The Economic Impacts of Oregon's Low Income Weatherization Program: An Input-Output Analysis
Executive Summary

Oregon Housing and Community Services (OHCS) has recently completed a study exploring the economic impact of Oregon's Weatherization Program on communities across the state. *Our research found that home weatherization significantly benefits local economies; sometimes doubling the initial economic and employment impacts from program expenditures and household energy savings.*

Approach

This study used Input-Output analysis to measure how weatherization dollars that move between businesses, vendors and households "multiply." For this particular research, we utilized the software program *IMPLAN Professional* (IMpact Analysis and PLANning).

"Inputs" for this study include labor and material expenditures (on various weatherization procedures such as insulation and furnace replacement), administrative spending (training, employee wages) and household energy savings. Program managers and weatherization contractors throughout the state of Oregon provided this data.

Findings

In 2005, agencies throughout Oregon weatherized 3821 homes, helping low-income families increase self-sufficiency through energy conservation and lower utility expenses. Oregon's Weatherization Program also results in considerable economic benefits to local communities. The program not only frees budget resources for household spending, but weatherization measures generate jobs and economic activity at local businesses.

Among our findings:

- For every weatherization program dollar spent in Oregon counties up to another $.83 is generated locally. Labor income is impacted as well; for each dollar spent on employee compensation through county weatherization programs, up to another $1.43 in labor income is produced within communities. Additionally, each job associated with weatherization programs produce up to another 1.3 jobs locally.

- Increased household spending as a result of energy savings also stimulates local economies. Dollars that would in most cases "leak" to out-of-town utility companies are instead spent on other goods (e.g. rent, food, clothing, transportation) in residents' own communities. This increased spending results in additional jobs, earnings and overall economic growth. Every dollar spent as a result of energy savings yields up to another $.63 within Oregon counties, and $.85 statewide.

- Economic impacts that may not be captured in local communities are retained at the statewide level—resulting in higher economic impacts across Oregon Estimates indicate that each weatherization dollar spent, regardless of county, generates up to another $1.11 within the state. Similarly, each job associated with the weatherization program produces up to another 1.66 jobs across Oregon.

While this study only examines the economic impacts associated with program spending and energy savings, our research indicates that Oregon's Low Income weatherization program generates multiple "indirect" benefits for both program clients and the community-at-large. These include improved physical health, better housing conditions and preservation of affordable housing stock. Further research is recommended to measure the weatherization effects in these areas.

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Introduction

Between rising fuel costs, a lack of affordable housing and one of the highest hunger rates in the country, Oregon families face a unique set of obstacles when formulating household budgets. Low income households are especially hard pressed, many being forced to make difficult choices between "hard" costs (e.g. rent, mortgage payments) and more "discretionary" spending (e.g. food , transportation, health care).

Increasing energy costs disproportionately effect low-income households. The United States Department of Energy estimates that low income families pay an average of 12.6% of their income for energy expenses, compared with the average US family who pays only 2.7%. In some cases (e.g. elderly households with fixed incomes) the share of income spent on energy expenses can reach as high as 35%.[1]

Since its inception in 1979, Oregon's Weatherization program has helped thousands of households conserve energy, reducing utility expenses for low-income families across the state. Home weatherization programs help to ease the unequal energy burden felt by low income families—reducing the need for emergency utility assistance and allowing more dollars in household budgets to be spent on housing, transportation, health and food related expenses.

In addition to increasing family self sufficiency through energy conservation, weatherization programs in Oregon and across the country have been recognized for their "non-energy related" benefits. A study by the Oak Ridge National Laboratory found that home weatherization increases household property values, maintains affordable housing, improves the environment through reduced consumption of fossil fuels and assists in national security by decreasing the use of imported oil.[2]

Another non-energy related benefit of weatherization programs involves significant economic impacts to local communities. Through increased household spending, generation of jobs and purchasing of materials--weatherization programs play an important role in local economic development. In many cases, when families pay their energy bills, the money is sent to out of town utility companies, "escaping" the local economy. When energy bills are reduced, the money is spent by families for goods and services *within the community*. Additionally, weatherizing homes directly provides jobs for local contractors and revenue for businesses who supply the materials necessary for weatherization procedures.

The economic "ripple effect" of Weatherization Programs in local economies goes well beyond these initial impacts. This report will look at the dynamics of Oregon's Weatherization Assistance program, then utilizing Input-Output analysis, will examine the extent to which Oregon's Weatherization Program economically benefits local communities as well as the entire State.

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[1] U.S. Department of Energy, 2006
[2] Schweitzer, Martin and Bruce Tonn, 2002

What Exactly is Weatherization?

Weatherization involves making a home more energy efficient. When the Department of Energy began the federal Weatherization Assistance Program in 1976, the weatherization techniques they used were limited to procedures that sealed the house from outside air and drafts—including weather stripping, caulking and plastic sheeting over windows. The program gradually evolved to allow for more permanent measures such as attic insulation, replacement of doors and windows, as well as repair and replacement of furnaces.[3]

