated that the weatherization activities “yes, definitely” helped them avoid having to move to another home. An additional 8% reported that the weatherization activities “yes, maybe”

³⁷ National Fuel Funds Network (October 2002). “Local Layoffs as National Emergencies: Using the National Emergency Grant Program to Respond to the Unmet Home Energy Needs of Displaced Low-wage Workers,” at 7 – 8, NFFN Toolkit #7, National Fuel Funds Network: Washington D.C., citing, Research and Policy Committee (1993). “Why Child Care Matters: Preparing Young Children for a More Productive America, A Statement by the Research and Policy Committee of the Committee for Economic Development,” at 1, Committee for Economic Development: New York.

³⁸ Harrigan, M. (1992). “Evaluating the Benefits of Comprehensive Energy Management for Low-Income, Payment-troubled Customers. Final Report on Niagara Mohawk Power Partnerships Pilot,” Alliance to Save Energy: Washington D.C.

³⁹ REACH is the Residential Energy Assistance Challenge (REACH) grant program operated by the U.S. Department of Health and Human Services.

⁴⁰ Khawaja, M. Sami (2001). “Final Findings: Indiana REACH Evaluation,” at III-9, III-11, Quantec: Portland (OR).

⁴¹ No adjustment is made for the fact that the Energy states are warm rather than cold weather states.

⁴² Colton, R. “A Road Oft Taken: Unaffordable Home Energy Bills, Forced Mobility, and Childhood Education in Missouri,” 2 *Journal of Children and Poverty* at 23 (1996).

⁴³ “Measuring All Program Net Benefits,” *supra*, at 85.

helped them avoid having to move to another home. This range (16% to 24%) brackets the Missouri findings (50% x 40% = 20%). A prevention of moves within 20% of the energy assistance recipient population is used for this analysis.

The Household-Level Impacts of Changed Behavior Patterns

Improved energy affordability allows energy assistance recipients retain additional income and spend that income on household necessities rather diverting that income to the behavior patterns and practices made necessary by unaffordable energy. These expenditures then ramify throughout the economies of the Entergy states.

Lost wages due to worker illness

Workers report losing one day of work a year to illness attributable to having their home be too cold in the winter. As with discussions above, rather than valuing these hours at minimum wage, these lost work hours are valued at the average hourly wage for low-wage workers (\$8.63).

Lost wages due to family care responsibility

Wages lost to family care responsibilities are valued at the average hourly wage for low-wage workers as well. One day of lost wages per dependent per year is used in this assessment.

Avoided forced mobility

Preventing the forced mobility of low-income residents creates three financial impacts for these households. First, the household avoids the lost wages attributable to the search time involved in relocation. As documented above, this search time is 32 hours (valued at the average wage for low wage workers). Second, the household avoids the need to post a new rental security deposit. As documented above, data provided by the U.S. Department of Housing and Urban Development (HUD) indicates that this security deposit will reach \$400 per household for all four Entergy states. Third, the household avoids the need to pay the utility-imposed fee for beginning or transferring service. A reasonable estimate for this fee is found to be \$30.⁴⁴

The Statewide Impacts of Changed Behavior Patterns

The determination of the statewide economic impacts of changed behavior patterns uses the same methodology as was used for improved payment patterns. The methodology consists of two steps:

- Determining the per-household (per customer) impact of the improved payment patterns; and
- Determining the incidence of the effects.

The product of these two factors yields the total direct dollars of economic impacts. As with the improved payment patterns, the impacts that have been identified above are limited to those impacts that will result in creating ripples of induced economic effects as well. The direct economic effects are thus subjected to a multiplier analysis to determine the total effect on the economy.

⁴⁴ While some customers will pay a lower fee for the transfer of service by a combination gas/electric utility, others will pay separate fees to each of the separate utilities delivering gas and electricity. The \$30 is a weighted average of these two circumstances.

Avoided lost wages to worker illness

As documented above, one of every 14 households will avoid the loss of one day of work per year. The discussion above documents that 80% of these workers will not have leave to use for this sick time. Reducing the number of avoided days of lost work to account for the percentage of workers with leave time results in a finding that preventing illnesses through energy assistance will have the combined effect of creating \$2.2 million in economic activity, \$0.8 million in earnings, and 55 new jobs.

