

# STATE FISCAL YEAR 2005 EVALUATION OF THE NRS 702

## ENERGY ASSISTANCE PROGRAM & WEATHERIZATION ASSISTANCE PROGRAM

May 2006

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## CONTENTS

<b>I.</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>II.</b>	<b>SOLVING THE COMMUNICATIONS PROBLEM.....</b>	<b>5</b>
A.	MAKING PEOPLE AWARE OF THE PROGRAMS.....	5
1.	<i>Not Simple</i> .....	6
2.	<i>Steps in a Communication Campaign</i> .....	6
3.	<i>Communications Tools (Ad, Poster, Brochure)</i> .....	7
B.	THE FUND FOR ENERGY ASSISTANCE AND CONSERVATION.....	10
1.	<i>Cost of the Vitalink Communications Effort</i> .....	11
2.	<i>Activities in the Communication Campaign</i> .....	12
3.	<i>Focus on the Payment Assistance Program</i> .....	13
4.	<i>Barriers to Program Awareness</i> .....	13
5.	<i>On-Going Challenges</i> .....	14
C.	RESULTS OF THE COMMUNICATIONS CAMPAIGN.....	15
D.	CONCLUSIONS .....	18
E.	RECOMMENDATIONS .....	18
<b>III.</b>	<b>THE SIZE OF THE NEED .....</b>	<b>19</b>
A.	HOW ENERGY BURDEN IS DEFINED.....	19
1.	<i>Energy Burden – A Federal Definition</i> .....	19
2.	<i>Nevada Energy Burden</i> .....	22
3.	<i>Energy Burden – A Household Perspective</i> .....	23
B.	INCOME ALLOCATION .....	23
C.	VERY HELPFUL, THOUGH UNRELIABLE FEDERAL FUNDING .....	24
D.	FEDERAL ASSISTANCE IN THE WINTER OF 2006.....	25
E.	THE UPWARD TREND OF ENERGY PRICES IN THE WEST .....	27
F.	THE UPWARD MOVEMENT OF NEVADA ENERGY PRICES .....	27
G.	NUMBER OF ELIGIBLE HOUSEHOLDS.....	31
H.	ANOTHER APPROACH TO NEED - SELF SUFFICIENCY VS. PERCENT OF POVERTY .....	32
I.	COMPARISON OF ALTERNATIVE ELIGIBILITY LEVELS .....	34
J.	SUMMARY .....	35
K.	RECOMMENDATIONS .....	35
<b>IV.</b>	<b>THE LOGIC OF THE PROGRAM .....</b>	<b>37</b>
A.	THE PHYSICAL REALITY OF RESOURCE CONSTRAINTS.....	37
B.	INCREASING PRICES .....	38
C.	DECREASING FAMILY INCOMES .....	38
D.	FAILURE OF BOTH “MARKET” & “COST OF SERVICE” PRICING .....	39
E.	EARLIER ATTEMPTS AT SOLUTIONS .....	40
F.	NEVADA’S APPROACH .....	40
G.	LOGIC MODEL.....	42
<b>V.</b>	<b>PROGRAM STORIES .....</b>	<b>45</b>
A.	ENERGY ASSISTANCE PARTICIPANTS .....	45
1.	<i>Ms. Z (Sparks)</i> .....	45
2.	<i>Ms. C (Las Vegas)</i> .....	46
B.	WEATHERIZATION ASSISTANCE PARTICIPANTS .....	47
1.	<i>Ms. M (Fallon)</i> .....	47
2.	<i>Ms. G. (Henderson)</i> .....	48
3.	<i>Ms. A (Yerington)</i> .....	49
4.	<i>Mr. &amp; Mrs. P (Winnemucca)</i> .....	50
C.	SUMMARY .....	51

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<b>VI.</b>	<b>AUTOMATION ANALYSIS.....</b>	<b>53</b>
A.	THE COMPUTER SYSTEM.....	53
1.	<i>Housing Division</i> .....	53
2.	<i>Welfare Division</i> .....	54
B.	HOUSING DIVISION: ONGOING INCREMENTAL IMPROVEMENTS .....	55
C.	WELFARE DIVISION: ONGOING INCREMENTAL IMPROVEMENTS.....	56
D.	SUMMARY .....	57
E.	RECOMMENDATIONS .....	57
<b>VII.</b>	<b>FISCAL ANALYSIS .....</b>	<b>58</b>
A.	THE CHARGE & THE FUND .....	58
B.	THE THIRD PROGRAM YEAR (SFY 2005).....	58
C.	COLLECTIONS (PUBLIC UTILITIES COMMISSION OF NEVADA).....	60
D.	THE FUND FOR ENERGY ASSISTANCE & CONSERVATION) .....	61
E.	THE PROGRAMS (WELFARE DIVISION & HOUSING DIVISION).....	63
F.	DISCUSSION.....	69
G.	SUMMARY .....	69
H.	RECOMMENDATIONS .....	70
<b>VIII.</b>	<b>THE WEATHERIZATION ASSISTANCE PROGRAM.....</b>	<b>72</b>
A.	SUBGRANTEE AGENCIES .....	72
1.	<i>HELP of Southern Nevada</i> .....	72
2.	<i>Community Service Agency (CSA)</i> .....	73
3.	<i>City of Henderson Neighborhood Services (NS)</i> .....	73
4.	<i>Rural Nevada Development Corporation (RNDC)</i> .....	74
5.	<i>Citizens for Affordable Homes, Inc. (CAHI)</i> .....	74
B.	NUMBER OF HOMES WEATHERIZED .....	75
C.	INSTALLATION SUMMARY .....	76
D.	COST “CAPS,” AVERAGE COST & COORDINATED FUNDING.....	77
E.	HEALTH & SAFETY .....	77
F.	SUBGRANTEE TRAINING.....	78
G.	UTILITY HELP .....	78
H.	FORMAL AND INFORMAL COMPLIANCE .....	78
1.	<i>Specific Provisions</i> .....	79
2.	<i>Review of Client Files</i> .....	80
a)	Documentation .....	83
b)	Uniform Application .....	84
c)	General Quality of Records .....	84
3.	<i>Informal Compliance</i> .....	85
I.	PLAN FOR ANALYSIS OF ENERGY SAVINGS .....	85
1.	<i>Analysis Plan</i> .....	85
2.	<i>Data Arrangements with the Utilities</i> .....	86
3.	<i>Analysis Window, Baseline &amp; Post Year</i> .....	87
4.	<i>Data Cycle for Evaluation</i> .....	87
5.	<i>Plan and Reality</i> .....	87
J.	ESTIMATES OF ENERGY SAVINGS .....	87
1.	<i>Nevada Power</i> .....	88
2.	<i>Southwest Gas</i> .....	89
3.	<i>Sierra Pacific Power Company</i> .....	91
a)	Method .....	92
b)	Summary of findings.....	93
c)	Discussion of Results .....	95
d)	Site Reports.....	99
e)	Conclusions.....	112
f)	Recommendations .....	112
K.	COMPARISON OF PLANNING ESTIMATES & RESULTS .....	113

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1.	<i>Nevada Power</i> .....	113
2.	<i>Southwest Gas</i> .....	113
3.	<i>Sierra Pacific Power Company</i> .....	114
4.	<i>Conclusion</i> .....	114
5.	<i>Energy Savings Estimation Recommendations</i> .....	115
L.	IMPROVEMENTS AND PLANS.....	116
M.	STAFFING ANALYSIS .....	117
N.	RECOMMENDATIONS .....	118
<b>IX.</b>	<b>RESPONSES TO WEATHERIZATION CLIENT SURVEYS .....</b>	<b>120</b>
A.	WHAT HAPPENS AFTER WEATHERIZATION? .....	120
B.	PROBLEMS WITH THE WEATHERIZATION PROGRAM.....	125
1.	<i>General Housing problems</i> .....	125
2.	<i>Air Leakage</i> .....	126
3.	<i>Appearance Problems</i> .....	127
4.	<i>The Wait for Service</i> .....	128
5.	<i>Solar Screens</i> .....	128
6.	<i>Process Problems</i> .....	128
7.	<i>Q/C Problems</i> .....	129
8.	<i>Thermostat</i> .....	130
C.	WHAT COULD BE DONE TO MAKE THE PROGRAM BETTER .....	130
D.	LINGERING CONCERNS .....	131
E.	ADDITIONAL COMMENTS .....	133
<b>X.</b>	<b>ENERGY ASSISTANCE PROGRAM.....</b>	<b>136</b>
A.	FAST-TRACK COMPONENT .....	138
B.	CRISIS-INTERVENTION COMPONENT .....	138
C.	YEAR-AROUND SERVICE.....	139
D.	ARREARAGE COMPONENT .....	139
E.	ENERGY ASSISTANCE PROGRAM (FORMAL COMPLIANCE).....	140
1.	<i>Specific Provisions</i> .....	141
2.	<i>Review of Client Files</i> .....	142
F.	INFORMAL COMPLIANCE.....	143
G.	CALCULATION OF MEDIAN ENERGY BURDEN .....	143
H.	STAFFING ANALYSIS .....	145
I.	PAYMENT BEHAVIOR .....	147
1.	<i>Method</i> .....	148
2.	<i>Results</i> .....	148
3.	<i>Discussion</i> .....	150
4.	<i>Recommendations</i> .....	150
J.	EFFECTIVENESS AND EFFICIENCY.....	151
K.	IMPROVEMENTS AND PLANS.....	152
L.	RECOMMENDATIONS .....	152
<b>XI.</b>	<b>RESPONSES TO THE ENERGY ASSISTANCE CLIENT SURVEY .....</b>	<b>153</b>
A.	SURVEY MEASURES OF PROGRAM EFFECTIVENESS.....	153
B.	PROBLEMS WITH THE ENERGY ASSISTANCE PROGRAM .....	153
1.	<i>Timing of payments; Payments running out</i> .....	154
2.	<i>Energy Bills Going Up, while Income is Fixed</i> .....	155
3.	<i>Time it Takes to Process Application &amp; Notice to Re-Apply</i> .....	157
4.	<i>Cut Off too Low</i> .....	158
5.	<i>Paperwork</i> .....	159
6.	<i>Special Problems</i> .....	159
C.	ADDITIONAL COMMENTS .....	160
D.	DISCUSSION.....	161

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<b>XII.</b>	<b>BEST PRACTICES COMPARISON (ENERGY EDUCATION)</b> .....	<b>163</b>
A.	EMERGENCE OF RESIDENTIAL ENERGY EDUCATION .....	163
B.	THE VALUE OF ENERGY EDUCATION .....	165
C.	BEST PRACTICE CONSIDERATIONS .....	166
D.	WHY INCLUDE ENERGY EDUCATION IN LOW-INCOME WEATHERIZATION PROGRAMS? .....	167
E.	OTHER FACTORS IN ENERGY EDUCATION .....	168
F.	RECOMMENDATIONS .....	169
<b>XIII.</b>	<b>APPENDIX 1. SFY 2005 RECOMMENDATIONS</b> .....	<b>171</b>
A.	OVERALL RECOMMENDATIONS .....	171
B.	WELFARE DIVISION .....	172
C.	HOUSING DIVISION .....	172
D.	EVALUATION .....	173
E.	UTILITIES .....	173
<b>XIV.</b>	<b>APPENDIX 2. SFY 2004 RECOMMENDATIONS</b> .....	<b>175</b>
A.	OVERALL RECOMMENDATIONS .....	175
B.	HOUSING DIVISION RECOMMENDATIONS .....	177
C.	WELFARE DIVISION RECOMMENDATIONS .....	177
D.	UTILITY RECOMMENDATIONS .....	178
<b>XV.</b>	<b>APPENDIX 3. SFY 2003 SUMMARY OF RECOMMENDATIONS</b> .....	<b>179</b>
A.	STATUTORY RECOMMENDATIONS .....	179
B.	WELFARE DIVISION RECOMMENDATIONS .....	180
C.	HOUSING DIVISION RECOMMENDATIONS .....	180
D.	EVALUATION RECOMMENDATIONS .....	182

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## TABLE OF TABLES

TABLE 1: LEVERAGING OF ADDITIONAL DOLLAR-EQUIVALENT VALUE.....	12
TABLE 2: MONTH OVER MONTH APPLICATIONS (SFY 2005 vs. SFY 2004).....	16
TABLE 3: YEAR BY YEAR INCREASE.....	17
TABLE 4: DECLINE IN CONSTANT DOLLAR LIHEA FUNDING SINCE THE MID 1980'S.....	25
TABLE 5: UTILITY BILLS IN NEVADA, 1978 TO 2004 (\$2004).....	28
TABLE 6: NUMBER OF INCOME-ELIGIBLE HOUSEHOLDS.....	31
TABLE 7: ALTERNATIVE ELIGIBILITY LEVELS.....	35
TABLE 8: TOP-LEVEL FISCAL PERSPECTIVE – UNIVERSAL ENERGY CHARGE.....	60
TABLE 9: TOP-LEVEL FISCAL PERSPECTIVE - NEW FUNDS (FEAC).....	61
TABLE 10: TOP-LEVEL FISCAL PERSPECTIVE - FUNDS CARRIED FORWARD (FEAC).....	62
TABLE 11: TOP-LEVEL FISCAL PERSPECTIVE - TOTAL FUNDS AVAILABLE.....	63
TABLE 12: FUND PLAN, BUDGET, EXPENDITURE.....	63
TABLE 13: RATE OF EXPENDITURE (WELFARE DIVISION).....	64
TABLE 14: RATE OF EXPENDITURE (HOUSING DIVISION).....	65
TABLE 15: FEAC – MAJOR LINE ITEMS.....	66
TABLE 16: ANOMALIES IN SFY 2005.....	68
TABLE 17: ALLOCATION TO DIVISIONS.....	68
TABLE 18: WEATHERIZED HOMES BY SUBGRANTEE.....	75
TABLE 19: TYPES OF HOMES WEATHERIZED (BY SUBGRANTEE).....	76
TABLE 20: COUNTIES.....	76
TABLE 21: WEATHERIZED HOMES BY SUBGRANTEE AGENCY.....	81
TABLE 22: ESTIMATION OF DOCUMENTATION COMPLIANCE FOR WEATHERIZED HOMES.....	82
TABLE 23: ESTABLISHMENT OF POPULATION PRECISION OF ESTIMATES.....	84
TABLE 24: GROSS COOLING LOAD REDUCTIONS (NEVADA POWER).....	88
TABLE 25: OVERALL CHANGES IN LOAD (NEVADA POWER).....	89
TABLE 26: GROSS SAVINGS - SOUTHWEST GAS.....	90
TABLE 27: SUMMARY OF FINDINGS (SAVINGS AS PERCENTAGE OF ANNUAL ENERGY USE).....	94
TABLE 28: ANNUAL SAVINGS IN ENERGY UNITS.....	95
TABLE 29: NORMALIZED ANNUAL GAS SAVINGS.....	100
TABLE 30: NORMALIZED ANNUAL ELECTRIC SAVINGS.....	101
TABLE 31: NORMALIZED ANNUAL GAS SAVINGS.....	102
TABLE 32: NORMALIZED ANNUAL ELECTRICITY SAVINGS.....	103
TABLE 33: NORMALIZED ANNUAL GAS SAVINGS.....	104
TABLE 34: NORMALIZED ANNUAL ELECTRICITY SAVINGS.....	105
TABLE 35: NORMALIZED ANNUAL GAS SAVINGS.....	106
TABLE 36: NORMALIZED ANNUAL ELECTRICITY SAVINGS.....	107
TABLE 37: NORMALIZED ANNUAL ELECTRIC SAVINGS.....	108
TABLE 38: NORMALIZED ANNUAL ELECTRIC SAVINGS.....	109
TABLE 39: NORMALIZED ANNUAL ELECTRIC SAVINGS.....	111
TABLE 40: PLANNING ESTIMATES AND MEASURED RESULTS (NEVADA POWER).....	113
TABLE 41: COMPARISON OF SAVINGS ESTIMATES.....	114
TABLE 42: HAVE YOU REPLACED A HEAT PUMP OR FURNACE?.....	120
TABLE 43: HAVE YOU REPLACED AN AIR CONDITIONER?.....	120
TABLE 44: HAVE YOU REPLACED ANY OTHER MAJOR APPLIANCES?.....	121
TABLE 45: HAVE YOU ADDED A WATERBED?.....	121
TABLE 46: HAVE YOU INCREASED THE SQUARE FOOTAGE OF YOUR HOME?.....	121
TABLE 47: ARE YOU HEATING OR COOLING ANY NEW AREAS OF THE HOUSE?.....	122
TABLE 48: CHANGED WINTER TEMPERATURE SETTING?.....	122
TABLE 49: CHANGED SUMMER TEMP SETTING?.....	122
TABLE 50: HAS THE NUMBER OF PEOPLE LIVING IN YOUR HOUSE CHANGED?.....	123
TABLE 51: IN WINTER, THE AMOUNT OF TIME YOU HEAT EACH DAY.....	123
TABLE 52: IN SUMMER, THE AMOUNT OF TIME YOU COOL EACH DAY.....	124
TABLE 53: DID YOU MAKE CHANGES TO THE MEASURES INSTALLED?.....	124

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TABLE 54: MEASURES REMOVED & MEASURED ADDED (N=155) .....	125
TABLE 55: INCOME GUIDELINES.....	137
TABLE 56: REVIEW SAMPLE: ENERGY ASSISTANCE PROGRAM.....	142
TABLE 57: ENERGY BURDEN CALCULATION.....	144
TABLE 58: PERCENTAGE OF BILL PAID (ALL CLIENTS).....	149
TABLE 59: MINIMUM FIXED ANNUAL CREDIT.....	150
TABLE 60: FISCAL YEAR 2005 PROGRAM STATISTICS.....	151
TABLE 61: RECOMMENDED FUNDING ALLOCATION .....	175

## TABLE OF FIGURES

FIGURE 1: COMMUNICATION (DIAGRAM PROVIDED BY VITALINK).....	7
FIGURE 2: PROGRAM AD (DESIGN BY VITALINK).....	7
FIGURE 3: POSTER (DESIGN BY VITALINK).....	8
FIGURE 4: OUTSIDE OF PROGRAM BROCHURE (DESIGN BY VITALINK).....	9
FIGURE 5: INSIDE OF PROGRAM BROCHURE (DESIGN BY VITALINK).....	10
FIGURE 6: RESULTS OF COMMUNICATIONS CAMPAIGN.....	16
FIGURE 7: INCREASING NUMBER OF APPLICATIONS.....	17
FIGURE 8: ENERGY BURDEN IN THE US (USDOE).....	20
FIGURE 9: THE FULL RANGES OF ENERGY BURDENS.....	21
FIGURE 10: INCOME DONUT – INCOME ALLOCATION IN NEVADA.....	24
FIGURE 11: CHANGE IN HOUSEHOLD HEATING BILL. SOURCE: CENTER ON BUDGET AND POLICY PRIORITIES.....	26
FIGURE 12: AVERAGE NATURAL GAS & ELECTRICITY PRICE INDEXES: WEST, URBAN.....	27
FIGURE 13: SIERRA PACIFIC AVERAGE MONTHLY BILLS (\$2004).....	29
FIGURE 14: NEVADA POWER AVERAGE MONTHLY BILLS (\$2004).....	29
FIGURE 15: SOUTHWEST GAS AVERAGE MONTHLY BILLS (\$2004).....	30
FIGURE 16: OVERALL LOGIC MODEL.....	43
FIGURE 17: EVALUATION WINDOW.....	59
FIGURE 18: TIMING FOR QUANTITATIVE ANALYSIS OF UTILITY DATA.....	86
FIGURE 19: STUDIES INCLUDED IN THE NATIONAL META-EVALUATION.....	91
FIGURE 20: PATTERN SHOWN BY REDUCTION IN GAS HEATING.....	96
FIGURE 21: PATTERN SHOWN BY INCREASE IN THERMOSTAT SETTING.....	98
FIGURE 22: WEATHER-NORMALIZED GAS BY END USE (CASE 121696).....	100
FIGURE 23: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 121696).....	101
FIGURE 24: WEATHER-NORMALIZED GAS BY END USE (CASE 188396).....	102
FIGURE 25: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 188396).....	103
FIGURE 26: WEATHER-NORMALIZED GAS BY END USE (CASE 192929).....	104
FIGURE 27: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 192929).....	105
FIGURE 28: WEATHER-NORMALIZED GAS BY END USE (CASE 124899).....	106
FIGURE 29: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 124899).....	107
FIGURE 30: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 417853).....	108
FIGURE 31: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 263989).....	110
FIGURE 32: WEATHER-NORMALIZED ELECTRICITY BY END USE (CASE 263896).....	111
FIGURE 33: STAFFING STRUCTURE.....	145

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## I. EXECUTIVE SUMMARY

This Evaluation Report for the for the Energy Assistance Program (NRS 702.260) and of the Weatherization Assistance Program (NRS 702.270) covers State Fiscal Year 2005.<sup>1</sup> The report describes the objectives of each program, analyzes the effectiveness and efficiency of each program in meeting its objectives, reports on the distribution of money from the Universal Energy Charge (UEC) and the Fund for Energy Assistance and Conservation (FEAC), reports on the coordination between the Housing Division and the Welfare Division in the conduct of the programs, and looks at planned program changes.

Previous evaluations focused on development of necessary infrastructure tools such as computer support, and the development of program capabilities, including staffing.<sup>2</sup> At the end of SFY 2004, a strategy was in place to meet the last major challenge of the initial program implementation, a communications campaign to help insure that eligible Nevadans are aware of the programs and learn how to apply. Participation in the Energy Assistance Program increased over the year, as documented in this report. The other new change for SFY 2005 is the arrearage component, analyzed in the Energy Assistance Program section of the report.

With the legislatively enacted programs basically in place at the end of SFY 2004 and the high-level implementation problems solved, this evaluation looks at possible adjustments for making the payment assistance and weatherization assistance programs more effective and efficient.

From a seasoned evaluation perspective it takes about five years for a new statewide program to be fully developed. Problems of implementation must be encountered and overcome, staffing levels adjusted, necessary computer programming infrastructure developed, modified, and in place, and communications working well. This evaluation is at the mid-point of what the evaluation team sees as a five year implementation period. The context is also changing with increasing energy prices and a long-term deterioration of America's job structure. In this context, for the Energy Assistance Program and the Weatherization Assistance Program, arriving at a fully mature program with a stable rate of application and participation will be more difficult, given these tendencies in prices and jobs (see the discussion of the increasing size of the need for the programs in Section III of this report).

Just as the SFY 2003 and SFY 2004 evaluations were designed to be read together, this evaluation (SFY 2005) is designed to be read along with the next one (for SFY

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<sup>1</sup> The evaluation is conducted pursuant to NRS 702.280(2-3).

<sup>2</sup> The SFY 2003 evaluation was the first full evaluation conducted pursuant to NRS 702.280(2-3). The SFY 2004 evaluation is the second.

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2006). The next evaluation will extend the analysis and provide more definitive results as the number of cases available for analysis is increased.

Due to the success of the Nevada model, these reports will have a wide readership outside of Nevada as well as by responsible leaders, staff, and advocates within the state. For this reason, it is appropriate to note that in developing the Housing and Welfare Division programs, Nevada has developed a “best practice” model for the Western states. Certain features of the Nevada approach should also be studied and copied by other states, particularly in the West but also in the rest of the country.

- **Formal Compliance.** Formal compliance is assessed by comparing agency work effort to the legislation mandating it. Formal compliance is very good, as discussed in the compliance sections of this report.
- **Informal Compliance.** In addition to formal compliance, informal compliance is an intangible dimension concerned with how the program effort appears and the informal relations that support formal compliance function. Informal compliance is proceeding well.
- **Logic.** The logic of the program is presented in Section IV, and the size of the need for the program is documented in Section III.
- **Automation & Reporting Systems.** Management reporting is essential for steering program implementation, insuring compliance, and maintaining program effort. This is the challenge of developing adequate computer tools and internal reporting systems for managing the programs. The automation work completed in SFY 2005 includes the missing reporting capabilities for payment assistance. Automation is discussed in Section VI.
- **Coordination.** The most effective overall program effort would include close coordination between the payment assistance program (Welfare Division) and the weatherization assistance program (Housing Division). Coordination is an element of the enabling legislation. There are ongoing needs to continue to strengthen coordination.
- **Outreach.** Outreach is both an internal and external challenge. There is a very strong and demonstrated need on the part of Nevada households for both payment assistance and weatherization assistance. Also, these programs are well designed to make a real difference for eligible Nevada households. However, outreach is not automatic, and may require some years of effort, testing approaches, to flow smoothly. The outreach & communications effort in SFY 2005 worked well, as discussed in the Communications section of this report (Section II).
- **Stories.** One of the best ways to understand the programs is to listen to the stories of participants. Some of these stories are presented in Section V.

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- **Surveys.** Another way to understand the programs is through the results of surveys of participants (Sections IX and XI).
  - **Energy Savings.** The energy savings documented for the weatherization effort is reported in Section VIII. Energy savings reported in this evaluation are not definitive, but are current best estimates and steps towards definitive results. The evaluation team expects to extend these initial estimates of energy savings to be definitive in the SFY 2006 evaluation.
  - **Payment.** For this evaluation, the payment focus is on the twelve-month pattern following receipt of the Fixed Annual Credit (Section X). Initial payment results were presented in the SFY 2004 evaluation.
  - **Best Practices.** Each evaluation has a section on best practices. In this evaluation, the focus is on education (Section XII).

Recommendations to make the programs more effective and efficient are developed throughout the study, and are collected in Appendix 1. Recommendations from the SFY 2003 (Appendix 2) and SFY 2004 (Appendix 3) are also attached.



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## II. SOLVING THE COMMUNICATIONS PROBLEM

As discussed in the SFY 2003 and SFY 2004 evaluations, the Nevada Universal Energy Charge programs supported by the Fund for Energy Assistance and Conservation initially exhibited a pattern in which collections got ahead of delivery of services. This is a fairly frequent pattern in the area of new service programs, particularly programs to serve low-income households. The collections for the Universal Energy Charge, implemented by utilities and overseen by the state Public Utility Commission required small adjustments to existing collections procedures, and was fully implemented almost immediately. The service delivery infrastructure had to be planned, built out, and continuously improved over several years. As discussed in the SFY 2003 evaluation, in the first full program year the full development of computer systems capabilities necessary to implement the payment assistance program lagged. This factor, in addition to the newness of the program, restricted participation.

The collection function was implemented as planned, but the programs and program infrastructure had to be developed over a period of time. After an initial lag for both the Welfare Division payment assistance program and the Housing Division home weatherization program in SFY 2003, the Housing Division caught up during SFY 2004. Also in SFY 2004, the Welfare Division put in place a communications strategy, using a contract with Vitalink, a social marketing firm that specializes in supporting state communications campaigns (for example, with various health programs in several states).

### ***A. Making People Aware of the Programs***

The work carried out by Vitalink is often referred to as “social marketing” today, and it is seen as the application of marketing skills to communication for state and non-profit programs that help society, rather than promote a commercial product. Health campaigns (for example, the new Medicare drug benefit, campaigns for people to be immunized against the flu, and the like) are “social marketing.”<sup>3</sup> Before the 1970’s, what is now called “social marketing” would have been called “communication.” Since the 1970’s whenever communication and marketing frameworks have been used to make people aware of programs that are in the interest of society, rather than to sell commercial products, the names “social marketing” or “societal marketing” have been applied to describe the work effort.

For the purposes of the evaluation, we will use the older term, “communication” to indicate the solid value produced by these efforts. While we use the more analytically accurate term, “communication,” we acknowledge that effective public

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<sup>3</sup> This section of the evaluation is based primarily on responses to written questions submitted to Vitalink by the evaluation team, and to a lesser extent to discussions with Vitalink.

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communications about the programs borrows from early developments in commercial marketing a set of frameworks and concepts. These frameworks and concepts are modified for purposes of public communication.

- **Awareness.** The first purpose of the communications campaign is to make potential participants aware of the programs administered by the Welfare Division and the Housing Division – that is, to make households that potentially qualify for the programs aware that the programs exist.
- **Attitude.** Beyond that, a goal is to address potential participants in terms that are relevant to their own perceptions, so as to encourage a positive attitude to the programs (the programs are real, they actual can help, it is not difficult to apply, it is worth the effort to find out about the programs). This can include communicating motivations to participate and communicating in ways that can remove barriers to participation.
- **Action.** The final goal is to increase participation (to communicate who qualifies, how to apply, and then make an application).

### 1. *Not Simple*

It might seem that increasing awareness and getting people to apply to the programs is a simple thing, but it is not. While for many applicants participation is simple, for many other potential applicants there will be gaps in awareness and understanding that prevent their application. Also, for example, many people today are skeptical of government. For people whose incomes are small so that they have trouble paying their utility bills, the economy is perceived to be not working well, and this inherently raises questions in peoples' minds about why government does not do much more to fix the economic problems that frame their life experiences. In this context, there is a natural barrier to overcome in coming to realize that here is a situation where government has done the job right, there is a real program that can actually solve the problem of utility bills, and it can actually work and solve a household' problems in securing the essential energy services necessary.

### 2. *Steps in a Communication Campaign*

By nature, the kinds of communications that make people aware of the programs and that encourage them to apply have been sustained, long-term efforts. The stages of a communication campaign are shown in Figure 1.

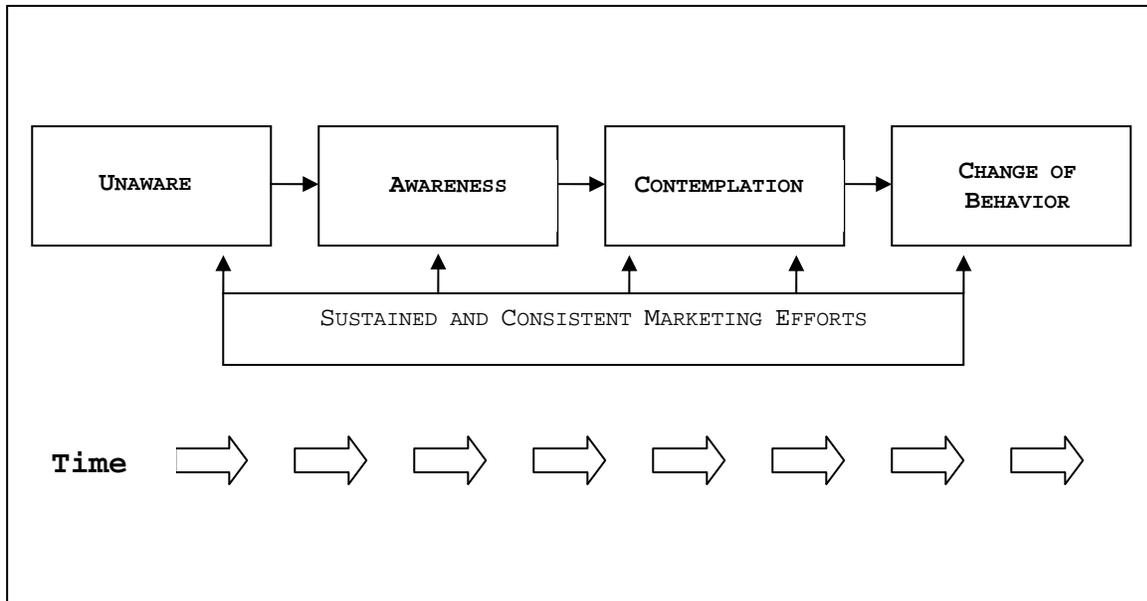


Figure 1: Communication (Diagram provided by Vitalink).

### 3. Communications Tools (Ad, Poster, Brochure)

An ad designed for the Nevada Energy Connection follows as Figure 2, the program poster as Figure 3, and brochure as Figures 4 & 5).

The advertisement is divided into two sections. On the left is the logo for "NEVADA energyconnection" with the tagline "Providing Energy and Weatherization Assistance". On the right, the main heading is "Need help paying your energy bill?". Below this are three bullet points: "Nevada Energy Connection is a state program designed to help carry the weight of high energy bills.", "In fact, last year the average household received \$500 to help pay their energy bills.", and "It's easy to see if you qualify." At the bottom right, it says "Make the connection. Call today. 1-866-846-2009" and "www.nevadaenergyconnection.nv.gov". A small note at the bottom left of the text area says "Made possible by the State of Nevada."

Figure 2: Program Ad (Design by Vitalink).



**Because your  
energy bill shouldn't  
break your back...**

- Nevada Energy Connection is a state program designed to help carry the weight of high energy bills.
- In fact, last year the average household received \$500 to help pay their energy bills.
- It's easy to see if you qualify.



**NEVADA  
energyconnection**  
Providing Energy and  
Weatherization Assistance

**Make the connection. Call today.  
1-866-846-2009**  
[www.nevadaenergyconnection.nv.gov](http://www.nevadaenergyconnection.nv.gov)  
Made possible by the State of Nevada.

Figure 3: Poster (Design by Vitalink).



Figure 4: Outside of Program Brochure (Design by Vitalink).



**About the Program**  
Nevada Energy Connection includes two key programs to help Nevadans cope with the high cost of energy.

**Energy Assistance Program**  
The Energy Assistance Program helps qualified Nevadans reduce their energy bills by making payments directly to the energy company on the consumer's behalf. Last year, more than 15,000 households participated in the program, with the average household receiving \$500 in energy assistance benefits. Payments are made directly to the energy supplier, and show up on your energy bill as a credit.  
The Energy Assistance Program also provides assistance to eligible households with special circumstances, including:

- **Fast-Track** - an expedited application process for emergencies like energy shut-offs.
- **Crisis Intervention** - assists households whose gross income may exceed the guidelines, except that an allowable expense reduces the income to or below the guideline limits.
- **Arrearage Assistance** - one-time assistance to help a household bring past due charges on their heating and/or cooling bill(s) current. Arrearage Assistance is only available to homes receiving service from Nevada Power, Sierra Pacific Power, Southwest Gas, or the cities of Boulder City, Caliente, Fallon, or Primm.

**Weatherization Program**  
The Weatherization Assistance Program helps qualified Nevadans reduce their energy bills by helping them improve the energy efficiency of their home. This assistance could come in the form of added insulation, weather stripping, and minor home repairs. Benefits for participating households are projected to be \$2,500 this year.

**Do I Qualify?**  
Nevadans who own their own home, town home, manufactured home, condo, or rent a home or apartment can qualify for the programs. To qualify, you must:

1. Be at least partly responsible for home heating or cooling costs by paying a utility company or fuel supplier directly, or as part of the rent.
2. Have a household income at or below the monthly levels in the chart below.

Household Size	Maximum Monthly Income
1	\$1,163.75
2	\$1,561.25
3	\$1,958.75
4	\$2,356.25
5	\$2,753.75
6	\$3,151.25
7	\$3,548.75
8	\$3,946.25

Add: \$397.50 for each additional person.

**NEVADA energyconnection**  
Providing Energy and Weatherization Assistance

For more information or to apply, call **1-866-846-2009** or visit our website at [www.nvadaenergyconnection.nv.gov](http://www.nvadaenergyconnection.nv.gov)

Made possible by the State of Nevada.

Figure 5: Inside of Program Brochure (Design by Vitalink).

## B. The Fund for Energy Assistance and Conservation

In March 2004, Vitalink<sup>4</sup> won a one-year contract in a competitive bid process that included more than a dozen firms. One of its recommendations was to use a more attractive and friendlier name to describe the Fund for Energy Assistance and Conservation programs administered by the Housing Division and the Welfare Division. To facilitate communication, the entire effort is called the Nevada Energy Connection Program.

Vitalink's work with the Nevada Energy Connection Program includes the development and implementation of a comprehensive communication campaign designed to increase awareness of the program, increase inquiries and applications

<sup>4</sup> Vitalink is a full-service marketing, advertising, research, and public relations firm headquartered in Raleigh, North Carolina. The firm specializes in providing service to educational institutions, nonprofit organizations, and local & state governments.

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to the program, and begin to break down some of the negative social stigma associated with the program.

Vitalink was tasked with targeting four key groups of people (all of which fall under the low-income category):

- The general population of those qualifying for the program;
- Households with children under the age of six;
- Households with adults over the age of 60; and
- Hispanic/Latino households.

#### 1. *Cost of the Vitalink Communications Effort*

The \$150,000 contract is split between the Welfare Division (75%, or \$112,500) and the Housing Division (25%, or \$37,500).