*Table 1: Descriptions of Various Weatherization Procedures**

Attic Insulation	Much of a home's heat can escape through an attic. Most attic insulation is "loose" cellulose material, and installed with an attic blower system.	Air Infiltration	Air Infiltration measures (weatherstripping, sealing holes in walls and foundation) helps to prevent unwanted drafts. One component of air infiltration includes "testing" a home for proper air flow and ventilation.
Kneewall Insulation	A "kneewall" is the wall between the floor of an attic and the rafters, or the short wall that separates the main walls of a house from the ceiling. Insulating these walls helps prevent moisture and drafts.	EPDM/Roof Systems	EPDM stands for "Ethylene Propylene Diene Monomer" or a rubber material used for roof systems on mobile homes. Because mobile homes don't have "attics," installing new roof systems allows for insulation of the ceiling cavity.
Sidewall Insulation	Insulating the main walls of a house prevents drafts and moisture. Wall insulation is usually batt material (paper/foil backed strips of insulation) although in some cases, loose insulation may be blown in through exterior siding.	Furnace Repair/ Replacement	Replacing or repairing inefficient and/or broken furnaces helps to conserve energy, as well as maintain family safety.
Floors	Underfloors and basements are the primary source of moisture and mold in a home. Insulating underfloors and installing vapor barriers can prevent drafts and moisture, as well as ground pollutants and mold from entering a home.	Water Heater	Replacing or repairing older, less efficient water heaters can reduce both household energy (electricity/natural gas) and water usage.
Windows/Doors	By eliminating drafts and "air escape," properly installing energy efficient windows can significantly reduce heating and cooling costs	Refrigerator	Replacing older, less energy efficient refrigerators can considerably cut back on electricity costs, and has the added benefit of maintaining household health and safety standards.
Duct Wrapping	Wrapping air ducts under the home with insulation helps prevent air from "escaping" and reduces heating/cooling costs	CFL	Compact Flourescent Lamps conserve energy by using less wattage, and lasting 10-15 times as long as conventional incandescent lighting.
Duct/HVAC Sealing	Similar to Duct Wrapping--except a "mastic" or caulking material is used to repair cracks/holes.	Energy Education	Energy Education involves talking to homeowners about how they can alter their everyday habits to conserve energy, and reduce utility expenses.

** Information gathered from weatherization contractors across Oregon*

Today, weatherization programs in Oregon and across the United States look much different. While many programs still use weather stripping and caulking—they are also using advanced

[3] U.S. Department of Energy, 2006

diagnostic systems to test which weatherization procedures will be most effective for particular housing types and climate.

Although each specific home demands a unique mix of weatherization measures, some of the more typical procedures include attic, wall and floor insulation, window and door replacement, heating and cooling repair/installation, air infiltration measures (air sealing) and replacement of older appliances with energy efficient alternatives (e.g. water heaters, Compact Fluorescent Lamp bulbs).

Another important aspect of current weatherization programs includes energy education. This involves representatives from local programs who talk with low-income homeowners about steps they can take to reduce energy consumption within their homes. These tips not only empower individuals to conserve energy, but help to optimize household utility savings gained from weatherization improvements.

How does the Oregon Weatherization Program work?

Oregon Housing and Community Services works with agencies throughout the state, which then determine eligibility and administer weatherization procedures to households in their particular region. Some of these agencies work with weatherization contractors in their communities, while other agencies have their own weatherization crews and warehouses.

Funding for Oregon's program comes from a variety of sources including the Department of Energy, the Department of Health and Human Services, the Bonneville Power Administration, utility companies and in some cases, landlord contributions.

Any household whose income is at or below 60 percent of Oregon's median income is eligible for services, and can contact the appropriate local agency to be put on a waiting list. While the waiting period varies between areas, households with senior or disabled members, as well as those households with children under the age of six, are given priority.[4]

Using Input-Output Analysis to explore Oregon's Weatherization Program

When local agencies implement weatherization programs within their communities, their purchase of materials and services directly impact the local economy. Economists use Input-Output analysis to measure these impacts—more specifically, how dollars that move between businesses, vendors and households "multiply." For example, when a person uses their paycheck to buy apples at a local grocery store, their money pays a cashier, the truck driver and the farmer who grew the apples. The cashier, truck driver and farmer then spend the money in their communities, purchasing dinner at a restaurant or donuts at their local coffee shop. How money is initially spent determines how much it will multiply.

For this particular analysis, we utilized the software program *IMPLAN Professional* (IMpact Analysis and PLANning).[5] IMPLAN allows users to construct models using a database of multipliers constructed from several data sources including the Bureau of Economic Analysis,

[4] 2006, Oregon Housing and Community Services
[5] IMPLAN Group, version 2002.

Bureau of Labor Statistics and the U.S. Department of Commerce. Using this type of modeling, we are able to capture a fairly predictive "snapshot" of how economic impacts (in this case, weatherization programs) can affect specific characteristics of a local economy. These aspects include:

- *Output:* purchases made between businesses resulting from the weatherization program
- *Employment:* jobs created from increased business
- *Earnings:* employee compensation and proprietor income

IMPLAN also measures the *type* of economic activity associated with specific impacts. These include:

- *Direct:* initial spending
- *Indirect:* spending by industries as they restock inventory/buy supplies in response to impact
- *Induced:* expenditures by households/government as a result of receiving direct/indirect income

While money may be spent in a local economy, the ability of an economic structure to support industry demands varies from region to region. For example, in rural communities, weatherization programs may be forced to import from outside the area to provide materials for contractors. Alternatively, urban areas will be more likely to support a higher proportion of program demand. IMPLAN accounts for these differences through the use of "regional purchasing coefficients" which determine how much of an initial impact will stay in a community, and how much will "leak" out into other (likely nearby) economies.

Weatherization as Economic Stimulus

For this report, information was gathered from around the state to see how weatherization contractors and local agencies spend money within their programs. This data was sorted into four categories: procedural and program impacts, administrative spending and household energy savings.

Procedural and Program Impacts:

Through various state surveys, analysis of weatherization invoices and discussion with community contractors--specific labor, material and "overhead" (e.g. equipment maintenance) expenses for each weatherization measure were recorded. These expenditures were then categorized into appropriate IMPLAN sectors. Some agencies grouped particular procedures together (for example, many included "knee walls" as part of the "sidewall" calculations) however these differences did not effect impact results. The proportion and type of labor, as well as materials, used for specific weatherization procedures were similar in all regions of Oregon, and therefore used across agency study areas.