Avoided lost wages to family care responsibilities

As documented above, a reduction from 29% to 11% will occur in the percentage of households losing work due to family care responsibilities attributable to unaffordable home energy. With one day lost per dependent, and reducing the lost work to account for the percentage of workers having leave time, we find that preventing family illnesses through energy assistance will have the combined effect of creating \$18.3 million in additional economic output, \$6.8 million in earnings, and 456 new jobs.

Avoided rental security deposits

As documented above, energy assistance will help prevent the forced mobility of 20% of recipients. Avoiding this mobility will prevent the need to commit \$400 per mover to new rental security deposits (not including prepaid rent). Reducing the need for these security deposits by preventing the forced mobility of energy assistance recipients will have the combined effect of creating \$22.9 million in economic output, \$8.5 in earnings, and 570 new jobs.

Avoided utility connection fees

In addition to paying a new rental security deposit, mover households will be required to pay a fee for the connection to, or transfer of, their utility service. Given the other documented factors associated with forced mobility, preventing the need to pay these fees will have the combined effect of creating \$1.7 million in economic activity, \$0.6 million in earnings, and 43 new jobs.

Avoided lost wages due to forced mobility

As documented above, households will lose 32 hours of work to the search time caused by the need to relocate. Reducing the number of avoided days of lost work to account for the percentage of workers with leave time results in a finding that preventing forced mobility will have the combined effect of creating \$12.6 million in economic activity, \$4.7 million in earnings, and 315 new jobs.

Summary of Behavioral Impacts

Changed behavior patterns attributable to energy assistance in the four Entergy states will create economic impacts throughout the economies of those states. These behavior impacts, standing alone (without the benefit or the payment impacts identified above), will yield \$57.7 million in economic activity, generate \$21.5 million in increased earnings and create 1,439 new jobs.

The breakdown of these benefits by behavior pattern is presented in the table as follows.

Behavior pattern impact	Impact on the Economy by Behavior Pattern Change		
	Output	Earnings	Jobs
Avoided lost wages—worker illness	\$2,210,530	\$821,367	55.1
Avoided lost wages—family care	\$18,315,817	\$6,805,616	456.4
Avoided rental deposits—forced mobility	\$22,870,071	\$8,497,843	569.9
Avoided utility connection fees—forced mobility	\$1,715,255	\$637,338	42.7
Avoided lost wages—forced mobility	\$12,631,598	\$4,693,529	314.7
Total	\$57,743,271	\$21,455,693	1438.8

Summary of Cash Assistance Economic Development Impacts

The delivery of energy assistance in the four Entergy states accomplishes far more for those states than simply helping low-income residents avoid arrears on home energy bills and preventing the potential loss of home energy service due to nonpayment. The delivery of home energy assistance also serves as a substantial economic stimulant for the economies of the Entergy states.

Energy assistance serves as an economic stimulant for the economy in three distinct ways. It creates economic activity. It generates additional earnings. It supports jobs.

Total Economic Impact: Entergy States	Impact on the Economy from Low-Income Fuel Assistance		
	Output	Earnings	Jobs
Benefit impacts	\$175,404,168	\$57,787,802	4,014
Payment impacts	\$76,702,627	\$28,626,505	1,954
Behavior impacts	\$57,743,271	\$21,455,693	1,439
Total	\$309,850,066	\$107,870,000	7,407

As can be seen, in total, the FY2002 distribution of energy assistance in the four state region including Arkansas, Louisiana, Mississippi and Texas:

- Created nearly \$310 million in economic activity;
- Generated nearly \$110 million in added earnings for workers; and
- Supported more than 7,400 new jobs in the four Entergy states.

