

**THE ECONOMIC IMPACTS OF  
HOME ENERGY ASSISTANCE IN COLORADO**

**February 2003**

***Prepared For:***

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OF  
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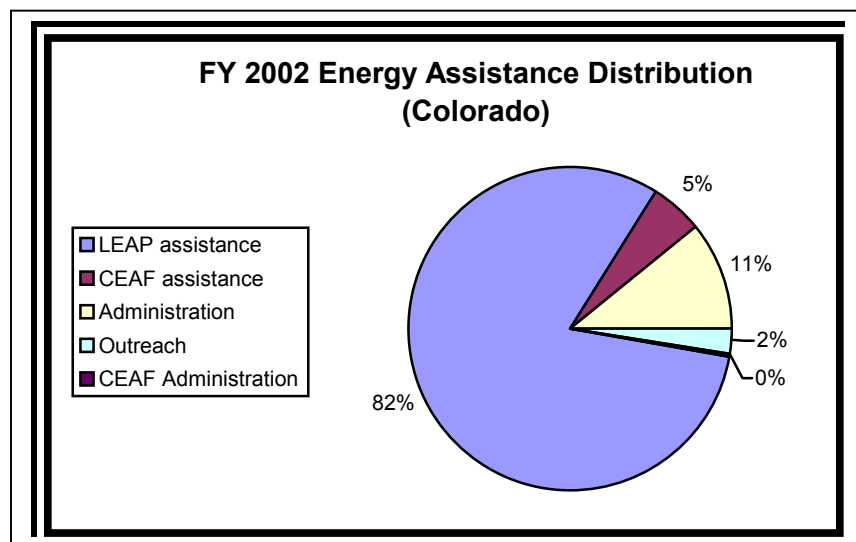
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The delivery of low-income home energy assistance in Colorado provides a wide range of economic benefits to the state. Frequently thought of exclusively as a way to prevent unpaid utility bills,<sup>1</sup> and to preserve service against termination 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 State of Colorado are quantified below.

### ENERGY ASSISTANCE IN COLORADO

Low-income energy assistance in Colorado is provided primarily through the federal Low-Income Home Energy Assistance Program (LIHEAP), known as LEAP in Colorado, and through the Colorado Energy Assistance Foundation (CEAF). While other sources of public and private energy assistance exist for the State of Colorado, LEAP and CEAF provide the bulk of cash assistance to help pay home energy bills.



In Fiscal Year 2002,<sup>2</sup> the Colorado LEAP program distributed \$21,735,441 in cash assistance. LEAP spent an additional \$661,000 on outreach and devoted \$2,941,600 to program administration. CEAF’s administrative costs are roughly 5% of its total expenditures on cash assistance (\$68,593). Funds devoted to crisis interventions, as well as to

weatherization, are not considered in this analysis.<sup>3</sup> Because of Colorado’s unique procedures in distributing LEAP funds, and unique shutoff protections once a household has been found eligible for LEAP, Colorado “crisis” benefits are not used for shutoff prevention purposes as crisis funds are commonly thought of in other states.<sup>4</sup>

Colorado LEAP dollars were provided through a \$26,839,585 block grant from the federal government, a \$2,500,000 grant from the Colorado Energy Assistance Foundation (CEAF), a \$339,896 “leveraging” grant from the federal government, \$1,500,000 in

<sup>1</sup> Throughout this analysis, “utility bills” will be deemed also to include, unless otherwise explicitly noted, bills for bulk fuels such as propane.

<sup>2</sup> October 1, 2001 through September 30, 2002.

<sup>3</sup> In addition to cash assistance, LEAP provided \$4,315,984 in weatherization funds, and \$1,101,368 in “crisis” intervention funds. LEAP carried a \$2,280,211 rollover into Fiscal Year 2003.

<sup>4</sup> In Colorado, crisis interventions are limited to furnace repairs, and related benefits.

TANF dollars,<sup>5</sup> and \$1,856,123 in carryover funds from the previous fiscal year. In addition to the \$2.5 million it provided in supplemental LEAP funding, CEAF provided \$1,371,869 to a range of non-profit agencies to fund energy assistance grants outside the LEAP framework.