Through previous research, we know that some weatherization measures conserve more energy than others. The advantage of breaking down impacts by procedure is that we are able to look at how various weatherization measures impact local economies differently. For the purpose of this report, multipliers were calculated for each procedure by agency, then averaged together to produce "state averaged" procedural multipliers for both local and statewide economic structures.

*Table 2: Breakdown of Material and Labor Expenditures by Procedure**

Attic Insulation	15%	Insulation Products
	35%	Attic Vents and Fans
	50%	Labor and Overhead Costs
Kneewall Insulation	40%	Insulation Products
	60%	Labor and Overhead Costs
Sidewall Insulation	40%	Insulation Products
	60%	Labor and Overhead Costs
Subfloor Insulation	35%	Insulation Products
	5%	Plastic Sheeting
	60%	Labor and Overhead Costs
Windows	50%	Windows
	50%	Labor and Overhead Costs
Doors	40%	Doors
	60%	Labor and Overhead Costs
Duct Wrapping	30%	Insulation Products
	70%	Labor and Overhead Costs
Duct/HVAC Sealing	10%	Mastic/Caulking Materials
	90%	Labor and Overhead Costs
Air Infiltration	10%	Mastic/Caulking Materials
	90%	Labor and Overhead Costs
Roof Systems/EPDM	25%	Insulation Products
	25%	Rubber Roofing Material
	50%	Labor and Overhead Costs
Furnace Repair	10%	Heating Parts and Supplies
	90%	Labor and Overhead Costs
Furnace Replacement	60%	Furnace/Heating Supplies
	40%	Labor and Overhead Costs
Water Heater	100%	Water Heater/Parts
Refrigerator	100%	Refrigerator & Supply
CFL's	90%	CFL Bulbs
	10%	Labor and Overhead Costs
Energy Ed	100%	Labor and Overhead Costs
Other	10%	Electrical Equip & Supply
	5%	Smoke/CO2 Detectors
	5%	Plumbing Equip & Supply
	5%	Household Fans and Vents
	75%	Labor and Overhead Costs

**Averaged figures obtained from agency contractors.*

Also, total expenditures for weatherization measures performed during the 2004 calendar year were calculated for each agency. These "program totals" were run through IMPLAN to estimate how local weatherization program spending impacts local communities.

Administrative spending

While a large proportion of program budgets are applied to actual weatherization measures, a small fraction of agency budgets are used to support costs associated with the administration of these services. Administrative expenditures include employee salaries, rent/lease of office space, insurance, office supplies, training and transportation.

Using statewide auditing information as well as agency-specific statistics, administrative expenditures were broken down into industry impacts, as well as household consumption expenditures (employee salaries). Once again, administrative spending proportions were similar in all regions of the state and therefore used across study areas.

*Table 3: Breakdown of Administrative Expenditures**

Wages	60%	Wages, Salaries of all Employees
Insurance/Benefits	12%	Health and Liability Insurance
Training	8%	Conferences, Safety and Procedural Trainings
Rent	5%	Building Lease, Mortgage or Rent
Auditing	5%	Safety and Accounting Audits
Utilities	3%	Electricity, Gas, Sewer and Water
Travel/Transportation	3%	Vehicle Maintenance and Fuel
Office Supplies	2%	Office Equipment, Maintenance and Supplies
Janitorial Services	2%	Office Cleaning and Building Maintenance

**Averaged Figures obtained from Agency Program Directors across Oregon*

Household Energy Savings:

According to the U.S. Department of Energy, households who participate in the weatherization program save an average $274.00 per year in energy costs. While utility payments tend to escape the local economy, household energy savings are likely to be spent on goods and services in residents' local communities.

Using the average incomes of Oregonians accessing the weatherization program, as well as the number of households each agency serves, we've run energy savings through IMPLAN as household consumption expenditures. This measure allows us to see where families would likely spend their extra money, and how this spending impacts the local economy.

Findings

Various weatherization procedures generate economic activity both locally and statewide. Local area impacts, although significant, are generally smaller than those impacts felt statewide. This is because many small communities cannot fully support industry demand, and must "import" supply from nearby economies. In most cases, these demands are absorbed within the state, hence larger statewide impacts.

Table 4 indicates that for each dollar spent on most weatherization measures, around .50 additional cents are produced in local communities, and another $1.10 is generated across the state

Table 4: Output by Procedure

State Averaged Project Multipliers*

	Local Impacts**				Statewide Impacts**			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Attic	1.00	0.14	0.37	1.52	1.00	0.27	0.82	2.09
Kneewall	1.00	0.14	0.38	1.53	1.00	0.27	0.82	2.09
Walls	1.00	0.15	0.38	1.53	1.00	0.27	0.82	2.09
Floors	1.00	0.14	0.37	1.52	1.00	0.27	0.82	2.09
Windows	1.00	0.14	0.37	1.50	1.00	0.27	0.85	2.12
Doors	1.00	0.14	0.37	1.52	1.00	0.27	0.81	2.08
Duct Wrap	1.00	0.15	0.36	1.51	1.00	0.28	0.78	2.06
Duct Sealing	1.00	0.17	0.37	1.54	1.00	0.29	0.72	2.01
Air Infiltration	1.00	0.17	0.35	1.52	1.00	0.28	0.68	1.96
EPDM	1.00	0.14	0.38	1.53	1.00	0.27	0.85	2.12
Furnace Repair	1.00	0.18	0.38	1.56	1.00	0.29	0.72	2.00
Furnace Replace	1.00	0.13	0.37	1.50	1.00	0.26	0.88	2.15
Water Heater	1.00	0.10	0.45	1.46	1.00	0.19	0.97	2.16
Refrigerator	1.00	0.08	0.42	1.50	1.00	0.19	0.97	2.15
CFL	1.00	0.12	0.44	1.56	1.00	0.24	0.98	2.23
Energy Education	1.00	0.19	0.39	1.58	1.00	0.29	0.68	1.97
Other	1.00	0.16	0.36	1.52	1.00	0.28	0.77	2.05