CHAPTER THREE - The Economic Development Impacts of Weatherization Assistance

The distribution of weatherization assistance in the Entergy states generates economic impacts of a similar nature to those generated by LIHEAP and fuel fund cash assistance. Three types of impacts arise:

- **The benefit impacts;**
- **The payment impacts; and**
- **The behavior impacts.**

The benefit impacts differ somewhat in that they include both the direct impacts of the expenditure of weatherization funds and the benefits of the energy bill savings produced for each client. In addition, the energy bill savings, along with the payment and behavior impacts, generated by weatherization assistance occur year-in and year-out over a designated time span. This analysis projects impacts over a 15-year time frame. The analysis does not present the cumulative savings on a year-by-year basis of the aggregate number of units weatherized to date. Instead, the analysis examines only those units weatherized in Program Year 2002 as reported by the National Association of State Community Service Program (NASCS).

The Benefit Impacts of Weatherization Assistance

Well-designed energy efficiency programs have been shown to produce substantial economic benefits for local and state economies. For most states, the electric and natural gas utilities are poor performers in terms of their ratios of in-state jobs to sales as well as 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.

It is possible to calculate the economic benefits to Entergy states, using state-specific data, arising from a low-income energy efficiency program. Energy efficiency programs produce additional economic benefits in terms of jobs and income in proportion to the extent that they are designed to be cost-effective. Currently, the nationwide ratio of benefits for the Weatherization Assistance Program (WAP), funded through the U.S. Department of Energy (DOE), is roughly 1.30:1.⁴⁵ This benefit/cost ratio is used in setting out the economic impacts in the Entergy states.

The benefit/cost ratio permits the quantification of energy savings over time. Given an assumed expenditures of \$1.0 million, for example, and a benefit/cost ratio of 1.0, every \$1.0 million spent on energy efficiency measures will return \$1.0 million in program benefits (as defined above). Assuming a benefit/cost ratio of 1.3, every \$1.0 million in energy efficiency expenditures returns \$1.3

⁴⁵ Linda Berry and Martin Schweitzer (February 2003). "Metaevaluation of National Weatherization Assistance Programs Based on State Studies: 1993 – 2002," at 15, Oak Ridge National Laboratory: Oak Ridge (TN) (program benefit/cost ratio of 1.30 assuming a discount rate of 3.2% and the fuel price forecasts shown on the Energy Information Administration web site in September 2002). The "program" benefit/cost ratio does not take societal benefits into account. Instead, it "compares the discounted value of energy savings to total program costs." "WAP Metaevaluation," *supra*, at 13 – 14

million in program savings. Accordingly, WAP returns \$1.3 million in program savings for each \$1.0 million in expenditures.

The direct impacts of energy efficiency have been calculated by comparing the economic activity, income, and employment that are supported by an efficiency scenario compared to the economic activity, income and employment that are supported by a non-efficiency scenario. The economic impacts arise at three levels:

- **The direct expenditure of money by the efficiency program will generate a multiplier impact;**
- **The dollars of energy bill savings will generate a multiplier effect as those dollars are spent in the economies of the Entergy states; and**
- **The dollars of energy bill savings will generate a lost multiplier effect (that must be netted against the positive impacts) by *not being spent in the electric and gas industries.***

The table below shows the impacts in Arkansas of a hypothetical \$1.0 million expenditure on energy efficiency (with a benefit/cost ratio of 1.3:1, indicating \$1.3 million in program savings for each \$1.0 million in program expenditures). As can be seen, the direct expenditures of \$1.0 million dollars for weatherization assistance in Arkansas will generate about 2.4x that amount in economic output, and about 1.4x that amount simply in increased earnings. The biggest benefit comes in job creation. Because of the tremendous disparity in job creation between the utility sector of the economy, on the one hand, and the retail trade and maintenance and repair sector on the other hand – this simply reflects the capital intensive nature of the utility industry-- each expenditure of \$1.0 million of weatherization funding will support 100 jobs.