The Colorado LEAP program assisted 79,617 total households. Of these, 14,091 involved customers that were in imminent danger of having service terminated for nonpayment in the absence of the LEAP payment. CEAF's direct grants assisted an additional 6,379 households.

## **DEFINING THE ECONOMIC IMPACTS OF ENERGY ASSISTANCE**

The distribution of energy assistance adds dollars of direct economic activity to the State of Colorado. In FY 2002, the combined CEAF/LEAP cash benefit distribution added more than \$23.1 million directly to the Colorado economy. In addition, these energy assistance programs added more than \$3.6 million in economic output through their administrative and outreach activities.

The *complete* economic impact of energy assistance, however, extends well beyond these direct impacts. Energy assistance benefits induce economic activity in three aspects of the Colorado 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 Colorado 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 Colorado economy.
- **Employment:** As energy assistance increases economic activity in the State of Colorado, 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 created as well. Indirect job creation occurs as the directly-created employees, in turn, spend their incomes and consume additional goods

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<sup>5</sup> TANF is Temporary Aid to Needy Families, formerly known as Aid to Families with Dependent Children (AFDC). TANF is what is normally considered to be “welfare.”

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 of 12.3, for example, each one million dollars of energy assistance delivered in Colorado supports 12.3 new jobs in the Colorado economy.

- **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 (\$1) of energy assistance benefits would create \$1.60 of total economic activity.

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

## **QUANTIFYING THE ECONOMIC IMPACTS OF ENERGY ASSISTANCE**

The distribution of energy assistance first creates economic activity for the State of Colorado 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 Colorado economy as a result of energy assistance<sup>6</sup> includes three distinct types of economic impacts:

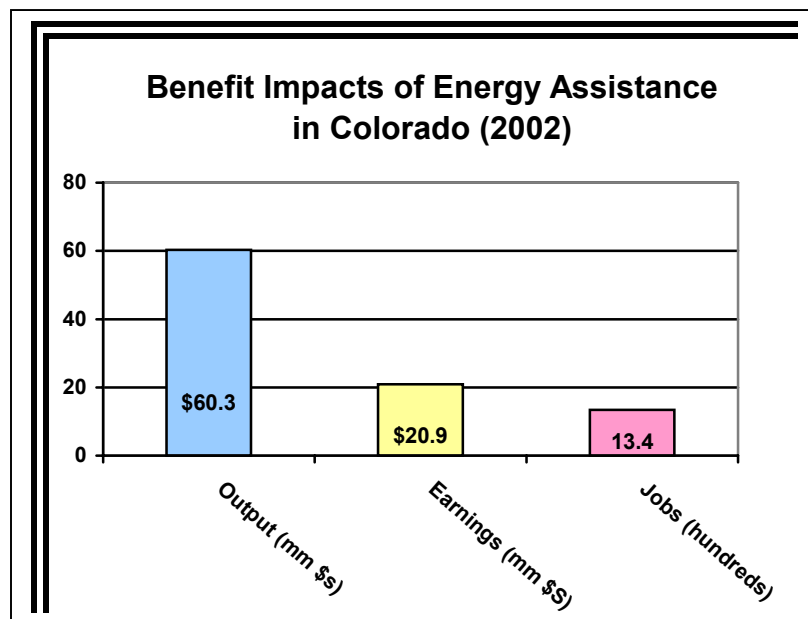
- The benefit impacts
- The payment impacts
- The behavior impacts

### ***The Benefit Impacts of Energy Assistance Dollars***

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<sup>6</sup> Only the impacts of cash fuel assistance are considered. Assessing the economic impacts of weatherization funded through LEAP or through CEAF are beyond the scope of this analysis. This is not because weatherization fails to create economic benefits, but rather simply because assessing such benefits is beyond the scope of this particular analysis.

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 administration and outreach.



In total, the distribution of energy assistance in Colorado (along with the attendant administrative and outreach expenditures) added \$60.3 million to the Colorado economy, created \$20.9 million in increased earnings, and supported 1,338 jobs. The payment impacts and behavior impacts are in addition to these benefit impacts.