Vitalink significantly leveraged the effectiveness of the \$150,000 budget through a combination of direct in-kind donations, an earned media public relations campaign, negotiations with media partners, and by establishing strategic alliances with relevant third parties.

- **Vitalink Contributions:** Vitalink tracked its own in-kind contributions (as valued by Vitalink) of \$67,300 in the areas of research, planning, strategy, creative production services, public relations, and account management.
- **Earned Media Public Relations Campaign:** Vitalink worked on public relations efforts. In their estimate these efforts resulted in story placements reaching people across the state. Value of these story placements is estimated at \$180,000 by Vitalink.
- **Negotiations with Media Partners:** Vitalink's negotiations with key media partners in the Las Vegas and Reno markets was able to leverage an additional \$72,889 in bonus spots and value added incentives, as estimated by Vitalink.
- **Strategic Alliances:** Alliances formed with third party organizations added another \$50,000 in value to the campaign, in Vitalink's estimation. These alliances include deals with hospitals, check-cashing stores, fast food stores, events and festivals, and mass merchandising stores. Additionally, alliances were established with all key power companies throughout the state to include

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inserts into monthly bills informing customers about the program (additional information was also included on all “shut-off” notifications).

<b>Cost Leveraging</b>		
<b>Fund for Energy Assistance and Conservation</b>	150,000	28.8%
<b>Vitalink Contributions (In-Kind)</b>	67,300	12.9%
<b>Earned Media Campaign</b>	180,000	34.7%
<b>Media Partners</b>	72,889	14.0%
<b>Strategic Alliances</b>	50,000	9.6%
<b>Total</b>	520,189	100%

**Table 1: Leveraging of Additional Dollar-Equivalent Value.**

In this accounting, which is based on Vitalink estimates, every dollar in cost to the State of Nevada Fund for Energy Assistance and Conservation leveraged an additional three dollars and forty-seven cents of dollar equivalent value for the communication effort.

## *2. Activities in the Communication Campaign*

Specific activities were as follows:

- **Market research** – Vitalink analyzed geographic, demographic, and psychographic information available on the target audiences. Vitalink reports using a statewide survey performed by one of its strategic partners in 2003. This survey provided consumer behavior and preference data on each of the defined target populations.
- **Planning & strategy** – Vitalink developed a strategic approach to reach the target populations through a social marketing campaign. This approach included the concept of re-branding the two separate energy assistance programs under a single “umbrella” program called Nevada Energy Connection.

Central to this was the goal of devising an intuitive, easy-to-remember name, and also distancing the program’s association with the Welfare division (people don’t like to think they’re receiving handouts). The campaign was

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designed around implementing a paid and unpaid broad-based media campaign, and supporting these efforts with public relations activities and developing strategic partnerships on the local level.

- **Creative & production services** – This area included designing a logo; message development; producing a 30-second television commercial in English and a 15-second television commercial in Spanish; producing a 30-second radio commercial in English and Spanish; implementing a website in English and Spanish; producing print collateral brochures and posters in English and Spanish; print concepts in English and Spanish; and designing a one-sheet “shell” template for the program.
- **Public relations** – Activities included researching and writing press releases for the program; media relations; story placement; coordination of interviews; and distribution of a statewide public service announcement campaign.
- **Paid media** – Activities included research, planning, negotiation, and placement of a paid media campaign in the two key markets of Nevada: Las Vegas and Reno. Primary emphasis was placed on television due to the strength it has with the core target audiences as the overwhelming preferred medium of choice. Media was also placed in radio and newspapers.
- **Account management** – Activities included managing all contract activities, meetings, communications, travel, and miscellaneous expenses. Vitalink notes that it absorbed all account management expenses, not charging any to Nevada.

### 3. *Focus on the Payment Assistance Program*

Vitalink worked with both the Welfare Division and the Housing Division to ensure that their programs were adequately portrayed, represented, and marketed under the umbrella campaign for the state. Both divisions were pleased with the campaign.

However, shortly after beginning the program effort for the communications campaign, the Housing department requested that Vitalink emphasize primarily the Welfare program due to the already existing backlog in the Weatherization Assistance Program.

### 4. *Barriers to Program Awareness*

The evaluation team submitted the following question to Vitalink on barriers to program awareness: “What barriers to program awareness existed when the Vitalink

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contract started, and how have these been overcome?” Following is Vitalink’s response:

Like many very worthy state and federal programs, Welfare’s energy assistance program and Housing’s weatherization program both suffered from having too low a profile and an absence of brand awareness.

Initially, both energy assistance programs were marketed separately using the original program acronyms (like LIHEAP – Low income housing energy assistance program). These program names were difficult to understand, and information regarding the programs was not very easy to find (you really had to know where to look). Additionally, the Welfare program had a significant stigma associated with the aspect of “receiving handouts”.

Our first goal was to establish an umbrella brand that would encompass both programs, and to market these programs under an intuitive, easy-to-remember name. Additionally, we wanted to downplay the association of the programs with welfare, and instead chose to include the tag “brought to you by the State of Nevada.”

Our second goal was to increase awareness of the program using a combination of paid media, public relations, and strategic alliances.

Finally, we wanted to ensure that information regarding the program was easy to find and access: on the web, in brochures, by phone, or even in the places people eat, shop, and visit.

## 5. *On-Going Challenges*

The evaluation team then posed the following question to Vitalink: “What ongoing challenges, if any, do you face in reaching the target markets and getting eligible households to sign up?” Vitalink notes the following as on-going challenges:

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There are several key challenges we face in reaching our target market households and changing their behavior, including:

**Stigma:** Reducing the stigma associated with receiving government assistance. We need to emphasize the positive aspects of participating in the program, and de-emphasize the concept of “welfare.”

**Transience:** The transient nature of the Las Vegas community in particular means that we are constantly receiving a stream of new citizens who are most likely not familiar with the program. This will necessitate an on-going effort to ensure our citizens remain aware of the program and the benefits it offers to them.

**Culture:** Cultural differences in the Hispanic/Latino community may make them even “more proud” and reluctant to accept government assistance.

**Stability:** Perhaps the biggest barrier to the programs eventual success, however, will be the continued support and funding of the program by the state. Social marketing campaigns take time, and they take a committed sustained effort to become successful (look at the anti-smoking social marketing campaigns which have been going on for decades).

### ***C. Results of the Communications Campaign***

The “paid media” portion of the communications campaign (roughly a two-month period at the beginning of summer 2004) produced the dramatic increase in applications for July through September (Figure 1). In July 2004, applications were up 96% over July 2003. In August 2005, applications were up 62% over August 2004, and in September 2004, applications were up 84% over September 2003.

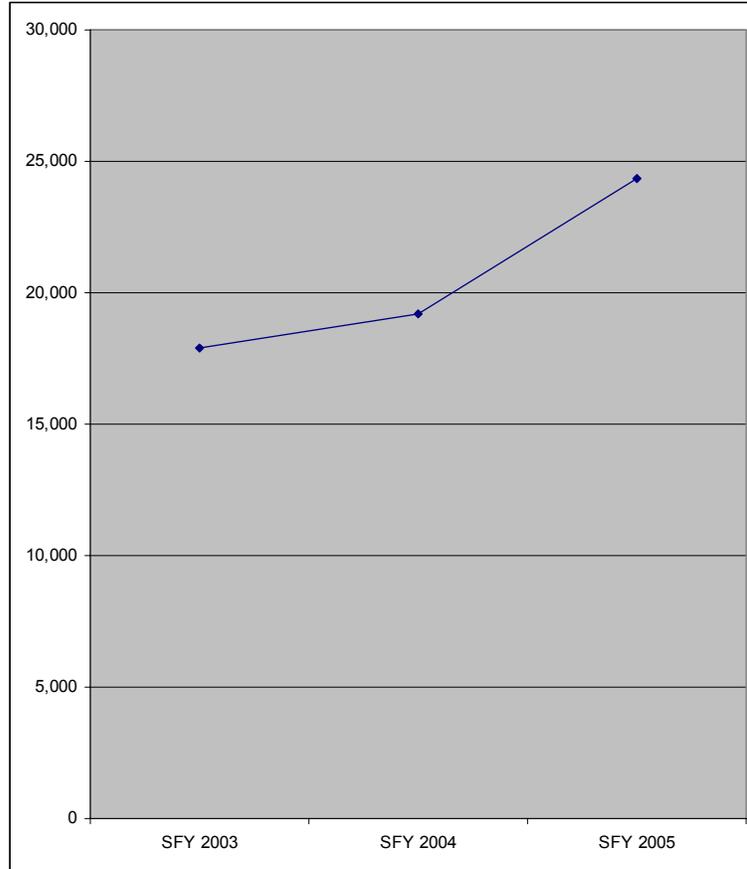
Applications then dropped in October, increased dramatically again in November 2004 compared the November 2003, and remained significantly higher except in April and June (Figure 1 and Table 2). Overall, there was about a 27% increase in applications for SFY 2005 over SFY 2004.



**Figure 6: Results of Communications Campaign.**

ENERGY ASSISTANCE PROGRAM													
MONTHLY APPLICATION STATISTICS - COMPARISON FY 04 TO FY 05													
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
<b>SFY 2004</b>	863	1,946	2,078	1,796	1,278	1,624	1,762	1,507	1,852	1,603	994	1,894	19,197
<b>SFY 2005</b>	1,693	3,144	3,819	1,417	1,982	1,910	2,191	1,814	2,220	1,582	1,492	1,085	24,349
<b>Mo. %</b>	96.2%	61.6%	83.8%	-21.1%	55.1%	17.6%	24.3%	20.4%	19.9%	-1.3%	50.1%	-42.7%	26.8%

**Table 2: Month over Month Applications (SFY 2005 vs. SFY 2004).**



**Figure 7: Increasing Number of Applications.**

<b>ENERGY ASSISTANCE PROGRAM APPLICATIONS PER YEAR</b>		
<b>State Fiscal Year</b>	<b>Number of Applications Received</b>	<b>Percentage Increase over Prior Year</b>
<b>SFY 2003</b>	17,925	
<b>SFY 2004</b>	19,197	7.10%
<b>SFY 2005</b>	24,349	26.84%

**Table 3: Year by Year Increase.**

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For perspective, the year by year increase in applications for energy assistance is shown in Figure 7 and in Table 3.

#### ***D. Conclusions***

- (1) The communications campaign worked. Participation for SFY 2005 was up by about 27% over SFY 2004. Looking at the data, the effect of the paid media part of the campaign can be seen as dramatic in July through September 2004, a time of year when participation is typically low.
- (2) *Communication regarding the Welfare Division payment assistance program is made particularly difficult due to the high transience of low-income households.* This factor suggests that a strong communications campaign must be *ongoing*. The goals of the communications campaign should to insure that all eligible applicants are aware of the program, know how to apply, and feel comfortable in making an application.
- (3) The communications campaign dropped off in June 2005 and was not continued into SFY 2006, when, in theory, it should have been at least a two to three year campaign. In particular, the campaign would have focused on a second ramping up in June 2005 similar to the ramping of the paid media campaign in June 2004.
- (4) Vitalink was effective, and leveraged considerable additional value,

#### ***E. Recommendations***

There is one recommendation in this area:

- (1) **Continue to develop and implement a Communications Campaign.**  
Due to recent rate increases and projected rate increases for both gas and electricity, households will probably be increasing responsive to the programs. They need to know that the programs exist, know how to apply, and they need to be encouraged to feel comfortable in making an application. Within the plan for a continuing campaign, local alliances should be a focus to develop community recruitment. Vitalink notes that the next strategic direction would be "...a slight shift in resources to increase the emphasis on public relations and developing strategic alliances on the local level." Local strategic alliances in a yearly communications campaign are a logical place to work to develop awareness. Also, the campaign should consider some direct buy communication and leveraging of outside resources.

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### III. THE SIZE OF THE NEED

The purpose of this section is to develop useful, policy-relevant information regarding the *size of need* for the Nevada Fund for Energy Assistance and Conservation (FEAC). In this section of the report, we discuss:

- **Energy Burden:** The definition of “energy burden.”
- **Income Allocation:** Census data on the allocation of income in Nevada
- **Energy Prices:** The trend in residential energy prices in the West, and specifically for Nevada.
- **Eligible Households:** An estimate of the number of households eligible for UEC funding.
- **A Closer Look at Eligibility:** A brief outline of alternative methods for determining eligibility is given followed by an analysis of how those alternatives would affect eligibility formulas.

#### ***A. How Energy Burden is Defined***

“Energy Burden” is the key concept for understanding both the needs of Nevada households and Nevada’s programs to meet the needs.

##### *1. Energy Burden – A Federal Definition*

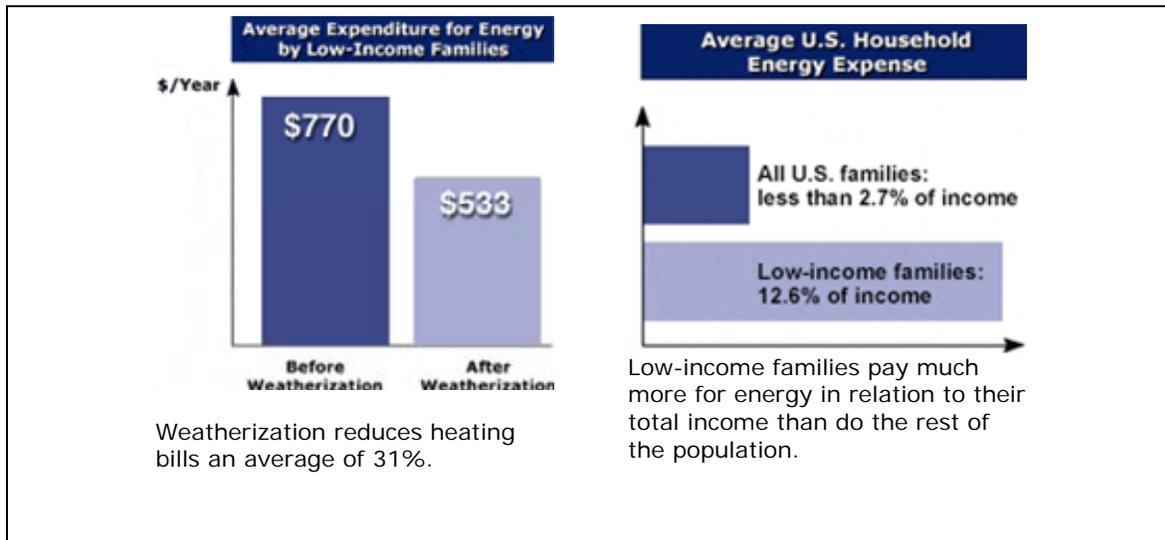
The definition of energy burden is given by the US Department of Energy (US DOE), Weatherization Assistance Program as follows:<sup>5</sup>

Low-income households spend much more of their income on energy bills than do families with median incomes (see chart). This percentage of income spent on energy is called the “energy burden,” and it is substantial for some weatherization recipients. For example, some elderly recipients who live on fixed incomes pay as much as 35% of their annual incomes for energy bills.

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<sup>5</sup> The quotation and Figure 8 are from the US DOE Weatherization Assistance Program at <http://www.eere.energy.gov/weatherization/reducing.html>.

As defined by US DOE, energy burden is *the percentage of income spent on energy*.<sup>6</sup> Note, however, that the federal definition is ambiguous in that the “percentage of income spent on energy” may or may not include the ancillary charges (beyond the literal commodity charge) bundled into the energy bills received by households. In the above example, “energy cost” is used interchangeably with “energy bills.”



**Figure 8: Energy Burden in the US (USDOE).**

While these two concepts (energy cost and energy bills) are part of the same energy metric, they are different in amount, and this difference may be highly relevant to households. Fixed costs, fees, and penalties can be a sizable “add-on” to the commodity cost component of energy bills.

However, the (ambiguous) federal definition of the concept of “energy burden,” is adequate to introduce the concept. A household’s energy burden for a year is the percentage of household income that is needed to cover the cost of energy

<sup>6</sup> The term “energy burden” means the expenditures of the household for home energy divided by the income of the household.” [Section 2603(2), Low Income Home Energy Assistance Act (46 U.S.C. 8622)]. According to the LIHEAP Clearinghouse, Congressional committee notes further provide the recommendation to use actual bills: “...In addition, the committee urges states to use actual energy bills in determining energy burdens and designing their benefit structures” (House Report 103-483 on H. R. 4250, Committee on Education and Labor).. The committee notes are cited in “State Strategies Based on Household Income, Energy Burden and Heating Costs,” Compiled by the LIHEAP Clearinghouse, February 2002 (<http://www.ncat.org/liheap/pubs/510targ.htm>).

**Table 2-1. Residential energy: Average annual household consumption, expenditures, and burden by all, non low income, low income, and LIHEAP recipient households, by main heating fuel type, United States, FY 2001<sup>1/</sup> (See also tables A-2a – A-2c, Appendix A)**

Main heating fuel	Fuel consumption (mmBTUs) <sup>2/</sup>	Fuel expenditures	Mean individual burden <sup>3/</sup>	Median individual burden <sup>4/</sup>	Mean group burden <sup>5/</sup>
<i>All households</i>					
All fuels	103.3	\$1,537	7.0%	4.1%	2.7%
Natural gas	124.5	\$1,654	7.5%	4.2%	2.9%
Electricity	60.1	\$1,227	5.7%	3.4%	2.2%
Fuel oil	137.1	\$1,966	8.1%	5.1%	3.4%
Kerosene	75.7	\$1,331	7.7%	5.4%	2.3%
LPG <sup>6/</sup>	108.3	\$1,688	8.3%	5.4%	3.0%
<i>Non low income households</i>					
All fuels	110.7	\$1,651	3.5%	3.0%	2.2%
Natural gas	131.0	\$1,750	3.6%	3.1%	2.4%
Electricity	64.7	\$1,322	2.9%	2.5%	1.8%
Fuel oil	149.4	\$2,192	4.3%	3.8%	3.0%
Kerosene	82.5	\$1,412	4.0%	3.7%	1.9%
LPG <sup>6/</sup>	112.1	\$1,732	4.2%	3.8%	2.4%
<i>Low income households</i>					
All fuels	88.5	\$1,311	14.0%	9.1%	8.9%
Natural gas	110.2	\$1,443	15.9%	10.0%	9.8%
Electricity	51.5	\$1,052	11.0%	7.1%	7.2%
Fuel oil	113.6	\$1,536	15.3%	11.4%	10.5%
Kerosene	67.9	\$1,236	12.0%	11.3%	8.4%
LPG <sup>6/</sup>	101.3	\$1,607	15.7%	11.3%	10.9%
<i>LIHEAP recipient households</i>					
All fuels	92.6	\$1,301	17.2%	12.2%	11.2%
Natural gas	122.9	\$1,504	19.5%	14.4%	12.9%
Electricity	50.3	\$998	13.8%	10.0%	8.6%
Fuel oil	98.4	\$1,450	13.9%	12.8%	12.4%
Kerosene <sup>7/</sup>	68.1	\$1,195	20.0%	12.1%	10.2%
LPG <sup>6/7/</sup>	96.2	\$1,538	21.9%	16.2%	13.2%

<sup>1/</sup>Data are derived from the 1997 RECS, adjusted to reflect FY 2001 heating degree days, cooling degree days, and fuel prices. Data represent residential energy used from October 2000 through September 2001.

<sup>2/</sup>A British Thermal Unit (BTU) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit. MmBTUs or mmBTUs refer to values in millions of BTUs.

<sup>3/</sup>Mean individual burden is calculated by taking the mean, or average, of individual energy burdens, as calculated from FY 2001 adjusted RECS data. See Appendix A for information on calculation of energy burden.

<sup>4/</sup>Median individual burden is calculated by taking the median of individual energy burdens, as calculated from FY 2001 adjusted RECS data.

<sup>5/</sup>Mean group energy burden has been calculated by first calculating average residential energy expenditures from the 1997 RECS for each group of households and dividing the adjusted figures for FY 2001 by the average income for each group of households from the March 2001 CPS.

<sup>6/</sup>Liquefied petroleum gas (LPG) refers to any fuel gas supplied to a residence in liquid compressed form, such as propane or butane.

<sup>7/</sup>These figures should be viewed with caution because of the small number of sample cases.

**Figure 9: The Full Ranges of Energy Burdens.**

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for the year. As the federal example shows, the average US family has a mean group energy burden under 2.7% (Figures 8 & 9).<sup>7</sup>

As shown in Figure 9, the *median* household energy burden is 4.1% overall, 3% for non-low income households, and 9.1% for low income households (Figure 2, Column 4).

## 2. Nevada Energy Burden

The Nevada interpretation of energy burden is currently that “energy” means the cost of energy calculated as the sum of the number kilowatt-hours used times the applicable electric rate plus the number of therms used times the applicable gas rate.<sup>8</sup> The estimate for all households computed in SFY 2004 for SFY 2005 is 3.06%;<sup>9</sup> the previous estimates were 2.90% for SFY 2004 and 4.27% for SFY 2003.

As in prior evaluations,<sup>10</sup> we recommend that this definition be expanded by a revision to NRS 702.010 (Definitions) to include both fixed and variable charge.

Nevada has set the required payment at the median household energy burden for the state (NRS 702.260.6.a). This is a significant advance over other states in two regards. First, the median energy burden is inherently fair and this quality of being fair will continue over time while a negotiated percentage or dollar amount might be seen as reasonable or fair at one point in time but not another. Second, other states have generally adopted percentages or dollar amounts, and have in some cases placed them in their state codes without a provision for updating.

In Nevada the median energy burden is updated each year using information on incomes provided by the State Demographer and energy usage data provided by the

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<sup>7</sup> Source: Reprinted from Department of Health and Human Services, *LIHEAP Home Energy Notebook for Fiscal Year 2001*, Table 2.1, Page 4.

<sup>8</sup> The official definition is a “commodity” definition that does not include several other components that go in to making up the energy bill. As in earlier evaluations, we recommend this definition be extended to include the fixed portion of energy bills along with the variable (per therm or per kWh) portion.

<sup>9</sup> Nevada Fund for Energy Assistance and Conservation State Plan 2005, P. 19.

<sup>10</sup> Peach, H. Gil, Anne West, Ryan Miller, Ayala Cnaan & Luisa Freeman, *State Fiscal Year 2003 Evaluation of the NRS 702 Energy Assistance Program & Weatherization Assistance Program*, Pp. I-3 to I-4. Peach, H. Gil, Ryan Miller, Luisa Freeman & Anne West, *State Fiscal Year 2004 Evaluation of the NRS 702 Energy Assistance Program & Weatherization Assistance Program*, P. II-4.

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major electric and gas utilities.<sup>11</sup> This will provide automatic adjustment for changes in costs while keeping the required payment at a fair level.

### *3. Energy Burden – A Household Perspective*

Substantively, when you talk with people, energy burden is a matter of energy bills, pure and simple. As any household struggling with bills can tell you, the relevant feature of the bill to the low-income household is the full “Please Pay” amount. If you try to talk with people about the different portions of a bill, people will be polite and let you talk about something you are interested in, but put it in the same category as if you were talking about growing apples from strawberry plants.

Of course, from an analytic perspective the different portions of a bill have different meanings and may have different causes.<sup>12</sup> But, for a household struggling to pay bills it is the total “please pay” amount on the bill that matters – it is this total bill that they will pay and often skip some meals or forgo medicine to pay, or that they will not pay, or underpay in order to get winter boots for the kids, or take a child for a doctor visit, or fill a necessary prescription.

Sometimes, if a household falls behind in bill payment, the combination of late fees, penalty fees, and possibly a reconnect fee or an additional deposit can be a substantial sum beyond the energy portion of the “please pay” bill.

### ***B. Income Allocation***

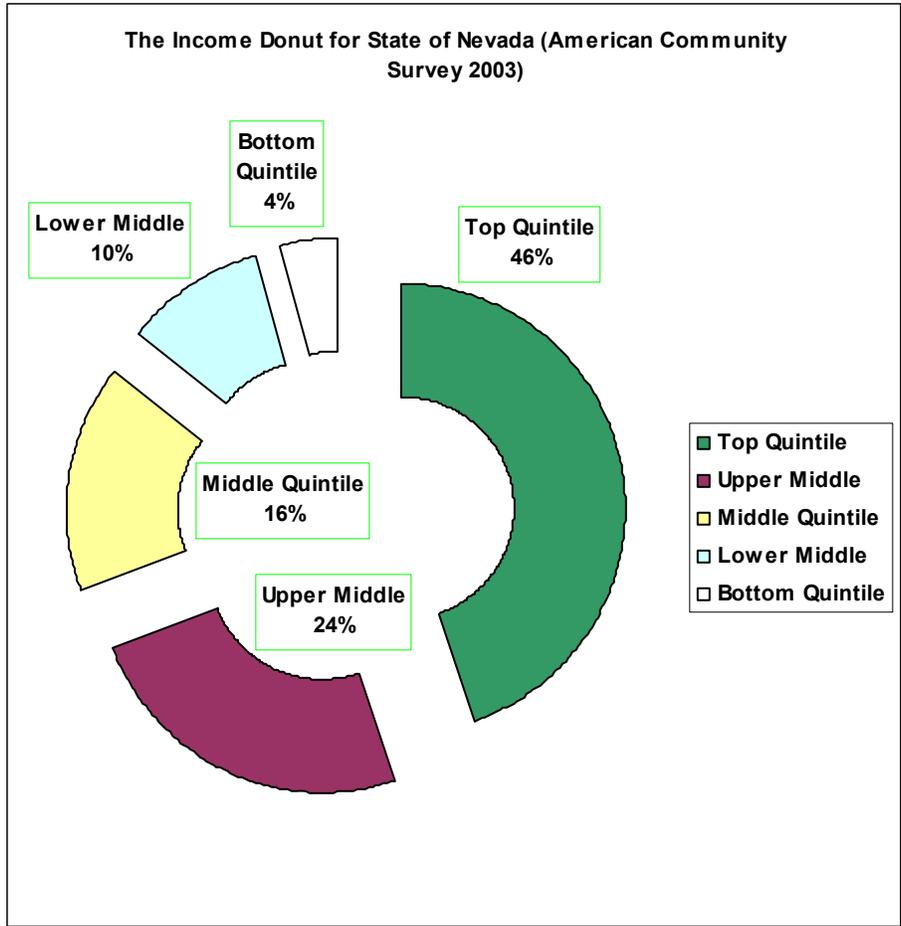
The income donut for Nevada (Figure 10) shows why traditional cost-based determination of utility bills cannot work in the absence of transfer income to make the difference between what families are billed and the income needed to pay utility bills.<sup>13</sup>

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<sup>11</sup> This updating is an important feature of the Nevada legislation. In some states this was not as well thought through and fixed numbers were set by statutes without a provision for keeping the numbers current with the economy.

<sup>12</sup> But this appearance is not quite correct. At a deeper level than the “facts” as printed on a utility bill, the other location where this kind of “total bill” perspective is acknowledged to govern is in a utility. A utility is primarily interested in “revenue recovery” and “cost of service” recovery. Discussions in utility rate departments begin and end with a focus on total recovery, pure and simple. The division of the billing arrangement into fixed and variable portions and the assessment of additional charges as a function of collections policies create the different bill components (along with state or national policies which may cause additional components to be broken out). What is most real in this process is total recovery, and the rational components of bills that then become the factual focus for collections or regulatory treatment are essentially strategies (or functional arguments of different kinds).

<sup>13</sup> Household income is derived as payment for work for example, wages, salary, small amount of interest) or as transfer income through social programs. If the job structure does not provide income necessary to meet ordinary social costs of living, there is no alternative but to provide it through



**Figure 10: Income Donut – Income Allocation in Nevada.**

Each part of the donut represents twenty-percent of Nevada households. Clearly, households in the bottom quintiles by income cannot be expected to pay cost-based bills without a transfer mechanism such as the Nevada payment assistance program. For the upper quintiles utility bills should be little or no problem.

***C. Very Helpful, Though Unreliable Federal Funding***

Federal LIHEA funding has been on a general decline since the mid-1980s. Although funding is heading up from a low point during the “boom” period of the mid-1990s and has almost recaptured its dollar level in unadjusted dollars, total funding is still far below the current real dollar equivalent of the mid-1980s. Table 4 illustrates this decline in total LIHEA funding.

transfer income. Transfer income can take many forms, including direct assistance and, for example, public funding of community facilities such as parks, police departments, and fire departments which provide public services for all households, regardless of income

Low Income Home Energy Assistance Program History of Federal Funding								
Federal Fiscal Year	LIHEA Block Grant	Leveraging	Contingency	Oil Overcharge	Total Funds	2004 Adjusted Dollars	% of 2004	% of 1985
1985	4,150,000	-	-	-	4,150,000	7,204,861	176.84%	100.00%
1986	4,010,000	-	-	-	4,010,000	6,831,346	167.67%	94.82%
1987	3,540,000	-	-	500,000	4,040,000	6,644,737	163.09%	92.23%
1988	2,980,000	-	-	2,041,859	5,021,859	7,933,427	194.72%	110.11%
1989	2,690,000	-	-	1,336,195	4,026,195	6,063,547	148.82%	84.16%
1990	2,711,280	-	-	1,530,000	4,241,280	6,058,971	148.71%	84.10%
1991	2,754,004	-	453,452	1,816,700	5,024,156	6,891,846	169.15%	95.66%
1992	2,870,660	242,217	-	700,000	3,812,877	5,077,067	124.61%	70.47%
1993	2,576,577	229,102	-	700,000	3,505,679	4,529,301	111.17%	62.86%
1994	2,754,413	176,024	-	-	2,930,437	3,695,381	90.70%	51.29%
1995	2,512,907	97,672	-	-	2,610,579	3,199,239	78.52%	44.40%
1996	1,710,491	156,931	351,152	-	2,218,574	2,641,160	64.82%	36.66%
1997	1,901,586	60,611	355,425	-	2,317,622	2,698,047	66.22%	37.45%
1998	1,901,586	60,906	-	-	1,962,492	2,247,986	55.17%	31.20%
1999	2,091,007	122,121	-	-	2,213,128	2,481,085	60.90%	34.44%
2000	2,091,695	90,447	816,470	-	2,998,612	3,252,291	79.82%	45.14%
2001	2,676,949	64,581	741,189	-	3,482,719	3,673,754	90.17%	50.99%
2002	3,262,202	168,143	1,312,645	-	4,742,990	4,925,223	120.88%	68.36%
2003	3,434,814	182,704	263,451	-	3,880,969	3,940,070	96.71%	54.69%
2004	3,436,889	559,849	77,573	-	4,074,311	4,074,311	100.00%	56.55%

**Table 4: Decline in Constant Dollar LIHEA Funding since the mid 1980's.**

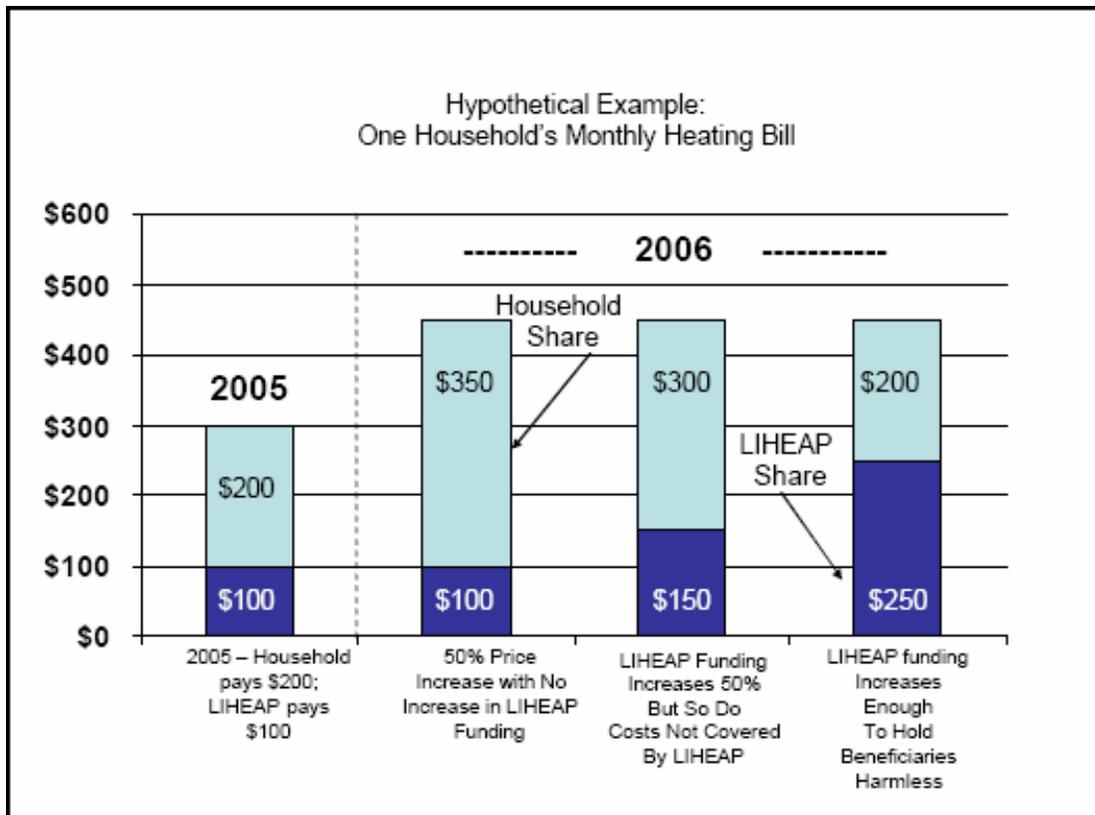
Also, the funding formula for LIHEA is permanently tilted towards the needs of the Northeastern states.<sup>14</sup> Even at its peak, LIHEA could only meet a fraction of the actual need. The federal program is very valuable and useful to Nevada; it is however, variable and is funded far below the level of need that existed prior to the current ramp-up in energy prices.

#### ***D. Federal Assistance in the Winter of 2006***

A new study from the Center on Budget and Policy Priorities indicates that, using data from the US Department of Energy, home heating costs for LIHEA beneficiaries will increase 47.5% between the winter of 2004-2005 and the winter of 2005-2006.<sup>15</sup> This will be the largest single year increase since 1974.

<sup>14</sup> Smith, Rebecca, "Policy Disconnect, In Aid for the Poor, Hotter States Get the Cold Shoulder," *The Wall Street Journal*, Thursday, August 18, 2005, Vol. CCXLVI No. 34, P. 1, continued on P. A-7.

<sup>15</sup> "Out in the Cold: How Much LIHEAP Funding Will Be Needed to Protect Beneficiaries from Rising Energy Prices?" Available from the Center for Budget & Policy Priorities website: <http://www.cbpp.org/10-6-05bud.htm>.



**Figure 11: Change in household heating bill. Source: Center on Budget and Policy Priorities.**

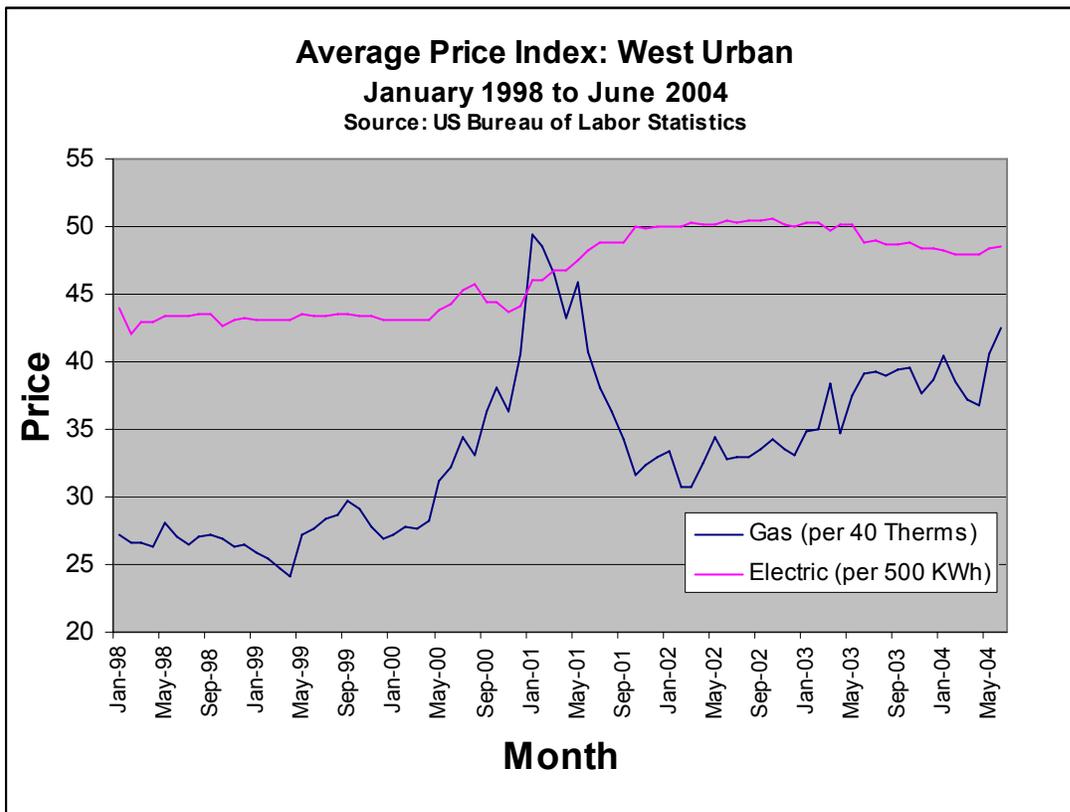
Figure 11 shows the effects of this increase on current funding. An increase of 50% on a family with a three hundred dollar (\$300) energy bill would lead to a bill of four hundred and fifty dollars (\$450). If that family received a one-hundred dollar (\$100) LIHEA benefit, their share would increase from \$200 to \$350, an increase of 75%. Simply providing a 50% increase in their LIHEA benefit (to \$150) would still increase their share of the bill to \$300 (by 50%). In fact, to completely absorb the 50% increase in the household's energy bill, the LIHEA benefit amount would have to be increased 150%.