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Table 5: Earnings by Procedure

State Averaged Project Multipliers*

	Local Impacts**				Statewide Impacts**			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Attic	1.00	0.22	0.76	1.99	1.00	0.32	1.15	2.46
Kneewall	1.00	0.21	0.74	1.95	1.00	0.32	1.15	2.46
Walls	1.00	0.22	0.75	1.96	1.00	0.32	1.15	2.46
Floors	1.00	0.22	0.76	1.99	1.00	0.32	1.15	2.46
Windows	1.00	0.21	0.76	1.97	1.00	0.30	1.14	2.45
Doors	1.00	0.22	0.76	1.98	1.00	0.32	1.15	2.46
Duct Wrap	1.00	0.22	0.74	1.96	1.00	0.34	1.15	2.49
Duct Sealing	1.00	0.25	0.75	2.00	1.00	0.38	1.15	2.54
Air Infiltration	1.00	0.25	0.72	1.97	1.00	0.36	1.10	2.47
EPDM	1.00	0.22	0.77	1.99	1.00	0.30	1.14	2.45
Furnace Repair	1.00	0.26	0.77	2.03	1.00	0.38	1.15	2.53
Furnace Replace	1.00	0.20	0.77	1.97	1.00	0.29	1.14	2.43
Water Heater	1.00	0.09	0.56	1.57	1.00	0.14	0.87	2.01
Refrigerator	1.00	0.08	0.59	1.68	1.00	0.14	0.87	2.01
CFL	1.00	0.17	0.81	1.97	1.00	0.25	1.14	2.39
Energy Education	1.00	0.28	0.79	2.07	1.00	0.41	1.16	2.56
Other	1.00	0.25	0.76	2.01	1.00	0.35	1.15	2.50

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Labor income consists of wages and salaries paid to local employers and employees, and is also significantly impacted by local weatherization programs. Table 5 estimates that each dollar spent on wages related to weatherization programs generates up to another $1.07 in local labor income. Statewide, one dollar in weatherization labor spending can generate up to another $1.56 in earnings.

Table 6: Employment by Procedure

State Averaged Project Multipliers*

	Local Impacts**				Statewide Impacts**			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Attic	1.00	0.26	0.80	2.05	1.00	0.37	1.36	2.73
Kneewall	1.00	0.29	0.94	2.23	1.00	0.37	1.36	2.73
Walls	1.00	0.25	0.96	2.21	1.00	0.45	1.39	2.84
Floors	1.00	0.27	0.83	2.10	1.00	0.37	1.36	2.73
Windows	1.00	0.26	0.80	2.05	1.00	0.37	1.44	2.81
Doors	1.00	0.26	0.82	2.08	1.00	0.39	1.34	2.73
Duct Wrap	1.00	0.29	0.88	2.17	1.00	0.37	1.29	2.66
Duct Sealing	1.00	0.31	0.81	2.11	1.00	0.37	1.15	2.52
Air Infiltration	1.00	0.26	0.70	1.96	1.00	0.37	1.15	2.52
EPDM	1.00	0.29	0.85	2.15	1.00	0.39	1.41	2.80
Furnace Repair	1.00	0.32	0.91	2.23	1.00	0.37	1.15	2.52
Furnace Replace	1.00	0.26	0.93	2.18	1.00	0.37	1.52	2.88
Water Heater	1.00	0.12	0.47	1.39	1.00	0.13	0.87	2.01
Refrigerator	1.00	0.09	0.59	1.69	1.00	0.13	0.87	2.01
CFL	1.00	0.23	1.08	2.31	1.00	0.36	1.75	3.12
Energy Education	1.00	0.31	0.89	2.20	1.00	0.37	1.07	2.44
Other	1.00	0.28	0.78	2.06	1.00	0.37	1.25	2.62

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Table 6 shows impact results in terms of employment, or jobs added to the local economy. For each job supported by local weatherization programs, up to another job and half is produced

within the statewide economy. These impacts are strongest, as anticipated, with procedures that are labor intensive (such as floor insulation and furnace repair).

Geographic factors such as climate and predominant housing type can influence which weatherization procedures local agencies rely more heavily on. However, the size and infrastructure of particular locations can also influence the impact weatherization programs will have on their communities. For example, in more rural areas, we can expect that agency multipliers will not be as large as in urban centers (where more resources are available).

Table 7 reflects this trend. Weatherization programs in larger areas (Washington, Multnomah, Clackamas counties) generate more local economic activity than in smaller locations. However, regardless of agency/county size, each dollar spent on weatherization yields another $1.10 across the state.

Table 7: Output by Agency Spending

		Project Multipliers*							
		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.18	0.52	1.70	1.00	0.27	0.84	2.11
CAO	Washington	1.00	0.21	0.62	1.83	1.00	0.27	0.84	2.11
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.08	0.23	1.30	1.00	0.27	0.84	2.11
CAT	Clatsop, Columbia, Tillamook	1.00	0.09	0.19	1.28	1.00	0.27	0.84	2.11
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.10	0.25	1.35	1.00	0.27	0.84	2.11
CCSSD	Clackamas	1.00	0.20	0.55	1.75	1.00	0.27	0.84	2.11
NI	Deschutes, Jefferson, Crook	1.00	0.16	0.44	1.60	1.00	0.27	0.84	2.11
CSC	Benton, Lincoln, Linn	1.00	0.13	0.34	1.47	1.00	0.27	0.84	2.11
HACSA	Lane	1.00	0.19	0.56	1.74	1.00	0.27	0.84	2.11
HCSC	Harney	n/a				n/a			
MCCAC	Hood River, Sherman, Wasco	1.00	0.10	0.29	1.39	1.00	0.27	0.84	2.11
MCOA	Malheur	1.00	0.08	0.26	1.34	1.00	0.27	0.84	2.11
Mulnomah	Multnomah	1.00	0.24	0.54	1.78	1.00	0.27	0.84	2.11
MWVCAA	Marion, Polk	1.00	0.16	0.47	1.62	1.00	0.27	0.84	2.11
OHDC	Klamath, Lake	1.00	0.14	0.33	1.46	1.00	0.27	0.84	2.11
ORCAA	Coos, Curry	1.00	0.10	0.22	1.32	1.00	0.27	0.84	2.11
UCAN	Douglas	1.00	0.13	0.25	1.38	1.00	0.27	0.84	2.11
YCAP	Yamhill	1.00	0.10	0.24	1.33	1.00	0.27	0.84	2.11