Energy Efficiency Economic Development Impacts: Arkansas							
From a \$1.0 Million Efficiency Expenditures Given a Benefit/Cost Ratio of 1.3:1							
Industries	Dollars	Multipliers			Impacts		
		Output	Income	Jobs	Output	Income	Jobs
Maintenance and repair	\$1,000,000	2.1697	0.7844	43.9	\$2,169,700	\$784,400	44
Electric & gas	\$1,300,000	1.8348	0.2509	11.3	\$2,385,240	\$326,170	15
Retail trade	\$1,300,000	2.0395	.07780	54.6	\$2,651,350	\$1,011,400	71
Net impact	***	***	***	***	\$2,435,810	\$1,469,630	100

Given the state-specific economic multipliers for each of the four Entergy states, and the dollars of expenditures on weatherization activities reported for each state for Program Year 2002, the direct economic development impacts (not taking into consideration the payment and behavior impacts) are those set forth in the table below.

In total, the direct impacts of the \$29.9 million in Program Year 2002 weatherization expenditures in the four Entergy states include:

- **Generating over \$71 million in economic activity;**
- **Creating nearly \$46 million in increased earnings; and**
- **Supporting nearly 2,800 jobs.**

The additional impacts arising from the payment and behavior effects of weatherization will be considered below.

Economic Output, Earnings and Jobs Impact of
Weatherization Expenditures in Four Energy States
For Program Year 2002

Economic Output					
	Total	Arkansas	Louisiana	Mississippi	Texas
Maintenance and repair	\$70,418,112	\$7,910,874	\$7,330,606	\$3,692,949	\$51,483,683
Electric and gas	(\$90,177,193)	(\$8,696,747)	(\$10,130,027)	(\$4,309,709)	(\$67,040,710)
Retail trade	\$90,891,451	\$9,667,002	\$9,819,495	\$4,465,246	\$66,939,708
Net impact	\$71,132,370	\$8,881,129	\$7,020,073	\$3,848,486	\$51,382,682
Earnings					
	Total	Arkansas	Louisiana	Mississippi	Texas
Maintenance and repair	\$24,672,274	\$2,859,976	\$2,663,895	\$1,297,730	\$17,850,673
Electric and gas	(\$11,860,764)	(\$1,189,238)	(\$1,288,872)	(\$576,378)	(\$8,806,276)
Retail trade	\$32,990,208	\$3,687,633	\$3,656,973	\$1,683,578	\$23,962,024
Net impact	\$45,801,718	\$5,358,371	\$5,031,995	\$2,404,931	\$33,006,421
Jobs					
	Total	Arkansas	Louisiana	Mississippi	Texas
Maintenance and repair	1,169	160	131	74	804
Electric and gas	(466)	(54)	(53)	(26)	(333)
Retail trade	2,053	259	249	123	1,422
Net impact	2,756	365	327	171	1,893

The Payment Impacts of Weatherization Assistance

As described above with respect to energy assistance, the payment impacts of weatherization assistance in the Entergy states are those economic benefits that arise from changes in payment practices of low-income households attributable to the distribution of weatherization assistance benefits. To the extent that weatherization assistance can change the level of household expenditures through modifications in utility payment patterns, the local economy will be enhanced.

Providing weatherization assistance to low-income customers helps those customers change payment patterns and practices that cost the household money. By helping low-income households change their prior payment practices, the weatherization assistance frees up household income to be spent (and circulated) within the local economy. As with the payment impacts of energy assistance, these dollars are assumed to be spent on the retail trade sector of the economy and will ramify throughout the economy.

Two changes in payment practices are considered in this analysis:

- Reductions in the extent to which weatherization assistance recipients carry arrears; and
- Reductions in the extent to which weatherization assistance recipients are subject to service terminations.

As with consideration of energy assistance payment impacts, this assessment of the economic impact of changes in payment patterns will focus exclusively on customers that use natural gas or electricity as their primary heating source. Weatherization participants are assumed to be in proportion to primary fuel users in the population as a whole. Roughly 90% of all customers in the Entergy states use electricity or natural gas as their primary fuel.

Process Issues with Quantifying Payment and Behavior Impacts

One difference in calculating the payment impacts of weatherization assistance and cash energy assistance is the time period in which the payment impacts will arise. Cash assistance is a discrete event, giving rise to a one-time payment impact. In order to generate the same impact in a future year, an additional cash assistance grant must be provided. In contrast, weatherization assistance will provide benefits in the form of reduced energy bills on a continuing basis for the life of the weatherization measures. As a result, the payment impacts that are generated will recur over time for the life of the measures. A 15-year life is used in this analysis.