This example illustrates the difficulties low-income families are experiencing in paying to heat their homes with the federal program but without the type of state program instituted by Nevada. It also indicates the reality of changes in energy costs, which will soon have to be factored in as an increase in State of Nevada allocations.<sup>16</sup>

<sup>16</sup> Note that these projections for the winter of 2006 are included to keep the needs section of this study current. For SFY 2005, for which the data in this evaluation are reported, this shift has not yet occurred. Escalation of energy commodity cost is the next piece of the energy puzzle.

### ***E. The Upward Trend of Energy Prices in the West***

According to the US Bureau of Labor Statistics, gas prices have been increasing as a whole since January of 2000 in urban areas in the West. Figure 12 shows the average electric and gas utility price from January 1998 to June 2004. Even without the jump indicated at the beginning of 2001, probably due largely to the actions of Enron, the graph indicates an overall, steady increase in price. While there will be fluctuations around the upward trend line, as has been the case in the past, this trend does not appear to have an end in sight.



**Figure 12: Average Natural Gas & Electricity Price Indexes: West, Urban.**

### ***F. The Upward Movement of Nevada Energy Prices***

Table 5 contains data specific to the Nevada energy market collected by the Consumer Protection Bureau of the State of Nevada Attorney General's Office.<sup>17</sup>

<sup>17</sup> The evaluation team would like to thank Bob Cooper of the Attorney General's Office for providing this information

This table shows the annual change of the average monthly bill seen by energy consumers in the five major energy markets in Nevada from 1978 to 2004 *in constant 2004 adjusted dollars*. The figures show that bills reached a peak in the early 1980's then dropped to a relatively constant level through the 1990's only to rise again in the early 2000's.

<b>Average Monthly Bills by Utility (2004 Constant Dollars)</b>					
	<b>SWG South</b>	<b>SWG North</b>	<b>NVP</b>	<b>SPPC Gas</b>	<b>SPPC Electric</b>
<b>1978</b>	*	\$74.92	*	*	*
<b>1979</b>	\$97.02	\$78.43	\$66.09	*	*
<b>1980</b>	\$78.36	\$99.77	\$70.42	*	\$118.53
<b>1981</b>	\$76.14	\$112.54	\$66.14	\$100.92	\$111.31
<b>1982</b>	\$95.33	\$119.46	\$75.54	\$136.43	\$110.96
<b>1983</b>	\$99.83	\$128.23	\$70.56	\$135.38	\$119.92
<b>1984</b>	\$109.02	\$122.90	\$74.19	\$131.39	\$116.60
<b>1985</b>	\$97.81	\$110.33	\$77.88	\$117.33	\$115.25
<b>1986</b>	\$79.73	\$92.06	\$73.24	\$101.46	\$114.11
<b>1987</b>	\$77.84	\$86.24	\$67.10	\$96.66	\$102.59
<b>1988</b>	\$80.80	\$85.55	\$62.65	\$98.26	\$99.91
<b>1989</b>	*	*	\$60.48	*	\$94.05
<b>1990</b>	\$70.42	*	\$55.23	\$82.15	\$88.28
<b>1991</b>	\$67.58	\$72.08	\$57.78	\$70.85	\$81.78
<b>1992</b>	\$64.75	\$69.94	\$59.05	\$64.32	\$83.19
<b>1993</b>	\$69.65	\$78.23	\$63.45	\$70.07	\$85.97
<b>1994</b>	\$75.46	*	\$65.47	\$75.66	*
<b>1995</b>	\$68.32	\$73.78	\$62.59	*	\$82.38
<b>1996</b>	\$60.51	\$65.72	*	*	*
<b>1997</b>	\$66.67	\$77.32	\$57.10	*	\$76.95
<b>1998</b>	\$72.63	\$79.42	\$59.15	*	*
<b>1999</b>	\$66.37	\$72.25	\$59.23	*	*
<b>2000</b>	\$65.67	\$77.72	\$61.16	*	\$74.74
<b>2001</b>	\$92.10	\$122.70	\$65.22	\$93.84	\$81.67
<b>2002</b>	\$66.93	\$113.70	\$77.74	\$103.62	\$77.68
<b>2003</b>	\$73.46	\$99.24	\$68.82	\$99.82	\$76.16
<b>2004</b>	\$85.17	\$110.21	\$75.83	\$100.56	\$85.70

**Table 5: Utility Bills in Nevada, 1978 to 2004 (\$2004)**

Figures 13 thru 15 chart the data presented in Table 2. Some data in the late 1980's and 1990's is missing; however, the general trend is evident.

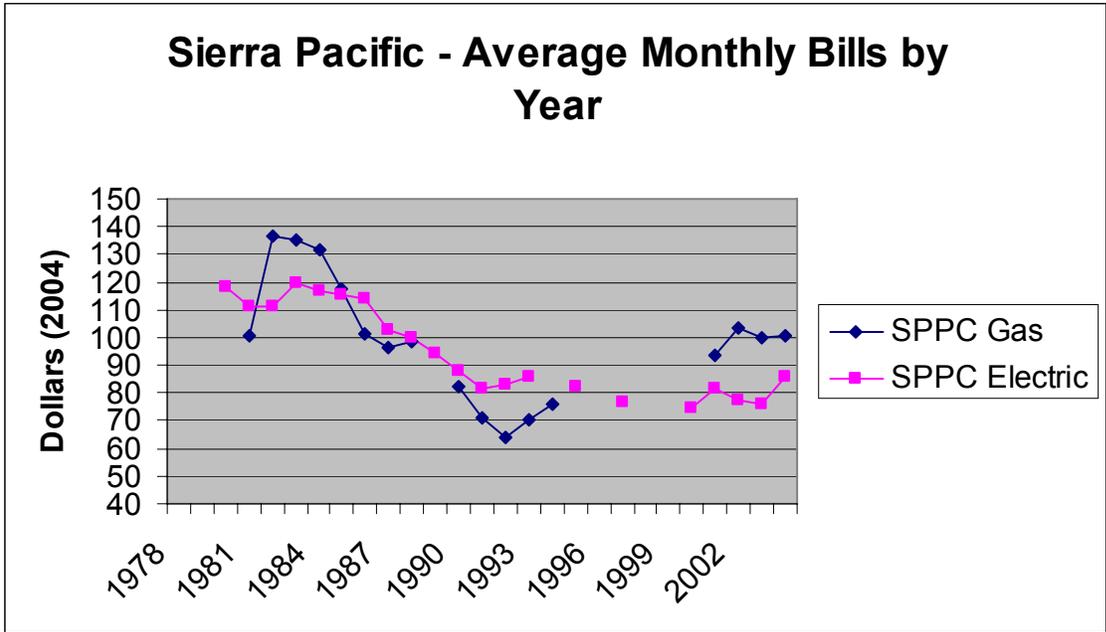


Figure 13: Sierra Pacific Average Monthly Bills (\$2004)

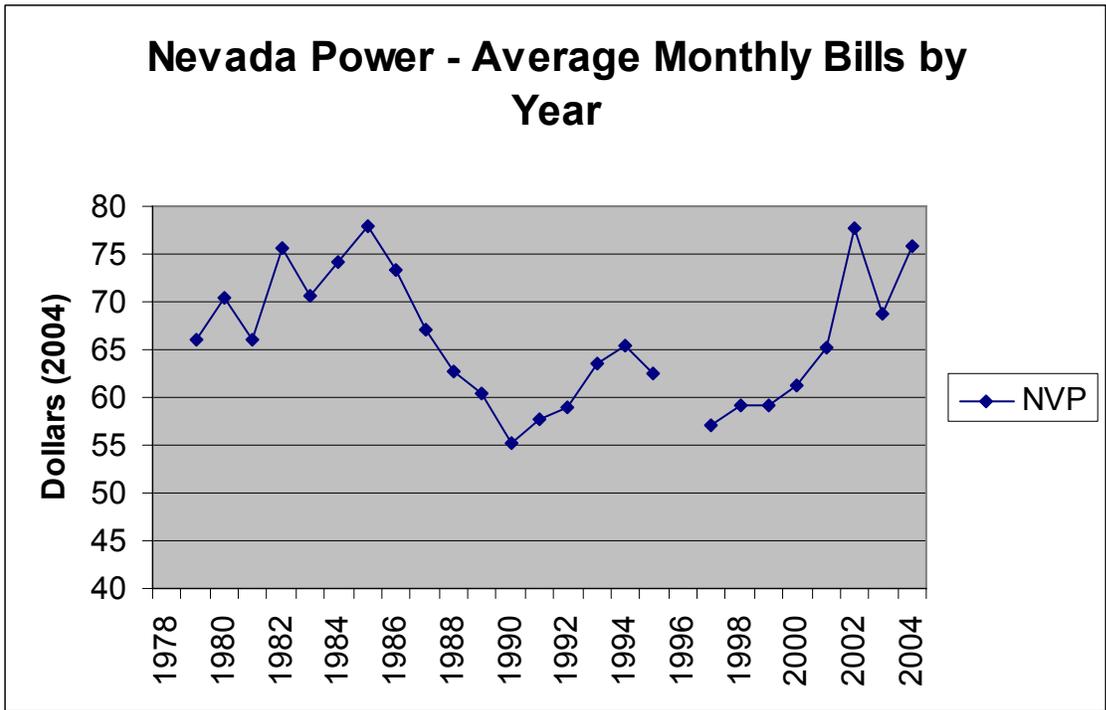
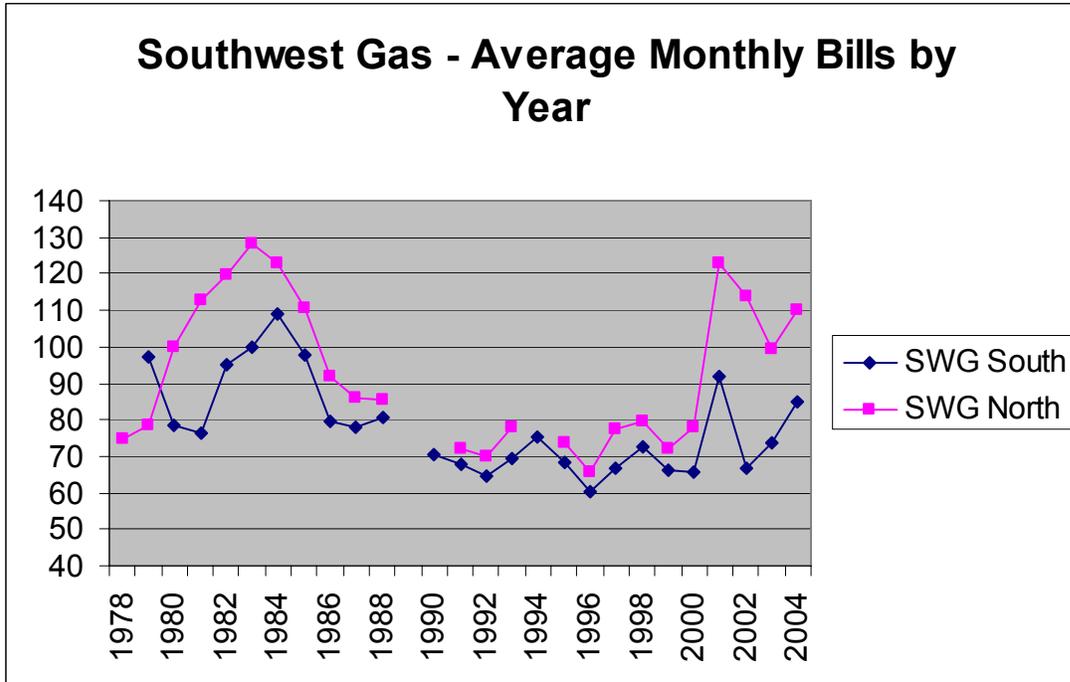


Figure 14: Nevada Power Average Monthly Bills (\$2004)



**Figure 15: Southwest Gas Average Monthly Bills (\$2004)**

These figures correspond with the general trend in the inflation adjusted retail price of gasoline in the same period. Given the recent market adjustments in reaction to hurricanes Katrina and Rita and the increase in the cost of home heating across the US in the winter of 2006, the upward trend in cost of energy to households appears set to continue.<sup>18</sup>

Taken together, the income allocation and the price trends illustrate why cost-based rates for energy services can no longer work for low income and some middle income households.<sup>19</sup> Note that the rapid ramp-up of prices for the winter of 2006 will occur after the endpoint of these graphs (see Section F, above).

<sup>18</sup> The dramatic run up in gas prices nationally towards the winter of 2005-2006 moderated in the spring of 2006 with high inventories of gas supplies projected into the fall of 2006 leading to a lowering of prices. However the prices of more distant gas transactions return to high levels. As always, much depends on weather.

<sup>19</sup> The distribution of Income in the United States is moving increased income towards very high income groups in the upper one-percent of households and above and removing income from the bottom income groups, especially from low-income families with children.

## G. Number of Eligible Households

The evaluation calculation of eligible households is in agreement with the program calculation. There are approximately 158,000 households meeting the current income criteria for the programs (Table 6).

If the income level for eligibility were raised to 175% of poverty, approximately 196,000 households would meet the income criteria; if eligibility were raised to 200% of poverty, 234,000 households would meet the income criteria.

	Churchill	Clark	Douglas	Elko	Esmeralda	Eureka	Humboldt	Lander	Lincoln	Lyon
Total	9,910	651,150	18,146	17,651	446	563	6,336	2,034	1,451	16,948
Under .50	339	30,281	625	581	39	43	195	136	95	673
50 to .74	210	13,733	399	348	27	31	155	20	57	427
75 to .99	342	18,664	389	425	28	16	209	80	134	657
1.00 to 1.24	386	22,455	516	649	23	26	200	69	82	651
1.25 to 1.49	485	25,806	596	713	30	23	214	76	116	731
1.50 to 1.74	597	26,258	624	732	40	37	267	77	98	939
1.75 to 1.84	308	11,242	206	272	3	15	152	10	32	439
1.85 to 1.99	220	14,786	301	394	10	24	122	63	28	458
2.00 and over	7,023	487,925	14,492	13,537	248	348	4,823	1,502	809	11,973
Under 150%	1,763	110,939	2,524	2,716	147	139	973	381	483	3,139
Under 175%	2,360	137,197	3,147	3,448	186	176	1,240	458	581	4,078
Under 200%	2,887	163,225	3,655	4,115	199	216	1,513	531	642	4,975

	Mineral	Nye	Pershing	Storey	Washoe	White Pine	Carson City	Totals
Total	1,774	14,494	2,517	1,441	145,561	3,404	20,962	914,788
Under .50	169	688	168	65	6,265	172	947	41,480
50 to .74	63	452	56	11	3,572	151	610	20,321
75 to .99	85	562	60	30	4,211	141	638	26,671
1.00 to 1.24	96	917	206	57	5,395	210	812	32,749
1.25 to 1.49	145	871	95	71	5,596	163	972	36,702
1.50 to 1.74	105	991	123	70	6,172	173	960	38,264
1.75 to 1.84	33	459	65	34	2,396	52	564	16,282
1.85 to 1.99	65	466	57	5	3,521	255	451	21,225
2.00 and over	1,013	9,088	1,688	1,099	108,434	2,087	15,006	681,094
Under 150%	559	3,490	584	233	25,038	836	3,980	157,923
Under 175%	663	4,481	708	303	31,210	1,009	4,940	196,187
Under 200%	761	5,405	829	342	37,126	1,317	5,956	233,694

Source: 2000 Census, Summary File 3, Tables P88, P93; 2004 Population Estimates, Nevada State Demographer. See Calculations Worksheet

**Table 6: Number of Income-Eligible Households.**

These estimates are based on 2000 Census data and 2004 population estimates from Nevada's State Demographer.<sup>20</sup> Taking data from the Nevada Demographer's

<sup>20</sup> Census data obtained from <http://www.census.gov>. State of Nevada Demographer data obtained from [http://www.nsbdc.org/demographer/pubs/pop\\_increase.html](http://www.nsbdc.org/demographer/pubs/pop_increase.html). The Census data comes from tables P88 and P93 of Summary File 3. Individual ratio-of-income to poverty data taken from table P88 is divided by the average household size. This table is then normalized to the number of

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population estimates, this table is adjusted to take into account Nevada's population growth since 1999. Nevada is currently growing very quickly in population and is the fastest growing state.

#### ***H. Another Approach to Need - Self Sufficiency vs. Percent of Poverty***

The current standard used to calculate eligibility for participation in low income programs is that of the Federal Poverty Level (FPL). A different metric, the *self-sufficiency standard*, allows for an alternative definition of eligibility. The sufficiency standard is relatively new and is not yet reflected in federal legislation. It comes much closer to representing the actual needs of families than the federal metric.

The development of the self-sufficiency standard was required to take into account the many critical problems in the calculation of the Federal Poverty Level (FPL). The FPL is based on the concept that food is one third of the income expenditure of American people. This was not a bad estimate in the mid-1960's when the metric was created using data from the late 1950's. Since that time, although the poverty level is updated each year to take into account the change in the real value of the dollar, it has gone out of calibration with the realities it is required to indicate.<sup>21</sup> *The federal numbers severely under-represent actual poverty.*

The existence of federal program guidelines based on 150%, 175%, 185%, 200%, or 250% of the Federal Poverty Level indicate practical adjustments to a defective metric. For example, the federal standard for LIHEAP is 150% of poverty or 60% of state median income, rather than the poverty level.<sup>22</sup> These adjustments attempt to take into account the failed calibration of the poverty metric but do so only in part. In general, there is strong consensus that Federal Poverty Levels do not accurately indicate need as experienced by households.

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households at 150% poverty taken from table P93 to give a household estimate of ratio-of-income to poverty level.

<sup>21</sup> There are many questions regarding even this fundamental adjustment due to changes to and substitutions in the calculation of the Consumer Price Index. While such changes may be reasonable overall, they may bias the use of the index in adjusting actual costs of low and moderate income families. There is an absence of consensus on these changes.

<sup>22</sup> Because evaluations are generally more useful if they recommend conservative steps in most recommendation areas and due to the large problems that would be involved in moving away from some level of the federal metric, a recommendation in the SFY 2003 evaluation was to move from 150% of poverty to 60% of the Nevada median income, an option that is permitted in the federal LIHEA program. This recommendation was repeated in the SFY 2004 evaluation and is again repeated in this SFY 2005 evaluation. It has the added advantage of allowing the federal and Nevada programs to be run in parallel. At the same time, we want to indicate that direction of change should be towards the self-sufficiency standard. A change of this kind would require study and discussion among levels of state government and among all advocates and representatives of affected parties and would likely be a multi-year process, requiring legislative action. However, the direction is clear.

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However, the correction offering the least administrative burden is to set program eligibility levels at multiples of the official Federal Poverty Level. For example, in Nevada LIHEA eligibility is currently set at 150% of poverty. Similarly, state mandated weatherization is set at 200% of poverty in Pennsylvania. California went to 250% of poverty for eligibility for its low-income rate program beginning in 2004. In November of 2004, Pennsylvania extended protections against utility shutoffs to 250% of poverty up from the 150% standard that was set in 1992. One component of the low-income weatherization program in Massachusetts, the Good Neighbor Program, goes to 275% of poverty to be able to provide services to households in which one or more persons are working full time at less than a living wage.

Although it takes more work to calculate, the family budget approach used by the Self-Sufficiency Project is more accurate than the federal poverty level metric.

- As a rule of thumb, mathematically recalibrating the FPL to its original relation to median income would lead to a criterion of 200% or more of the current FPL.<sup>23</sup> This, then, is a conservative base required for fairness in order to recapture the coverage of the poverty programs in the 1960s during the War on Poverty and compensate for economic erosion since.
- However, 250% of poverty is the level at which poverty is no longer experienced if we take into account additional needs such as a car, the ability to deal with medical needs, or the ability to put aside some resources for retirement, all of which are reasonable needs.

The bottom line is that the federally defined poverty criteria have become seriously mismatched to the actual situation of poverty as experienced by households. Being outside the 100% of poverty level today means little. By 1992, the 150% of Federal Poverty Level captured a good bit of slippage in the federal indicator system. The 200%+ level is more accurate today. But, to be certain, the 250% of the Federal Poverty Level begins to indicate the rate at which poverty is not actually experienced and a minimal but decent level of family living over the full lifespan is supported.<sup>24</sup>

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23 Calculation performed based on data presented in Figure 2, P. 11 in Pearce, Diana & Jennifer Brooks, "The Self-Sufficiency Standard for Pennsylvania, Summary Report." Swarthmore, Pennsylvania: Women's Association for Women's Alternatives: 1998. See also, "Working Hard, Living Poor, Part I: Nevada: Basic Needs and a Living Wage," A Report by the Progressive Leadership Alliance of Nevada, Susan Chandler, MSW, Ph.D., Project Research Director & Alicia Smalley, MSW, Research Assistant, August 2001. Progressive Leadership Alliance of Nevada, [www.PlanNevada.org](http://www.PlanNevada.org).

24 The Self-Sufficiency calculation of 200% of the Federal Poverty Level does not allow for purchase of a car or other major items, provision for retirement, or the ability to deal with family emergencies.

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## ***I. Comparison of Alternative Eligibility Levels***

As discussed in this section of the report, a full solution would be provided by a move to the 250% of poverty eligibility level, a level that is likely to replace the current 150% of poverty eligibility level in coming years.

That is where the United States has to go if poverty problems are actually to be solved to the level that they are solved in the European Union. However, this evaluation recommends only the conservative first step – moving to 60% of Nevada median income.

The recommendation and rationale (from the SFY 2003 report) is as follows:

**Eligibility Level.** As shown in this study, the federal poverty definition is far out of date and has not been sufficiently recalibrated to make it directly useful. This is indicated, for example, by the program participation criteria having been set at 150% of the federal poverty level. Actually, about 250% of the federal poverty level corresponds to the divide below which families and households currently have the experience of poverty and above which they do not. California recently moved its low-income rate program to 250% of poverty, and other states (such as Pennsylvania) use 200% of poverty for their housing assistance (weatherization) programs. The general recommendation in this area is to take the reality that households face into account and move the eligibility level upwards from 150% of poverty but not higher than 250% of poverty. Within this range, the specific recommendation at this time is to move the eligibility level to 60% of Nevada median household income. For comparison, since the poverty metric is dependent on family size as well as on income, the equivalent poverty percentage of 60% of median income is a range of poverty percentages. This range runs from about double (200% of poverty) for one or two person families to about 150% for a family of eight, essentially where the eligibility level is now. Also, a move to 60% of median income permits maintaining compatibility with the flexibility provided in the federal Low Income Home Energy Program (LIHEAP). The programs could be set together at 60% of Nevada household median energy burden. This means the Nevada program and the federal program could be kept in parallel to provide equal service to households and families eligible for either, as is currently the case at the 150% of poverty level.

Table 7 shows the State Fiscal Year 2005 income levels for poverty (Col. 1), one-hundred fifty percent of poverty – the current program level (Col. 2), and sixty percent of Nevada Median Income (Col. 3).

The equivalent federal poverty level (FPL) for the sixty percent of median income eligibility criterion is shown in Col. 4. The relative percentage increase in moving toward higher eligibility levels is shown in Columns 5 through 8.

Comparison of Alternative Eligibility Levels								
HH Size	Federal Poverty Level		60% of Nevada Median		Increase from Current 150% Level			
	100% FPL (\$)	150% FPL (\$)	(\$)	%FPL	60% of Nevada Median	175% FPL	200% FPL	250%FPL
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8
1	\$9,310	\$13,965	\$18,591	200%	33%	17%	33%	67%
2	\$12,490	\$18,735	\$24,312	195%	30%	17%	33%	67%
3	\$15,670	\$23,505	\$30,031	192%	28%	17%	33%	67%
4	\$18,850	\$28,275	\$35,753	190%	26%	17%	33%	67%
5	\$22,030	\$33,045	\$41,473	188%	26%	17%	33%	67%
6	\$25,210	\$37,815	\$47,194	187%	25%	17%	33%	67%
7	\$28,390	\$42,585	\$48,266	170%	13%	17%	33%	67%
8	\$31,570	\$47,355	\$49,339	156%	4%	17%	33%	67%

**Table 7: Alternative Eligibility Levels.**

### ***J. Summary***

The purpose of this section on quantifying needs is to provide the reader with information with which to independently gauge the need for the program.

- Energy costs are rising and real incomes are falling for low-income and moderate income families, especially for families with children.
- Federal support, though essential, is unreliable.
- The full solution would be to move support levels to self-sufficiency levels or to approximately 250% of poverty, a target level that is being arrived in different studies around the US.
- A next step would be to move eligibility from 150% of federal poverty to 60% of Nevada median income.

### ***K. Recommendations***

There are two recommendations based on need for the program:

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- (1) **Increase Eligibility.** With the support of the Governor's Energy Office, the Welfare Division should develop a proposal to increase the eligibility level for the Energy Assistance program. At the most, eligibility should be increased to 250% of poverty, the approximate the level at which family income self-sufficiency occurs. A smaller step, and one permitted for federal funds so that federal and Nevada programs could continue to work in parallel, is to move eligibility to 60% of Nevada median income. A yet smaller step is to create an inclusion provision for households, regardless of income, with demonstrated need in a temporary emergency such as loss of work, death of an income earner, divorce, serious illness, serious accident or similar emergency. This recommendation would require both study and consultation with interested parties. Putting this modification into effect would require action by the legislature. The Welfare Division should collaboratively study the problem of increasing eligibility as energy costs continue to increase.
  
  - (2) **Collaborate on increasing LIHEA.** With the support of the Governor's Energy Office, the Welfare Division and the Housing Division, should coordinate with the major utilities to work towards making the annual federal LIHEA funding both more dependable and more sizable for Nevada. More adequate federal funding can increase the joint effects of the Fund for Energy Assistance and Conservation and LIHEA.

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## IV. THE LOGIC OF THE PROGRAM

The need for the program is threefold. It is based in physical realities of material resource constraints; in what is happening to household incomes; and in what is happening to energy prices.

### *A. The Physical Reality of Resource Constraints*

Each year it takes more energy input per unit of energy extracted to develop the remaining gas supply. During the brief encounter with energy deregulation, regulatory oversight in the neighboring state of California was relaxed and new electricity plants were designed to capitalize on the advantages of natural gas. Had there been strong oversight it is likely that much greater fuel diversity would have occurred; also, the very strong demand-side management effort of the early 1990's would have been continued in order to gain identical benefits from less fuel use. Instead, for a time, utility regulation was all but abandoned. Provision of energy supply and pricing were left to market forces.<sup>25</sup> The lack of appropriate fuel diversity means, nationally, that households and electric generation stations are in competition for gas supply.

In the past few years as gas costs have risen and remained high, a secondary effect has been an increase in use of electricity when households cannot pay their gas bills.<sup>26</sup> This creates an increase in electric bills. The net effect at the household level is that energy bills become difficult and then impossible to pay.<sup>27</sup> Many US utilities are experiencing payment problems.

Along with these realities, current climate research is reporting a decline in Sierra Nevada snow pack and Cascade snow pack. Loss of free water storage in the form of snow pack will require greatly increased attention to problems water supply in

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<sup>25</sup> Or, what at the time were conceptualized as market forces. The market forces of the deregulation era were not characteristic of the forces of a "free" market with many competitors, many buyers, inability to use market power to shape price, easy entry and exit of suppliers, etc. The electricity supply market is not the simple competitive market of Economics 101.

<sup>26</sup> If gas is disconnected for nonpayment, or is simply costing too much for the household budget, households in cold weather regions have no choice but to turn to other means of heating in winter. Household problems with gas prices quickly transfer into problems with electricity bills.

<sup>27</sup> There is a possibility that the shortage could be remedied through the development of LNG stations along the California coast. However, new LNG tankers and stations raise problems of security and it is unlikely that any coastal community would permit new stations if included in planning consultations and permitted to choose whether they would like a new LNG terminal next door.

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Nevada's neighboring regions of California and the Northwest.<sup>28</sup> The primary effect of loss of snow pack on electricity is in the projected changes in hydro-generation resources in regions connected to Nevada over transmission interties, leading to scarcity and a long-term series of price increases.<sup>29</sup>

### **B. Increasing Prices**

The immediate consequence of the underlying physical realities is that energy costs are increasing. This trend is expected to continue for both gas and electricity. The trend in energy cost is a matter of basic economics in a classic situation of resource constraint, a market situation with little resemblance to the traditional markets of economic textbooks, or even to a traditional regulated monopoly. Resource constraint situations involve the second law of thermodynamics,<sup>30</sup> material limits, and rising costs per unit.<sup>31</sup>

### **C. Decreasing Family Incomes**

The United States is experiencing increasing tension along lines of income and wealth. Poor families are becoming increasingly poor as the status of jobs changes due to globalization and related political economic trends. As a result of these trends, the very rich are becoming extremely rich, and the families in between are

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<sup>28</sup> Welch, Craig, "Global Warming Hitting Northwest Hard, Researchers Warn," *Seattle Times*, Saturday, February 14, 2004; Luers, Amy Lind, "A Tale of Two Futures, California Feels the Heat," Pp. 8-9, *Catalyst*, fall 2004.

<sup>29</sup> This is the classic problem of physical limits. The climate studies show the problem is occurring on the electric side due to global warming as it also occurs on the gas side due to depleting gas supply. "Limits situations" require strong state regulatory protections, strong state and utility planning capabilities, and enforcement for the common welfare. This is a special area of economics, well researched, but somewhat obscure, a sub-case mentioned but not well developed in standard economic texts, such as Samuelson (Samuelson, Paul A, & William D. Nordhaus, *Economics*, Sixteenth Edition, International Edition. New York: McGraw-Hill, 1998). The classic study of what happens when resource constraints and laws of physics dominate an economic market is Georgesçu-Roegen, Nicholas, *The Entropy Law and the Economic Process*. Cambridge, Massachusetts: Harvard University Press, 1971. A more easily readable treatment is given by Beard, T. Randolph and Gabel A. Lozada, *Economics, Entropy and the Environment, The Extraordinary Economics of Georgesçu-Roegen*. Cheltenham, UK & Northampton, MA, USA: Edward Elgar Publishing, 1999. Also see: Odum, Howard T. & Elisabeth C. Odum, *A Prosperous Way Down, Principles & Policies*. Boulder, Colorado: University Press of Colorado, 2001.

<sup>30</sup> The second law can be expressed in many ways: hot frying pans tend to cool down; water tends to flow downhill; time's arrow tends to point in one direction; if two systems are in contact with each other, their energy differences tend to even out; the total entropy of an isolated thermodynamic system tends to increase over time. Under resource constraint, it tends to take ever more energy to extract energy, so prices for energy tend to increase over time.

<sup>31</sup> For how costs increase, see references in footnote 29, above.

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experiencing more economic fear than has happened since perhaps the 1930s. For the last thirty five years, low-income to moderate income families and particularly low-income families with children are *losing real income* from year to year as the nature of available employment changes.

#### ***D. Failure of both “Market” & “Cost of Service” Pricing***

With the exception of the deregulation era programs in some states in which pricing was envisioned to become a purely market function, in the US, utility rates are traditionally regulated to reflect actual cost of utility service. There is an inherent sense of fairness in the “cost of service” principle, which is retained today for electricity and gas distribution. The “commodity cost” of gas is generally now treated as a “pass through” under contractual arrangements though which gas utilities try to minimize price, but price is determined by market conditions of supply and demand.<sup>32</sup> The “generation cost” of electricity is determined by both market forces and regulations as to which customers will share in the cost of traditional integrated utility generation and which will be free to purchase the “generation part” of electric service from other kinds of non-regulated merchant entities. Merchant entities do not follow a cost of service principle; they look for value in deals. What has been found in deregulation is that these deals disproportionately benefit the major market players at the expense of the residential, small commercial and low-income sectors. When some larger entities are freed to choose a supplier, everyone else has to cover more of the fixed costs of community utility generation, so household energy bills increase due to yet another market factor.

However, neither market (deregulated) rates nor regulated cost of service rates can work for low-income households and for many moderate income households. For many households, changes in jobs, rapidly increasing housing prices, and decreasing real incomes are causing households to gradually lose ability to consistently pay their utility bills. Even if full traditional regulation is used, the logic of allocating rates based on cost of service only works if incomes are generally both adequate and do not show substantial extremes.<sup>33</sup>

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<sup>32</sup> In states that required their utilities to sell off all generating plants to other entities, cost of supply is bid up to the cost of the marginal unit, and the lower-cost plants are gradually re-capitalized to operate at higher cost. This increases cost of electricity in neighboring states also, and local cost advantages due to an advantageous (for example, non-gas) generation mix are lost. Similar to the situation with gas utilities, electric utilities from which generating plants have been stripped simply transmit the higher market price of electricity that they must now purchase at market price.

<sup>33</sup> It is important to note that there is nothing wrong, in principle, with markets if all members of the community have the income necessary to participate in the markets and meet their energy needs and supply in the market approximates the ideal-typical model of supply under “free” or perfectly competitive market conditions. Also, basing rates on (regulated) cost of service is technically rational. It is only that if households increasingly lack ability to pay, and real household income declines from year-to-year, cost based rates and traditional payment policies will not permit essential electricity and gas service for an increasingly large number of low-income and moderate income households.

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### ***E. Earlier Attempts at Solutions***

Self-help (including family and friends), and help from the community including lodges, civic clubs, unions, religious and community organizations has, in the past, helped individual households to deal with energy affordability problems. In very good economic times, when payment troubles are relatively small, these efforts can have a significant effect. Today, individual and association voluntary efforts cannot even begin to deal with the scale of growing affordability problems. Beyond these ineffective efforts, utilities typically provide systematic assistance, available to customers experiencing payment trouble. Equal payment plans, adjustment of bill dates to align utility bills with pay days, referral to fuel funds, and low-income rates are examples of useful utility programs that can help mitigate the problem.<sup>34</sup> Yet, need has grown (and continues to grow) far beyond the scope of temporary assistance, voluntary response, and the scope of individual utility programs.<sup>35</sup> Federal LIHEAP funds, also used for these purposes, are *always* far short of need in Nevada, are unreliable in amount, and are “locked in” by an allocation formula that sends these funds primarily to the Winter weather states of the Northeast.

All of these approaches are useful, but very limited in ability to provide answers in relation to the scale of the problem.

### ***F. Nevada’s Approach***

The Nevada UEC is an innovation that goes beyond individual help and previous kinds of program approaches. The UEC is the basis for universal service, and a real solution. In this matter, Nevada and a few other states have arrived at a workable solution that benefits the participants, the other customers, the general public, and the energy companies. The fund insures access to service while permitting Nevada’s energy companies to remain solvent.<sup>36</sup>

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<sup>34</sup> For a history through the early 1980’s, see Sweet, David C. & Kathryn Wertheim Hexter, *Public Utilities and the Poor, Rights and Responsibilities*. New York: Praeger, 1987.