These benefits arise because, to the extent Colorado

provides energy assistance to low-income households, the benefits free up funds to buy other household necessities.<sup>7</sup> Household expenditures arising as a result of the distribution of energy assistance are assumed to follow the same expenditure patterns that low-income consumers<sup>8</sup> exhibit with respect to other variable household expenditures.<sup>9</sup> These additional household expenditures will occur in the retail trade sector of the Colorado economy. The distribution of energy assistance dollars will increase total economic activity in Colorado, increase total employee earnings, and create additional jobs.

Energy assistance provided \$23,107,310 in cash assistance to Colorado households in FY 2002. In addition to the dollars of cash benefits distributed, energy assistance contributed to economic output in the state through its own administrative and outreach activities. LEAP spent \$3.6 million on administration and outreach, while CEAFF spent roughly \$70,000 (\$3.67 million total).

<sup>7</sup> Energy assistance benefits, in other words, are not used to pay for increased energy consumption.

<sup>8</sup> 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.

<sup>9</sup> Some expenditures will not change as a result of the receipt of LEAP. Household expenditures on shelter, new car expenses, insurance, and other fixed household costs are considered not to be variable expenditures.



The breakdown of the economic benefits generated by cash assistance, and administrative/outreach dollars, is presented in the table below:

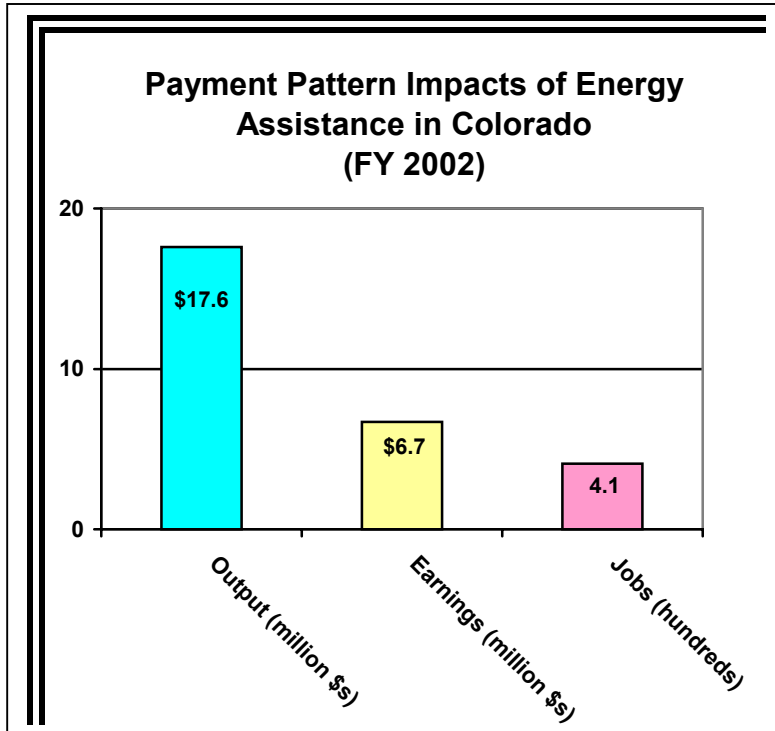
<i>Energy Assistance</i>	<i>Added Economic Output</i>	<i>Added Earnings</i>	<i>Added Jobs</i>
Cash benefits	\$51,868,979	\$19,659,699	1,206
Outreach/Administration	\$8,427,592	\$1,196,626	131
Total	\$60,296,570	\$20,856,325	1,338

### ***The Payment Impacts of Energy Assistance***

The payment impacts of energy assistance in Colorado are those economic benefits that arise from changes in payment practices of Colorado 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 Colorado economy.

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.

To the extent that Colorado provides energy assistance to Colorado residents, these benefits help residents change payment patterns and practices that cost the household



money. Through these payment practice changes, energy assistance will create \$17.6 million in economic activity, \$6.7 million in earnings, and 409 jobs

By helping Colorado 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 Colorado residents. The expenditures will occur in the retail trade sector of the Colorado 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. Colorado 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 Colorado customers use either electricity or natural gas as their primary heating fuel.