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Earnings, are once again, significantly impacted at both the local and state levels. According to Table 8, local impact estimates are particularly high in developed areas along the 1-5 corridor (e.g. Lane, Linn, Marion, Multnomah counties). However, while smaller areas at the corners of the state (e.g. Coos, Clatsop, Umatilla counties) are not as likely to generate large multipliers, their impacts are still significant. For example, in the year 2004, OHCS estimates that Coos and Curry counties combined spent approximately $285,000 on project labor income. This spending generated an additional $153,000 in employee compensation for the Coos/Curry county economy.

Table 8: Earnings by Agency Spending

Project Multipliers*

		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.25	0.88	2.13	1.00	0.31	1.14	2.45
CAO	Washington	1.00	0.22	0.72	1.95	1.00	0.31	1.14	2.45
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.16	0.62	1.78	1.00	0.31	1.14	2.45
CAT	Clatsop, Columbia, Tillamook	1.00	0.19	0.63	1.82	1.00	0.31	1.14	2.45
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.20	0.66	1.86	1.00	0.31	1.14	2.45
CCSSD	Clackamas	1.00	0.24	0.77	2.01	1.00	0.31	1.14	2.45
NI	Deschutes, Jefferson, Crook	1.00	0.25	0.91	2.16	1.00	0.31	1.14	2.45
CSC	Benton, Lincoln, Linn	1.00	0.23	0.81	2.05	1.00	0.31	1.14	2.45
HACSA	Lane	1.00	0.24	0.89	2.13	1.00	0.31	1.14	2.45
HCSC	Harney	n/a				n/a			
MCCAC	Hood River, Sherman, Wasco	1.00	0.15	0.62	1.78	1.00	0.31	1.14	2.45
MCOA	Malheur	1.00	0.14	0.64	1.78	1.00	0.31	1.14	2.45
Mulnomah	Multnomah	1.00	0.29	0.79	2.08	1.00	0.31	1.14	2.45
MWVCAA	Marion, Polk	1.00	0.24	1.04	2.28	1.00	0.31	1.14	2.45
OHDC	Klamath, Lake	1.00	0.21	0.74	1.95	1.00	0.31	1.14	2.45
ORCAA	Coos, Curry	1.00	0.19	0.67	1.86	1.00	0.31	1.14	2.45
UCAN	Douglas	1.00	0.15	0.66	1.79	1.00	0.31	1.14	2.45
YCAP	Yamhill	1.00	0.20	0.65	1.85	1.00	0.31	1.14	2.45

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Table 9: Employment by Agency Spending

Project Multipliers*

		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.28	0.99	2.28	1.00	0.35	1.32	2.66
CAO	Washington	1.00	0.28	0.96	2.25	1.00	0.35	1.32	2.66
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.15	0.55	1.70	1.00	0.35	1.32	2.66
CAT	Clatsop, Columbia, Tillamook	1.00	0.25	0.63	1.88	1.00	0.35	1.32	2.66
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.25	0.63	1.88	1.00	0.35	1.32	2.66
CCSSD	Clackamas	1.00	0.28	0.93	2.21	1.00	0.35	1.32	2.66
NI	Deschutes, Jefferson, Crook	1.00	0.29	0.98	2.27	1.00	0.35	1.32	2.66
CSC	Benton, Lincoln, Linn	1.00	0.26	0.80	2.06	1.00	0.35	1.32	2.66
HACSA	Lane	1.00	0.29	1.00	2.29	1.00	0.35	1.32	2.66
HCSC	Harney	n/a				n/a			
MCCAC	Hood River, Sherman, Wasco	1.00	0.17	0.58	1.75	1.00	0.35	1.32	2.66
MCOA	Malheur	1.00	0.25	0.50	1.75	1.00	0.35	1.32	2.66
Mulnomah	Multnomah	1.00	0.32	0.91	2.25	1.00	0.35	1.32	2.66
MWVCAA	Marion, Polk	1.00	0.28	1.02	2.30	1.00	0.35	1.32	2.66
OHDC	Klamath, Lake	1.00	0.27	0.73	2.00	1.00	0.35	1.32	2.66
ORCAA	Coos, Curry	1.00	0.22	0.65	1.87	1.00	0.35	1.32	2.66
UCAN	Douglas	1.00	0.25	0.75	2.00	1.00	0.35	1.32	2.66
YCAP	Yamhill	1.00	0.20	0.59	1.79	1.00	0.35	1.32	2.66

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

The weatherization program's most significant impact is on employment. Table 9 indicates that for each job associated with the weatherization program, up to another 1.3 jobs are created locally. The statewide impact is even more significant. For each job supported or created as a result of the weatherization program, another one and a half jobs are generated throughout the state.

Administrative Spending

Administrative spending includes a variety of expenditures, all which ensure effective implementation of the weatherization program. Included in administrative expenses are typical costs such as employee wages, insurance (health and liability), facilities maintenance, and office supplies. However, the administrative breakdown also incorporates employee training, auditing and research. These types of expenditures maintain the safety of program recipients and employees—as well as further the technology and efficiency of current weatherization program measures.