<sup>35</sup> Similarly, in broad areas of the country, food banks have grown dramatically but hunger has increased. For how voluntary capacity has been overrun, see: Pependieck, Janet, *Sweet Charity?* New York: Viking, 1998

<sup>36</sup> Several states are now turning to the UEC model, including Maryland (electricity only, 3% of income), New Hampshire (electricity only, 4% of income) and New Jersey (electricity 3% of income; gas 3% of income). The Ohio model (electricity 5% of income; gas 10% of income) is not working well because the percentages were set too high. The underlying tension of increasing energy costs and decreasing ability to pay is in play throughout the United States. With a UEC, energy costs can be covered and service provided. In states without a UEC, in the fall and winter of 2005 record numbers of households were excluded from service as companies struggled with the problems of non-payment. (In states with winter termination prohibitions, the disconnects occurred in the spring.) Energy service is essential for life. Terminations are associated with forced moves, loss of habilitation, sickness, stress, and for a small minority of customers who try to “jury-rig” service or try to use candles for light and burner units for heat, with fires and deaths. From a social or family perspective, it is much more sensible to keep families who lose ability to pay connected.

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The Nevada Universal Energy Charge (UEC) funds the Fund for Energy Assistance and Conservation, one of several new state energy assistance funds established over the past ten years. Nevada's program works. It remedies a severe problem of many Nevada households – inability to pay for the energy necessary to meet such basic household needs as moderating natural temperature extremes through home cooling and home heating. The Nevada UEC provides a means for the state to respond to the underlying tension between the trend in energy costs and the trend in ability to pay in a manner that is appropriate to Nevada's particular needs.

Five features define the careful and conservative character of the Nevada UEC:

- (1) **Requirement to Pay-In.** *It is necessary to pay into the UEC to be eligible for UEC assistance.* In the legislation, paying in is determined primarily by utility service territory. The paying in provision is a link to the tradition of balance of self-reliance and the community pulling together when necessary.<sup>37</sup>
- (2) **Realistic and Fair.** By setting the Fund for Energy Assistance and Conservation payment assistance at the level of the Nevada median household energy burden, Nevada has established a realistic level of payment assistance. The level is inherently rooted in a principle of fairness – energy assistance is provided at the level of the median percentage of household income for the state. The portion below that level remains the household's responsibility. The portion above that level is covered by the Fund.
- (3) **Starting with a Conservative Eligibility Level.** The eligibility level for SFY 2003 was set at 150% of the federal poverty level. Our calculations indicate that the current actual breakpoint for poverty in the US is 250% of the poverty level (a point of increasing consensus arrived at in different studies around the US). Some of the newest program changes in other states are in employing levels of 60% of state median income, 175% of poverty, 200% of poverty, or 250% of poverty. But 150% was a reasonable level to start the program.
- (4) **Understanding of Long-Term Energy Affordability Problem.** Unless there occurs a dramatic turnaround in the provision of "living wage" jobs (defined as a job that can support a family, including some provision for meeting medical needs, a car, and retirement) increasingly large numbers of American households, including households with one or more full time workers, and a good history of bill payment and work discipline, will be unable to fully pay for their basic energy needs. As globalization advances, there is nothing on the horizon that offers to restore opportunities for "living wage" jobs for households who lose them, or for newer households that are formed. For low and moderate income households, real income is likely to continue to decline. The

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<sup>37</sup> Federal funds and some other state funds are used to the extent available to help households not paying in to the Nevada UEC.

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Nevada UEC payment assistance is therefore essential – picking up the part of the energy burden that is higher than that of the median Nevada household. While households must reapply each year and there will always be some turnover for some households where conditions improve, the affordability problem is built-in to the national economy.

**(5) Investment and Cost-Effective Approach to Weatherization.**

Weatherization fixes a home so that it can require substantially less energy to achieve the same (or sometimes better) levels of cooling, heating, and other energy services. The one-time investment of weatherization, combined with occasional minor maintenance is designed to provide an economically cost-effective return on investment over many years. The investment nature and the cost-effective return for the “weatherization package” as a whole define the essential characteristics of the Housing Division portion of the Nevada Fund.

The Nevada UEC payment assistance program is a realistic solution to this ongoing and growing problem. It meets increasing cost based rates with payment assistance set at the median household energy burden. As rates increase and bills change, the Nevada UEC will likewise adjust.

***G. Logic Model***

The overall logic model for the programs implemented from UEC funding is shown in Figure 16.

The logic model is actually three interlocking models:

- One for funding;
- One for payment assistance;
- One for weatherization assistance

In this model, for each activity there is an objective. Each objective has associated indicators and a means of verification. Together, the elements in this model and the discussion that has been presented in this section frame the overall logic of the program.<sup>38</sup> The new program element implemented in FY 2005 is arrearage forgiveness.

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<sup>38</sup> Logic models have been a required element in program evaluations since the early 1990's, and are associated with a focus on “program theory.” See, for example, Chen, Huey-Tsyh, *Theory-Driven Evaluations*, Newbury Park, London & New Delhi: Sage Publications, 1990. Also, Plantz, Margaret C., Martha Taylor Greenway, and Michael Hendricks, “Outcome Measurement: Showing Results in the Nonprofit Sector,” *New Dimensions in Program Evaluation*, No. 75, Fall 1997.

Program Logic Model - FY 2005				
Activities	Assumptions	Objectives	Indicators	Means of Verification
<b>Insure collections and appropriate refunds - Public Utility Commission (PUC)</b>				
<b>Administration</b>	The PUC is the collector, since it is granted full authority to regulate, audit, and investigate, and enforce utility compliance.	Collect and Transmit UEC Funds to Welfare Division	Funds collected, appropriate refunds made on request, funds transmitted to Welfare Division	Match of PUC and Welfare Division records.
<b>Low income Energy Assistance Program - Welfare Division (NWD)</b>				
<b>Administration</b>	The percentage of the UEC assigned to program administration is workable for administration.	Implement, Administer	Implementation in compliance with regulatory intent (NRS 702)	Interviews, Compliance Review, Analysis of Effectiveness
<b>Assistance</b>	Assistance will permit continued service and help with economic viability of households.	Provide targeted assistance	Assistance program developed and implemented. Internal support systems in place.	Interviews, Document Review
<b>Outreach/Communications Campaign</b>	Outreach and contact is a function that requires special effort	Enroll households	Targets met or approached in SFY 2005	Interviews, Program Records, Document Review
<b>Program Design</b>	Program improvement is a continuing function.	Construct annual Plan	Program improvements developed. Arrearage Component in effect SFY 2005. Annual plan submitted.	Interviews, Review of Plan
<b>Coordination</b>	Welfare Division should stay in continuing contact with stakeholders to insure continuing input of perspectives and ideas for improvement.	Communicate with and listen to stakeholders	Open Coordinating Meetings	Observe meetings, Interviews with Stakeholders
<b>Annual Evaluation</b>	Annual evaluation will provide useful assessment and feedback for improvement	Complete annual Evaluation	Evaluation for SFY 2005 completed.	Completion of Evaluation
<b>Weatherization Assistance Program - Housing Division (NHD)</b>				
<b>Administration</b>	The percentage of the UEC assigned to program administration is workable for administration.	Implement, Administer	Implementation in compliance with regulatory intent (NRS 702)	Interviews, Compliance Review, Analysis of Effectiveness
<b>Energy Conservation/Efficiency Services</b>	The means to implement the program must be developed and maintained.	Arrange services, including contracts with subgrantees, training, inspection, BWR database and reporting.	Subgrantees developed, training developed. Inspection, database and reporting arranged. Accountability to Housing Division established and maintained over time.	Interviews, review of Documents
<b>Improvements for Energy Conservation/Efficiency</b>	Physical improvements will lower energy bills	Arrange installations	Improvements installed in homes, reporting system functional, inspections completed	Interviews, Review of Program records, systems, and documents. Analysis of Energy Savings.
<b>Outreach/Communications Campaign</b>	Outreach and contact is a function that requires special effort	Enroll households	Enrollment target met or approached.	Interviews, Program Records, Document Review
<b>Program Design</b>	Program improvement is a continuing function.	Construct annual Plan	Program improvements developed. Annual plan submitted.	Interviews, Review of Plan
<b>Coordination</b>	Housing Division should stay in continuing contact with stakeholders to insure continuing input of perspectives and ideas for improvement.	Communicate with and listen to stakeholders	Open Coordinating Meetings	Observe meetings, Interviews with Stakeholders
<b>Annual Evaluation</b>	Annual evaluation will provide useful assessment and feedback for improvement	Complete annual Evaluation	Evaluation for SFY 2005 completed.	Completion of Evaluation
Note 1: Energy Assistance Authorization: The 2001 Nevada Legislature Assembly Bill (AB) 661, codified as Nevada Revised Statute (NRS) 702. Note 2: The three logic models included in this table show the interlocking logic of the Nevada Fund for Energy Assistance and Conservation.				

**Figure 16: Overall Logic Model.**

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## **V. PROGRAM STORIES**

The Fund for Energy Assistance and Conservation funds two services: payment assistance and weatherization assistance.

Many low income households are overwhelmed with the pressures caused by poor housing, high energy bills and low incomes. Through participation in the UEC/Fund for Energy Assistance and Conservation programs (the Payment Assistance Program and Weatherization Assistance Program), these feelings have been replaced by feelings of hope, increased control over one's situation, and a general sense of empowerment.

The programs cannot address the changing structure of jobs (erosion of family wage jobs, erosion of pensions, and erosion of general income security), or the job structure. However, Nevada's Universal Energy Charge programs are real programs capable of solving energy payment problems, and helping people keep their homes and their health.

To document how the programs appear from the perspectives of Nevada households served by the programs, interviews were conducted with seven Nevada families, three from the Energy Assistance Program and four from the Weatherization Assistance Program.

Their stories are summarized below.

### ***A. Energy Assistance Participants***

#### *1. Ms. Z (Sparks)*

Ms. Z is a single mother of a 17 year old son and an 11 year old daughter. She works full time and makes annual earnings of around \$16,000. She only received about \$692 in child support for the entire year last year, and is the sole support for the household. Ms. Z received energy assistance benefits totaling \$476 for current bills, and an additional \$326 for past due charges that had built up over the winter. Her annual electric bill was \$563 and gas bill \$425 for a combined energy cost of \$988.

Ms. Z reports that this program has been a life saver for her and her family. She says that without the assistance to help with her energy bills, she would simply not have been able to stay in their rental unit. "Honestly, I don't know what I'd do. We'd have been thrown out." She says "They [the Payment Assistance program] have

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helped me monthly with a certain amount,” and “Now when my bill is due, I can pay it on time.”

Before the assistance, Ms. Z says that she had to constantly call the power company and make arrangements because she could not pay the bill. She originally applied for assistance back in October 2004, but had to wait until she was eligible again (having participated previously), so the process took several months before relief arrived. However, she reports that the electric company was more understanding once she told them that she had applied for assistance.

Ms. Z, who is 36, indicated that the extra money she has had available now that her energy bills are under control has literally enabled her to “put more food on the table,” and most importantly, has “kept me in my home.” She is profoundly grateful for the help.

Regarding energy efficiency, Ms. Z feels that, although they live in an older building and cannot do much in the way of physical improvements, her family is fairly energy conscious and tries to avoid wasting energy. They do not have air conditioning, but on occasion use a “swamp cooler” to get relief on really hot days when they are at home. Ms. Z says that while energy costs are under control for her, she remains concerned about her water bills which are very high, and hopes to find ways that they can be reduced. She says that the energy assistance people are very nice, do the best they can, are pretty timely and that she and her family are very appreciative. “It’s just a blessing.”

## 2. Ms. C (Las Vegas)

Ms. C is single, working age adult who also receives an SSD benefit monthly for a disability. She is able to work part-time and did so until she was suddenly let go from her job last year, thus making her ineligible for unemployment compensation. She told the story of how she was looking for another job at the time, and somehow her boss found out about her job search. She was fired on the spot and not able to give her two-week notice. Then the job that she was hoping for did not materialize. When she lost her job her household income was cut by 75%.

After she became unemployed, Ms. C said she was really worried about how to pay the bills, especially the gas and electric bills. “I was eating mostly beans and rice because I could not afford anything more than that, wondering how I was going to pay my bills. Then my caseworker at Social Security told me about the Nevada Energy Assistance program—it was a lifesaver!” She said she received \$581 last year; most went on the electric because those bills are higher than her gas. “I was so happy they could give me some assistance on both because my electric is very high especially in summer—the A/C can run as much as \$150 per month.”

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Ms. C reported that she thought the program was easy to access. When she first applied, she reported that the intake worker went out of her way to help her facilitate getting her income verification paperwork from her former place of employment, a situation that could have been touchy, since she was fired. She added, “The people at Energy Assistance were wonderful and they helped me get the payments on my utilities as soon as possible.” When asked whether she had experienced any problems with the program, Ms. C said, “none whatsoever—everyone knew what they were doing and was very professional. I cannot think of one thing that could be improved upon. They should just keep telling people how to help themselves, especially through energy efficiency and education.”

Energy conservation seemed to be a normal practice for Ms C even before she became eligible for energy assistance. “I was always one to go around turning off the lights when not needed, trying to conserve gas and electric, and being careful with the A/C in the summer.” She added that the intake worker gave her literature on conservation and the state housing supervisor where she lives stresses energy savings. Interestingly, after receiving the assistance payments on her utilities, she said, “I felt a new awareness to really make the energy assistance money stretch through being very energy efficient.”

## ***B. Weatherization Assistance Participants***

### *1. Ms. M (Fallon)*

Ms. M is an elderly woman who lives alone in her small (768 square foot) home in Fallon. She heats her home with natural gas, and does not have any air conditioning. The Weatherization program spent a total of \$4,860 on improvements, including replacement windows and a new front door. Weatherization measures such as caulking and exterior door sweeps were also installed, along with replacement compact fluorescent light bulbs.

Ms. M says the work was completed over a two day period after the audit was done to identify what was needed to improve the energy efficiency of her home. She reports that the people doing the work did an excellent job, followed up and left her home clean and neat. The project was completed in June 2005, and we interviewed her during the summer, so she had not yet seen the impact of the work on her winter energy bills yet.

However, Ms. M reports that she is significantly more comfortable in her home in summer. She loves the new front door in that it keeps the coolness in rather than having the heat seep in from the front porch. The new windows are wonderful, she says, and are particularly appreciated because the previous windows had many leaks. She could not have afforded to have them replaced without the program.

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Ms. M indicated that in the past she has not used her wall heater too much, and hopes that the increased comfort in the home due to the reduced air leaks will make it more comfortable in the winter. She is also hoping for lower gas bills in the winter. For the summer, though, she is enjoying the increased coolness.

As for the CO detector, she admits to at first seeing it on the wall and wondering what it was. After inquiring, she understood that it is an added safety measure related to indoor air quality. Above all, Ms. M appreciated the follow up inspection and attention to quality that was demonstrated by the program people. "They did a really good job," she said.

## *2. Ms. G. (Henderson)*

Ms. G is enthusiastic about the weatherization program and what it has done to help her be more comfortable in her home and better afford her energy bills. Just over \$2,200 was spent by the program on her home. With work having been completed in November 2004, she has already noticed reduced energy bills from the previous year.

The primary measure she is most appreciative of is the solar screens placed on all the windows. She says that they have made "a tremendous difference – it was much hotter before." She reports that in the past she used to put all kinds of things up over the windows to keep the heat out, but it did not work. Now, her new beige solar screens really work well, (although she wonders if the other option of black screens would have kept even more heat out.)

Even though Ms. G does have air conditioning, she keeps it set at 82 degrees in summer because she cannot afford the energy bills for keeping it on a lower setting. Ms. G is elderly and lives alone, having raised two children while working 7 days per week, 18 hours per day. She reports that it is so much more expensive to live these days, and she feels programs like this are a great help to people like her. She reports that her electric bill for June 2005, which she just received when we interviewed her, was \$137 – still too high for her to afford, but much better than last summer's bill of \$240 for the same month. (It will take her two payments to cover this bill; she says she can more readily afford \$40 to \$50 a month for energy bills, but that is about all. More than that, she has to pay on installment. She says she hopes to receive help from LIHEA but has not heard back yet.) Ms. G now lives on \$700 per month, and says "my bills have just thrown me!" She hopes for lower energy bills this coming winter due to the improvements completed through the program.

Ms. G is particularly enthusiastic about the young woman who conducted the assessment, came back and inspected the work, and got after the contractors to have them fix a few things that were not to her satisfaction. Ms. G. says that she was excellent, with such a responsible, polite and efficient attitude, and that it was a real pleasure to work with her.

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Finally, Ms. G noted that she knows a lot of people like her – elderly with very limited incomes – who have fallen on hard times because of the high cost of living, energy included, and that they too could benefit greatly from a program such as this. “You know, every little bit helps.”

### 3. Ms. A (Yerington)

Ms. A lives on just over \$9,000 per year and is also a participant in the payment assistance program. She reports that, after having the weatherization work done, she is using much less propane than before. In fact, her propane dealer told her recently that she had better use more or her payment assistance allocation will be reduced (*NOTE: that this is probably not what Nevada wants propane dealers advising people...*). Ms. A says her electric bill also has gone down, partly because of the compact fluorescent lights that were installed which she thinks are great.

As to the effects of the program work that was done, she says “It is really warmer in winter; I try not to use the propane and use the fireplace instead. They replaced the front door threshold and in the bedroom installed a carbon monoxide detector. They also added required ventilation which wasn’t there before. Ms. A says she appreciates all that was done.”

Ms. A had insulation put on the pipes under her sinks and they now have not frozen up as they did before. She also says she appreciated the increased warmth in her spare room which used to be a two car garage and is now her laundry and music room. She says “They put a vent thing in my washer and dryer’ and the added warmth allows her to keep her heirloom player piano in the room, which she really appreciates.

“I use the payment assistance but have been using less. I arranged for lower monthly payments on my electricity and propane. I guess I come up again for it [payment assistance] on December 22. I use cold water for everything, but the propane guy said to use hot water. I only use my thermostat in the morning to heat up the house, and then I use my fireplace. The [weatherization] work has really made a difference in the heat in the house.”

Ms. A is most appreciative of the extra warmth from plugging holes in her home. “Well just the fact that the heat I get now - when I turn it on, it makes a difference. They put plastic covers over the vents for the swamp cooler in the ceiling, and that’s made a huge difference.”

As to what she is able to do with the extra money she has saved on propane and electricity, she says she uses it to buy groceries and pay her other bills.

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“I think the state programs are great – and in regard to the assistance, I am not needing it as much now. I still keep my thermostat down and layer my clothes, but it does make a difference. I still use the fireplace.”

Her final comments regarding the program were “I really appreciated it and it sure is helping me out regarding my electricity and my propane.”

#### 4. *Mr. & Mrs. P (Winnemucca)*

Mrs. P and her husband live on about \$14,000 per year. They had twelve windows replaced, including a sliding glass door, which she says she knows is usually not done under programs like this. The effect has been much lower energy bills, plus significantly increased comfort in the home.

“We are really pleased very pleased – It made a huge difference as far as our heating and comfort in the house. We have seen our energy bills go down, our propane and electric. For our propane, we were doing sixteen gallons a day before and now we’re using half that. We use propane for heat, water and other things.”

“We had to have a new stove because after they did the blower door work, it showed our stove was not efficient and they provided a new stove and it has made a big difference. Oh, and the windows were so bad, you could feel the chill just coming into the room before.

The work done under the weatherization program has helped increase comfort in the house “considerably.” “The floor is not cold anymore, the ducts were disconnected before, and it made the floor real cold. Before, the animals wanted to be up on the furniture, and now they lay on the floor. It has been a huge difference.”

Safety has also improved, according to Mrs. P, but in a less conventional way. She notes that she appreciates the new windows the most because “I can get the windows open now and that was a big concern before, because our previous windows required having to take down the screens. Now if something were to happen, we could just pop them open and get out.”

When asked what the most important benefit has been to her household, Ms. P says “They fixed the sliding door because mine was so bad. Now you don’t feel the cold before you get there. This is the first winter and it’s really great and made a totally big difference. Our curtains don’t move when the wind blows. In the summer the house was definitely cooler, and I don’t think we used our AC hardly at all. “

In spite of all the work that was done, Ms. P says her family feels they need to do more themselves, and they plan on leveraging the energy savings to do just that. “We realize on our part that we need a new roof, and our siding needs repair, we know that there are things we need to do. So we’ve kind of figured to save the

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money from the lower energy bills from this weatherization work and then do the next project using that money.”

Mrs. P says they had never participated in a state program such as this before, and she was unaware of payment assistance, not having used it before. In closing she says “The people were just great – they were so polite and so good. Took care of their business and discussed things with us. It was a great experience.

### ***C. Summary***

In summary, the families interviewed had a very positive experience with the program. The interviews show that the programs make a real difference in the lives of those in need, and that people are appreciative that the state has real programs.



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## **VI. AUTOMATION ANALYSIS**

Automation was as a major endeavor for the first two program years (SFY 2003 and SFY 2004). At the close of SFY 2004, all computer-assisted operations were programmed and in place, with the exception of management reports, and the final programming for the arrearage assistance component. These were functional in SFY 2005.

A number of coding changes were requested and completed in SFY 2005 to improve functionality for SFY 2006. These involved minimum payment coding, subsidized housing, ability to handle both Universal Energy Charge and LIHEA, and better ability to handle households with one UEC utility and one non-UEC utility.

No major computer or programming problems remain to be addressed at the end of SFY 2005. What remains are ongoing maintenance of programs and computer support, including a number of requests for incremental small improvements. In addition, the full use of the Welfare Division NOMADS computer system for automated communication, though planned for SFY 2005, was not implemented.

### ***A. The Computer System***

The Welfare Division and Housing Division are linked and can share information back and forth. The Housing Division is also linked to computers at subgrantee agencies via the Internet. Internet communication of data between the subgrantees and the Housing Division makes use of encryption for security. Also, the Welfare Division Energy Assistance unit is linked to the customer information systems of Nevada Power, Sierra Pacific Power, and Southwest Gas. This enables quick and accurate reference to bill and payment status for the past year.

#### *1. Housing Division*

The Housing Division provides the Welfare Division with a list of eligible households that have received weatherization services.

All essential information on homes provided by Housing Division subgrantees is maintained in electronic format for analysis and reporting and is maintained in the Building Weatherization Report database. The Building Weatherization Report (BWR) is the primary tool used by the Housing Division Weatherization Assistance Programs to track weatherization measures installed. It has been used in DOE funded weatherization since 1977. The current electronic version was developed in-house in SFY 2003<sup>39</sup> and has been used by the Housing Division and subgrantee agencies since March 2003.

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<sup>39</sup> Architectural Energy Corporation served as consultant in the development of this system.

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The BWR system uses profiles: four climate zones, a set of residential building types, county, fuel type, and historical installed cost data. The system output is a prospective Savings to Investment Ratio (SIR). The SIR is used to rank energy efficiency measures and develop a priority list (rank order) for cost-effective measure installation for each home, depending on its classification within the profile information. This priority list is used in place of auditing each home and saves the cost of carrying out extensive diagnostics (a detailed energy audit) on each home prior to weatherization.

As an addition to the BWR system, an energy savings tracking Database was developed for the Housing Division by Architectural Energy Corporation (AEC) and is used with the BWR to compute planning estimates of therms and kWh saved by measures installed.<sup>40</sup>

## *2. Welfare Division*

The Welfare Division's computer system electronically transmits data elements between the Welfare Division and Housing (name, address, telephone, FAC benefit, and energy usage/burden of eligible households receiving in excess of \$600 in energy assistance).<sup>41</sup> As noted above, the Welfare Division's computer system is also capable of accessing energy use and payment information from the Customer Accounting Systems of the three major utilities (Sierra Pacific Power Company, Nevada Power, and Southwest Gas).<sup>42</sup>

In communicating the program to households served by the Welfare Division, the NOMADS computer system was used in SFY 2005 to generate notices to Temporary Assistance to Needy Families (TANF), Food Stamp, and Medicaid lists. The notices alerted households to the existence of the payment assistance program, and where to call for an application, and were incorporated in the "Notice of Decision" letters for these programs.

It was planned to use NOMADS to screen all applicants/recipients for Welfare Division programs (other than the Energy Assistance Program) as they applied to determine if they are known to the Energy Assistance Program and fit the eligible

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<sup>40</sup> Architectural Energy Corporation, "Technical Report for the Development of Weatherization Energy Savings Tracking Database," prepared for State of Nevada, Division of Business and Industry, Housing Division, updated June 2004.

<sup>41</sup> Welfare Division/Housing Division exchange of data is consistent with the 2005 State Plan. Nevada Fund for Energy Assistance and Conservation State Plan 2005, Nevada State Welfare Division, April 2004, §14.1.3, p. 29.

<sup>42</sup> The Housing Division can obtain utility information, but does not have the real-time tie in to the utility customer information systems.

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income limits for payment assistance.<sup>43</sup> Those qualifying on these screens were to be automatically sent a program application and cover letter. This systematic communication was planned to begin in SFY 2005, but did not begin due to computer programming problems. Then, a decision was made to hold off processing until the Energy Assistance Program meets its target of processing all cases within thirty days at both Carson City and Las Vegas. The Carson City office has been able to meet this target, but the Las Vegas office has not.<sup>44</sup>

### ***B. Housing Division: Ongoing Incremental Improvements***

In order to link the BWR modeling of planning estimates (the AEC estimates) of therms and kWh saved to actual energy use outcomes as recorded in information from the utility customer information systems, the BWR “JOB ID” (used by the subgrantees and Housing Division as the unique identifier of each home weatherized) has to be matched across to the unique utility account numbers for utilities serving the home. The BWR system is where this linking takes place.

However, the BWR was designed primarily to emphasize weatherization reporting and it currently does not contain a standard report that classifies weatherized homes completed by utility. Though it contains the “JOB ID” and two fields in which utility account numbers are to be recorded, during program start-up, very few utility account numbers were entered into the BWR by the subgrantees.

In retrospect, it should not be considered unusual in a major start up effort for subgrantees to focus first on their weatherization work (that is, to focus on completing their primary tasks) and on the related systematic entry of data elements required for weatherization reporting. Since the subgrantees needed the “JOB ID’s” to get started on the homes, they are all recorded in the BWR. Also, any inconsistent entry of data elements required for standard weatherization reports would have been quickly caught and fixed.<sup>45</sup> The consistency and completeness of entry for reported data elements would have been insured in the first (SYF 2003) or second (SFY 2004) program year. However, the utility account numbers are not used in the weatherization work or required in generating the standard BWR reports. Very few were recorded.

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<sup>43</sup> Nevada Fund for Energy Assistance and Conservation State Plan 2005, Nevada State Welfare Division, April 2004, §15.4.2, p. 31.

<sup>44</sup> In application processing, the Energy Assistance Program aims for a processing time of thirty-days or less. The Welfare computer system assists with eligibility and benefit determination, processing time frames, and tracks benefits

<sup>45</sup> A reality associated with the use of information systems is that it is only when data from an information system is used that it becomes clear if the required data elements have been consistently recorded in a usable form.

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The point at which the link between the BWR “JOB ID” and utility account numbers is tested occurs is in the evaluation. With the way the program years and evaluation studies are integrated, the point at which the utility account information is used comes slightly two years after the BWR information is recorded.<sup>46</sup>

When this problem was identified in developing the SFY 2004 evaluation, Housing Division staff asked the subgrantees to be systematic in filling in the utility account information for each weatherization site. In the fall of 2005, the Housing Division and the evaluation team worked with the subgrantees to further standardize the data elements for the utility account numbers, and these changes were fully implemented in the late fall of 2005.

### ***C. Welfare Division: Ongoing Incremental Improvements***

For the Welfare Division, in June 2005, the Division conducted an internal observation and review of operations to try to determine ways to reduce the time required to process an Energy Assistance application. The following are selections from the recommendations made and the actions taken.

Caseworkers need desk-top printers. Approval was obtained and one was ordered for each caseworker.

Clerical need to enter household members when data entering applications. Requires allowing data entry access to Household Member Screen. Approval was obtained and access granted.

Clerical should input cases in Staggered Mailing List. This is planned for implementation for FY06 cases. Caseworkers will print Notices, attach budgeting memo for approved cases and Crisis Intervention Letter for cases denied for over-income and give them to the clerical staff (need a special In-Box for clerical desk). Clerical will enter all cases in the Staggered Mailing List and then mail the notices.

There needs to be a Group EAP Email Account for each office. The Southern office will use the Flamingo Office group email account. The person(s) responsible for this account will forward Client Update Forms and other documentation that comes from the Customer Service Unit at the Desert Inn location to the southern EAP office. With respect to the north, the group email account for the Carson office will be established when the clerical staff moves into the Customer Service Unit.

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<sup>46</sup> It is inherent in evaluation of weatherization program that there is more than a one year, and usually in practice a slightly more than two year delay between completion of a home by the subgrantees and assessment of results for that home. At least one year of post retrofit energy use data is the usual standard for inclusion in a definitive evaluation or results.

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The automated RFI for Income is cumbersome and not efficient. A work item was sent to correct the form.

The Budgeting Memo and the Crisis Intervention Letter need to be attached to the appropriate auto-generated notices rather than caseworkers manually attaching these to the outgoing Notice of Decision. A work item was sent to modify all appropriate notices.

In addition, the evaluation team identified a need for zip code information to be included in the twice yearly standard transmission of data to the evaluation team.<sup>47</sup>

#### ***D. Summary***

As indicated in this section, the kinds of changes now required in computer programming and, more generally, in computer support are small incremental improvements. The final major additions to the computer systems were completed in late SFY 2004 and in SFY 2005. For SFY 2006 and SFY 2007, it is likely that additional capabilities will be required, but these will be in the nature of incremental improvements. The computer systems will continue to require ongoing support and maintenance, but computer support for the programs is now mature.

#### ***E. Recommendations***

- (1) The Housing Division should develop a standard report on weatherization by utility to add to the other standard reports in the BWR system. Running this report once a month or every quarter will help maintain subgrantee focus on entering utility account numbers as time goes by and there are staffing changes.
- (2) The Housing Division should revise the BWR data collection format to add a separate field for utility name to go with each of the two fields for utility account numbers.
- (3) The Welfare Division should add the zip code to the standard format of data transmitted to the evaluation team.

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<sup>47</sup> For the current evaluation, zip codes were generated by address matching software. Having the actual zip codes should marginally improve response to client surveys used in the evaluations.

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## VII. FISCAL ANALYSIS

The Universal Energy Charge (UEC) was established by the 2001 Nevada State Legislature, and became effective during State Fiscal Year 2002.<sup>48</sup> The first full program year was SFY 2003. This analysis is for State Fiscal Year 2005.<sup>49</sup>

This section of the report relies on amounts reported in the state computer system (DAWN) and accounting provided by the Welfare Division and the Housing Division. When there are discrepancies, we use the Division accounting numbers.

### A. *The Charge & the Fund*

- The Universal Energy Charge (UEC) represents total collections of the Universal Energy Charge.<sup>50</sup> Collection is an operation completely separated from program administration and is separately administered by the Public Utilities Commission. The Public Utilities Commission began to receive Universal Energy Charge payments in the fall of 2001 (early in SFY 2002). Amounts collected are periodically reconciled and then transmitted to the Accounting section of the Welfare Division.
- The Fund for Energy Assistance and Conservation (FEAC) is maintained by the Accounting section of the Welfare Division. The FEAC is the UEC minus the administrative expense for the Commission and refunds. In addition, it includes any carry over funds from a prior fiscal year and any interest accrued. It is reduced by the amount of any refunds directed by the Commission.<sup>51</sup>

### B. *The Third Program Year (SFY 2005)*

Since Nevada Revised Statutes 702 anticipated that the Welfare Division program would go into effect beginning with State Fiscal Year 2003, the perspective in the

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<sup>48</sup> Collection of the UEC was fully functional in SFY 2002, but the programs were not yet functioning under the new designs and were only starting up. The legislation specified that the new program designs would become effective at the start of SFY 2003.

<sup>49</sup> Beginning July 1, 2004 and ending June 30, 2005.

<sup>50</sup> Officially (NRS 702.100), "Universal Energy Charge" means the charge imposed pursuant to NRS 702.170.

<sup>51</sup> Officially (NRS 702.040), "Fund" means the Fund for Energy Assistance and Conservation created by NRS 702.250.

Evaluation is that State Fiscal Year 2003 is the first program year.<sup>52</sup> Thus, SFY 2005 is the third program year.

<b>Program Years (State Fiscal Years)</b>					
<b>Past</b>			<b>Future</b>		
<b>First Full Program Year</b>	<b>Second Year</b>	<b>Evaluation Window for this Report</b>	<b>Fourth Year</b>	<b>Fifth Year</b>	<b>→</b>
<b>SFY 2003</b>	<b>SFY 2004</b>	<b>SFY 2005 Program Year</b>	<b>SFY 2006</b>	<b>SFY 2007</b>	<b>SFY 2008 and Beyond</b>
1-Jul-02	1-Jul-03	1-Jul-04	1-Jul-05	1-Jul-06	1-Jul-07
30-Jun-03	30-Jun-04	30-Jun-05	30-Jun-06	30-Jun-07	<b>→</b>

**Figure 17: Evaluation Window.**

To interpret the program in context, Figure 17 shows SFY 2005 as the midpoint of the first five years of program services. As a general rule, a program of this complexity takes about five years to become fully implemented and to run as a mature program.

- For a statewide program of this complexity, in the first few years there are typically problems in getting the infrastructure in place (computer support, including special computer programs, tracking systems, and management reporting systems; as well as staffing).
- Also, the potential participants in the program have to be made aware that the program actually exists. This is an obvious problem for the first year, but for low-income households, communications remains a significant problem from year to year. By the end of year five, there will be general knowledge of the program, yet mobility and the demographic of new households means that communications must remain a program emphasis each year.
- Further, the state, the utilities, and Nevada helping agencies have to put procedures in place so that qualified participants are not only made aware of

<sup>52</sup> SFY 2003 was the first *full* program year.

the program but learn how to apply, and to bring about appropriate applications. “Word of mouth” from successful participants is one of the best ways for other low-income families to become sure enough of the program to make application. It is important to note that communication with households is not simply a matter of making it known that Nevada has a program, but that the program is real and can work to help families solve utility payment and energy use problems.

All of these program areas have been developed for the Welfare Division payment assistance program and the Housing Division weatherization assistance program over the first three program years, and some additional development work remains at the end of SFY 2005.

**C. Collections (Public Utilities Commission of Nevada)**

The Public Utilities Commission of Nevada (PUCN) is the focus of oversight responsibilities for regulated Nevada utilities. The agency has both investigative and enforcement powers. Commission responsibilities for the UEC include collection, refunds in accordance with legislative provisions,<sup>53</sup> and investigation of collections matters and enforcement of collections matters to the extent necessary. Collections have proceeded smoothly. There has been no occasion for exercise of the Commission’s investigative or enforcement powers through the close of SFY 2005.

The Commission transfers funds to the Fund for Energy Assistance and Conservation (FEAC) which is administered by the Welfare Division. The Welfare Division accounting function then transfers funds to the Housing Division.

<b>Universal Energy Charge (UEC)</b>				
<b>Line</b>	<b>Item</b>	<b>SFY 2003</b>	<b>SFY 2004</b>	<b>SFY 2005</b>
		<b>(\$)</b>	<b>(\$)</b>	<b>(\$)</b>
1	UEC Receipts (Public Utilities Commission)	10,653,628	11,219,024	11,630,353
2	Cost of Administration (Public Utilities Commission)	(105,704)	(102,883)	(106,824)
3	Net UEC for transfer to Welfare Division	10,547,924	11,116,141	11,523,529

**Table 8: Top-Level Fiscal Perspective – Universal Energy Charge.**

<sup>53</sup> Refunds, as directed by the Commission and carried out by the Accounting section of the Welfare Division.

The lines of Table 8 are explained below:<sup>54</sup>

**Line 1: UEC Receipts.** This is the total collected by the Commission for each fiscal year. As the state is growing, the UEC shows a gradual increase in dollar amount. According to the Commission staff projections, UEC collections will trend upwards. Actual collections vary from year to year around this trend, but can be expected to follow Nevada's upward trend in energy use, largely a reflection of continuing increase in population. To date, the increase in UEC receipts from SFY 2003 to SFY 2004 was 5.3%, from SFY 2004 to SFY 2005 was about 3.7%, and the increase overall from SFY 2003 to SFY 2005 was about 9.2%.