Projecting future economic benefits, however, raises the question of how to reduce those future benefits to current dollars. One common method used to make this adjustment is to escalate prices into the future and then to reduce them back to present value using a discount rate.⁴⁶ If price escalations can reasonably be expected to track the discount factor, however, the same result is obtained by neither escalating nor discounting the current value. The result is simply to assume that the escalation rate and the discount rate are the same. Using this methodology is an accepted mechanism for economic analysis. The approach is frequently used, for example, with projecting future wages.

The dollar figures used in this analysis of the economic impacts of changes in payment patterns and practices lend themselves to this latter approach. It is reasonable to assume that the escalation and discount factors will closely track each other. Rather than escalating the dollars to a future value only to discount them back by the same amount, the present dollar value is accepted as an appropriate statement of a discounted present value. The present dollar amount is used for each of the 15 years of the life of the weatherization measure.

⁴⁶ As noted above, energy savings used fuel prices projected by the Energy Information Administration of the U.S. Department of Energy and reduced the savings to present value using a discount rate of 3.2%.

A second and more complicated problem is posed by the fact that some low-income households receive *both* weatherization *and* cash energy assistance. The incremental payment impacts arising from weatherization when the household has already received cash assistance (or vice versa) have neither been studied nor quantified. Failing to account for the overlap, however, would double count payment impacts to some extent, by attributing the payment impacts first to the receipt of cash assistance and then attributing those same impacts again to the receipt of weatherization assistance. To avoid the duplicate counting of payment impacts, the number of weatherized units has been reduced by an overlap factor between the weatherization and fuel assistance programs in the first year. A smaller overlap factor is applied in subsequent years. The effect of this process is to assign a zero incremental value to the effect that weatherization will have on payment patterns and practices when the household receives both weatherization and fuel assistance.⁴⁷ This approach arbitrarily assigns the payment benefits to the cash assistance rather than to the weatherization assistance program.⁴⁸ A 35% overlap factor is applied in Year 1 with a 15% overlap factor applied in subsequent years.

Quantifying the Weatherization Impacts

Given the resolution of these process issues involving the payment impacts arising from weatherization, five separate payment impacts have been assessed for this analysis of weatherization impacts:

Avoided collection and reconnect fees

This figure includes the utility-imposed fees associated with the collection of delinquent accounts and the termination of service to accounts with arrears. These avoided collection and reconnect fees will have the combined impact of creating \$0.6 million in economic activity, \$0.2 million in increased earnings, and 13 new jobs.

Avoided new utility deposits

This figure includes the avoided cash security deposits imposed subsequent to the termination of service for nonpayment. These avoided utility deposits will have the combined impact of creating \$1.2 million in economic activity, \$0.4 million in increased earnings, and 27 new jobs.

Avoided lost wages associated with service disconnections

This figure considers the lost wages associated with the time devoted to having the customer find money, contact the utility, make payment arrangements, and await the physical reconnection of service. These avoided lost wages will have the combined impact of creating \$0.4 million in economic activity, \$0.2 million in increased earnings, and 10 new jobs.

Avoided rental security deposits

This figure includes those dollars associated with required rental security deposits when households relocate after a service disconnection. These avoided rental deposits will have the combined impact of creating \$1.8 million in economic activity, \$0.7 million in increased earnings, and 43 new jobs.

⁴⁷ The percentage reduction does not imply that the *same* household will receive fuel assistance each year. It merely assumes that a constant percentage of weatherized customers will receive fuel assistance each year.

⁴⁸ This distinction has no practical implication when the combined effects of the two programs are considered together. If the effects of the weatherization program were considered independently, however, this process would understate the benefits of weatherization.

Avoided lost wages associated with relocations

This figure includes those dollars associated with the time devoted to relocation after a service termination. These avoided lost wages will have the combined impact of creating \$0.9 million in economic activity, \$0.3 million in increased earnings, and 21 new jobs.

Each of these components to payment impacts is more fully defined and documented in the discussion above regarding the payment impacts flowing from the distribution of cash energy assistance.