Neither the State of Colorado nor its energy providers 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 reported 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.<sup>10</sup> 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,<sup>11</sup> 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.<sup>12</sup> After an extensive empirical review, the Pennsylvania Public Utilities Commission estimated that 40% of all low-income customers are in arrears at any given time.<sup>13</sup>

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 Colorado LEAP recipients will use their LEAP dollars to help retire pre-existing 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. The Colorado LEAP program, like many utility-operated programs nationwide, structures its distribution of benefits so as to reduce winter heating bills to an affordable percentage of income. Estimating the impact of Colorado's income-based energy assistance is thus based on other income-based programs in the country.

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<sup>10</sup> U.S. Census Bureau, *Extended Measures of Well-Being: 1992*, P70-50RV (November 1995).

<sup>11</sup> Department of Energy and Community Affairs, *Residential Energy Costs and Assistance in Illinois: The 1997 – 98 Winter*, at 6, Springfield (IL).

<sup>12</sup> 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).

<sup>13</sup> 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).

Pennsylvania's experience with its energy assistance programs<sup>14</sup> 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),<sup>15</sup> CAP customers

had 53% fewer *new* payment agreements and 67% fewer credit hold requests. In addition, the Columbia Gas impact evaluation found that, for CAP customers, cancellation of payment plans was reduced by 69% and termination notices declined

***Income based energy assistance, such as that distributed in Colorado, has been found to reduce the incidence of low-income arrears amongst recipients by 35% to 70%.***

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.”<sup>16</sup>

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.

According to the Census Bureau, while 1.8% of non-poor families had their electric and/or natural gas service disconnected for nonpayment, 10.5% of public assistance recipients

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<sup>14</sup> 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.

<sup>15</sup> Ramos, K. *et al.* (November 1996). *Final Pilot Evaluation, Columbia Gas (PA) Customer Assistance Program (CAP)*, at 13, A&C Enercon: Columbus (OH).

<sup>16</sup> 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.

suffered this same deprivation.<sup>17</sup> 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

***Income-based energy assistance, such as that distributed in Colorado, has been found to reduce service disconnections amongst recipients by 65% to 80%.***

of service disconnections decreased by "slightly over 80%."<sup>18</sup> 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 Colorado energy assistance recipients, and accounting for the explicit targeting of energy assistance to households in danger of imminent service termination, results in an expected reduction in the rate of service disconnections of 80% 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 2.1% (80%), is reasonable for purposes of this analysis. This reduction applies only to gas and electric customers.

In addition, much LEAP assistance is explicitly targeted to households in danger of utility terminations due to nonpayment. Of the 79,617 LEAP recipients in FY 2002, 14,091 received LEAP assistance as a mechanism to retire arrears in the face of an imminent termination of utility service for nonpayment.

### **The Household-Level Financial Impacts of Improved Payment Patterns**

Improved payment patterns 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 Colorado economy.

**Late payment charges:** Reduced arrears will result in a reduction in the late payment charges imposed on energy assistance recipients. Rather than devoting the entire energy assistance payment to arrears, energy assistance recipients are found to be, on average, roughly two bills behind in their payments. For those customers in arrears, therefore, \$200 of their energy assistance payment will be devoted to retiring those arrears.

<sup>17</sup> *Extended Measures of Well-Being, supra.*

<sup>18</sup> Barakat & Chamberlin (March 1999). *National Fuel Gas (PA) Low-Income Rate Assistance (LIRA) Program*, at 23, National Fuel Gas Distribution Corporation: Buffalo (NY).

To the extent that energy assistance retires arrears, it will generate an avoided late payment charge to the customer.<sup>19</sup> The reduced late payment charge is equal to the late payment rate (1.5%/month) times the dollar-months of arrears avoided.