**Line 2: Cost of Administration (Public Utility Commission).** The cost of Public Utilities Commission administration of the UEC is capped at 3% of UEC receipts. Monies within this authorization that are not spent for PUCN Administration flow through to the FEAC. Looking forward, the necessary percentage is likely to decrease as energy use in Nevada increases.

**Line 3: Net UEC for Transfer to Welfare Division.** This is the yearly net amount transferred to the Fund for Energy Assistance and Conservation (not adjusted to account for UEC Refunds).

*D. The Fund for Energy Assistance & Conservation)*

A "top level" view of the Fund for Energy Assistance & Conservation (FEAC) is shown in Table 9.

**Table 9: Top-Level Fiscal Perspective - New Funds (FEAC)**

<b>Fund for Energy Assistance &amp; Conservation [New Funds]</b>				
Line	Item	SFY 2003 (\$)	SFY 2004 (\$)	SFY 2005 (\$)
4	Net addition from UEC (from line 3)	10,547,924	11,116,141	11,523,529
5	Treasurer's Interest Distribution	159,130	218,826	291,462
6	Refunds (as directed by PUCN)	0	(2,558)	0
7	Net New Funding for Fiscal Year	10,707,054	11,332,409	11,814,991
Note: Line 6 is paid from Welfare 6031 account.				

The line items for Table 9 are explained below:

<sup>54</sup> Data for Table 1 was provided from reports developed by Harry Butz of the Public Utilities Commission.

**Line 4: Net Addition from UEC.** The amount is the same as in Line 3, representing the net amount of UEC collections minus Commission administration transferred to the FEAC in each fiscal year.

**Line 5: Treasurer’s Interest Distribution.** This is the new money each year developed as interest on the FEAC account.

**Line 6: Refunds.** Refunds are applied by the Welfare Division Accounting Section at the direction of the Commission.

**Line 7: Net New Funding for Fiscal Year.** This is the sum of the new money from all sources for the fiscal year.

Carry over funds are shown in Table 10.

<b>Fund for Energy Assistance &amp; Conservation [Carry Over Funds]</b>					
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6
Line	Item	From SFY 2002 to SFY 2003 (\$)	From SFY 2003 to SFY 2004 (\$)	From SFY 2004 to SFY 2005 (\$)	From SFY 2005 to SFY 2006 (\$)
<b>9</b>	<b>Total</b>	6,483,875	10,868,358	15,149,765	10,984,965

**Table 10: Top-Level Fiscal Perspective - Funds Carried Forward (FEAC).**

**Line 9: Carry Over Funds.** The “carry-forward problem” was solved in SFY 2005. A new program with the complexity of the UEC generally takes about three to five years to become fully functional. In the initial years, there is typically a substantial carry over of funds to subsequent fiscal years. Also, once the programs are mature, they will likely show a small carry over each year, serving as a contingency reserve. For the Universal Energy Charge, the collections activity had a substantial start on program activity, which took time to deploy and a three years to fully ramp-up. As shown in Table 10 (Line 9), the carry-forward reached its peak in SFY 2004 to SFY 2005 (\$15,148,311). The carry-forward from SFY 2005 to SFY 2006 shows a drop back to the SFY 2003 to SFY 2004 level. With the higher level of program activity, it is expected that the program momentum established will continue and the carry-forward will drop to a contingency reserve level within two to three years.

<b>Fund for Energy Assistance &amp; Conservation</b> [Funds Available]				
Line	Item	SFY 2003	SFY 2004	SFY 2005
		(\$)	(\$)	(\$)
10	Net New Funding for Fiscal Year (from line 7)	10,707,054	11,332,409	11,814,991
11	Total Carried Forward (from line 11b)	6,483,875	10,868,358	15,149,765
12	FEAC (Available for Fiscal Year)	17,190,929	22,200,767	26,964,756

Table 11: Top-Level Fiscal Perspective - Total Funds Available.

Line items for Table 11 are explained below:

**Line 10, Net New Funding.** This is the new funding from line 7.

**Line 11, Total Carried Forward.** This is the carry forward, from line 9.

**Line 12: Available for Fiscal Year.** This is the effective budget for the fiscal year, including funds from all sources.

*E. The Programs (Welfare Division & Housing Division)*

The Welfare Division operates the energy assistance (payment assistance) program and the Housing Division operates the weatherization assistance program. The Divisions coordinate efforts in several ways but separately operate the two programs.

Expenditure against effective budget for the overall effort is shown in Table 12.

<b>Fund for Energy Assistance and Conservation</b> [Funds Expended]				
Line	Item	SFY 2003	SFY 2004	SFY 2005
		(\$)	(\$)	(\$)
13	FEAC (Total Revenue Available for Fiscal Year)	17,190,929	22,200,767	26,964,756
14	Expended	6,322,571	7,051,004	15,978,337
15	Percentage Expended	41%	34%	59%

Table 12: Fund Plan, Budget, Expenditure.

Line items for Table 12 are explained below:

**Line 13: Available for Fiscal Year.** This is the total of funds available.

**Line 14: Expended.** Funds expended over the fiscal year.

**Line 15: Expended as Compared to Effective Budget.** Amount expended divided by amount available, expressed as a percentage. Note the increase in percentage expended in SFY 2005. This increase (against the accrued total) represents a level of effort that will reduce the cumulative carry forward from earlier years to essentially zero by SFY 2007 or SFY 2008.

Welfare Division expenditures are summarized in Table 13.

Rate of Expenditure: Welfare Division							
Line	Item	SFY 2003		SFY 2004		SFY 2005	
		(\$)	(%)	(\$)	(%)	(\$)	(%)
16	Available to Welfare Division	8,030,291		8,499,307		8,861,243	
17	Carried Forward from Previous Year	4,785,190		9,423,157		14,224,098	
18	Effective Budget	12,815,481	100%	17,922,463	100%	23,085,342	100%
19	Expended	3,392,324	26%	3,698,365	21%	13,357,064	58%

Note: Line 16 is 0.75 times the amount given in Line 7 [that is, Revenue plus Interest minus Refunds],

**Table 13: Rate of Expenditure (Welfare Division).**

Line items for Table 13 are explained below:

**Line 16: Available to Welfare Division.** New funds available to the Welfare Division for the payment assistance program for the fiscal year (75% share of UEC plus 75% share of interest minus any refunds).

**Line 17: Carried Forward from Previous Year(s).** Payment assistance funds carried forward.

**Line 18: Effective Budget.** This line shows the total available for the payment assistance program.

**Line 19: Expended.** Energy assistance (payment assistance) program amount expended.

Generally programs of this size and complexity take three years for the necessary support systems to be completely in place and five years to become fully functional. If this rule of thumb holds true, the required support systems will be fully functional in SFY 2005 and expenditure will match effective budgets in SFY 2006 or SFY 2007.

Housing Division expenditures are summarized in Table 14.

Rate of Expenditure: Housing Division							
Line	Item	SFY 2003		SFY 2004		SFY 2005	
		(\$)	(%)	(\$)	(%)	(\$)	(%)
20	Allocated to Housing Division	2,676,764		2,833,102		2,953,748	
21	Carried Forward from Previous Year	1,709,947		1,456,463		935,475	
22	Effective Budget	4,386,711	100%	4,289,565	100%	3,889,223	100%
23	Expended	2,930,247	67%	3,352,637	78%	2,621,272	67%

**Table 14: Rate of Expenditure (Housing Division).**

Line items for Table 14 are explained below:

**Line 20: Available to Housing Division.** New funds available to the Housing Division for weatherization assistance program for the fiscal year. This is twenty-five percent of Line 7.

**Line 21: Carry Forward from Previous Year(s).** Funds carried forward.

**Line 22: Effective Budget.** This is the total budget available for the weatherization assistance program for the fiscal year.

**Line 23: Expended.** The total expended for the weatherization assistance program in each fiscal year.

Major Line Items are shown in Table 15. Note that administration of collections by the Public Utility Commission is reported separately in Table 4, above, and is not included in Table 15.

<b>Expenditures Fund for Energy Assistance &amp; Conservation [Administration &amp; Major Line Items]</b>				
Col. 1	Col. 2	Col. 4	Col. 4	Col. 5
Line	Item	SFY 2003 (\$)	SFY 2004 (\$)	SFY 2005 (\$)
<b>Welfare Division</b>				
<b>24</b>	<b>Administration - Welfare Division</b>	101,475	152,035	400,711
<b>25</b>	<b>Client Payments</b>	2,967,640	3,350,212	12,553,566
<b>26</b>	<b>Outreach</b>	65,018	154,110	31,636
<b>27</b>	<b>Program Design (Computer Programming)</b>	242,156	0	233,054
<b>28</b>	<b>Evaluation</b>	16,035	42,010	138,098
<b>29</b>	<b>Subtotal (Welfare Division)</b>	3,392,324	3,698,367	13,357,064
<b>Housing Division</b>				
<b>30</b>	<b>Administration - Housing Division</b>	106,941	112,338	123,996
<b>31</b>	<b>Housing Improvements, Weatherization, Energy Efficiency (Subgrantees)</b>	2,772,464	3,072,121	2,400,138
<b>32</b>	<b>Outreach</b>	1,112	34,621	4,566
<b>33</b>	<b>Program Design</b>	27,456	73,653	20,206
<b>34</b>	<b>Evaluation</b>	22,274	59,904	72,367
<b>35</b>	<b>Subtotal (Housing Division)</b>	2,930,247	3,352,637	2,621,272
<b>Total (Fiscal Year)</b>				
<b>36</b>	<b>Administration</b>	208,416	264,373	524,707
<b>37</b>	<b>Client Payments + Housing Subgrantees</b>	5,740,104	6,422,333	14,953,703
<b>38</b>	<b>Outreach</b>	66,130	188,731	36,201
<b>39</b>	<b>Program Design</b>	269,612	73,653	253,260
<b>40</b>	<b>Evaluation</b>	38,309	101,914	210,465
<b>41</b>	<b>Total (Fund for Energy Assistance &amp; Conservation)</b>	6,322,571	7,051,004	15,978,337
<b>42</b>	<b>Carry Forward to SFY 2006</b>			10,986,419
Note: Amounts shown in this table were provided by the Housing and Welfare Divisions.				

**Table 15: FEAC – Major Line Items.**

**Line 24: Welfare Administration.** In the Nevada legislation, program administration was capped at three percent of the 75% Welfare Division allocation. For SFY 2006, and thereafter, this has been amended to five percent of the Welfare Division allocation.<sup>55</sup>

<sup>55</sup> “Seventy-five percent of the money in the Fund must be distributed to the Division of Welfare and Supportive Services for programs to assist eligible households in paying for natural gas and electricity. The Division may use not more than 5 percent of the money distributed to it pursuant to this section for its administrative expenses” (NRS 702.260 (1)).

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**Line 25: Client Payments.** This is the amount applied to direct energy payments.

**Lines 26-28:** An innovation that the legislature placed into the program design is shown Lines 26-28. Outreach, Program Design (of which the major component is computer support), and Evaluation were not capped.<sup>56</sup>

**Line 29: Subtotal (Welfare Division):** The subtotals for the Welfare Division are developed from the individual category amounts (Lines 24-28) provided by the Welfare Division for SFY 2003, SFY 2004, and SFY 2005. These subtotals also match the DAWN system records for these fiscal years.

**Line 30: Housing Administration.** Housing Division administration is limited to six percent of the 25% Housing Division allocation (or 1.5 percent of overall budget).<sup>57</sup>

**Line 31: Direct Services.** This line shows the amount used for direct installations and closely related services.

**Lines 32-34:** As with the Welfare Division, for the Housing Division an innovation that the legislature placed into the program design is shown Lines 30-32. Outreach, Program Design (of which the major component is computer support), and Evaluation were not capped.

**Line 35: Subtotal (Housing Division):** The subtotals shown in Line 5 are developed from the individual category amounts (Lines 30-34) as provided by the Housing Division.

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<sup>56</sup> This evaluation recommends moving the PUC administration outside the program administration cap, and then increasing the program administration cap (see recommendations at the end of this section). However, leaving outreach, program design, and evaluation outside the administrative cap is an innovation other states might do well to consider as they move to implement similar Universal Energy programs.

<sup>57</sup> The caps are specified in NRS 702.260(1): "Seventy-five percent of the money in the Fund must be distributed to the Welfare Division for programs to assist eligible households in paying for natural gas and electricity. The Welfare Division may use not more than 3 percent of the money distributed to it pursuant to this section for its administrative expenses." Also, NRS 702.270(1): "Twenty-five percent of the money in the Fund must be distributed to the Housing Division for programs of energy conservation, weatherization and energy efficiency for eligible households. The Housing Division may use not more than 6 percent of the money distributed to it pursuant to this section for its administrative expenses."

Two anomalies are shown in Table 16.

Anomalies		
43	Housing's portion of 2005 allocation recieved in 2006	-634,097
44	Welfare's portion of 2005 funds balanced fwd to 2006	650,880

**Table 16: Anomalies in SFY 2005.**

As shown in Table 16, two anomalies occurred in SFY 2005. First, \$634,097 was drawn down by Housing from SFY 2005 funds, but the funds for the final quarter of SFY 2005 were not transferred to the Housing Division until SFY 2006. Second, \$650,880 in SFY 2006 funds was inadvertently drawn by Welfare in SFY 2005, but returned for use (correctly) in SFY 2006. These anomalies approximately balance.

Finally, as shown in Table 17, the required allocation of 75% to the Welfare Division effort and 25% to the Housing Division effort was maintained for the new funding developed for SFY 2004.<sup>58</sup>

Fund for Energy Assistance and Conservation Allocation to Divisions			
Line	Item	SFY 2005	
		(\$)	(%)
45	FEAC (Net New Funding, composed of UEC plus Interest)	11,814,991	100%
46	Available to Welfare Division	8,861,243	75%
47	Available to Housing Division	2,953,747	25%

**Table 17: Allocation to Divisions.**

<sup>58</sup> The proportions are specified in NRS 702.260(1) and NRS 702.270(1).

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## *F. Discussion*

There was substantial carry forward from year to year in the initial program years. The carry forward was initially due to the start-up of collection of the Universal Energy Charge occurring significantly before the Fund for Energy Assistance and Conservation programs could be set up and become operational. The problem was extended due to problems in getting the computer programming infrastructure in place, tested, and functional. The computer infrastructure became fully functional during SFY 2005, the third program year. Communications and outreach also become fully functional during SFY 2005. The carry-forward peaked in SFY 2004 and was significantly reduced in SFY 2005.

Looking ahead, as near-full expenditure occurs; control tools will need to be introduced to increasingly target funds within the applicant eligible households. Such tools have been envisioned in the program legislation (NRS 702.260) which has considered priorities to follow in allocation of funds when applications exceed funding.<sup>59</sup>

In SFY 2006 and SFY 2007, the parties with an interest in the program and the legislature will need to review the program to look at increasing the overall funding level in relation to need.

## *G. Summary*

1. In SFY 2005, the collection process continued to run smoothly.
2. Funds continued to be allocated according to the 75% Welfare Division and 25% Housing Division formula established in NRS 702.260(1) and NRS 702.270(1).
3. Based on the record of activity the Housing Division is essentially at full expenditure. The Welfare Division, through completion of essential computer work and communication and outreach, has reached a level of activity that will provide full expenditure in SFY 2006 or SFY 2007. This expenditure pattern is typical for major new programs in that as a rule of thumb it takes about three years to get necessary infrastructure in place (for example, computer support

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<sup>59</sup> According to NRS 702.260(6) (a), The Welfare Division... "[s]hall, to the extent practicable, determine the amount of assistance that the household will receive by determining the amount of assistance that is sufficient to reduce the percentage of the household's income that is spent on natural gas and electricity to the median percentage of household income spent on natural gas and electricity statewide. Beyond this, in NRS 702.260(6)(b) the Welfare Division ... [m]ay adjust the amount of assistance that the household will receive based upon such factors as: (1) The income of the household; (2) The size of the household; (3) The type of energy that the household uses; and (4) Any other factor which, in the determination of the Welfare Division, may make the household particularly vulnerable to increases in the cost of natural gas or electricity.

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and required staffing) and about five years to achieve fully operational programs.

***H. Recommendations***

There is one new recommendation in this area for the SFY 2005 evaluation.

1. In SFY 2006 and SFY 2007, the parties with an interest in the program and the legislature should meet to review the program to look at increasing the overall funding level in relation to need.

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## VIII. THE WEATHERIZATION ASSISTANCE PROGRAM

The Weatherization Assistance Program (WAP) assists low-income households in reducing their utility costs by providing for various energy conservation, and health and safety improvements to homes.

WAP is administered by the Housing Division of the Nevada Department of Business and Industry. The funding for the program comes primarily from the Fund for Energy Assistance and Conservation which is funded through Nevada's Universal Energy Charge (NRS 702).

The Housing Division coordinates Nevada's funding from Nevada's Fund for Energy Assistance and Conservation with a smaller amount of federal funding received from the from the US Department of Energy (DOE). In addition, the Housing Division continues to work with Sierra Pacific Power Company's and Nevada Power Company's Demand-Side Management Programs in areas of client outreach, client education, quality assurance, ensuring cost effectiveness, technical training, and technical assistance.

For this evaluation, we focus only on Weatherization Assistance Program services provided by the Housing Division through the Fund for Energy Assistance and Conservation (NRS 702).

### ***A. Subgrantee Agencies***

There are now five Subgrantee Agencies:

#### *1. HELP of Southern Nevada*

HELP of Southern Nevada  
1640 E. Flamingo #100  
Las Vegas, Nevada 89119  
(702) 795-0575

HELP (not an acronym) of Southern Nevada serves the Las Vegas area (all of Clark County, except the City of Henderson). HELP has been an active community outreach agency for over thirty years and assists about 65,000 people each year. HELP is an umbrella organization that links individuals to support services and operates a number of programs. These programs include energy resource services, weatherization, rental assistance, utility assistance, food, referrals to senior programs, legal guardians of grandchildren, and youth summer food program. A displaced homemaker program assists men or women of spouses or significant

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others about to lose assistance. Assistance is provided with job seeking, resumes, and stabilizing family domestic violence. The common theme among programs is to promote self sufficiency and to provide short-term assistance. There has been an Agency-wide drop in funding as the need for services in southern Nevada has ballooned. Explosive growth in need has been occurring in a depressed economy.

In SFY 2005, HELP was using both agency crew and outside installation contractors. The employee crew has been reduced to four technicians. This internal staff continues to conduct the initial home assessment prior to weatherization, and inspections after weatherization. They also do installations. In any given month, there can be up to 65 homes ready for assessment and 50 waiting for applicants to send in missing documentation. HELP continues to improve its operations and delivery procedures.

## *2. Community Service Agency (CSA)*

Community Services Agency  
1094 E. Eighth Street  
Reno, Nevada 89512  
(775) 786-6023

The Community Service Agency and Development Corporation (CSA) was one of the first two agencies to provide services to State of Nevada Housing Division to weatherize homes with FEAC funds during the SFY 2002 ramp-up year. CSA weatherizes homes with UEC funding within Washoe County.

## *3. City of Henderson Neighborhood Services (NS)*

City of Henderson  
Neighborhood Services  
240 Water Street  
Henderson, Nevada 89009  
(702) 267-2014

Neighborhood Services serves the City of Henderson in Clark County. The City of Henderson Neighborhood Services Division (NS) is operated under the City Manager's office. The Neighborhood Services Division offers outreach services and has four Divisions in addition to Affordable Housing Programs. These are Neighborhood Programs, Neighborhood Enhancement, Grants (such as Community Development Block Grants) and Rebuild America.

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Applications continue to be completed at the participant's home, where required documentation is copied<sup>60</sup>, client education is delivered in person, and the home is visually assessed.

#### 4. *Rural Nevada Development Corporation (RNDC)*

Rural Nevada Development Corporation  
1320 E. Aultman Street  
Ely, Nevada 89301  
(775) 289-8519

The Rural Nevada Development Corporation (RNDC) provides services to the largest geographic area with the sparsest population. The RNDC office is located in Ely in White Pine County. RNDC provides services in eleven counties, including Churchill, Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Mineral, Nye, Pershing, and White Pine County.

Applications are necessarily taken over the phone rather than through home visits due to the large territory RNDC serves. RNDC has no difficulty identifying potential installation sites, but the problem is in making it possible to do the necessary work for rural homes. The challenge is finding the right mix of funds to leverage since repairs are often necessary before installations can be made. Also, installations are expensive in this rural area. In many cases only DOE funding is available. Wells Rural Electric and Mount Wheeler Power have contributed weatherization funds.

#### 5. *Citizens for Affordable Homes, Inc. (CAHI)*

Citizens for Affordable Homes, Inc.  
100 Pine Cone Road  
Dayton, Nevada 89403  
(775) 883-7101

Citizens for Affordable Homes, Inc. (CAHI) is a 501 (c) (3) non-profit housing development organization started in March 1993. CAHI's primary mission is: to provide assistance to families with low and very-low incomes through the development of affordable homes with an emphasis on home ownership. CAHI is the leading builder of self-help homes in Nevada, and provides both federal and Fund for Energy Assistance and Conservation weatherization services in Carson, Douglas, Lyon, and Storey counties.

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<sup>60</sup> The home visit includes taking a lightweight copier to the client's home so that no income eligibility documentation leaves the home. Clients appreciate this, a technical innovation that would not have been possible in prior weatherization programs, and clients appreciate the face-to-face contact.

**B. Number of Homes Weatherized**

The Housing Division administers the Weatherization Assistance Program through five subgrantee agencies.<sup>61</sup> Each covers a specific area of the state. Subgrantees are the community based organizations (CBOs) or county or municipal public entities that determine eligibility for programs and perform the weatherization work itself. Four subgrantee agencies have been implementing the Weatherization Assistance Program for some years. These were joined by Citizens for Affordable Housing, Inc. (CAHI) during SFY 2005. The total of homes treated in SFY2005 was 994. Of these, the total with Fund for Energy Assistance and Conservation funding was 847 (Table 18).

<b>Fund for Energy Assistance &amp; Conservation Weatherized Homes (SFY 2005, by Subgrantee)</b>		
<b>Subgrantee Agency</b>	<b>Homes Weatherized</b>	
<b>HELP of Southern Nevada (HELP)</b>	457	53.96%
<b>Community Service Agency (CSA)</b>	164	19.36%
<b>Rural Nevada Development Corporation (RNDC)</b>	117	13.81%
<b>City of Henderson Neighborhood Services (NS)</b>	93	10.98%
<b>Citizens for Affordable Homes, Inc. (CAHI)</b>	16	1.89%
<b>Total</b>	<b>847</b>	<b>100.00%</b>

**Table 18: Weatherized Homes by Subgrantee.**

<sup>61</sup> With regard to the current market situation for weatherization services and skilled personnel, as noted in prior evaluations, Nevada’s rapid increase in population is tending to pull contractors and workers with housing knowledge and experience towards new construction where opportunities are currently quite high, and pay scales are higher than in retrofit work. Weatherization is typically a community service specialty and the rewards are in part the intangible rewards of community service. Those with retrofit skills and experience can move between sectors. Also, outside of Las Vegas/Henderson and Reno, it is not easy to provide services in rural areas where travel distance from the subgrantee office to homes that require weatherization services can be long, and with the current run up in gasoline prices, an expense factor that has to be continuously monitored.

**C. Installation Summary**

Table 19 shows SFY 2005 installations by housing type.

<b>Number of Homes Weatherized by Provider and Housing Type (FEAC Funds) SFY 2005</b>						
	<b>CSA</b>	<b>HELP</b>	<b>NS</b>	<b>RNDC</b>	<b>CAHI</b>	<b>Total</b>
<b>2-4 Family</b>	5	19	12	14	0	50
<b>5+ Family</b>	40	132	12	28	3	215
<b>Mobile Home</b>	68	147	15	42	8	280
<b>Single Family</b>	51	159	54	33	5	302
<b>Total</b>	164	457	93	117	16	847

**Table 19: Types of Homes Weatherized (by Subgrantee).**

Most homes weatherized in SFY 2005 were located in Clark County (550), Washoe (164), and Carson City (62), together accounting for 776 of the 847 homes (about 92% of homes weatherized). The list of installations by county is shown in Table 20.

**Table 20: Counties.**

<b>Installations by County</b>		
<b>Clark</b>	550	64.9%
<b>Washoe</b>	164	19.4%
<b>Carson City</b>	62	7.3%
<b>Lyon</b>	21	2.5%
<b>Douglas</b>	12	1.4%
<b>Churchill</b>	8	0.9%
<b>Elko</b>	6	0.7%
<b>Humboldt</b>	6	0.7%
<b>Lander</b>	4	0.5%
<b>Pershing</b>	4	0.5%
<b>Mineral</b>	3	0.4%
<b>Eureka</b>	2	0.2%
<b>Lincoln</b>	2	0.2%
<b>Nye</b>	1	0.1%
<b>Storey</b>	1	0.1%
<b>Esmeralda</b>	1	0.1%
<b>White Pine<sup>1</sup></b>	0	0.0%
<b>Total</b>	847	100.0%

<sup>1</sup>Since utilities operating in White Pine do not participate in the UEC, UEC funds cannot be spent in White Pine.

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#### **D. Cost “Caps,” Average Cost & Coordinated Funding**

During SFY 2005 as in earlier years, there was a \$4,000 per home cap on Fund for Energy Assistance and Conservation (Universal Energy Charge) funds. Under federal rules, there is no cap on the amount of DOE funds that could be expended per home to complete the weatherization work.<sup>62</sup> The average weatherization expenditure (cost) was \$2,468 per unit. The average cost was determined by adding the Program Operation expenditures plus ½ of the Health and Safety expenditures and dividing the sum (\$2,453,065) by the total units weatherized for 2005 (994) for both sources of funds.<sup>63</sup>

In SFY 2005 there were 10 installations with costs greater than \$6,000, with the most costly at \$9,444. Installations over \$6,000 included a funding source other than FEAC/UEC funding. These installations typically included equipment replacement or repair and/or home repair costs necessary before weatherization could take place.

There was no change from SFY 2004 to SFY 2005 in the measure installation priority list used by the Subgrantees to determine the order of cost-effective measure installation.

#### **E. Health & Safety**

Housing is the only agency in the State of Nevada that provides emergency replacement of failed heating and cooling equipment to the resident. Other agencies would require the resident take out a loan to replace equipment, and *could not act in time to insure health and safety*. Loans, if available, are typically not taken out by low income households because of the resident’s financial situation. So, without the Housing Division emergency replacement, heating or cooling equipment is not replaced.

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<sup>62</sup> In SFY 2005 an expenditure cap of \$6,000 was imposed on homes using both FEAC and DOE funds. The cap on FEAC funding has been \$4,000 since SFY 2003.

<sup>63</sup> Calculation of average cost as the average of the sum of 100% of program operations expenditures plus one-half of health and safety expenditures follows the model prescribed by DOE Grant Guidance. Cost to the Subgrantee would be slightly different.

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## ***F. Subgrantee Training***

Richard Heath & Associates, Inc. (RHA) has provided weatherization training, inspection and monitoring services. One person from RHA conducted the training for all Subgrantees.

Beginning in SFY 2005, however, with the addition of the technical position to the Housing Division weatherization program, training is being shifted to Nevada and will be conducted primarily by the Housing Division.

Ten percent (10%) of all installations are inspected in the field and the files are reviewed for completion and accuracy.

## ***G. Utility Help***

Two major Nevada utilities, Sierra Pacific Power Company and Nevada Power provide DSM weatherization funding for customers above 150% of poverty but below 60% of state median income (“GAP funding”). The utilities are mandated to support program effectiveness and efficiency by the Public Utility Commission.

## ***H. Formal and Informal Compliance***

**Finding: The UEC Weatherization Assistance Program (UEC WAP) program is in compliance with subsections 3<sup>64</sup> and 6<sup>65</sup> NRS 702.270, the relevant sections related to formal compliance.**

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<sup>64</sup> NRS 702,270 (3): Except as otherwise provided in subsection 4, to be eligible to receive assistance from the Housing Division pursuant to this section, a household must have a household income that is not more than 150 percent of the federally designated level signifying poverty, as determined by the Housing Division.

<sup>65</sup> NRS 702,270 (6): In carrying out the provisions of this section, the Housing Division shall: (a) Solicit advice from the Welfare Division and from other knowledgeable persons; (b) Identify and implement appropriate delivery systems to distribute money from the Fund and to provide other assistance pursuant to this section; (c) Coordinate with other federal, state and local agencies that provide energy assistance or conservation services to low-income persons and, to the extent allowed by federal law and to the extent practicable, use the same simplified application forms as those other agencies; (d) Encourage other persons to provide resources and services, including, to the extent practicable, schools and programs that provide training in the building trades and apprenticeship programs; (e) Establish a process for evaluating the programs conducted pursuant to this section; (f) Develop a process for making changes to such programs; and (g) Engage in annual planning and evaluation processes with the Welfare Division as required by NRS 702.280. (Added to NRS by 2001, 3235)

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The Housing Division is mandated to comply with certain provisions of the weatherization program as stated in NRS 702. Below are some of the relevant specifications and a description of how Housing implemented these requirements or did not when it was unfeasible.

1. *Specific Provisions*

**(1) 6(a) Solicit advice from Welfare and other knowledgeable persons**

Ongoing outreach was conducted in SFY 2005, in cooperation with the Welfare Division and the Advisory Committee. In addition, Housing Division staff worked with the Governor's Energy Advisor, and with the utilities to coordinate and strengthen program services. There were a number of formal and informal meetings with stakeholders/advocates to discuss aspects of the program and how the program could be improved. The Housing Division participated with the Welfare Division in the statewide open planning meeting, held in the spring, and worked jointly to implement the SFY program plan and to develop the SFY 2006 program plan.

**(2) 6(c). Use the same simplified application form**

No application forms are used in common with Welfare. As reported in the SFY 2003 evaluation, a working group consisting of both Housing and Welfare management tried to streamline the application so that both agencies could use a common form. The two agencies have different data collection needs and the joint form became too long. The agencies decided to continue using their own forms.<sup>66</sup>

**(3) 6(c). Coordinate with other agencies that provide energy assistance**

The Weatherization Assistance Program coordinated Nevada Fund for Energy Assistance and Conservation funding with federal Department of Energy weatherization assistance funding.

The Housing Division coordinates with the Welfare Division, which downloads records for all recipients receiving energy payment assistance to the Housing Division. Housing can prioritize the list to customize postcards sent to recruit clients,

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<sup>66</sup> Housing has identified a software program "DirectApps" that could be used by Welfare and Housing for common applications. This would require an initial investment of \$80-100,000 to purchase and modify the application for use, plus the cost to incorporate the application into both Welfare and Housing systems. The initial application would be taken at any point of contact and this system would forward income qualified applications to both agencies. At the current weatherization funding levels Housing can serve roughly 1500 clients. With 15,000 income qualified LIHEA clients, Housing could be overwhelmed with applications. A joint application system of this type would require careful scrutiny of costs and benefits.

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with the intent to capture leads for the subgrantees.<sup>67</sup> The Welfare Division sends daily emails of clients with FAC \$2,000 to Housing for immediate follow-up.

The Housing Division continues to coordinate with Sierra Pacific which provides “GAP” funding to treat homes up to 60% of area median income, which is about 200% of Federal Poverty Level. This Gap funding provides a ‘safety net’ and is available to weatherize homes between 150%-200% of FPL which would otherwise go untreated. The other UEC utilities are not currently providing this GAP funding, so this coverage is available only in Sierra Pacific and Nevada Power service territory.

Additional utility DSM funding has helped toward client education curriculum from time to time, including customer energy kits and brochures for use by the Subgrantees. A portion of the funding for crew training and manuals came from DSM funds.

The Housing Division has been working towards coordination with the agency administering federal rural Home Funds to try to develop an ability to cover home repairs necessary before installing weatherization materials.<sup>68</sup> This is an important objective – substantial repairs are necessary in many rural homes due to the nature of the rural housing stock and overcoming this problem would overcome a substantial barrier to weatherization efforts.

No other local agencies are providing financial assistance to the Housing weatherization program.

## 2. *Review of Client Files*

The Weatherization Assistance Program is administered by the Housing Division and is implemented through five Subgrantee agencies, responsible for different portions of the state. The total of homes treated in SFY2005 was 994. Of these, the total number of units weatherized with Fund for Energy Assistance and Conservation funding was 847.

For SFY2005, files were randomly selected for each agency from a copy of the final electronic database for SFY 2005 maintained by the Housing Division. Selection of cases for the review sample was in proportion to the number of homes treated by each agency in SFY2005. The total number of cases with Fund for Energy Assistance and Conservation funding by agency is shown in the table below.

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<sup>67</sup> Cards are not sent to counties for which there is a substantial backlog.

<sup>68</sup> The general goals of the US Department of Agriculture Home Improvement and Repair programs are “to enable very low-income rural homeowners to remove health and safety hazards in their homes and to make homes accessible for people with disabilities.” For information on USDA Rural Development programs see <http://www.rurdev.usda.gov/nv/housing/hrepair.htm>.

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<b>Fund for Energy Assistance &amp; Conservation Weatherized Homes (SFY 2005, by Subgrantee)</b>			
<b>Subgrantee Agency</b>	<b>Homes Weatherized</b>	<b>Initial Review Sample</b>	<b>Final Review Sample</b>
<b>HELP of Southern Nevada (HELP)</b>	457	68	65
<b>Community Service Agency (CSA)</b>	164	25	25
<b>Rural Nevada Development Corporation (RNDC)</b>	117	18	18
<b>City of Henderson Neighborhood Services (NS)</b>	93	15	15
<b>Citizens for Affordable Homes, Inc. (CAHI)</b>	16	5	0
<b>Total</b>	847	131	123

**Table 21: Weatherized Homes by Subgrantee Agency.**

The target was 125 files, and 131 were drawn. Statistical Package for the Social Sciences™ (SPSS) was used to generate a random sample, with a few extra cases added for each agency in case there were problems with some of the files. In the final sample, there were 123 fully usable cases, not including the cases from Citizens for Affordable Homes, Inc. (CAHI).

Five files were excluded from the sample from the new sub-grantee, Citizens for Affordable Homes Inc. (CAHI). They were excluded because they were only in the Weatherization Assistance Program for a portion of the year, and the evaluators felt the sample should reflect a random selection of cases for the entire year. They will be included in the SFY 2006 sample.

<b>Fund for Energy Assistance &amp; Conservation Weatherized Homes (SFY 2005)</b>						
<b>Form</b>	<b>Exact Results for Review Sample</b>		<b>Estimate of Results for Population of Weatherized Homes</b>			
	<b>Number Missing</b>	<b>Percent Missing</b>	<b>Percent Missing</b>		<b>Number Missing</b>	
			<b>Max</b>	<b>Min</b>	<b>Max</b>	<b>Min</b>
<b>Application</b>	0	0.0%	1.4%	0.0%	12	0
<b>BWR</b>	0	0.0%	1.4%	0.0%	12	0
<b>CAS (where appropriate)</b>	0	0.0%	1.4%	0.0%	12	0
<b>Blower Door Weatherization Data Sheet</b>	0	0.0%	1.4%	0.0%	12	0
<b>Expenditure Report/Payment Authorization/ Customer Signoff Forms<sup>1</sup></b>	0	0.0%	1.4%	0.0%	12	0
<b>Weatherization Inspection Report (or equivalent)</b>	1	0.8%	2.2%	0.1%	19	1
<b>Copy of Utility Bill(s)</b>	2	1.6%	3.0%	0.2%	26	2
<b>Income Requirements Met (Documentation in Case File)</b>	0	0.0%	1.4%	0.0%	12	0
<b>Customer Contact Log<sup>2</sup></b>	0	0.0%	1.4%	0.0%	12	0
<b>Weatherization Priority List (Not Required)</b>	4	3.3%	4.7%	1.9%	40	17

<sup>1</sup> Invoices are required if work is subcontracted out by a subgrantee agency, or if a contractor submits a bill to a subgrantee agency. The expenditure report was initiated by one agency. All agencies now include equivalent information in customer folders.

<sup>2</sup> A customer contact log is not a required document and was initiated by one agency. All agencies now record equivalent information in customer folders.

Note: Population maximum and minimum values calculated using NQuery Advisor™.