Like procedural spending, the costs associated with running a statewide weatherization program have significant effects on local economies. According to Table 10, for every dollar spent on administrative costs, another .88 cents is generated statewide.

In the case of administrative spending, labor income (i.e. employee earnings) captures the most significant impacts both locally and statewide. As indicated in Table 11, for every dollar spent toward labor, up to another $1.43 is produced locally, and an additional $1.48 is generated across the state.

Table 10: Output by Administrative Spending

		Project Multipliers*							
		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.15	0.47	1.62	1.00	0.22	0.66	1.88
CAO	Washington	1.00	0.17	0.46	1.63	1.00	0.22	0.66	1.88
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.07	0.24	1.31	1.00	0.22	0.66	1.88
CAT	Clatsop, Columbia, Tillamook	1.00	0.08	0.24	1.31	1.00	0.22	0.66	1.88
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.09	0.27	1.36	1.00	0.22	0.66	1.88
CCSSD	Clackamas	1.00	0.16	0.42	1.58	1.00	0.22	0.66	1.88
NI	Deschutes, Jefferson, Crook	1.00	0.16	0.49	1.65	1.00	0.22	0.66	1.88
CSC	Benton, Lincoln, Linn	1.00	0.12	0.37	1.49	1.00	0.22	0.66	1.88
HACSA	Lane	1.00	0.16	0.49	1.65	1.00	0.22	0.66	1.88
HCSC	Harney	1.00	0.05	0.14	1.19	1.00	0.22	0.66	1.88
MCCAC	Hood River, Sherman, Wasco	1.00	0.07	0.27	1.34	1.00	0.22	0.66	1.88
MCOA	Malheur	1.00	0.06	0.22	1.27	1.00	0.22	0.66	1.88
Mulnomah	Multnomah	1.00	0.21	0.44	1.65	1.00	0.22	0.66	1.88
MWVCAA	Marion, Polk	1.00	0.15	0.50	1.66	1.00	0.22	0.66	1.88
OHDC	Klamath, Lake	1.00	0.11	0.32	1.44	1.00	0.22	0.66	1.88
ORCAA	Coos, Curry	1.00	0.08	0.25	1.33	1.00	0.22	0.66	1.88
UCAN	Douglas	1.00	0.11	0.31	1.41	1.00	0.22	0.66	1.88
YCAP	Yamhill	1.00	0.10	0.28	1.39	1.00	0.22	0.66	1.88
OHCS	Statewide Administrator	1.00	0.22	0.66	1.88	1.00	0.22	0.66	1.88

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

CCNEO	Baker, Grant, Union, Wallowa	1.00	0.20	0.78	1.98	1.00	0.32	1.16	2.48
CCSSD	Clackamas	1.00	0.27	0.85	2.12	1.00	0.32	1.16	2.48
NI	Deschutes, Jefferson, Crook	1.00	0.27	1.00	2.27	1.00	0.32	1.16	2.48
CSC	Benton, Lincoln, Linn	1.00	0.22	0.90	2.11	1.00	0.32	1.16	2.48
HACSA	Lane	1.00	0.27	1.00	2.27	1.00	0.32	1.16	2.48
HCSC	Harney	1.00	0.12	0.72	1.84	1.00	0.32	1.16	2.48
MCCAC	Hood River, Sherman, Wasco	1.00	0.14	0.71	1.85	1.00	0.32	1.16	2.48
MCOA	Malheur	1.00	0.13	0.73	1.86	1.00	0.32	1.16	2.48
Mulnomah	Multnomah	1.00	0.32	0.83	2.15	1.00	0.32	1.16	2.48
MWVCAA	Marion, Polk	1.00	0.26	1.17	2.43	1.00	0.32	1.16	2.48
OHDC	Klamath, Lake	1.00	0.21	0.83	2.04	1.00	0.32	1.16	2.48
ORCAA	Coos, Curry	1.00	0.17	0.78	1.96	1.00	0.32	1.16	2.48
UCAN	Douglas	1.00	0.20	0.77	1.97	1.00	0.32	1.16	2.48
YCAP	Yamhill	1.00	0.22	0.77	1.99	1.00	0.32	1.16	2.48
OHCS	Statewide Administrator	1.00	0.32	1.16	2.48	1.00	0.32	1.16	2.48

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Table 12: Employment by Administrative Spending

		Project Multipliers*							
		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.24	0.85	2.09	1.00	0.28	1.01	2.28
CAO	Washington	1.00	0.24	0.73	1.97	1.00	0.28	1.01	2.28
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.15	0.59	1.74	1.00	0.28	1.01	2.28
CAT	Clatsop, Columbia, Tillamook	1.00	0.16	0.66	1.82	1.00	0.28	1.01	2.28
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.18	0.63	1.81	1.00	0.28	1.01	2.28
CCSSD	Clackamas	1.00	0.23	0.75	1.99	1.00	0.28	1.01	2.28
NI	Deschutes, Jefferson, Crook	1.00	0.23	0.81	2.04	1.00	0.28	1.01	2.28
CSC	Benton, Lincoln, Linn	1.00	0.22	0.79	2.01	1.00	0.28	1.01	2.28
HACSA	Lane	1.00	0.25	0.85	2.10	1.00	0.28	1.01	2.28
HCSC	Harney	1.00	0.11	0.45	1.56	1.00	0.28	1.01	2.28
MCCAC	Hood River, Sherman, Wasco	1.00	0.14	0.60	1.74	1.00	0.28	1.01	2.28
MCOA	Malheur	1.00	0.12	0.52	1.64	1.00	0.28	1.01	2.28
Mulnomah	Multnomah	1.00	0.27	0.72	1.99	1.00	0.28	1.01	2.28
MWVCAA	Marion, Polk	1.00	0.24	0.97	2.21	1.00	0.28	1.01	2.28
OHDC	Klamath, Lake	1.00	0.19	0.69	1.89	1.00	0.28	1.01	2.28
ORCAA	Coos, Curry	1.00	0.16	0.63	1.79	1.00	0.28	1.01	2.28
UCAN	Douglas	1.00	0.20	0.62	1.82	1.00	0.28	1.01	2.28
YCAP	Yamhill	1.00	0.19	0.66	1.85	1.00	0.28	1.01	2.28
OHCS	Statewide Administrator	1.00	0.28	1.01	2.28	1.00	0.28	1.01	2.28

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Employment is also impacted significantly by administrative spending. In many communities, for every job associated with administration of the weatherization program, another one job is created. This estimate is even higher statewide: every administrative-related job yields another one and a quarter jobs across Oregon.