**Utility collection and reconnection fees:** In addition to reducing the incidence of customers having arrears, energy assistance payments will reduce both the rate and number of utility service terminations.<sup>20</sup> 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 found 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 Colorado Public Utility Commission (PUC) regulations, a utility may require a deposit of three times the average monthly bill. Given an average monthly bill of \$100, a cash security deposit will thus equal \$300, removing 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 necessary for the customer to take to find money, to contact the utility, to make payment arrangements, and to await the physical reconnection will all take time. The lost work time devoted to the reconnection of service will represent 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.<sup>21</sup> Each hour of lost work time is valued at the average wage for working poor households (\$8.63/hour).<sup>22</sup>

**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.

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<sup>19</sup> This avoided late charge is calculated for only one payment period. To that extent, the household savings generated represents a conservative estimate. In addition, the avoided late charge is calculated only for those customers who completely retire their arrears. The calculation, in other words, considers the reduced incidence of arrears, but not the reduced level of arrears amongst those customers still having arrears.

<sup>20</sup> Only one cycle of terminations will be affected.

<sup>21</sup> Lisa Skumatz (March 2001). *Non-Energy Benefits (NEBS): Recognizing and Measuring All Net Program Benefits*, at 81, Skumatz Economic Research Associates (SERA): Superior (CO).

<sup>22</sup> 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.

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 throughout Colorado supports a one-month rental security deposit of \$700. 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 overwhelmingly do not have leave time to devote to this housing search, 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.<sup>23</sup> While this previous research has valued each hour at minimum wage,<sup>24</sup> for the reasons discussed above, this analysis instead values lost wages at the average wage for a working poor household (\$8.63/hour).<sup>25</sup>

### **The Statewide Economic 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.<sup>26</sup> 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 Colorado economy.

**Avoided late payment charges:** The discussion above identifies that one impact of energy assistance will be reduction of the incidence of accounts in arrears from 40% of the low-income population without energy assistance to 20% with energy assistance.

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<sup>23</sup> *Measuring All Net Program Benefits*, *supra*, at 86.

<sup>24</sup> 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*).

<sup>25</sup> 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.

<sup>26</sup> 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.

Preventing the incursion of late fees will create \$105,000 in economic activity, \$40,000 in additional earnings, and 2.5 new jobs.

**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 \$2.0 million in economic activity, \$760,000 in additional earnings, and 46.6 new jobs.

**Avoided cash security deposits:** Colorado 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 State nor the utilities 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 \$4.0 million in economic activity, \$1.52 million in additional earnings, and 93.2 new jobs.

**Avoided lost wages due to reconnections:** As documented above, previous research has found that each disconnected customer that has 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.<sup>27</sup> 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 \$1.5 million in economic activity, \$600,000 in additional earnings, and 34.3 new jobs.

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<sup>27</sup> 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.



**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 \$7.6 million in economic activity, \$2.9 million in additional earnings, and 176.9 new jobs.

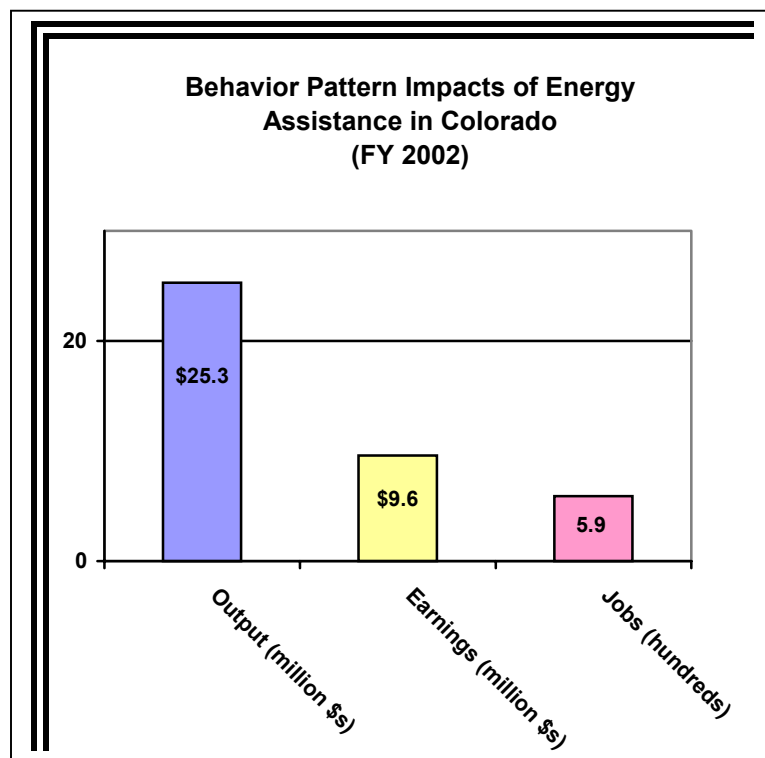
**Avoided lost wages to relocation search:** Lost work devoted to the search time associated with housing relocation represents lost wages to a low wage worker without leave time. Applying the factors identified above regarding avoided service terminations, relocation rates, and lack of leave time, preventing utility service terminations will have the combined effect of creating \$2.4 million in economic activity, \$910,000 in additional earnings, and 55.8 new jobs.