**Table 22: Estimation of Documentation Compliance for Weatherized Homes.**

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### a) Documentation

For the files reviewed, virtually all required documentation was included. The application and income verification were present in all files checked.

We also looked for the:

- a. BWR – a 1-2 page form – the full copy should be in the file.
- b. Combustion Appliance Safety Inspection Form (CAS) – a six page form completed in the field during the combustion appliance safety assessment – this should be in certain files.
- c. Blower Door Weatherization Data Sheets (a two-page document that records initial and final blower door assessments);
- d. Weatherization Inspection Report (or another form), showing the precise items installed at the residence.
- e. Copy of a utility bill from each utility that pays the UEC (documenting that the residence qualifies for UEC funded weatherization, and allowing for follow-up that requires knowledge of the utility account number).
- f. Expenditure Report/Payment Authorization/Customer signoff form(s).

The files checked were a random sample of files for each agency.

In checking for all required documentation across the full sample of 123 files, we found there were only four files (3.3%) missing any of the required information.

- Two files (1.6%) did not contain a copy of utility bills or usage information, both at Community Service Agency.
- One file (0.8%) did not contain a Weatherization Inspection Report at Neighborhood Services and one file included a blank Blower Door Weatherization Data Sheet at Rural Nevada Development Corporation.

In addition to the required documents noted above, we also looked for the Weatherization Priority List used by a few of the contractors. This form is not required as a matter of program policy and is not uniform through all the subgrantees; however, this form does contain useful information. It will be our recommendation that this form be included and standardized across the program for future program years (see Recommendations section). All but four files (3.3%) included the priority list.

<b>Confidence interval for Proportion</b> (Normal Approximation for Large Number of Cases, Adjusted for Finite Population Correction)	
<b>Design Parameters</b>	
<b>Confidence Interval (1-<math>\alpha</math>)</b>	0.90
<b>One or Two-Sided Interval</b>	Two sided
<b>Expected Proportion in Error</b>	0.01
<b>Population Size</b>	847
<b>Review Sample Size</b>	123
<b>Result</b>	
<b>Distance from Proportion to Limit, <math>\omega</math></b>	+/- 0.014
<p>Note: For large samples, the confidence interval for a single proportion extends a distance of approximately</p> $\omega = z\sqrt{(\pi(1-\pi)(N-n_A)/(n_A N))}$ <p>from the observed proportion in one or both directions, when the finite population size is N. The distance from proportion to limit (<math>\omega</math>) was calculated using the NQuery Advisor™ sample design software package.</p>	

**Table 23: Establishment of Population Precision of Estimates.**

### b) Uniform Application

All cases complied with the income requirements (Subsection 3 of NRS 702.270).

### c) General Quality of Records

The Weatherization Assistance Program files are well kept. Due to the decentralized implementation of the program by the Housing Division through the subgrantees, the files have an appearance of non-uniformity. However, while forms not required by program policy may differ for each Subgrantee, for the SFY 2005 records required by the Housing Division, *all of the required forms are being properly and consistently maintained by the program's Subgrantees.* The required information is present.<sup>69</sup>

<sup>69</sup> There are certain forms that should be present in a complete customer file. These are records of the work done on the house and the final signoff. While most of the data exists electronically, it should also be in hard copy in the customer files. The hard copy of the forms also has items that cannot be entered electronically.

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### 3. *Informal Compliance*

With regard to informal compliance, which has to do with meeting expectations in addition to formal requirements, the Housing Division has no problems of real or apparent conflict of interest.

- In particular, the costs for weatherization by housing type are realistic. There is a strong strategic and technical effort to maximize energy savings while minimizing cost, given that a “whole house” approach is most cost-effective in the long-run.
- In SFY 2005 the Housing Division is achieving full implementation (the small carry forward to SFY 2005 is a contingency reserve).
- The Housing Division has cooperated in the communications and market efforts in SFY 2005 (covered in the Communications section of this report), and these efforts were successful.

In summary, the Housing Division met both formal compliance requirements and informal expectation for the conduct of its work in SFY 2005

#### ***I. Plan for Analysis of Energy Savings***

For the SFY 2005 evaluation, an analysis of energy consumption and energy savings was carried out. However, for this evaluation, as with SFY 2004, there were a number of data problems. The problems encountered are discussed in this section and limited results are reported.

##### *1. Analysis Plan*

The “data years” required for each evaluation will generally lag by one to two years. Figure 20 shows the plan for evaluation analysis of energy savings. Each evaluation study reports on the activity of a designated program year (for example, the SFY 2005 evaluation covers the *activity* and *budget* of the SFY 2005 program year). However, an exception is that analysis dependent on data from utility customer information systems will generally be lagged by one to two years.<sup>70</sup> As shown in

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<sup>70</sup> The lag is generic to all weatherization analysis designed to produce definitive results. With the end of the program year on June 30<sup>th</sup>, at least one additional year is required to measure the performance of homes in order to take seasonal variation in energy use into account and then to normalize results to a standard weather year. The added time to gather data from utility cycle data to be received by utilities, to transmit customer information data to the evaluation team, and to analyze the data results in a lag of at least one year and possibly up to two years, depending on how the data flows and evaluation cycles fit together.

Figure 18, the plan for the SFY 2005 evaluation is to analyze and report energy savings for the homes weatherized during SFY 2004.

<b>Time Window for SFY 2005 Evaluation</b>		
<b>Report Elements</b>	<b>Fiscal Year</b>	<b>Months Included</b>
<b>Program Analysis</b>		
<b>General</b>	FY 2005	July 1, 2004 through June 30, 2005
<b>Analysis that Requires Utility Customer Information System Data</b>		
<b>Weatherization Installations</b>	FY 2004	July 1, 2003 through June 30, 2004
<b>Baseline Year</b>	FY 2003	July 1, 2002 through June 30, 2003
<b>Post Year</b>	FY 2005	July 1, 2004 through June 30, 2005

**Figure 18: Timing for Quantitative Analysis of Utility Data.**

## *2. Data Arrangements with the Utilities*

Sierra Pacific Power, Nevada Power, and Southwest Gas utilities are providing full support for the necessary data arrangements for the evaluation. Establishing the understandings and relationships to insure data transfers and then actualizing the first set of data transfers took considerable time. The first data provided required programmers to write data extraction programs at the utilities, and the back and forth interaction between analysts and IT professionals that is involved in setting up new data arrangements. In addition, as is the case in many other areas, there is a new focus on data security which included data encryption. The process of developing arrangements for data transfer revealed some constraints that are due to the ways that different utilities maintain their energy usage and customer information. For the SFY 2005 evaluation, utility responses to the evaluation data requests was particularly quick, reflecting the programming investment made by the utilities in the earlier evaluations, as well as the continuing support by their executives and managers for the program.<sup>71</sup>

<sup>71</sup> Responses are not complete, reflecting the earlier, and now corrected problem, of missing utility account numbers in the BWR system. Use of address standardization software by the evaluation team and some attempts by the utilities to use BWR name and address records helps match BWR records to utility accounts. However, these methods are labor intensive and result in only small improvements in matching BWR records to utility account numbers.

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### *3. Analysis Window, Baseline & Post Year*

Because the methods needed to analyze energy use and energy savings (in kWh and therms) require a full year of pre-weatherization data and a full year of post-weatherization data to produce fully definitive results, the analysis plan uses at least a thirty-six month window for each analysis. The size of the data window requires a lag of at least one and up to two years in reporting.

### *4. Data Cycle for Evaluation*

For organizational purposes, it is important to note that each evaluation cycle should begin at least by December of each year. Two data requests to the utilities are required each year, one should be planned for February and one for August. Each utility data request first requires the evaluation team to request and receive Welfare Division and Housing Division service data, and partitioning of the data by utility using utility account records in the Welfare and BWR data systems. Each request to the utilities is split into two parts since information required for evaluation of two program years is included in each

### *5. Plan and Reality*

Just as with the program implementation, evaluation plans have to adjust to realities encountered. For SFY 2005 (the analysis of the SFY 2004 weatherization cases), a number of constraints were encountered that limit the analysis of energy savings. Results in this evaluation report are not definitive for this reason. However, analysis is improved over the SFY 2004 evaluation (using SFY 2003) data, and the analysis here provides the groundwork for a definitive analysis in the SFY 2006 evaluation.

### ***J. Estimates of Energy Savings***

This section of the SFY 2005 evaluation presents energy savings estimates. These estimates are a current best estimate and a step on the way to more broadly based and definitive estimates in the next (SFY 2006) evaluation. The savings estimates in this report are based on gross savings rather than net savings and are best estimates rather than definitive.

Analysis of energy savings relies on utility energy usage data from the customer information systems of Nevada Power, Sierra Pacific Power Company, and Southwest Gas. Results are presented by utility.

## 1. Nevada Power

Out of the one-thousand two hundred and ninety-four (1,294) homes receiving weatherization services through the Fund for Energy Assistance and Conservation database Housing Division subgrantees for SFY 2004, one hundred and seventy-five (175) could be matched between the Building Weatherization “Job Number” and a utility account number at Nevada Power Company. Since utility billing data records for these accounts were available beginning in January 2003, it was necessary to further restrict analysis to the one hundred and twenty-eight (128) Nevada Power homes that completed weatherization from January 2004 through June 30, 2004. This restriction was necessary to provide a full twelve-month baseline year for each account.

<b>Nevada Power Customers: Gross Reductions in Cooling Load</b>					
<b>Housing Type</b>	<b>Cases (n)</b>	<b>Baseline (kWh)</b>	<b>Post (kWh)</b>	<b>Change (kWh)</b>	<b>Reduction (%)</b>
<b>Electric Heat</b>					
<b>Apartments</b>	43	1,896	1,779	117	6.2%
<b>Mobile Homes</b>	5	1,189	946	224	18.8%
<b>Single-Family</b>	16	2,320	1,633	686	29.6%
<b>Heat with Natural Gas</b>					
<b>Apartments</b>	2	4,826	3740	1087	22.5%
<b>Mobile Homes</b>	16	2,718	1,774	943	34.5%
<b>Single-Family</b>	11	2,929	2,332	598	20.4%

**Table 24: Gross Cooling Load Reductions (Nevada Power).**

A PRISM™-like analysis was run for each of the 128 homes for both the baseline and post periods. The results were weather normalized using model results. The calculations partition effects among baseload, space heat and space cooling. Analysis is confined to use of electricity. Also, note that reported energy savings are gross savings (post-year compared to baseline year), rather than net savings.<sup>72</sup>

<sup>72</sup> For the first evaluation of the Universal Energy Charge/Fund for Energy Assistance and Conservation programs, the SFY 2003 evaluation, energy data was not available. For the SFY 2004 evaluation, only a very few weatherized homes could be analyzed; and the evaluation team assessed these as not as many as would be necessary to conduct the energy analysis. The data constraints are part of the program start-up, which requires coordination of Housing Division, Welfare Division, and utility data. For SFY 2004, too few cases could be linked across the “JOB ID” case identifier used by the subgrantees and the Housing Division Building Weatherization database and the account numbers used as case identifiers by utilities. Available cases were further narrowed by the specifications used in the energy analysis: a fully adequate case must have a full baseline year and a full post-year of data so that change in energy use can be measured. Since data for energy analysis lags by one to two years from the year of each report, it takes two years for improvements in the data systems to be reflected in a report. For this report (SFY 2005) preliminary gross savings are available, although the size of the available samples is still much smaller than desired. For the SFY 2006 evaluation, net savings will be reported.

Results in Table 24 are restricted to effects on cooling loads.

Change in overall energy use is shown in Table 25. Since the electricity measures installed in Las Vegas and Henderson are directed primarily to cooling loads, the overall results shown in Table 25 are not unexpected. Note that these are gross changes without “netting out” the changes in a comparison group. A comparison group will be added in the next (SFY 2006) evaluation.

<b>Nevada Power Customers: Gross Reductions in Total Load</b>					
<b>Housing Type</b>	<b>Cases (n)</b>	<b>Baseline (kWh)</b>	<b>Post (kWh)</b>	<b>Change (kWh)</b>	<b>Reduction (%)</b>
<b>Electric Heat</b>					
<b>Apartments</b>	43	5,216	5,012	205	3.9%
<b>Mobile Homes</b>	5	3404	3799	(395)	-11.6%
<b>Single-Family</b>	16	6405	6779	(375)	-5.8%
<b>Heat with Natural Gas</b>					
<b>Apartments</b>	2	9,902	8,960	943	9.5%
<b>Mobile Homes</b>	16	6578	6821	(243)	-3.7%
<b>Single-Family</b>	11	7,180	7,182	(3)	0.0%

**Table 25: Overall Changes in Load (Nevada Power).**

## 2. Southwest Gas

For Southwest Gas, a total of twenty-six (26) homes could be matched across from the Housing Division subgrantee “Job ID” to the Southwest Gas account number. In some cases, a second step of generating standardized addresses was used to complete the match. Of these, twenty-four homes met the requirement of a billing record of at least one hundred eighty (180) days prior to treatment and after treatment.<sup>73</sup> All homes that matched were used in a pooled analysis, including single family and multifamily.<sup>74</sup>

<sup>73</sup> The evaluation plan was to require a full baseline year and a full post year, but there would not have been enough cases to analyze if the requirement was not relaxed.

<sup>74</sup> The evaluation plan was for estimation of home specific models in both the baseline and post treatment periods, followed by use of these models to estimate Normalized Annual Consumption (NAC) before and after treatment. Since Southwest Gas billing histories began in late 2003 or early 2004 for most homes and gas meters are read every other month, most homes had only three baseline meter reads, a number insufficient for estimating statistical models. Instead, billing records across homes with adequate data were pooled into a common analysis. This provided sufficient baseline and post treatment data. An indicator (“0-1”) variable was used to identify baseline and post treatment billing records, with the billing period in which the home was treated dropped from the analysis. A measure of space heating requirements was calculated by multiplying heating degree days (HDD) by the square footage of the home. The result was then multiplied by the indicator variable. The dependent variable in the regression is therms per day. Several models were estimated

Several terms were used in the model to test for treatment effects in a variety of circumstances. Overall, the terms used to measure the treatment effects in multifamily homes did not perform well in the model. The treatment effect for single family homes, however, proved to lower annual therm usage by a statistically significant amount (at 10% probability testing).

<b>Southwest Gas Customers: Gross Reductions in Total Load (n=24)</b>				
<b>Load</b>	<b>Baseline (Therms)</b>	<b>Post (Therms)</b>	<b>Change (Therms)</b>	<b>Reduction (%)</b>
<b>North</b>				
<b>Total</b>	353.7	296.1	57.7	16.3%
<b>South (Las Vegas/Henderson)</b>				
<b>Total</b>	200.4	181.9	18.5	9.2%

**Table 26: Gross Savings - Southwest Gas.**

The model developed for analysis of Southwest Gas accounts also permits a partitioning of heating related load which is estimated at two hundred twenty-six (226) therms for homes towards the North and about one hundred sixty eight (168.3) therms for homes in Las Vegas/Henderson. These percentage reductions (16.3% or 9.2%) translate to an overall twenty-six percent (26%) reduction when applied to heating load, North and South.

These results may be compared with the results of the most recent meta-evaluation of state Weatherization Assistance Program (WAP) evaluations.<sup>75</sup> This study includes state-level results for nineteen (19) states with seventeen (17) states having state-level WAP evaluations. The funding-weighted average of the seventeen data points weights results to reflect the Northeast states, which are favored in the federal funding formula for the national Weatherization Program. In this meta-evaluation, the percentage of baseline energy reduction is 22.9%, which translates to a 32.3% reduction in gas space heating. As shown below, *no states bordering Nevada or with similar climate zones were included in the national study.*<sup>76</sup> With this difference in

using different reference temperatures for calculating the HDD. A value of sixty-one (61) was found to produce the model with lowest root mean square error and was used for calculating savings in an approach consistent with the PRISM™ model.

<sup>75</sup> Schweitzer, Martin, Estimating the National Effects of the U.S. Department of Energy's Weatherization Assistance Program with State-Level Data: A Metaevaluation using Studies from 1993 to 2005. Oak Ridge, Tennessee: Oak Ridge National Laboratory, September 2005, ORNL/CON-493.

<sup>76</sup> Map of states (Figure 19) from Schweitzer, Page 1, Figure 1.



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In this analysis, the energy savings due to these remedial efforts will be examined for a limited number of cases (7) in Northern Nevada.

a) **Method**

With respect to the energy efficiency portion of the housing improvements the question naturally arises: How much energy is actually saved? At this point there have been two ways to estimate the energy savings. Here we will introduce a third method.

(1) ***Planning Estimates***

The first way, employed in program planning, relies on hypothetical engineering estimates of the energy savings for various combinations of measures and building stock applied in each of the Nevada climate areas. These engineering estimates, along with various cost data have been used periodically to check on the cost effectiveness of the energy savings efforts. However, as a final judgment, these estimates are limited because they are based on a hypothetical average building stock.

(2) ***Statistical Analysis of Utility Records of Energy Use***

The second way to estimate the energy savings relies on a statistical analysis of the actual utility bills for a year before and a year after the energy remedies. The utility bills are “where the rubber hits the road,” and the changes observed are the true bottom line of the matter. Except that people’s lives usually change in the course of the two year data interval (births, deaths, moving in and out etc) and the energy use changes also for reasons unrelated to the energy remedies. So this statistical approach, commonly done with a method called the Princeton Scorekeeping Method (PRISM™), relies on a large number of cases to produce an average of all cases that is indicative of the energy savings. However, these statistical operations are quite abstract, and bear no physical relationship to any particular energy savings efforts at a particular site. For example the statistical approach will not answer the question: Did the roof insulation (or windows, or new furnace etc) achieve the expected physical result? The method employs good statistics, real world utility data, but no engineering review.<sup>79</sup>

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<sup>79</sup> PRISM™ was used in this section of the analysis (for Sierra Pacific Power Company homes). A very close “PRISM™-like” method was used for Nevada Power homes; this approach was carried out using Statistical Analysis System (SAS™) and replicates all of the steps of PRISM™ but is not the proprietary package. A pooled regression approach using SAS™ was used for analysis of energy saving for the Southwest Gas homes.

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### (3) *E-Z SIM*<sup>TM</sup>

A third method, combining attributes of the first two methods, will be employed in these Sierra Pacific Power Company customer case studies. In the third method, the actual utility bills (from before and after weatherization) constitute the ultimate measure of results. However, the utility bills are used in a way that is responsive in both a statistical and an engineering sense. If, at a particular site, there is an observable change in energy use, it can be examined in terms of the engineering expectations for the particular combination of measures actually applied and in terms of other specific site conditions. The program used to execute this third method is referred to as EZ SIM<sup>TM</sup>. The program was derived from extensive building modeling using the industry standard DOE2, and has been approved for and used extensively in evaluation work in California, Oregon, Washington, and Utah.

As with all other forays into reality of weatherized homes, the use of this program requires good engineering and field judgment to interpret the results. Neither this program, nor any other, can tell us what really happened at a site three or four years ago. But it can tell us with reasonable clarity if the patterns observed in the utility data are consistent with specific physical and behavioral changes at the site. For example, if energy use at a site increased, the patterns in the data can tell us if the increase was due to a thermostat increase or to faulty insulation.

In these case studies the utility bills, the actual monthly temperatures, and the site records regarding energy savings measures, are taken together to reconstruct a coherent explanation for what happened to the use of energy in each home.

#### b) **Summary of findings**

Results of the seven case studies are summarized in Table 4.

Note in Table 27 that a positive entry indicates savings (an energy use reduction), and a negative entry indicates an energy use increase. Also note that energy use changes in Table 27 are expressed as a percentage change in relation to baseline energy use.

**Table 27: Summary of Findings (Savings as Percentage of Annual Energy Use).**

<b>Summary: Analysis of Seven Northern Nevada (SPPC) Cases</b>			
<b>Percent Savings</b>			<b>Explanation</b>
<b>Site ID</b>	<b>Gas Savings (%)</b>	<b>Electricity Savings (%)</b>	
<b>Gas Heated Homes</b>			
188396	21%	0%	Major measures were installed, producing substantial savings. There is no change in the household, and no offset to the savings produced.
121696	12%	-13%	Reasonable gas heating savings. However, this gas heated home also has significant supplemental electric heat. The use of supplemental electric heat increased post retrofit.
192929	-14%	-7%	In this home, the thermostat setting was increased post retrofit. (This can be due to a household change such as a member being out of work and at home during the day, to an older child moving back home, or to old age or chronic illness of a family member.) Electric baseload also increased.
124899	7%	6%	Reasonable gas savings. However, this gas heated home also has significant electric heat. Part of the effectiveness of the retrofit is shown in gas savings and part in supplemental electric heat savings.
<b>Electrically Heated Homes</b>			
417893	No Gas Service	-9%	In this electrically heated home, following weatherization the thermostat setting was increased, The use of domestic hot water also increased post retrofit. This pattern is often associated with a household member out of work, or with illness of a household member, or an older person moving in with a daughter or son's family.
263989	No Gas Service	6%	Reasonable electric heat savings is offset in part by increased domestic hot water use. This pattern is often associated with children moving into teenage years.
263896	No Gas Service	1%	In this home, reasonable savings in electric heat is largely offset by increased domestic hot water use.

The corresponding absolute gas and energy use changes are summarized in Table 28. In this table the same gas energy changes as are shown in Table 27 are converted to kWh/year to permit a comparison of the magnitudes of the electric and gas savings in the same units.

**Table 28: Annual Savings in Energy Units**

<b>Summary in Conformed Units</b>						
<b>Site ID</b>	<b>Gas Delta (Therms)</b>	<b>Gas Delta (converted to kWh)</b>	<b>Electricity Delta (kWh)</b>	<b>Net Change (kWh)</b>	<b>Direction of Change in Energy Use</b>	<b>Explanation for Increase</b>
121696	108	3,158	-754	2,408	Savings	N.A.
188396	224	6,566	-12	6,554	Savings	N.A.
192929	-143	-4,197	-514	-4771	Increase	Measures installed not heating measures; thermostat set point raised
124899	76	2,219	708	2,927	Savings	N.A.
417893	No Gas Service		-1,515	-1,515	Increase	Thermostat set point raised
263989			662	662	Savings	N.A.
263896			66	66	Savings	N.A.

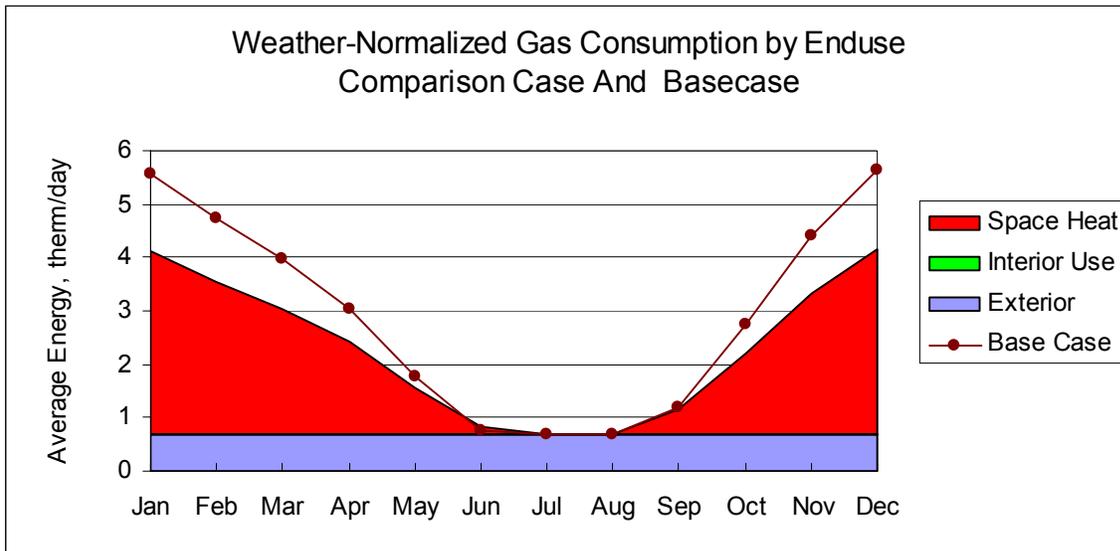
It is apparent in Tables 4 and Table 5 that five of the seven sites showed energy savings, but that there is a wide range in these savings. This is typical of the complexity of actual practice of weatherization when the physical effects of energy saving due to weatherization are offset to a greater or lesser degree by interaction with the contingencies of life. It serves as a starting point for a deeper discussion.

### c) Discussion of Results

Energy use is inextricably entwined into the patterns of life and developments in people’s lives. It is rare to find a clear cut case where the energy savings are conspicuous and the occupants’ behavior has been constant for three years. But that is the case at site 188396. This site shows what a clear success looks like and indicates the size of the physical effect of the weatherization work.

Figure 20 is the first of several similar diagrams in this section. It shows the gas energy use at this site before and after the retrofit which consisted of a shell seal, attic insulation, and a hot water tank wrap. In this figure monthly energy use is shown for a “normal” year, thus correcting for the temperature variations between the baseline retrofit and post retrofit years.<sup>80</sup>

<sup>80</sup> All energy use data presented in this section of the evaluation has been weather normalized.



**Figure 20: Pattern shown by reduction in Gas Heating.**

In the figure, the energy use in the baseline year (prior to retrofit) is shown by the line labeled as “Base Case.” Energy use in the post retrofit year is shown by shaded areas. Note that the shaded areas are coded to show how the post retrofit energy was probably used. The darker or reddish shaded area indicates the gas usage for space heat. The lighter or bluish shaded area, labeled as “Exterior,” and represented as a horizontal stripe along the bottom of the graph is gas used for water heat.

*The important thing to note is that the post retrofit gas use falls well below the line indicating use of gas over the months of the baseline year. For example, the baseline gas use for January is about five and one-half (5.5) therms/day, while the post retrofit use for January is reduced to about four (4) therms/day. As is also evident in the graph, for this home summer gas use does not change between the baseline and post retrofit years. This is expected, since in this home gas is used primarily for space heating and hot water.*

The effect of the weatherization work can be seen in the gap between the Base Case line and the shaded in post retrofit areas. *For this home, space heat energy use has been reduced by more than twenty-five percent (25%) due to the shell sealing and increased ceiling insulation. This is consistent with the engineering expectation. Similar reviews of energy use have been prepared for each site for electric energy and for gas and are presented in the individual site summaries below. However, as is usually the case, the other sites are not so clear cut and show some of the complexities involved in developing the actual energy savings following weatherization work. At the other sites the occupants are using electric heat along with gas heat, changing thermostat settings, changing occupancy, and changing hot water use. Each of these cases is discussed below in detail.*

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## (1) **Supplementary Electric Heat**

At three of the four gas heated sites, the homes also have some supplementary electric heating. The supplementary electric heat is only about ten to twenty percent (10-20%) of the heat load overall. However, at two of the four gas heat sites, about half of winter electricity use was for space heat. In these cases of homes with gas heat and supplemental electric heat, there is an interaction between the supplementary electric heating and the retrofit. In one case, site 121696, the electric heat went up after the retrofit. In another case, site 124899, the electric heat decreased after the retrofit.

Even at today's volatile gas prices, considering current price alone, it is in the household's best financial interest to use gas for space heat instead of resistance electric heat if gas service is available. At the same time, it is generally true from an economic perspective that having the ability to use two fuels is an inherent material advantage for a household (should shortages occur or prices change). And, particularly in poorly insulated homes there may be rooms or areas in which a supplemental electric heater is necessary to produce comfortable temperatures especially on unusually cold days.<sup>81</sup> In weatherization work, it is currently considered best practice to eliminate all electric resistance heat when gas heat is also being used. However, if this is done in a home that has been using supplemental electric heat, there will be an impact.

*If supplemental electric heat equipment is removed, a significant portion of the removed load will be taken up by the gas heating. This will tend to increase the gas heating and to reduce any apparent retrofit savings.*

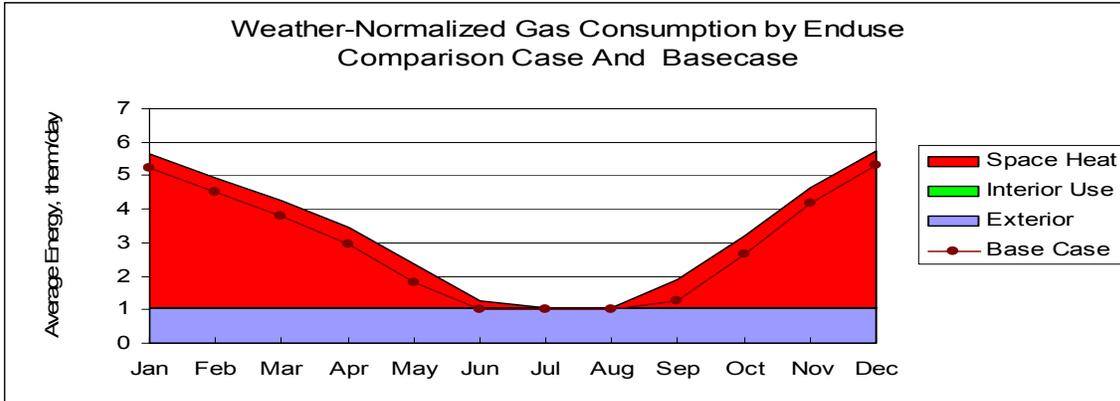
In the most extreme case in the set under review (Site 121696), removal of the supplementary electric heat would have reduced the observed savings. The observed saving of one hundred and eight (108) therms/year would have been about eighty-four (84) therms/year. At another site (Site 124899) electric heat decreased after the retrofit, probably because the building was more comfortable. This decrease in electric heat will make the gas savings lower than expected because the difference is made up in electricity savings.

## (2) **Changes in Thermostat Settings**

Two of the seven sites showed evidence of thermostat changes. In both homes the thermostat was set up and led to increased energy use. A thermostat increase leads to a very recognizable pattern in the energy use (Figure 21).

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<sup>81</sup> It is not unusual in any home for there to be one or more portable space heaters in storage in a closet or attic. In rural areas it is not unusual for a room or work area in a single family home to have baseboard electric installed even though most of the heating for the house is from a central heating unit.



**Figure 21: Pattern Shown by increase in Thermostat Setting.**

In Figure 21, note that the post retrofit gas energy use during the heating months is greater than the pre retrofit energy use (the Base Case dotted line has been submerged into the shaded Post Retrofit area). In this home, increased energy use is reasonably uniform from month to month in winter. This is the classic pattern for an increased thermostat set point. It is important to note that this particular thermostat change leads to about 200 therms/year increase in energy use, a large enough change to erase most of the heating savings from significant insulation measures.

This thermostat change is for site 417893, where the electric use also increased. Taken together, this pattern suggests that this home had an increase in occupied hours such as from a medical change or a change in employment. From an energy savings stand point this site was the major loser. But close analysis indicates that the weatherization had the planned effect. However, it was offset by changes in energy use attributable to a change in occupancy.

As suggested by this example, thermostat changes can lead to significant changes in energy use. The program should make every effort to assure that thermostats are used properly. But, as in this example, a thermostat increase may proceed quite reasonably from a change in circumstance. The energy saved by the retrofit in this case is still saved at a physical level, but it does not show in utility billing and usage records because of changes in the use of the home.

### (3) **Water Heating Savings**

The principal water heating measures are a water heater blanket and hot water flow reductions. Three to four of the sites showed a constant small increase in the summer energy use. While this increase may be due to an occupancy or appliance change, it is a pattern usually seen with increased hot water use. At two of the smallest sites, 263896 and 263989, hot water use appears to increase and to

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diminish the savings associated with space heat measures leading to an offset of about half the annual savings actually produced by the weatherization work. It is important to note that the effect of water heat measures is relatively more pronounced on small sites where the other measures are necessarily less extensive.

Hot water use reduction is an important measure because it is occurring all year. What appears to be a small measure can have leverage in terms of annual savings. Retrofit programs commonly use a 2.5 gallon per minute (GPM) showerhead as a replacement. Other evaluations have shown that a 2.5 GPM replacement can have a minimal effect because the resulting flow may be only slightly below the initial flow. Best practice is to use a 2.0 GPM labeled shower head. The Nevada water situation may also have more scaling waters that obstruct the flow of existing showerheads, making it even more likely to find an initial low flow situation. There is a reasonable likelihood that in many cases the replacement showerheads actually increased the hot water use due to this factor.

Best practice is to use a 2.0 or 1.5 GPM labeled showerhead made of a non-scaling material such as "Teflon" or "delrin". It is also a good practice to measure the before and after replacement flow rates at the time of installation. It is usually possible to assure that the replacement head can give a good shower at a reduced flow rate. These flow measurements are commonly made with a bucket and stopwatch, a flow bag and watch, or most accurately with a "microwier"

Hot water use savings measures are deceptive because they are quite inexpensive and simple relative to the main portions of a retrofit job. It is easy for this measure to get lost in the shuffle, and to settle for less than the best possible.

#### **d) Site Reports**

Discussion of each of the seven sites follows.

(1) **Site 121696**

Size: 1065 ft<sup>2</sup> frame house with crawlspace  
 Heat and DHW: Central gas heat, gas DHW

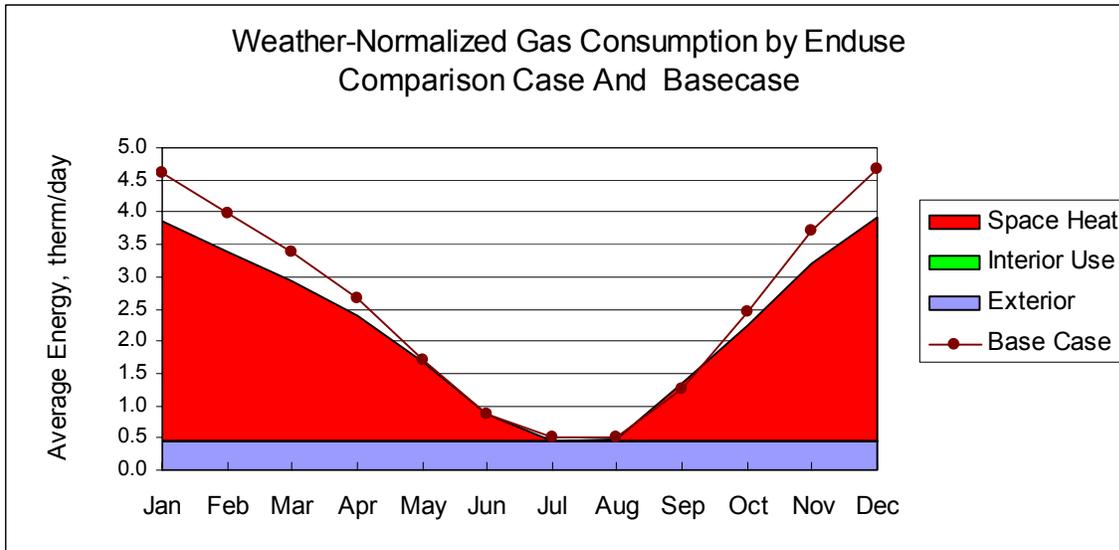
Measures:

Shell seal, Duct seal, Low flow showerheads, 35 ft<sup>2</sup> double pane glass,  
 1065 ft<sup>2</sup> R19 attic insulation

Cost: \$2,877

**Table 29: Normalized Annual Gas Savings**

Method	Baseline (Therms)	Post Year (Therms)	Gas Energy Savings (Therms)	Savings as Percentage of Baseline Gas Energy Use (%)
<b>PRISM™ Estimate</b>	<b>880</b>	794	86	10%
<b>E-Z SIM™ Estimate</b>	<b>920</b>	813	108	12%
<b>Planning Estimate (AEC)</b>	N.A.		143	16%



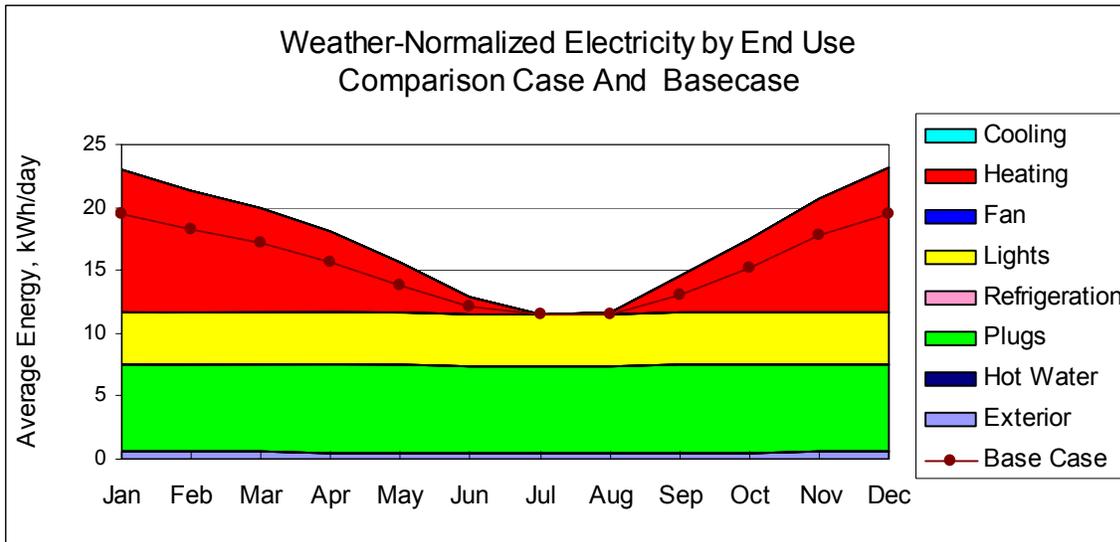
**Figure 22: Weather-Normalized Gas by End Use (Case 121696).**

There are clear gas winter heating savings of about eight tenths therms per day (0.8 therms per day) in January and a slight indication of baseload (DHW) gas savings. These winter gas savings would have been larger if the building had been heated by gas alone, but electric heat is evident in the billing histories.