Energy Savings

Households who conserve energy also save on their utility expenses, enabling them to spend this extra money within their communities. According to Table 13, families who save on their energy bills generate up to an additional .85 cents of economic activity for each dollar they spend.

Energy Savings and subsequent spending also stimulates labor earnings as well. According to Table 14, for each dollar earned as a result of household expenditures about another $1.43 in wages and salaries are generated within the statewide economy. Local economies also see significant impacts, anywhere from .73 cents to $1.27 in earnings are produced within communities across Oregon as a result of household energy savings.

Table 13: Output by Energy Savings

		Project Multipliers*							
		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.16	0.46	1.62	1.00	0.21	0.64	1.85
CAO	Washington	1.00	0.15	0.43	1.59	1.00	0.21	0.64	1.85
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.08	0.23	1.31	1.00	0.21	0.64	1.85
CAT	Clatsop, Columbia, Tillamook	1.00	0.09	0.25	1.33	1.00	0.21	0.64	1.85
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.08	0.26	1.34	1.00	0.21	0.64	1.85
CCSSD	Clackamas	1.00	0.14	0.39	1.53	1.00	0.21	0.64	1.85
NI	Deschutes, Jefferson, Crook	1.00	0.14	0.46	1.60	1.00	0.21	0.64	1.85
CSC	Benton, Lincoln, Linn	1.00	0.12	0.35	1.46	1.00	0.21	0.64	1.85
HACSA	Lane	1.00	0.16	0.47	1.63	1.00	0.21	0.64	1.85
HCSC	Harney	n/a				n/a			
MCCAC	Hood River, Sherman, Wasco	1.00	0.08	0.27	1.35	1.00	0.21	0.64	1.85
MCOA	Malheur	1.00	0.06	0.22	1.28	1.00	0.21	0.64	1.85
Mulnomah	Multnomah	1.00	0.19	0.42	1.61	1.00	0.21	0.64	1.85
MWVCAA	Marion, Polk	1.00	0.14	0.46	1.60	1.00	0.21	0.64	1.85
OHDC	Klamath, Lake	1.00	0.10	0.31	1.41	1.00	0.21	0.63	1.85
ORCAA	Coos, Curry	1.00	0.08	0.25	1.32	1.00	0.21	0.64	1.85
UCAN	Douglas	1.00	0.11	0.30	1.40	1.00	0.21	0.64	1.85
YCAP	Yamhill	1.00	0.09	0.26	1.36	1.00	0.21	0.64	1.85

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

In some areas, energy savings can make a significant difference to both the local and statewide economy in terms of employment growth. Table 15 suggests that within some communities, for every job created or supplied as a result of energy savings, another job is generated within the local economy. Statewide, for each job associated with weatherization-related savings, another 1.23 jobs are produced across Oregon.

Table 14: Earnings by Energy Savings

Project Multipliers*

		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.24	0.89	2.13	1.00	0.30	1.13	2.43
CAO	Washington	1.00	0.25	0.77	2.02	1.00	0.30	1.13	2.43
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.15	0.64	1.80	1.00	0.30	1.13	2.43
CAT	Clatsop, Columbia, Tillamook	1.00	0.16	0.67	1.83	1.00	0.30	1.13	2.43
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.16	0.67	1.82	1.00	0.30	1.13	2.43
CCSSD	Clackamas	1.00	0.24	0.79	2.03	1.00	0.30	1.13	2.43
NI	Deschutes, Jefferson, Crook	1.00	0.22	0.90	2.12	1.00	0.30	1.13	2.43
CSC	Benton, Lincoln, Linn	1.00	0.19	0.81	2.01	1.00	0.30	1.13	2.43
HACSA	Lane	1.00	0.25	0.91	2.16	1.00	0.30	1.13	2.43
HCSC	Harney	n/a				n/a			
MCCAC	Hood River, Sherman, Wasco	1.00	0.13	0.62	1.75	1.00	0.30	1.13	2.43
MCOA	Malheur	1.00	0.12	0.61	1.73	1.00	0.30	1.13	2.43
Mulnomah	Multnomah	1.00	0.29	0.77	2.05	1.00	0.30	1.13	2.43
MWVCAA	Marion, Polk	1.00	0.22	1.05	2.27	1.00	0.30	1.13	2.43
OHDC	Klamath, Lake	1.00	0.17	0.73	1.90	1.00	0.30	1.13	2.43
ORCAA	Coos, Curry	1.00	0.15	0.68	1.83	1.00	0.30	1.13	2.43
UCAN	Douglas	1.00	0.17	0.68	1.86	1.00	0.30	1.13	2.43
YCAP	Yamhill	1.00	0.17	0.66	1.82	1.00	0.30	1.13	2.43

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Table 15: Employment by Energy Savings