Summary of Payment Impacts

Improved payment patterns attributable to weatherization assistance will create economic impacts throughout the economy. These payment impacts, standing alone (without the direct impacts described above or the behavior impacts identified below) will yield \$4.9 million in economic activity, generate \$1.8 million in increased earnings, and support 114 new jobs. The breakdown of these benefits by payment practice is presented in the table below.

Economic Output, Earnings and Jobs Impact of Changes in Household Payment Practices From Weatherization Expenditures in Four Entergy States For Program Year 2002					
Economic Output					
	Total	Arkansas	Louisiana	Mississippi	Texas
Avoided collection fees	\$579,367	\$104,730	\$30,662	\$50,200	\$393,775
Avoided utility deposits	\$1,158,733	\$209,461	\$61,323	\$100,400	\$787,549
Avoided lost wages—reconnections	\$426,660	\$77,126	\$22,580	\$36,968	\$289,986
Avoided rental deposits	\$1,837,984	\$300,764	\$154,094	\$252,286	\$1,130,840
Avoided lost wages—relocation	\$918,962	\$166,118	\$48,634	\$79,624	\$624,586
Total	\$4,921,706				
Earnings					
	Total	Arkansas	Louisiana	Mississippi	Texas
Avoided collection fees	\$211,273	\$39,951	\$11,419	\$18,946	\$140,957
Avoided utility deposits	\$422,547	\$79,902	\$22,838	\$37,892	\$281,915
Avoided lost wages—reconnections	\$155,587	\$29,421	\$8,409	\$13,952	\$103,805
Avoided rental deposits	\$672,134	\$114,731	\$57,388	\$95,215	\$404,800
Avoided lost wages—relocation	\$335,128	\$63,386	\$18,112	\$30,051	\$223,579
Total	\$1,796,669				
Jobs					
	Total	Arkansas	Louisiana	Mississippi	Texas
Avoided collection fees	13	2.8	0.8	1.4	8.4
Avoided utility deposits	27	5.6	1.6	2.8	16.7
Avoided lost wages—reconnections	10	2.1	0.6	1.0	6.2
Avoided rental deposits	43	8.1	3.9	6.9	24.0
Avoided lost wages—relocation	21	4.4	1.2	2.2	13.3
Total	114				

The Behavior Impacts of Weatherization Assistance

As described above with respect to energy assistance, the behavior impacts of weatherization assistance in the Entergy states are those economic benefits that arise from changes in behavior patterns of low-income customers attributable to the distribution of energy assistance benefits. As with changes in payment practices, these changes in behavior patterns will, in turn, have dollar consequences that ripple throughout the economies of the states. As with payment impacts, the benefit impacts discussed above are in addition to these behavior impacts.⁴⁹

Providing energy assistance to low-income residents helps these residents change behavior patterns and practices that cost the household money. Through these behavior pattern changes, energy assistance will create economic activity, generate added earnings, and support new jobs.

By helping low-income residents change their prior behavior patterns, the energy assistance both increases household resources and frees up resources to be spent (and circulated) within the local economy. As with the analyses above, these dollars of expenditures are assumed to reflect the overall expenditure patterns of low-income residents generally. The expenditures will occur in the retail trade sector of the Entergy states and will ramify throughout the economy. Unlike the payment pattern impacts discussed above, a consideration of the economic impacts of these behavior changes need not be limited to customers that use electricity or natural gas as their primary heating fuels.

Three behavior patterns are considered in this analysis:

- Reductions in the extent to which low wage workers miss days of work due to the illness of the wage earner attributable to unaffordable energy;
- Reductions in the extent to which low wage workers miss days of work due to family care responsibilities attributable to unaffordable energy; and
- Reductions in the “forced mobility” of low-income households attributable to unaffordable home energy.⁵⁰

The determination of the statewide economic impacts of changed behavior patterns uses the same methodology as was used for cash energy assistance. The methodology determines the per-household (per customer) impact of the changed behavior patterns. It then determines the incidence of the effects. The product of these two factors yields the total direct dollars of economic impacts. These effects are then subjected to a multiplier analysis to determine the total effect on the economy.