**Table 30: Normalized Annual Electric Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
PRISM™ Estimate	5298	6327	-1029	-19%
E-Z SIM™ Estimate	5,622	6,377	-754	-13%
Planning Estimate (AEC)	N.A.		0	0%

Note that the planning estimate for this home missed the supplemental heat equipment.



**Figure 23: Weather-Normalized Electricity by End Use (Case 121696).**

Electricity use at this site increased by about three (3) kWh per day in January. This site meets a portion of the space heat load with electric heat. This use of electric heat increased after the retrofit. From a cost point of view the occupants would currently benefit by using gas to meet the full space heat load of their home.

(2) **Site 188396**

Size: 1554 ft<sup>2</sup> frame house with slab  
 Heat and DHW: wall mount gas heat, gas DHW

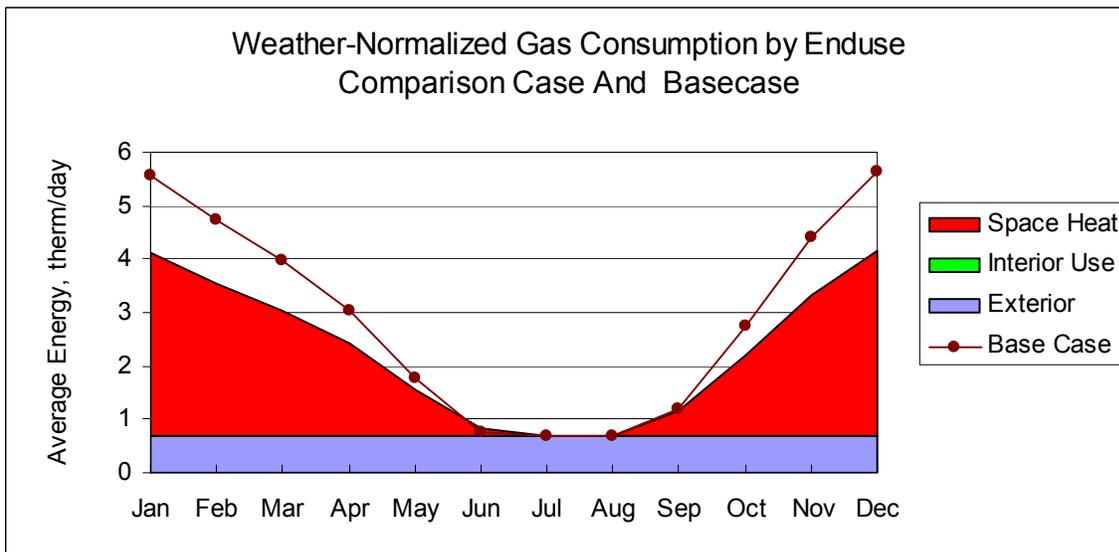
Measures:

- Shell seal, weather strip
- DHW Tank Wrap
- 1554 ft<sup>2</sup> R19 attic insulation

Cost: \$1,578

**Table 31: Normalized Annual Gas Savings**

Method	Baseline (Therms)	Post Year (Therms)	Gas Energy Savings (Therms)	Savings as Percentage of Baseline Gas Energy Use (%)
<b>PRISM™ Estimate</b>	1006	819	187	19%
<b>E-Z SIM™ Estimate</b>	1,067	843	224	21%
<b>Planning Estimate (AEC)</b>	N.A.		31	3%



**Figure 24: Weather-Normalized Gas by End Use (Case 188396).**

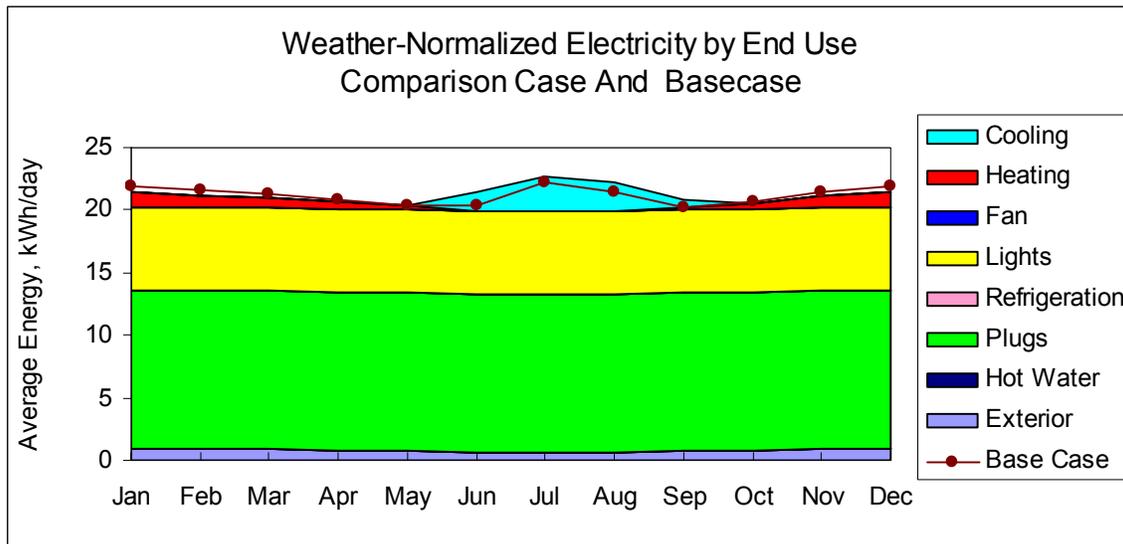
There are clear gas winter heating savings of about one and one-half (1.5) therm/day in January and a slight indication of baseload (DHW) gas savings. Space heating

energy use is reduced by about 28%. This is a reasonable physical expectation for these measures.

For this home, the Planning Estimate of gas savings (ftherm), derived for an average hypothetical building, is not in the right ballpark and significantly different from the observed therm savings

**Table 32: Normalized Annual Electricity Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
PRISM™ Estimate	7899	7856	43	1%
E-Z SIM™ Estimate	7,743	7,756	-12	0%
Planning Estimate (AEC)	N.A.		0	0%



**Figure 25: Weather-Normalized Electricity by End Use (Case 188396).**

Electricity use at this site is essentially unchanged. There is some evidence of summer use of an evaporative cooler or other fans in summer. Electric energy use for heating is for operation of furnace fan. The reduced use of the gas furnace appears to have led to slightly lower winter electric use through reduced use of the furnace fan.

(3) **Site 192929**

Size: 1200 ft<sup>2</sup> frame house with slab  
 Heat and DHW: wall mount gas heat, gas DHW

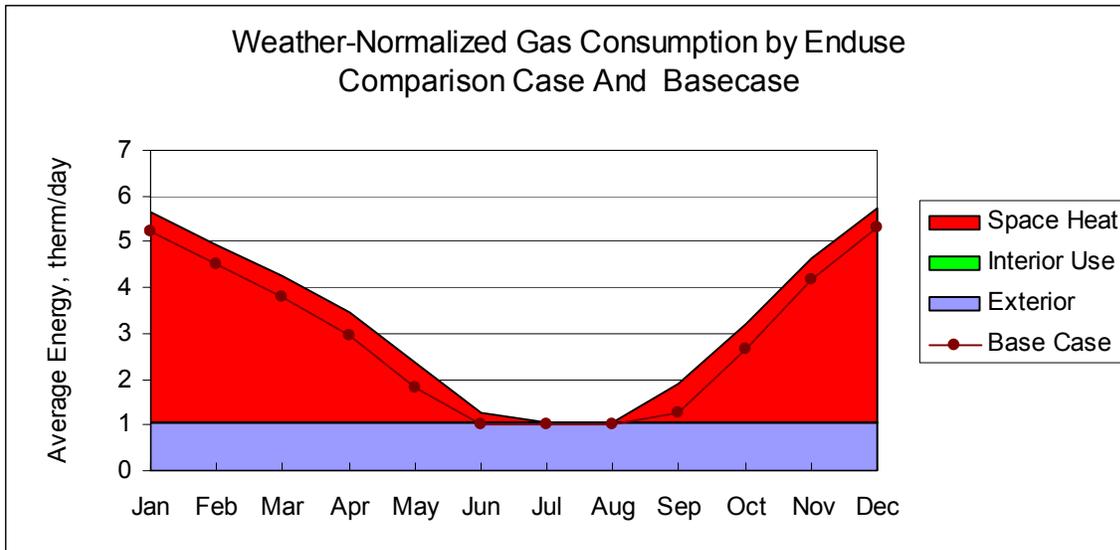
Measures:

Shell seal, weather strip, door bottoms, outside door replaced  
 Repair 11.5 ft<sup>2</sup> broken window

Cost: \$1,662

**Table 33: Normalized Annual Gas Savings**

Method	Baseline (Therms)	Post Year (Therms)	Gas Energy Savings (Therms)	Savings as Percentage of Baseline Gas Energy Use (%)
<b>PRISM™ Estimate</b>	1058	1131	-73	-7%
<b>E-Z SIM™ Estimate</b>	1,057	1,201	-143	-14%
<b>Planning Estimate (AEC)</b>	N.A.		155	15%



**Figure 26: Weather-Normalized Gas by End Use (Case 192929).**

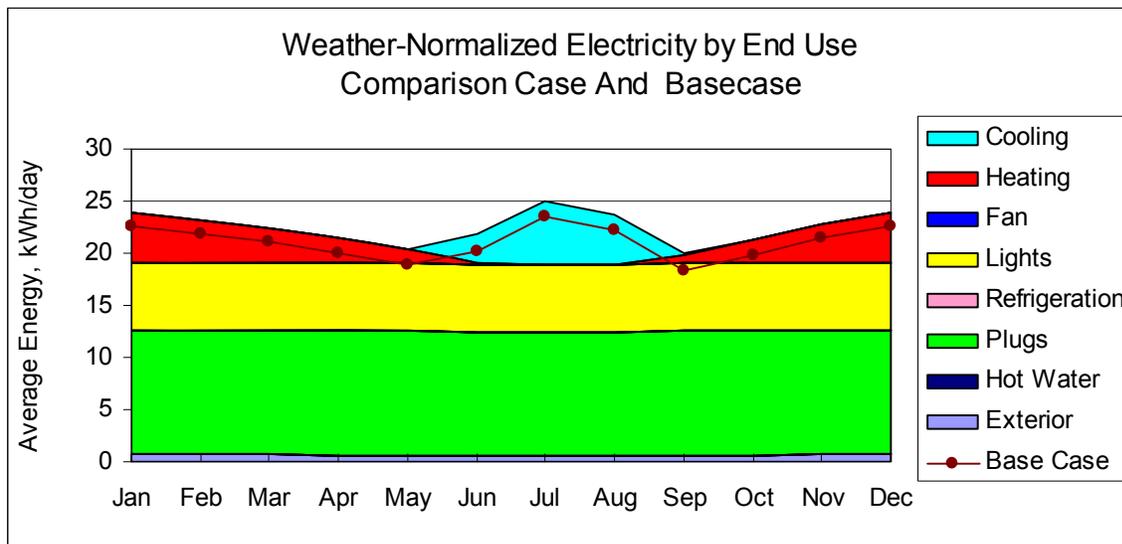
The gas winter heating increased after the retrofit by about five (5) therms per day in the heating months and a slight increase of domestic hot water (DHW) gas savings. The increased heating is consistent with an increased thermostat set point. The

measures installed in this home are not significant heating savings measures, and little savings would be physically expected. If the thermostat setting had not been increased there would have been little change in the heating energy.

The Planning Estimate of gas savings (ftherm) derived for an average hypothetical building is higher than would be expected from the recorded measures.

**Table 34: Normalized Annual Electricity Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
PRISM™ Estimate	7494	8521	-1027	-14%
E-Z SIM™ Estimate	7,689	8,203	-514	-7%
Planning Estimate (AEC)	N.A.		0	0%



**Figure 27: Weather-Normalized Electricity by End Use (Case 192929).**

Electricity use at this site increased by about one and one-half (1.5) kWh/day all year. There is some evidence of summer use of air conditioning, an evaporative cooler, or other fans in summer. The increased electric energy use is either due to a new appliance installed about the time of the retrofit or to increased ventilation fan use after the retrofit.

(4) **Site 124899**

Size: 1400 ft<sup>2</sup> frame house with crawl space  
 Heat and DHW: central gas heat, gas DHW

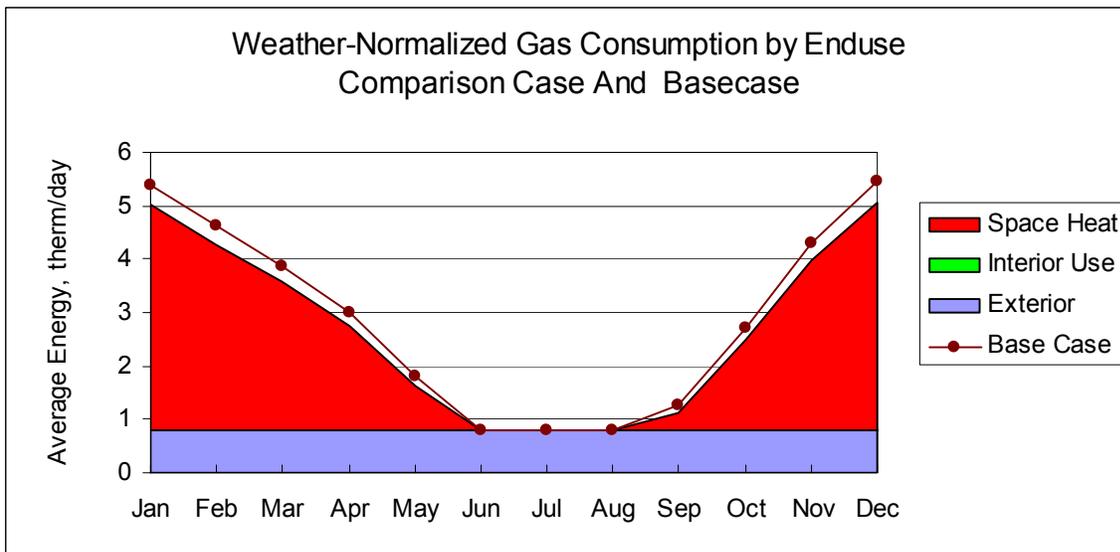
Measures:

- Shell seal, weather strip, door bottoms, outside door replaced
- DHW insulation blanket
- Cooler cover

Cost: \$1,079

**Table 35: Normalized Annual Gas Savings**

Method	Baseline (Therms)	Post Year (Therms)	Gas Energy Savings (Therms)	Savings as Percentage of Baseline Gas Energy Use (%)
<b>PRISM™ Estimate</b>	1,035	932	103	10%
<b>E-Z SIM™ Estimate</b>	1,056	981	76	7%
<b>Planning Estimate (AEC)</b>	N.A.		121	12%



**Figure 28: Weather-Normalized Gas by End Use (Case 124899).**

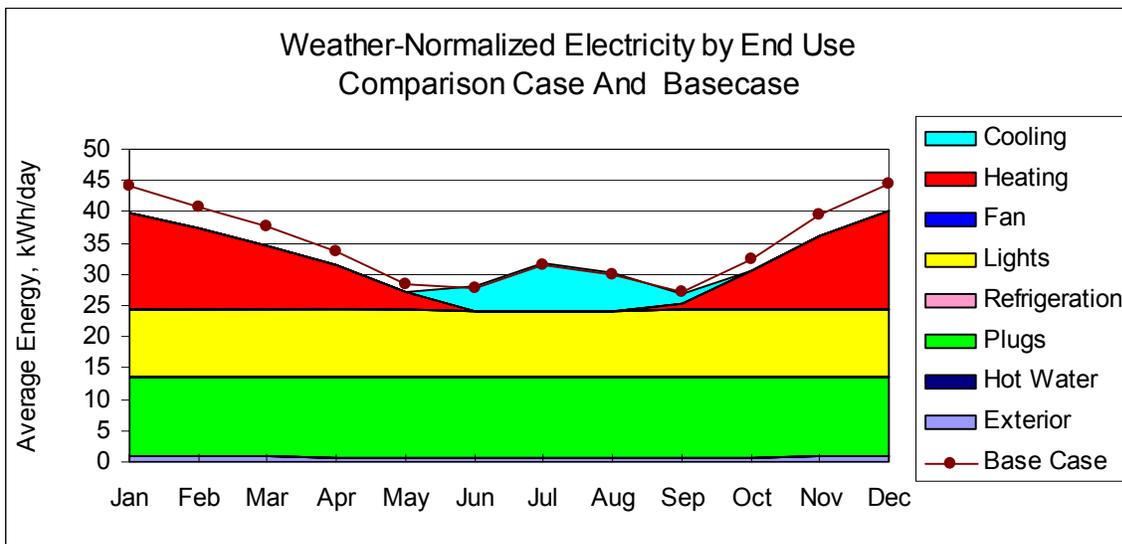
There are clear gas winter heating after the retrofit of about one-half (0.5) therm per day in January and almost no change of baseload (DHW) gas use. The measures are not significant heating savings measures, and little savings would be physically expected. The observed savings are reasonable for these measures.

The gas savings, f<sub>therm</sub>, derived for an average hypothetical building, is reasonably consistent with the observed savings.

**Table 36: Normalized Annual Electricity Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
PRISM™ Estimate	12697	12425	272	2%
E-Z SIM™ Estimate	12,692	11,984	708	6%
Planning Estimate (AEC)	N.A.		-54	0%

**Figure 29: Weather-Normalized Electricity by End Use (Case 124899).**



Electricity use at this site decreased by about 4 kWh/day in January. There is some evidence of summer use of an air conditioner or evaporative cooler in summer. There appears to be evidence in the billing of electric heating use in winter. The decreased electric energy use is unexpected, and is probably due to diminished electric heat use after the retrofit (because the gas heat was more comfortable).

(5) **Site 417853**

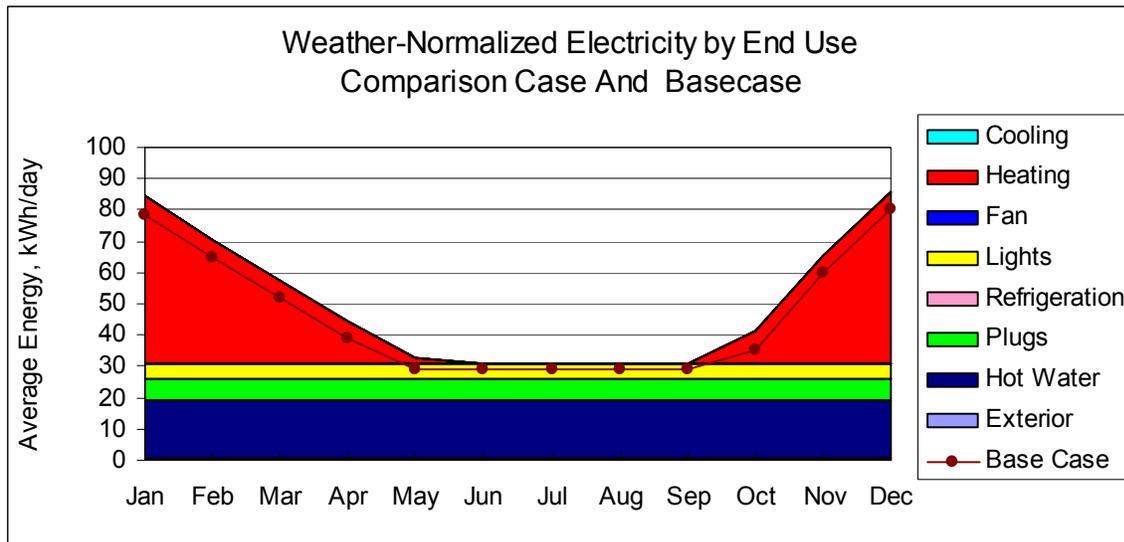
Size: 924 ft<sup>2</sup> mobile home with crawl space  
 Heat and DHW: central electric heat, electric DHW

Measures:  
 Shell seal, weather strip, door bottoms  
 Low flow showerheads

Cost: \$1,227

**Table 37: Normalized Annual Electric Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
<b>PRISM™ Estimate</b>	18,307	17,702	605	3%
<b>E-Z SIM™ Estimate</b>	16,880	18,394	-1,515	-9%
<b>Planning Estimate (AEC)</b>	N.A.		1.5	0%



**Figure 30: Weather-Normalized Electricity by End Use (Case 417853).**

Beginning in January, electricity use at this site increased by about five (5) kWh per day. There is no evidence of use of an air conditioner or evaporative cooler in

summer. The increased winter energy use is consistent with an increased thermostat set point. There is also evidence of increased domestic hot water (DHW) energy use. The Planning Estimate of electricity savings (fkWh) derived for an average hypothetical building, is not in the right ballpark, and is significantly different from the observed savings.

**(6) Site 263989**

Size: 810 ft<sup>2</sup> multifamily frame home with slab  
 Heat and DHW: wall mount electric heat, electric DHW

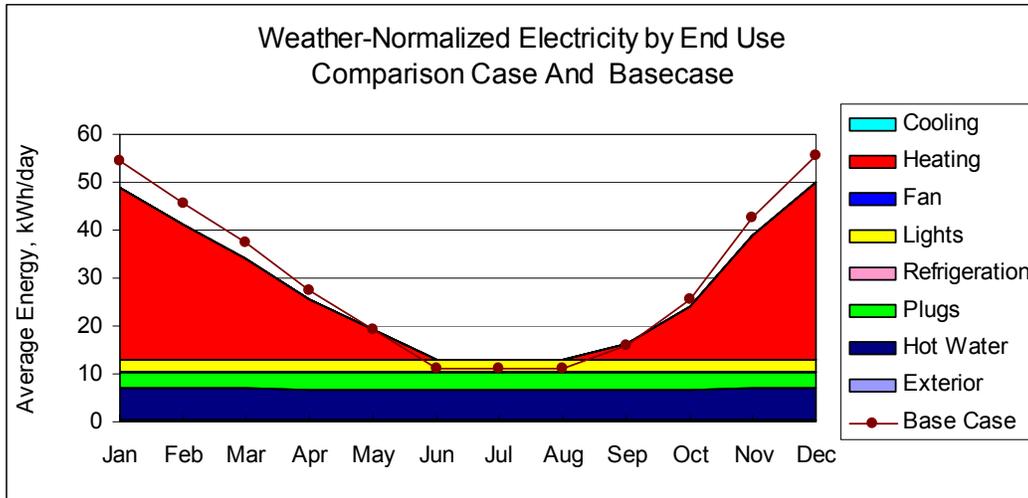
Measures:

- Shell seal, weather strip, door bottoms
- 35 ft<sup>2</sup> dual pane window
- 810 ft<sup>2</sup> R19 attic insulation
- Low flow showerhead

Cost: \$3,113

**Table 38: Normalized Annual Electric Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
<b>PRISM™ Estimate</b>	10339	9755	584	6%
<b>E-Z SIM™ Estimate</b>	10,864	10,217	647	6%
<b>Planning Estimate (AEC)</b>	N.A.		1381	13%



**Figure 31: Weather-Normalized Electricity by End Use (Case 263989).**

There is a clear indication that winter electricity use at this site decreased by about six (6) kWh per day beginning in January. There is also evidence of increased baseload DHW energy use of about one and one-half (1.5) kWh/day. This was probably caused by a replacement showerhead flow greater than original. This is a case where the winter savings were achieved, but they were diminished by an increase in baseload DHW use. If the baseload had not increased, the savings would be about 1100 kWh/yr, about double what was observed. There is no evidence of use of an air conditioner or evaporative cooler in summer. The Planning Estimate of electric savings (fkWh), derived for an average hypothetical building, is approximately correct and would have been accurate if the baseload had not increased.

(7) **Site 263896**

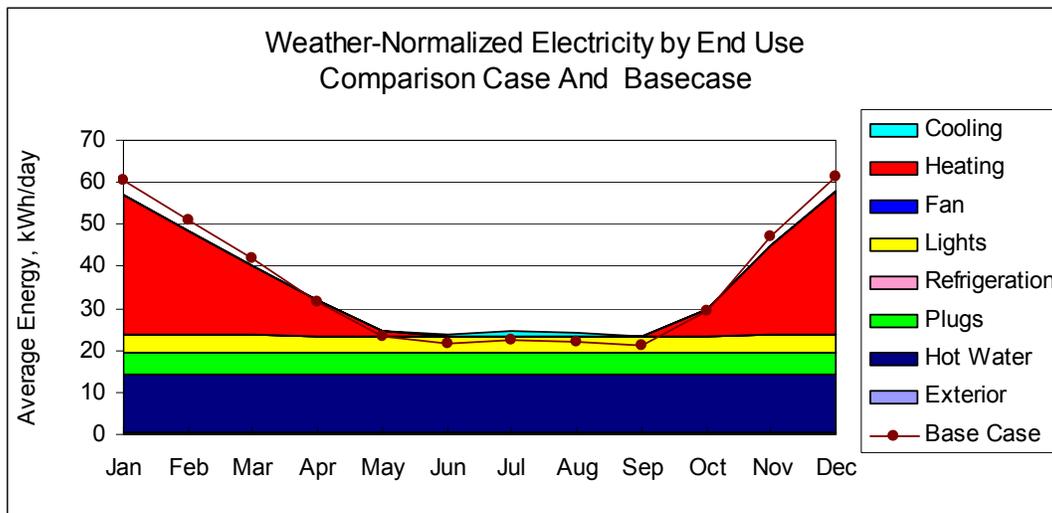
Size: 960 ft<sup>2</sup> multifamily frame home with slab  
 Heat and DHW: wall or baseboard mount electric heat, electric DHW

Measures:  
 Shell seal, weather strip, door bottoms  
 45 ft<sup>2</sup> dual pane window  
 Low flow showerhead

Cost: \$2,748

**Table 39: Normalized Annual Electric Savings**

Method	Baseline (kWh)	Post Year (kWh)	Electricity Savings (kWh)	Savings as Percentage of Baseline Electric Energy Use (%)
<b>PRISM™ Estimate</b>	12674	12468	206	2%
<b>E-Z SIM™ Estimate</b>	13,169	13,103	66	1%
<b>Planning Estimate (AEC)</b>	N.A.			2%



**Figure 32: Weather-Normalized Electricity by End Use (Case 263896).**

There is a clear indication that winter electricity use at this site decreased by about two (2) kWh per day in January. There is some evidence of use of an evaporative cooler in summer. There is also evidence of increased baseload DHW energy use of about two and one-half (2.5) kWh per day, probably caused by a replacement

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showerhead with a flow rate greater than original flow rate. This is a case where the winter savings were achieved, but they were diminished by an increase in baseload DHW use. If the baseload had not increased, the savings would be more than eight hundred (800+) kWh per year, about double what the result observed.

The Planning Estimate of the electric savings (fkWh) derived for an average hypothetical building, is consistent with the observed savings, but it would have been low if the baseload energy had not increased.

### **e) Conclusions**

The savings estimates in this evaluation are initial estimates and not definitive. Definitive results await the next evaluation when many more cases should be available for analysis. However, this evaluation shows that there are substantial reductions in cooling load and heating load as a result of weatherization. It also shows a wide variation among homes treated. In the seven detailed cases reviewed, the physical effect anticipated for the measures occurs, but in some cases the effect is partially or wholly offset by changes in the way the home is used. These changes are neither pro nor anti-conservation; they are just changes in living pattern, such as turning up the thermostat set point and using more hot water because a member of the household is out of work or is home with a chronic health condition. Or, for example, children become teenagers and hot water use increased substantially. These background factors are sometimes considered “behavioral”; but it is more correct to consider them simply encounters with emergent nature and contingencies of life.

### **f) Recommendations**

- (1) The next (SFY 2006) evaluation should further develop a focus on evaluation of energy savings, and the next few evaluations should do the same as the number of usable cases for analysis increases each year.
- (2) The Housing Division should add a standard report to the BWR system to classify jobs completed by utility and run the report monthly or quarterly to insure that utility names and utility account numbers are being recorded in the BWR database by the subgrantees.
- (3) The Housing Division should request the subgrantees to acquire, use, and systematically record results using microwiers to check shower flow. It is likely that some old showerheads have become clogged and permit less hot water use than the new energy efficient shower heads.
- (4) The Housing Division should check specifications to require showerheads used by the subgrantees to be 2.0 or 1.5 GPM labeled showerhead made of a non-scaling material such as “Teflon” or “delrin.”

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## ***K. Comparison of Planning Estimates & Results***

Planning estimates have been made as a means of screening measures for cost effectiveness. These planning estimates have been made for a complex matrix of different variations of the expected housing stock, for north/south variations in the Nevada climate, and for a wide variety of measure combinations. In the Buildings Weatherization Report (BWR) database, the planning estimate for gas savings is designated as “ftherm” and for electricity savings as “fkWh.”

### *1. Nevada Power*

For the Nevada Power cases, estimation was at the home level with results grouped by housing type (Table 40).

**Table 40: Planning Estimates and Measured Results (Nevada Power).**

<b>Housing Type</b>	<b>Cases (n)</b>	<b>Measured Savings as % of Planning Estimate</b>	<b>Measured Savings as % of Baseline Energy Use</b>
<b>Electric Heat</b>			
Apartments	43	26.4%	14.9%
Mobile Homes	5	-9.7%	119.7%
Single-Family	16	-4.6%	126.0%
<b>Heat with Natural Gas</b>			
Apartments	2	87.7%	10.9%
Mobile Homes	16	-15.0%	24.6%
Single-Family	11	0.0%	33.2%

### *2. Southwest Gas*

For the Southwest Gas cases, the planning estimates were generally off by a large amount, so that for twenty-three cases the evaluation model regression produced savings that were approximately seven percent (7%) of the planning estimates. In reviewing the cases, this appears to be due to a systematic problem with planning overestimation of baseline energy use in these homes. The value of “ftherm” planning estimates was about seventy-two percent (72%) of baseline energy use. However, twenty-three cases is not a large enough analysis group to establish these differences and the pooled data analysis used for Southwest Gas in this report did not always have a year of data on both sides of the treatment period so that with weather variation the evaluation estimates are not as sound as we would desire them to be.

### 3. Sierra Pacific Power Company

A comparison of planning estimates with the PRISM™ and E-Z SIM™ billing based savings estimates for the Sierra Pacific Power Company homes is given in Table 41.

**Table 41: Comparison of Savings Estimates**

Site ID	Estimation Method					
	Planning Estimate (AEC)	PRISM™ Estimate	E-Z SIM™ Estimate	Planning Estimate (AEC)	PRISM™ Estimate	E-Z SIM™ Estimate
	Gas Savings (Therms/Year)			Electricity Savings (kWh/Year)		
121696	143	86	108	0	-1029	-754
188396	31	187	224	0	43	-12
192929	155	-73	-143	0	-1027	-514
124899	121	103	76	-54.9	272	708
417893	No Gas Service			2	605	-1515
263989				1381	584	662
263896				281	206	66

The table shows significant agreement for the billing based estimates, PRISM™ and E-Z SIM™. Though the numbers are different in magnitude, the pattern of results is similar. This is as expected because both approaches are anchored by actual energy usage from the utility customer information system. Where there are no significant changes in behavior or in the use of the home, the planning estimate is generally closer to the observed savings as estimated by the billing based methods.

It is notable that the planning estimate (AEC estimate) shows no electricity savings at any of the four gas heated sites, though an increase in electricity use is indicated at one of these sites. However, changes in electricity use are actually observed at all four gas heated homes. There show increase electricity use, one a decrease in electricity use.

At site 188396 the AEC estimate is way off. The planning estimates were reviewed for evidence of a fundamental calculation or physics error and none was found. It is likely that this difference is due to a data transcription error or a glitch in the BWR savings tracking for a particular combination of measures and conditions.

### 4. Conclusion

A firm conclusion to this comparison of planning estimates and measured results in the form of PRISM™, PRISM™-like, and E-Z SIM™ estimates of energy savings is not yet possible. That will await the more extensive database to be available for the

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SFY 2006 and subsequent evaluations. However, there is clearly enough variation in this preliminary analysis to warrant further developing the relation of planning estimates and measured results as a focus of the SFY 2006 evaluation.

It should be noted in concluding this discussion (until its continuation in the SFY 2006 evaluation) that the original purpose of planning estimates in the Buildings Weatherization Reporting database was not to develop a *reportable* estimate of energy savings per home. According to the developer, “The energy savings (kWh or therms) are an intermediate step to calculate the energy cost savings in the Improvement Analysis and are not reported.”<sup>82</sup> Their original use was in developing a set of weatherization priority lists for use in Housing Division weatherization programs.<sup>83</sup> The lists prioritize the weatherization measures in order of decreasing savings-to-investment ratio.<sup>84</sup>

From a quantitative analysis perspective, this is a “ranking” procedure to develop prescriptive paths so that extensive diagnostic analysis is not required to be performed on each home prior to weatherization. Use of measure savings estimates in various combinations and interactions does not require the individual estimates to be correct in size so long as they are in approximately proper relation to each other.

Extension of these intermediate calculation aids to develop a tracking database to record estimates of measure savings that total to reportable whole house gas and electricity savings inherently involves a much higher order of complexity. It may take a number of years of “training” such an intelligent tracking database to bring whole house estimates into line with (1) actual Baseline energy use for individual homes, (2) interactions of measures, and (3) necessary additions to specification of listed conditions that must be taken into account with regard to measure interactions within the homes.

## 5. *Energy Savings Estimation Recommendations*

Based on this review, there are two recommendations:

- (1) The fit of planning estimates (AEC estimates) to utility data should be further developed in the next evaluation (SFY 2006), and continued as a focus into subsequent evaluations.

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<sup>82</sup> Architectural Energy Corporation, “Technical Report for the Development of Weatherization Energy Savings Tracking Database,” prepared for State of Nevada, Division of Business and Industry, Housing Division, updated June 2004.

<sup>83</sup> Separate lists were developed for each house type, climate location, heating fuel, cooling system, and other variables, resulting in a complex matrix.

<sup>84</sup> The system was created by Architectural Energy Corporation, using its REM/Design™ home energy analysis software.

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- (2) The BWR database planning estimates for therms and kWh saved should be “trained” according to actual weather normalized savings, once a substantial number of completed cases can be matched across from the BWR “JOB ID” to the utility records of energy use for a full baseline and post period. Although the value of the planning estimates in developing prescriptive paths for homes is not affected by this training, planning estimates should be modified over a period of two to three years to align with savings produced, and the model appropriately adjusted.

### ***L. Improvements and Plans***

**Housing Repair Fund:** A significant problem encountered in the field installation efforts by all Subgrantees is the older or rural home that does not meet current building codes or requires some kind of extensive repair. For example, when trying to do meaningful weatherization retrofit work, there can be a barrier of about \$1,000 per home (or somewhat over \$1,000) because old knob and tube wiring needs to be replaced. Proceeding to weatherize without bringing the wiring to code creates a fire hazard. Other homes might need significant roof repair or repair of holes in the flooring before they can be weatherized. These older or rural homes have the potential for significant energy savings but have to be skipped over for weatherization. Yet, these are often the homes that require treatment.