Project Multipliers*

		Local Impacts**				Statewide Impacts**			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
ACCESS	Jackson, Josephine	1.00	0.22	0.76	1.98	1.00	0.26	0.96	2.23
CAO	Washington	1.00	0.21	0.65	1.85	1.00	0.26	0.96	2.23
CAPECO	Gilliam, Morrow, Umatilla, Wheeler	1.00	0.14	0.50	1.64	1.00	0.26	0.96	2.23
CAT	Clatsop, Columbia, Tillamook	1.00	0.14	0.54	1.69	1.00	0.26	0.96	2.23
CCNEO	Baker, Grant, Union, Wallowa	1.00	0.14	0.52	1.66	1.00	0.26	0.96	2.23
CCSSD	Clackamas	1.00	0.20	0.67	1.88	1.00	0.26	0.96	2.23
NI	Deschutes, Jefferson, Crook	0.00	0.00	0.00	0.00	1.00	0.26	0.96	2.23
CSC	Benton, Lincoln, Linn	1.00	0.18	0.65	1.84	1.00	0.26	0.96	2.23
HACSA	Lane	1.00	0.24	0.78	2.02	1.00	0.26	0.96	2.23
HCSC	Harney	n/a				n/a			
MCCAC	Hood River, Sherman, Wasco	1.00	0.13	0.51	1.63	1.00	0.26	0.96	2.23
MCOA	Malheur	1.00	0.12	0.45	1.57	1.00	0.26	0.96	2.23
Mulnomah	Multnomah	1.00	0.24	0.65	1.89	1.00	0.26	0.96	2.23
MWVCAA	Marion, Polk	1.00	0.21	0.87	2.08	1.00	0.26	0.96	2.23
OHDC	Klamath, Lake	1.00	0.16	0.60	1.76	1.00	0.26	0.96	2.23
ORCAA	Coos, Curry	1.00	0.14	0.53	1.67	1.00	0.26	0.96	2.23
UCAN	Douglas	1.00	0.20	0.58	1.78	1.00	0.26	0.96	2.23
YCAP	Yamhill	1.00	0.16	0.52	1.67	1.00	0.26	0.96	2.23

** Multipliers represent increased economic activity per each dollar expenditure.*

***Totals may not add up due to independent rounding.*

Suggestions for Further Research

The Oregon Weatherization Program has multiple objectives, primarily to increase household energy conservation and curb energy costs for families across the state. However, our research indicates that services provided through weatherization assistance programs have the extraneous benefit of economically impacting local communities across Oregon.

According to our research these effects are significant, sometimes doubling the initial impacts made by weatherization program expenditures--including materials, labor and administrative spending. Increased household spending as a result of energy savings also stimulates local economies; dollars that would in most cases "leak" to out-of-town utility companies are instead spent on other goods (e.g. rent, food, clothing, transportation) in residents' own communities. This increased spending results in additional jobs, earnings and overall economic growth.

Such findings are valuable to both program managers and legislators at the state and federal levels. As agencies compete for limited funding, it is necessary to demonstrate that programs not only assist direct recipients, but entire communities across the state.

While this study is limited to economic impacts associated with program spending and energy savings, national research indicates that weatherization programs boast multiple benefits--including but not limited to: preservation of affordable housing, regional energy conservation, long-term home improvement, safer housing conditions and improved physical health.

With skyrocketing fuel prices, energy conservation is currently at the top of the national policy agenda. Weatherization programs across Oregon are assisting in the effort by decreasing home use of electricity and natural gas—as well as empowering and educating individuals to conserve resources through energy education. With 3821 Oregon homes weatherized in 2005 alone, it would be worthwhile to conduct research that explores the potential "large scale" effect of weatherization measures on natural resources in the Northwest.

At the program level, cost-benefit analysis could be utilized to determine long term impacts of various weatherization measures—explicitly, which procedures conserve the most resources in consideration of time and money expended.

While energy conservation is a primary aspect of the weatherization program, housing conditions are also an important objective. As housing prices continue to rise in the face of rapidly changing demographics, the struggle to create and maintain affordable housing stock is becoming more difficult. Through low-income home improvement measures such as insulation, window replacement and duct sealing—the Oregon weatherization program serves to *preserve and maintain* existing affordable housing units throughout the state.

Weatherization programs also directly influence the households they serve. In many cases, agencies that weatherize homes also improve safety conditions in the process. For example, in older homes, lead testing is performed prior to any service provision, and moisture sealing procedures help to prevent mold and mildew (widely known to exacerbate respiratory illnesses). In many cases, unsafe appliances (such as older furnaces) are removed from the home and replaced with more efficient models. Carbon monoxide and smoke detectors are

installed in homes where there were none. While these are not primary goals of the program, auditing records to identify specific "safety measures" may provide program directors with additional data helpful for outcome based benchmarks and funding requests.

Another household benefit of weatherization includes reduced utility bills. While our study examines how these energy savings stimulate local economic activity, further research could explore how money saved on energy bills may influence family financial outcomes and self sufficiency—explicitly, in terms of changes in welfare receipt, emergency utility assistance and/or self-perceived improvements to financial security.

Beyond measuring conservation, efficiency and dollars—there are some outcomes "behind the numbers" that are difficult to measure empirically. While safety is certainly tied to physical health, a multitude of research indicates that housing conditions also contribute to emotional and social well-being. Studies suggest a range of connections between housing conditions and individual empowerment, increased social capital, child behavior and performance in school. If weatherization programs improve the safety and conditions of housing units, we could anticipate seeing positive, "difficult to measure" social outcomes (e.g. empowerment, increased community involvement, improved school performance) amongst clients within the state. Qualitative research such as interviews, open-ended surveys or focus groups would allow program directors to gather information about these types of benefits.

While studies to examine the multi-faceted benefits of weatherization programs have been performed across the nation, it is important that Oregon begin to engage in state-specific studies of this nature. This is particularly relevant as the state weatherization program is in the process of determining outcome-based benchmarks and improving auditing tools--all in an effort to streamline services for increased efficiency. Understanding weatherization outcomes and how they differ across communities will assist local program directors in developing realistic objectives for their programs, and will contribute to the formation of short and long-term weatherization goals for the State of Oregon.

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