Changes in low-income customer behavior patterns lead to the following impacts arising from weatherization.

Avoided lost wages to worker illness

This figure considers the lost wages associated with the number of days of lost work resulting from worker illnesses. These avoided lost wages will have the combined effect of creating \$0.7 million in economic activity, \$0.3 million in earnings, and 17 new jobs.

⁴⁹ In addition, the discussion of the aggregation of payment impacts over time, as well as the treatment of present valuation, are both equally applicable to the behavior impacts.

⁵⁰ As with the improved payment patterns, the impacts that have been identified above are limited to those impacts that will result in creating ripples of induced economic effects as well.

Avoided lost wages to family care responsibilities

This figure considers the lost wages associated with the number of days of lost work resulting from family care responsibilities involving illnesses in a worker's family. These avoided lost wages will have the combined effect of creating \$6.2 million in economic activity, \$2.3 million in earnings, and 143 new jobs.

Avoided rental security deposits

This figure considers those dollars associated with avoided rental security deposits incurred when households relocate in search of more affordable home energy. These avoided rental deposits will have the combined impact of creating \$7.7 million in economic activity, \$2.8 million in increased earnings, and 178 new jobs.

Avoided utility connection fees

This figure considers those dollars associated with avoided utility connection fees incurred when households experience forced mobility in search of more affordable home energy. These avoided utility collection fees will have the combined impact of creating \$0.6 million in economic activity, \$0.2 million in increased earnings, and 13 new jobs.

Avoided lost wages due to forced mobility

This figure includes those dollars associated with the time devoted to relocation when households experience forced mobility in search of more affordable home energy. These avoided lost wages will have the combined impact of creating \$4.3 million in economic activity, \$1.6 million in increased earnings, and 98 new jobs.

Each of these components to behavior impacts is more fully defined and documented in the discussion above regarding the behavior impacts flowing from the distribution of cash energy assistance.

Summary of Behavior Impacts

Changed behavior patterns attributable to weatherization assistance will create economic impacts throughout the economy. These payment impacts, standing alone (without the direct impacts or payment impacts described above) will yield \$19.5 million in economic activity, generate \$7.1 million in increased earnings, and support 449 new jobs. The breakdown of these benefits by behavior pattern is presented in the table that follows.

⁴⁹ In addition, the discussion of the aggregation of payment impacts over time, as well as the treatment of present valuation, are both equally applicable to the behavior impacts.

⁵⁰ As with the improved payment patterns, the impacts that have been identified above are limited to those impacts that will result in creating ripples of induced economic effects as well.

Economic Output, Earnings and Jobs Impact of Changes in Household Behavior Patterns
From Weatherization Expenditures in Four Energy States
For Program Year 2002

Economic Output					
	Total	Arkansas	Louisiana	Mississippi	Texas
Avoided lost wages					
Worker illness	\$748,035	\$135,220	\$39,588	\$64,814	\$508,413
Avoided lost wages					
Family care	\$6,198,009	\$1,120,395	\$328,014	\$537,033	\$4,212,567
Avoided rental deposits					
Relocation	\$7,739,153	\$1,398,983	\$409,575	\$670,567	\$5,260,028
Avoided connect fees					
Relocation	\$580,437	\$104,924	\$30,718	\$50,293	\$394,502
Avoided lost wages					
Relocation	\$4,274,490	\$772,686	\$226,217	\$370,368	\$2,905,219
Total	\$19,540,124				
Earnings					
	Total	Arkansas	Louisiana	Mississippi	Texas
Avoided lost wages					
Worker illness	\$272,780	\$51,582	\$14,743	\$24,461	\$181,994
Avoided lost wages					
Family care	\$2,260,180	\$427,393	\$122,159	\$202,680	\$1,507,948
Avoided rental deposits					
Relocation	\$2,822,177	\$533,664	\$152,534	\$253,077	\$1,882,902
Avoided connect fees					
Relocation	\$211,664	\$40,025	\$11,440	\$18,981	\$141,218
Avoided lost wages					
Relocation	\$1,558,745	\$294,754	\$84,248	\$139,779	\$1,039,964
Total	\$7,125,546				
Jobs					
	Total	Arkansas	Louisiana	Mississippi	Texas
Avoided lost wages					
Worker illness	17	3.6	1.0	1.8	10.8
Avoided lost wages					
Family care	143	30.0	8.3	14.8	89.5
Avoided rental deposits					
Relocation	178	37.5	10.4	18.5	111.8
Avoided connect fees					
Relocation	13	2.8	0.8	1.4	8.4
Avoided lost wages					
Relocation	98	20.7	5.7	10.2	61.7
Total	449				