### Summary of Payment Impacts

Improved payment patterns attributable to Colorado energy assistance will create economic impacts throughout the Colorado economy. These payment impacts, standing alone (without the benefit impacts described above or the behavior impacts identified below), will yield \$17.6 million in economic activity, generate \$6.7 million in increased earnings, and create 409 new jobs. The breakdown of these benefits by payment practice is presented in the table below.

<i>Payment pattern impact</i>	<i>Impact on the Colorado Economy by Payment Pattern Change</i>		
	Output	Earnings	Jobs
Avoided late fees	\$105,397	\$39,948	2.5
Avoided collection and reconnect fees	\$601,468	\$227,972	14.0
Avoided collection and reconnect fees (crisis)	\$1,403,189	\$531,845	32.6
Avoided new deposits	\$1,202,936	\$455,944	28.0
Avoided new deposits (crisis)	\$2,806,378	\$1,063,691	65.3
Avoided lost wages--reconnect	\$442,937	\$167,885	10.3
Avoided lost wages--reconnect (crisis)	\$1,033,346	\$391,665	24.0
Avoided rental security deposit	\$3,022,763	\$1,145,706	70.3
Avoided rental security deposit (crisis)	\$4,583,750	\$1,737,361	106.6
Avoided lost wages--rent search	\$954,019	\$361,598	22.2
Avoided lost wages--rent search (crisis)	\$1,446,684	\$548,331	33.6
Total	\$17,602,868	\$6,671,331	409.4

## *The Behavior Impacts of Energy Assistance*



The behavior impacts of energy assistance in Colorado are those economic benefits that arise from a change in behavior patterns of low-income Colorado 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 Colorado economy. As with payment impacts, the benefit impacts discussed above are in addition to these behavior impacts.

To the extent that Colorado provides energy assistance to Colorado residents, these

benefits help residents change behavior patterns and practices that cost the household money. Through these behavior pattern changes, energy assistance will create \$25.3 million in economic activity, \$9.6 million in added earnings, and 588 new jobs.

By helping Colorado 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 Colorado residents. The expenditures will occur in the retail trade sector of the Colorado economy and will ramify throughout the economy.

### **Changes in Behavior Patterns**

Three behavior patterns are considered in this analysis:

- Reduction 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.”<sup>28</sup> While the issue had not been previously well-documented in the literature, this researcher found that “one in fourteen 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-fourteen wage earners as the basis for the calculations below.

**Avoided work lost to family care responsibilities:** The discussion of improved health in the Skumatz documentation of lost sick days 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.”<sup>29</sup>

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.<sup>30</sup> 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 REACH<sup>31</sup> program found that the energy

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<sup>28</sup> *Measuring All Program Net Benefits*, *supra*, at 95.

<sup>29</sup> 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.

<sup>30</sup> 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.

<sup>31</sup> REACH is the Residential Energy Assistance Challenge (REACH) grant program, operated by the U.S. Department of Health and Human Services.

assistance provided through that program resulted in an 18% increase in the children's school attendance.<sup>32</sup> 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 any 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%.

**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.”<sup>33</sup> Of these frequently mobile households, 50% cited unaffordable home energy bills as being an important factor in their most recent move.

Similarly, Skumatz<sup>34</sup> reported survey data indicating that 16% of weatherization program participants indicated that the weatherization activities “yes, definitely” helped them having to move to another home. An additional 8% reported that the weatherization activities “yes, maybe” 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 Financial Impacts of Changed Behavior Patterns**

Improved energy affordability allows energy assistance recipients to 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 Colorado economy.

**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).

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<sup>32</sup> Khawaja, M. Sami (2001). *Final Findings: Indiana REACH Evaluation*, at III-9, III-11, Quantec: Portland (OR).

<sup>33</sup> Colton, R. “A Road Oft Taken: Unaffordable Home Energy Bills, Forced Mobility, and Childhood Education in Missouri,” 2 *Journal of Children and Poverty* 23 (1996).

<sup>34</sup> *Measuring All Program Net Benefits*, *supra*, at 85.

**Lost wages due to family care responsibility:** Wages lost to family care responsibilities are again valued at the average hourly wage for low-wage workers. 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, Colorado data indicates that this security deposit will reach \$700 per household. 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.<sup>35</sup>

### **The Statewide Economic 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 Colorado economy.

**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 \$750,000 in economic activity, \$280,000 in earnings, and 17.4 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

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<sup>35</sup> 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.

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 \$6.2 million in additional economic output, \$2.3 million in earnings, and 143.8 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 \$700 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 \$13.5 million in economic output, \$5.1 in earnings, and 314.2 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 \$580,000 in economic activity, \$220,000 in earnings, and 13.5 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 \$4.3 million in economic activity, \$1.6 million in earnings, and 99.2 new jobs.

### **Summary of Behavior Impacts**

Changed behavior patterns attributable to Colorado energy assistance will create economic impacts throughout the Colorado economy. These payment impacts, standing alone (without the benefit or the payment impacts identified above), will yield \$25.3 million in economic activity, generate \$9.6 million in increased earnings, and create 588 new jobs.

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

<i>Behavior pattern impact</i>	<i>Impact on the Colorado Economy by Behavior Pattern Change</i>		
	Output	Earnings	Jobs
Avoided lost wages—worker illness	\$746,320	\$282,875	17.4
Avoided lost wages—family care	\$6,183,798	\$2,343,821	143.8
Avoided rental deposits—forced mobility	\$13,512,465	\$5,121,578	314.2
Avoided utility connection fees—forced mobility	\$579,106	\$219,496	13.5
Avoided lost wages-forced mobility	\$4,264,689	\$1,616,428	99.2
Total	\$25,286,379	\$9,584,199	588.0

### THE PARTICULAR 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."<sup>36</sup> According to this research:

Oakland's low-income area businesses have a distribution network (incoming goods) that is 54 percent Oakland-based. Nineteen percent say their main suppliers are half inside the city and half outside, and 27 percent have suppliers outside the city borders. In stark contrast, only 19 percent of [more middle income neighborhood] stores have main suppliers in Oakland. Twenty-five percent report that half their suppliers are Oakland-based and half are not. Yet 56 percent 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\* \* \*."<sup>37</sup>

<sup>36</sup> David Dante Troutt (1993). *The Thin Red Line: How the Poor Still Pay More*, at 35, Consumers Union: San Francisco (CA).

<sup>37</sup> *Id.*, at 36.

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**SUPPLIER LOCATION: BUSINESSES SERVING LOW-INCOME AND MIDDLE-INCOME NEIGHBORHOODS**

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**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%

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**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%

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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.

**SUMMARY AND CONCLUSIONS**

The delivery of energy assistance in Colorado accomplishes far more for the State 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 Colorado economy.

Energy assistance serves as an economic stimulant for the Colorado economy in three distinct ways. In total, the Fiscal Year 2002 distribution of energy assistance in Colorado:

- Created more than \$103 million in economic activity;
- Created more than \$37 million in added earnings for Colorado workers; and
- Created more than 2,300 new jobs for the state.