Summary of Weatherization Assistance Economic Development Impacts

The delivery of weatherization assistance in the four Entergy states accomplishes far more for those states than simply helping low-income residents avoid arrears on home energy bills and preventing the potential loss of home energy service due to nonpayment. The delivery of weatherization assistance also serves as a substantial economic stimulant for the economies of the Entergy states.

Weatherization assistance serves as an economic stimulant for the economy in three distinct ways. It creates economic activity. It generates additional earnings. It supports jobs.

Total Economic Impact: Entergy States	Impact on the Economy from		
	Low-Income Weatherization Assistance		
	Output	Earnings	Jobs
Benefit impacts	\$71,132,370	\$45,801,718	2,756
Payment impacts	\$4,921,706	\$1,796,669	114
Behavior impacts	\$19,540,124	\$7,125,546	449
Total	\$95,594,200	\$54,723,933	3,319

As can be seen, in total, the FY2002 distribution of weatherization assistance in the four state region including Arkansas, Louisiana, Mississippi and Texas:

- Created nearly \$96 million in economic activity;
- Generated nearly \$55 million in added earnings for workers; and
- Supported more than 3,300 new jobs in the four Entergy states.

Chapter Four - The Particular Economic Development Benefits to the Low-Income Community

While the discussion above looks at economic benefits on a statewide basis, in fact, the economic impacts provide particular advantage to low-income communities. Existing research indicates that low-income households tend to shop at local retail establishments. For food in particular, low-income households tend to shop at small, local food stores. Moreover, not only are low-income *households* more likely to shop locally, but the *businesses* serving low-income households are more likely to shop locally as well. Research in Oakland, California, for example, found that businesses serving low-income communities "strengthen other locally-based business--even more than stores in middle-income neighborhoods."⁵¹ According to this research:

Oakland's low-income area businesses have a distribution network (incoming goods) that is 54 % Oakland-based. Nineteen % say their main suppliers are half inside the city and half outside, and 27 % have suppliers outside the city borders. In stark contrast, only 19 % of [more middle income neighborhood] stores have main suppliers in Oakland. Twenty-five % report that half their suppliers are Oakland-based and half are not. Yet 56 % have main suppliers from outside the city.

The research concluded that "low-income area businesses of whatever kind purchase the bulk of their goods from Oakland-based suppliers. These suppliers are themselves sources of local employment."⁵²

Supplier Location: Businesses Serving Low-Income and Middle-Income Neighborhoods

Supplier Location for Select Low-Income Area Businesses

Type of Store	Food Stores	Eating Places	Liquor Stores	Personal Services	TOTAL
Inside Oakland	45%	64%	47%	59%	54%
Half Inside, Half Outside	22%	9%	40%	6%	19%
Outside Oakland	33%	27%	13%	35%	27%

Supplier Location for Select Middle-Income Area Businesses

Type of Store	Food Store	Eating Places	Liquor Stores	Personal Services	TOTAL
Inside Oakland	12.5%	25%	0%	29%	19%
Half Inside, Half Outside	12.5%	25%	100%	42%	25%
Outside Oakland	75%	50%	0%	29%	56%

In sum, not only will the provision of energy assistance provide income and employment to low-income households, but the earnings and employment that are delivered to such households will likely be spent, retained and recirculated within the low-income community as well.

⁵¹ David Dante Troutt (1993). "The Thin Red Line: How the Poor Still Pay More," at 35, Consumers Union: San Francisco (CA).

⁵² *Id.*, at 36.



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