Each of the Subgrantees expressed a clear need for a designated repair fund outside the UEC guidelines and spending cap per home that currently cannot sustain the cost overhead of this type of repair work. Realistically, the UEC program has to overcome this repair barrier one way or another. Currently, the Subgrantees often try to leverage funds with other agency rehab dollars, but this doesn’t solve the problem, because the problem is larger than the funds available.

We recommend designation of a repair fund outside other cost-effectiveness considerations or tests to meet this real need in rural and older homes. It could also cover some similar, but smaller, costs for non-rural Nevada homes. The basic need is to establish a separate fund for these real needs that is governed by different rules than the weatherization program itself.

**DSM Funds:** Justification of additional funds from utilities under the framework of Integrated Resource Planning where the Least-Cost alternative to utilities may be an addition to the ongoing residential weatherization work. Essentially, this is a “coordinated program” recommendation in which, for Demand-Side Management (DSM) purposes the work carried out already under the federally funded and state

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UEC residential weatherization effort would be looked at by the utilities as an off-budget cost for purposes of developing a DSM addition to the current program.<sup>85</sup> Crews are already in the homes and carrying out the UEC work. Since that is a “sunk cost,” could the utilities use that effort as leverage to fund additional measures that are not covered under the current program? It should be noted that Sierra Pacific Power Company and Nevada Power do provide DSM assistance that is used, for example, by Henderson Neighborhood Services to extend residential weatherization beyond the UEC income limit of 150% of the federal poverty level (“gap funding”), so that a coordinated program approach does exist in that sense. The proposal here, however, differs in the concept of an “add on” to homes covered by the current program. As proposed by Ernest Nielson, there could be both an energy use component (kWh) and a separate demand component (kW) to this funding because the residential weatherization work creates both values for the utilities. While the full UEC could not be cost-justified on this basis from a utility perspective, given that the UEC work is authorized by law for different, though related, reasons, there should be DSM add-ons cost-beneficial from a utility perspective.<sup>86</sup>

**Training & Technical Assistance:** Training and technical assistance of different types are ongoing activities in a program of this kind. These activities are a necessary cost overhead to maintain quality and to continuously improve weatherization work. It would be functional to define this work in NRS 702 as outside the administrative percentage of budget for the Housing Division. This could be accomplished by adding a subsection to NRS 702.270 (2). The subsection would read: “(f) Pay for training and technical assistance.”

### ***M. Staffing Analysis***

To keep the program effort as carried out by the Subgrantee agencies fully accountable, an additional technical position is required within the Weatherization Assistance Program. A Technical Officer is required to carry out *inspection* and *training* functions. Both of these functions better belong within the office rather than under contract with service providers. It is important that the state have an inspection function independent of the agencies. It is not that this Officer is required to carry out all inspections, but that quality of all inspections is likely to be raised and maintained by having this position in the Housing Division. This position is necessary for program control and quality assurance.

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85 Technique for design of “Coordinated Programs” is developed by Lawrence J. Hill and Marilyn A. Brown in “Estimating the Cost-Effectiveness of Coordinated DSM Programs,” *Evaluation Review*, 19(2):181-196, 1995.

86 Ernest K. Nielsen, an active participant in the formation of the UEC and of the committee following implementation has proposed and is working on these possibilities.

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The Technical Officer position was added during SFY 2005. This will result in both higher quality work in weatherization installations and will enable ongoing training to be shifted from California to on-site training from the Housing Division.

One further concern involves the dedication of a portion of Nevada Power and Sierra Pacific Power residential DSM funding to augment the Housing Division and subgrantee effort. Additional funding is being discussed to provide more intensive energy savings installations (for example air conditioner replacements), energy education, and to permit service to more Nevada homes. Should these plans develop, it will be important to provide staffing for additional services, either within the utilities, through contractors to the utilities, within the subgrantees, or in the Housing Division. The current effort is very economically staffed and attention will have to be placed in developing additional resources if the utilities add significant program DSM support in a Housing Division/utility coordinated effort.

### ***N. Recommendations***

For the SFY 2005 evaluation, recommendations for the Housing Division are limited:

- (1) A repair fund should be established (please see “L,” above).
- (2) When the Housing Division requests downloads from the Welfare Division, the requests should include the utility customer account numbers to support later identification and cross-matching of the Welfare Division UPI number, the Housing Division Job number and the utility account numbers (please see “F,” above).
- (3) Cost-effectiveness should be coordinated to the extent possible with applicable utility DSM programs. At the same time, if the utilities are able to provide additional DSM support, the Housing Division should try to insure that a portion of the DSM support covers the incremental resource required for implementation. Also, in coordinating cost-effectiveness, the electric utilities should include an appropriate kW estimate to accompany the kWh estimate in cost justification (please see “L,” above).
- (4) Request that training and technical assistance be reviewed by the appropriate legislative committees to add a subsection to NRS 702.270 (2). The subsection would read: “(f) Pay for training and technical assistance.”

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## IX. RESPONSES TO WEATHERIZATION CLIENT SURVEYS

In early 2006, mini-surveys were sent to 466 Housing Division clients weatherized in SFY 2004. Of these, 157 were returned (approximately 34%).<sup>87</sup> The survey is designed both to provide a picture of what happens in client homes after weatherization work is finished, and to develop a participant perspective on any problems encountered in the weatherization work and what could be done to improve the program.

### A. What Happens After Weatherization?

In the one and one-half to two and one-half years following weatherization, almost ten percent (10%) of weatherized homes replaced a heat pump or furnace.

**Table 42: Have you replaced a Heat Pump or Furnace?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	141	89.8	90.4	90.4
	Yes	15	9.6	9.6	100.0
	Total	156	99.4	100.0	
Missing	System	1	.6		
Total		157	100.0		

About twelve percent (12%) replaced an air conditioner.

**Table 43: Have you replaced an Air Conditioner?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	137	87.3	87.8	87.8
	Yes	19	12.1	12.2	100.0
	Total	156	99.4	100.0	
Missing	System	1	.6		
Total		157	100.0		

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<sup>87</sup> The survey was sent in two waves. The first wave was a random sample of 404 homes from the SFY 2004 work effort and contained all housing types. The second wave was limited to the remaining 62 single family homes in the SFY 2004 weatherization effort. Letters were sent on Housing Division stationery, with a note from Craig Davis and Suzanne Martin offering to answer any questions, the survey form, plus a stamped return envelope addressed to the Housing Division in Carson City. Percentages given in this section of the report are percentage of households responding to each survey question. All 157 surveys completed were from households living in the same house as they were living in when it was weatherized.

About (20%) replaced at least one major appliance.

**Table 44: Have you replaced any Other Major Appliances?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	123	78.3	79.9	79.9
	Yes	31	19.7	20.1	100.0
	Total	154	98.1	100.0	
Missing	System	3	1.9		
Total		157	100.0		

None of the households (0%) responding to the survey added a waterbed.

**Table 45: Have you added a Waterbed?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	155	98.7	100.0	100.0
Missing	System	2	1.3		
Total		157	100.0		

Only about one percent (1%) added to the size of the home.

**Table 46: Have you increased the Square Footage of Your Home?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	153	97.5	98.7	98.7
	Yes	2	1.3	1.3	100.0
	Total	155	98.7	100.0	
Missing	System	2	1.3		
Total		157	100.0		

About three percent (3%) extended the Area of the Home Heated or Cooled.

**Table 47: Are you Heating or Cooling any New Areas of the House?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	150	95.5	98.0	98.0
	Yes	3	1.9	2.0	100.0
	Total	153	97.5	100.0	
Missing	System	4	2.5		
Total		157	100.0		

Approximately nine percent (9%) increased their winter heat setting, while 35% set their thermostats lower in winter.

**Table 48: Changed Winter Temperature Setting?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lowered	53	33.8	34.6	34.6
	Same	91	58.0	59.5	94.1
	Raised	9	5.7	5.9	100.0
	Total	153	97.5	100.0	
Missing	System	4	2.5		
Total		157	100.0		

In summer, about twenty-three percent (23%) lowered their temperature setting, and about nine percent (9%) raised their summertime temperature setting.

**Table 49: Changed Summer Temp Setting?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lowered	34	21.7	22.7	22.7
	Same	102	65.0	68.0	90.7
	Raised	14	8.9	9.3	100.0
	Total	150	95.5	100.0	
Missing	System	7	4.5		
Total		157	100.0		

About one percent (1%) of homes had fewer people living in the home that when weatherization was completed; about four percent (4%) had more people living in the home.

**Table 50: Has the Number of People living in Your House Changed?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Decreased	2	1.3	1.3	1.3
	Same	147	93.6	94.8	96.1
	Increased	6	3.8	3.9	100.0
	Total	155	98.7	100.0	
Missing	System	2	1.3		
Total		157	100.0		

About twenty percent (20%) of household decreased the amount time the house was heated in the winter; while nine percent (9%) increased the time the house was heated.

**Table 51: In Winter, the Amount of Time You Heat Each Day**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Decreased	31	19.7	20.0	20.0
	Same	110	70.1	71.0	91.0
	Increased	14	8.9	9.0	100.0
	Total	155	98.7	100.0	
Missing	System	2	1.3		
Total		157	100.0		

About twenty-one percent (21%) of households decreased the hours of cooling in the summer, while about eight percent (8%) increased cooling hours in the summer.

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**Table 52: In Summer, the Amount of Time You Cool Each Day**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Decreased	32	20.4	21.1	21.1
	Same	108	68.8	71.1	92.1
	Increased	12	7.6	7.9	100.0
	Total	152	96.8	100.0	
Missing	System	5	3.2		
Total		157	100.0		

There was very little change to the measures installed. However, about three percent (3%) of households removed at least one measure, while about four percent (4%) added at least one additional weatherization measure.

**Table 53: Did you make changes to the measures installed?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Removed	5	3.2	3.2	3.2
	No change	144	91.7	92.9	96.1
	Added	6	3.8	3.9	100.0
	Total	155	98.7	100.0	
Missing	System	2	1.3		
Total		157	100.0		

One-hundred forty-four of the one-hundred fifty-five homes reporting did not change weatherization measures (about 96%). Changes in individual homes are listed in the table below. As can be seen in the table, only one house received significant additional weatherization measures.

**Table 54: Measures Removed & Measured Added (N=155)**

<b>Measures Removed</b>	<b>No. of Households</b>
CO detector. (They installed it in the middle of the living room wall, without asking so I removed it.)	1
One screen, to allow more light and more sunshine.	1
Shower head	1
Thermostat	3
Water Cooler	2
<b>Measures Added</b>	
Made inside storm windows for 8 windows	2
4" Styrofoam insulation, new metal roof, double pane vinyl windows	1

### ***B. Problems with the Weatherization Program***

People experienced a number of problems with their homes. However, not all of these problems are related to the weatherization program. Some are problems are landlord-tenant problems, others are related to owner occupied single family housing, but not to weatherization. These are listed as general housing problems.<sup>88</sup>

#### *1. General Housing problems*

- Had difficulty with thermostat. No heat from furnace, but attic insulation helped keep a little warmth.
- I have the roof leaking in four places.
- My roof is leaking.
- Rain water runs under house and makes a sizable mud puddle. This contributes to dampness and cold of our house. Come and see and we can show you. We need to keep the heat up because the rain drains empty water

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<sup>88</sup> These are important problems, but they do not fall into the weatherization scope of services.

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under the apartments. It keeps us cold unless we turn the heat up, so the gas bill goes way up!

- Kitchen floor area sagging. The men hired to fix the floor in kitchen arrived a little drunk. Area now starting to sag.
- Thermostat removed 3 times and does not work at all. They would not let me keep the one you folks put in, they took it away. Now I have no way to watch temperatures. Also, my landlord will not replace anything that you put in and feels it is my responsibility. Showers broke and they charged me.
- Roof leaks, There is no fan in the bathroom. Also, the windows do not open.
- Whenever unit comes on automatic, it makes one cough. I have asthma.
- When the work was done the men did no work in the bathroom - the toilet needed to be replaced.
- I had a leak in the roof where the heating unit was installed. It still leaked and had to be repaired again. They put a weatherization coating on the roof just a few months ago. Now it is peeling off.
- My digital thermostat did not turn on and off when it was set on auto (A/C or Heat). Highland village apartments replaced (the one you installed) twice but it still doesn't go on and off when set on auto.

In every major weatherization project there is some household confusion regarding weatherization and other household needs. This leads to a tendency to associate all household structural problems with the weatherization service, though these problems are unrelated to weatherization. The client concerns above, listed from the responses to the weatherization survey fall into this class of response.

## 2. *Air Leakage*

The most frequently mentioned problem was concerned air leakage. In some cases, clients indicate that work was not correctly performed. In others, clients expect windows, especially replacement of leaky single pane windows with new double pane windows.<sup>89</sup>

- A worker left a tool in my crawl space attic and after he returned to retrieve it he neglected to replace the vent over the hole in the outside wall. It was too

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<sup>89</sup> Though windows replacement is an important client expectation, cost effectiveness concerns limit windows applications in most homes.

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high for my ladder, so I called to ask for assistance and was told that it was "too late" for complaints to be acted upon. This was in winter of 04/05 and my newly insulated attic filled with wet snow.

- They did not do a very good job around the front door.
- My windows are still leaking lots of air.
- The windows are a major problem. They are single pane - cold air comes in all of them. They told me unless the windows are broken they couldn't replace them.
- Cold air comes in through the windows
- There is a 1/4 inch gap at the bottom of our living room door.
- I thought they might do something about the windows. They leak real bad, but nothing was done.
- Windows leak. Front door leaks air.
- The two doors were not changed and the air seeps in very much.
- Problem with front door.
- They didn't weatherize the windows and some are cracked and the wind blows right through them.
- My windows still have a lot of air coming in, and along the door
- Weather-stripping around doors is not very good. I can see light of day through door frame.
- Workers left a weatherstrip kit for me to use instead of their doing it for me. They had tools, I don't.
- When they did the air pressure thing the should of done the front door. That's where all the cold air comes from. It should have been fixed.

### *3. Appearance Problems*

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Probably every project that involves construction and retrofit has associated with it some appearance concerns. There were two comments in this area, suggesting that two of about 157 installations were not done carefully as the others.

- They mess up the doors, the framing of the door, door trims. They put holes in the wall, mess up the bedroom wall, floors to the door. Doors latches and locks don't close right. They did the work like we lived in the ghetto.
- Lot of smear in caulking around window installations

#### *4. The Wait for Service*

There is only one comment in this area, but it is a concern that affects many not yet served by the weatherization program. Those not yet served are, of course, not represented in the survey.

- Waiting too long (too many years) for next help in weatherization.

#### *5. Solar Screens*

There were four comments on problems with solar screens.

- It is cooler, but also darker inside the house.
- The only problem I have experienced is that the solar screens are very hard to put back on the windows after they are cleaned. The screens fit so tightly.
- The screens never fit right.
- I have no light in my windows.

#### *6. Process Problems*

The following comments have to do with jobs not completed, or not sufficiently inspected or overseen from the perspective of the client.

- Not enough follow-up as to adjustments
- We were approved and told that the contractor would contact us. But we never received the windows. We froze this winter. Can we still get the windows, even though my wife works now?

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- The work was never completed.
  - The job was never finished. Six windows were not replaced.
  - There is no follow through. I was told by two different people the work would be completed and it never was.
  - If you have a problem with your staff/crew, complete the client's weatherization anyway. This happened to me 2 years ago and no one finished the job!
  - We tried to get the job finished and were told the job was already done. We qualified but will have to wait 10 years (name & address).
  - Was told they changed my shower head but they never did!
  - All they offered is 5 screens, 5 light bulbs, and a weather strip on the door and changed the filters in the AC. I am poor and can't afford any extras.

### *7. Q/C Problems*

The following appear to be quality control problems. Some of these problems suggest faulty installations. Others a tendency to miss key efficiency problems which are not included in standard procedures, such as dealing with a cold cement floor.

- The seal on the outside door of the hot water tank was never replaced after the new door was installed
- Entered program for 30 year old furnace. Was not addressed. Continues to shut off. No rhyme or reason.
- I live in an end apartment. The bedroom wall is on the end and it gets real cold. I have to put the heat up to maintain a level so I am able to shower in the morning.
- I need to re-weatherstrip my front door because it is coming off.
- Xmas in April installed a door (steel) that is hotter or colder than the original wood door and was installed crookedly with a damaged frame. Air can get through in the winter and heat in summer and any burglar and weather stripping, doesn't improve the situation due to the shoddy installment.
- Energy saver bulbs lasted only 1 year, not 5

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- They changed the water heater to a new one, which I didn't need. I have no padding or carpet on the cement floor in the big room, so in the winter it is very cold. I am disabled, and ill, and on a fixed income and need help.
  - My CO detector started beeping all the time after a couple of days. Henderson Fire Department said it was defective and needed to be replaced.
  - My bill is still high. In the bigger bedroom it still is not cool in summer or heat in the winter
  - My problem is my siding in the ...is warping from water and rain. It is falling off the house. The insulation is coming apart. Can you give me a phone number to get some help? My number is 702-294-0608.
  - One window not replaced. Took out heating stove but left hole in the roof.

#### *8. Thermostat*

There were two comments on thermostats.

- Thermostat very difficult to keep adjusted.
- Use a different type of thermostat (easier to use).

#### ***C. What Could be Done to Make the Program Better***

Clients offered several suggestions for what can be done to make the program better.

- You could use tinting instead of the screens? The screens make it too close and dark.
- Try to make it lighter for eye handicapped people, if possible.
- I believe resident should have input in the process. For instance, they rebuilt the wall of my furnace room and left it unfinished.
- Always change single pane windows to double pane.
- For older mobile homes, do the roofs and add floor insulation and carpets.
- A lot of people don't like the water-saver showerheads because their hair is too thick; it never gets the soap and conditioner rinsed out. The thing that I

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would do if I were a crew manager is I would ask the homeowner if they want their current showerheads or the water-saver new ones, before taking their current ones without telling them!

- Maybe the option of a follow-up visit.
- Someone should come back a month or more after installation to make sure everything is OK with the work that has been done.
- Have someone come out and check on the work.
- There should be more people to oversee the repairs and appliances that are needed.
- Only thing I would ask for is a better warranty on items placed into my home.
- I understand once they have completed everything that they can't come back for ten years. I think this should change since circumstances change
- Would like on-site evaluation of windows, furnace output, testing of cold air flow.
- Would like to have some high school kids involved and tutored in hands-on experience.
- You should find people that know what they are doing.
- Address actual problems. Believe they did what was on surface.
- People knowing what they are doing.
- A little bit better workmanship.
- Just a little more neatness in Work Procedure

#### ***D. Lingerin*g Concerns**

The following concerns remain two years after installation:

- I'm 60 and if you could help with roof leaks that would be just great.
- The guys did a great job on what they did. They said the refrigerator should be replaced and gave me a number to call but no one ever got back.

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- Work done had nothing to do with weather - just light bulbs.
  - A more overall completion - the new windows leak more air (cold or warm). The door lets in air, needs to be reset in frame. Need more weatherizing.
  - Wish I could get my old thermostat back in - as I have none now.
  - Keep in touch more and asking if more help is needed. I don't feel you helped with the weatherization of my home. Needed more done. (Phone number)
  - I need a new AC; the unit is about 37 years old. I need some help please.
  - I wish that I could be a little more comfortable in my house with heat in winter and cooler in the summer
  - What with power costs increasing, and weather variations I cannot determine any significant difference. My electric bills are higher. Maybe they would be worse without the weatherization program.
  - Would really help if you had someone to check on us older handicapped persons to see if we are on track with savings.
  - Please call about replacing CO detector and thermostat.
  - The Refrigerator still not working properly.
  - [After they put it in] the space is too narrow. I complained to Debbie many times but they refused to move the unit. I do trip and fall because of narrow space. I called Craig Davis. So far, no return call. I need Mr. Davis or Sue Martin to call me (702-648-2317)
  - We were very unhappy with the work they did. They sent workers that did not know what to do. These people did not know anything and it took over five trips and they still didn't do it right!
  - It helps some but not much. The real problem still exists.
  - A good program. You had some people not running it right, you know how it is - sometimes it take a while to get the bugs out. Thank you.

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### ***E. Additional Comments***

Clients offered these additional comments:

- I appreciate the blow-in ceiling insulation, also seals on door thresholds and light bulbs to reduce power bills.
- It is a great program and I received wonderful services. It couldn't have been better. Thank you.
- The program worked great for us.
- I appreciate what you have done
- I have noticed a difference in the utilities.
- Keep up the good work, as was done for me.
- Done and executed very professionally and efficiently.
- People were polite and professional.
- The men who did the work were very nice and polite.
- I truly appreciate the help.
- I am very pleased with the Weatherization assistance program.
- Appreciate your good help.
- Thank you for your assistance.
- We all appreciate what you are doing for seniors.
- I just want to say thank you.
- Thank you for helping me.
- Good Job!
- I thank you! Did a good job.
- Since the weatherization we are using less air conditioning for heating or cooling.

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- Great Job! Lowers my heating and air by 35% Thank you. The work was excellent, good service.
  - The solar screen on the sliding glass door does reduce the impact of the sun (which I really, really like).
  - All the people and workers were so concerned and helpful!
  - Thank you very much. I appreciate what you are doing for people.
  - Thank you kindly.
  - I think this was a wonderful group of people. They were all great and very helpful in showing me things I didn't know about in my home. The office employee was always sweet and wonderful on the phone also.
  - Due to the "heat island" problem, nights do not cool in summer causing hotter summer temps and longer cooling days. Each year gets worse! The solar screens have helped.
  - I enjoyed the class and learned about saving energy. The people who came to my house were wonderful.
  - Thank you for the changes to my home. My electric bill was lower this last summer with my A/C on. I did change my setting up by seven degrees, but the weatherization helped bring my bill down as well.
  - The amount of kWh used has decreased from previous months, so even with the power bills raised my bill was lowered.
  - (Since being weatherized) all weatherization has been in excellent shape!
  - Easier to cool in the summer.
  - I love the screens and they've saved me a lot of money, all through winter and summer. Thanks.
  - I appreciate the solar screens. They are such a good thing when the summer arrives and the sun shines in.
  - The changes made to my condo have saved me a lot of money. I can stay warm in winter and cooler in summer and still have a lower power bill. The window shade sun screens are a big help.
  - I can tell a difference.

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- I can't thank you everyone enough for what they have done for me.
  - Thank you -- We appreciate all you did for us and our energy bills!
  - The system currently in place is very helpful.
  - Continue the program; it is much needed.
  - Thanks so very much for the great service you have given us so we can live a normal life. But most of all I must thank God for guiding all of you to look out for us in this Beautiful State of Nevada.

The Housing Division is following up on a number of the survey responses. It was found that one contractor, who had been identified as underperforming and had been removed from the program was responsible for many of the perceived problems reported in the survey.

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## X. ENERGY ASSISTANCE PROGRAM

The Energy Assistance Program helps eligible households pay utility bills. The program is not designed to pay the total cost of energy. Each household is responsible for paying the balance.

Eligible households receive an annual benefit which is paid directly to their energy providers.<sup>90</sup> Applications are accepted through June 30th, or until funds are exhausted, whichever comes first. Prior year recipients may not reapply until approximately eleven (11) months after they received their last benefit.<sup>91</sup> Payments from the Fund for Energy Assistance and Conservation are keyed to the state median household energy burden. The program year begins each July 1<sup>st</sup> and is the same as the State Fiscal Year.

Although more steps are involved, the three primary steps in calculating the Fixed Annual Credit for a household are:

- **Identify household's annual gross income.** The Welfare Division identifies the household gross annual income. The household's annual income must not be more than 150% of the federally designated level signifying poverty, as determined by the Welfare Division. Eligibility is based on the income of the entire household, and is documented during the application process.<sup>92</sup>
- **Apply the median energy burden.** The Welfare Division then applies the median energy burden percentage to determine the amount the household is expected to pay. For FY 2005, Nevada's median income was \$44,581 and the median household energy burden for natural gas and electricity 3.06%.<sup>93</sup>
- **Identify household's annual usage in dollars for all energy sources.** During the application, the Welfare Division determines total annual cost of energy use for the household (including, for example, natural gas, electricity, wood, oil, propane, and kerosene), and generally requests the client to show bills or may receive copies of bills directly from energy supply companies. The Welfare Division has a computer link to the customer information systems of the three major utilities (Nevada Power, Sierra Pacific Power Company, and

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<sup>90</sup> UEC funds are used first for payments to utilities in UEC. Federal LIHEA and/or other funds are used for payments to non-UEC utilities, such as propane dealers.

<sup>91</sup> Application packets are mailed to prior year recipients when it is time for them to apply.

<sup>92</sup> There is no asset test for FY 2005.

<sup>93</sup> Nevada State Welfare Division, Nevada Fund for Energy Assistance and Conservation State Plan 2005, §10.1.3, Page 19.

Southwest Gas). The applicants are expected to help the Welfare Division obtain billing records where necessary.

- **Determine the Fixed Annual Credit.** For SFY 2005, if the household's annual dollar usage is greater than 3.06% of household's income, the difference is the Fixed Annual Credit (FAC). If the result of the calculation is less than \$180, the result is set equal to \$180, the minimum payment for eligible households.<sup>94</sup>

Income eligibility guidelines for SFY 2005 are shown in Table 57.

<b>SFY 2005 Energy Assistance Income Eligibility Guidelines</b>		
<b>Household Size</b>	<b>Maximum Annual</b>	<b>Maximum Monthly</b>
	<b>Gross Income</b>	<b>Gross Income</b>
	<b>150% of Federal Poverty Level</b>	
1	\$13,965	\$1,164
2	18,735	\$1,561
3	23,505	\$1,959
4	28,275	\$2,356
5	33,045	\$2,754
6	37,815	\$3,151
7	42,585	\$3,549
8	47,355	\$3,946
Add:	\$4,770	\$398
Note: Based on 2004 HHS Poverty Guidelines for 48 Contiguous State and Washington, DC. Federal Register, Vol. 69, No. 30, February 13, 2004, pp. 7336-7338.		

**Table 55: Income Guidelines.**

Only customers of utilities that require customers to pay the Universal Energy Charge (UEC) adder on their monthly bills are eligible to receive help from the Nevada Fund

<sup>94</sup> Eligible subsidized housing residents, who receive a Utility Fuel Allowance (UFA) that is used in computing the household's portion of the rent, receive a payment of \$180. If all utilities are in landlord's name and are included in the rent and the household does not receive a separate bill that includes consumption & dollar usage, the household will receive \$180. In these cases, the Fixed Annual Credit (FAC) portion of the \$180 is paid from Universal Energy Charge (UEC) funds, and the balance with non-UEC monies. If all utilities are in landlord's name but the household receives a separate bill which includes consumption and dollar usage, the household receives a FAC and the benefit is paid to the household. If one of the utilities is in landlord's name and one is in household's name, the household will receive a FAC based on the utility in the household's name payable to the utility, unless the household receives a separate bill from the landlord that includes consumption & dollar usage in which case the household receives a FAC based on both utilities that is payable to the household's utility not to exceed the annual usage, and the remainder is paid to the household.

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for Energy Assistance and Conservation (FEAC). However, the state UEC program is coordinated with the federal program so that all eligible Nevada households receive equal treatment.<sup>95</sup> For SFY 2005, the Fixed Annual Credit could be paid from the Nevada Fund for Energy Assistance and Conservation (FEAC), from federal low-income Energy Assistance (LIHEA) funds, or from a one-time award of Nevada Housing Bond monies from the Single Family Mortgage Revenue Program administered by the Housing Division.

### ***A. Fast-Track Component***

The Welfare Division attempts to fast-track households that have been disconnected from service or that have received a 48-hour disconnect notice, or are nearly out of heating fuel. This is not an emergency program, but will jump an application to first position in processing. Normally, applications are processed in date order received.<sup>96</sup>

### ***B. Crisis-Intervention Component***

The Crisis Intervention Program assists households experiencing a special circumstance or crisis and whose gross annual income exceeds 150 percent of poverty except for allowably qualifying expenses that reduce the annual income to 150% of poverty.<sup>97</sup>

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<sup>95</sup> This coordination implements NRS 702.250(3): "The Welfare Division shall, to the extent practicable, ensure that the money in the Fund is administered in a manner which is coordinated with all other sources of money that are available for energy assistance and conservation, including, without limitation, money contributed from private sources, money obtained from the Federal Government and money obtained from any agency or instrumentality of this state or political subdivision of this state."

<sup>96</sup> There are additional conditions that must be met to be placed in the Fast-Track component. The additional requirements are designed to insure that a household designated for priority service is doing what it can to meet its energy bills. Both Fast-Track and Crisis Intervention components will be continued in SFY 2006.

<sup>97</sup> Qualifying expenses must be supported by valid and verifiable documentation and must create a financial hardship of no less than three months, and may include: Un-reimbursed medical expenses for medical emergencies or long-term, chronic medical conditions; Un-reimbursed compulsory and necessary home repairs; Automobile repairs only if transportation is needed for ongoing medical care, the repairs are critical to the operation of the vehicle, and it is the only registered vehicle in the household. Regular maintenance is excluded, including tire purchases.

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### **C. Year-Around Service**

The Welfare Division provides help year-around, a good fit to Nevada's diverse climates and weather.<sup>98</sup>

### **D. Arrearage Component**

When an eligible household receives a Fixed Annual Credit, the credit is sent to the utility (or divided among the utilities) as a one-time payment. It is designed to enable a household to pay the median Nevada energy burden for twelve months with the Fixed Annual Credit making up (approximately) the difference in the utility bills. This means that if the Fixed Annual Credit is applied to a household without current arrearage, it can approximate the difference between Nevada's median energy burden and total bill for the next twelve months, so long as the household makes payments equivalent to the median energy burden. However, if the household starts out with an arrearage problem the utility will first apply the Fixed Annual Credit to back bills, and the amount left for the next twelve months may fall significantly short of providing the necessary bill assistance beyond the first months of the twelve month period. The Arrearage Payment Program is designed to supplement the effect of the Fixed Annual Credit by eliminating debt owed to a household's heating/cooling energy supplier. This enables the Fixed Annual Credit to function as designed for the next twelve months.

A Universal Energy Charge household may receive arrearage help only once.<sup>99</sup> As with the Fixed Annual Credit, the household's annual income must not exceed 150% of the federal poverty level. Application for arrearage assistance can only be made with or following application for the Fixed Annual Credit since it is designed as a supplement to the Fixed Annual Credit. In addition, to be eligible for arrearage assistance the UEC-eligible household must have paid an amount equal to at least 2.90% of their current income toward the arrearage during the twelve months in which the arrearage occurred.<sup>100</sup>

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<sup>98</sup> This is a program feature that fits the climates of the Western states and which other states should consider adopting. States that do not have a UEC but rely on federal LIHEA funding typically have narrow service windows that change from year to year depending on when federal budgets are passed and on variable federal funding.

<sup>99</sup> There is an exception for households with chronic, long-term medical conditions that create a financial hardship and/or increase energy consumption.

<sup>100</sup> It is possible to request a hardship exemption to this provision by written petition to the Administrator of the Welfare Division.

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Once accepted for arrearage assistance, the household must budget its Fixed Annual Credit over the next twelve months to insure an arrearage does not occur.<sup>101</sup>

For FY 2005, total arrearage payments were \$2,195,120 for 5,447 households, with an average arrearage payment of \$403. About 37% of these households were below seventy-five of the poverty level, about 19% between seventy-five and one-hundred percent of the poverty level, 17% between one-hundred to one-hundred twenty-five percent of the poverty level, and 13% from 125-150% of the poverty level.

Eighty-two percent (82%) of arrearage assistance payments went to electric utilities and eighteen percent (18%) to gas utilities.

### ***E. Energy Assistance Program (Formal Compliance)***

**Finding: The Energy Assistance Program (EAP) program is in compliance with subsections 3<sup>102</sup> and 8<sup>103</sup> NRS 702.260, the relevant sections related to formal compliance.**

The Welfare Division is mandated to comply with certain provisions of the weatherization program as stated in NRS 702. Below are some of the relevant specifications and a description of how the Welfare Division implemented these requirements or did not when it was unfeasible.

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<sup>101</sup> If the household incurs another arrearage within twelve months and receives a shutoff notice from their utility or service is terminated, the household is ineligible for expedited case processing, such as Fast Track.

<sup>102</sup> NRS 702.260 (3): Except as otherwise provided in subsection 4, to be eligible to receive assistance from the Welfare Division pursuant to this section, a household must have a household income that is not more than 150 percent of the federally designated level signifying poverty, as determined by the Welfare Division.

<sup>103</sup> NRS 702.260 (8): In carrying out the provisions of this section, the Welfare Division shall: (a) Solicit advice from the Housing Division and from other knowledgeable persons; (b) Identify and implement appropriate delivery systems to distribute money from the Fund and to provide other assistance pursuant to this section; (c) Coordinate with other federal, state and local agencies that provide energy assistance or conservation services to low-income persons and, to the extent allowed by federal law and to the extent practicable, use the same simplified application forms as those other agencies; (d) Establish a process for evaluating the programs conducted pursuant to this section; (e) Develop a process for making changes to such programs; and (f) Engage in annual planning and evaluation processes with the Housing Division as required by [NRS 702.280](#). (Added to NRS by 2001, [3234](#).)

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1. *Specific Provisions*

**(1) 6(a) Solicit advice from Welfare and other knowledgeable persons**

Ongoing outreach was conducted in SFY 2005, in cooperation with the Housing Division and the Advisory Committee. In addition, Welfare Division staff worked with the Governor's Energy Advisor, and with the utilities to coordinate and strengthen program services. There were a number of formal and informal meetings with stakeholders/advocates to discuss aspects of the program and how the program could be improved. The Welfare Division participated with the Housing Division in the statewide open planning meeting, held in the spring, and worked jointly to implement the SFY program plan and to develop the SFY 2006 program plan.

**(2) 6(c). Use the same simplified application form**

No application forms are used in common with Housing. As reported in the SFY 2003 evaluation, a working group consisting of both Housing and Welfare management tried to streamline the application so that both agencies could use a common form. The two agencies have different data collection needs and the joint form became too long. The agencies decided to continue using their own forms.<sup>104</sup>

**(3) 6(c). Coordinate with other agencies that provide energy assistance**

The Welfare Division carefully coordinated Nevada Fund for Energy Assistance and Conservation funding for the Energy Assistance Program with federal LIHEA payment assistance funding throughout SFY2005.

In coordination with the Housing Division, the Welfare downloads records for all recipients receiving energy payment assistance to the Housing Division. The Welfare Division sends daily emails of clients with a FAC of \$2,500 or greater to Housing for immediate follow-up.

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<sup>104</sup> Housing has identified a software program "DirectApps" that could be used by Welfare and Housing for common applications. This would require an initial investment of \$80-100,000 to purchase and modify the application for use, plus the cost to incorporate the application into both Welfare and Housing systems. The initial application would be taken at any point of contact and this system would forward income qualified applications to both agencies. At the current weatherization funding levels Housing can serve roughly 1500 clients. With 15,000 income qualified LIHEA clients, Housing could be overwhelmed with applications. A joint application system of this type would require careful scrutiny of costs and benefits.

## 2. Review of Client Files

Records were checked by drawing a systematic random sample of cases.<sup>105</sup> In a careful examination of 251 client files developed as systematic random samples from the Las Vegas office (n=120) and the Carson City headquarters office (n=131).

In this review we found no major problems with the procedures used to carry out the Energy Assistance Program or in the calculations of appropriate assistance amounts.

**Determination of Eligibility:** Virtually all cases were in full compliance with subsection 3 of NRS 702.260 (eligibility). In SFY 2005 no cases in the sample reviewed had eligibility errors. All approved cases were under 150% Federal Poverty Level and cases over 150% FPL were properly denied. There was one case that was denied for failure to respond to a Request for Information about a job that was not mentioned in the file. This anomaly was explained to the evaluators and the denial for failure to respond was assessed to be appropriate.

**Uniform Application:** In the judgment of the evaluators, all cases exhibited a sufficient amount of consistency to be considered uniform.

<b>Fund for Energy Assistance &amp; Conservation Energy Assistance Program (SFY 2005)</b>			
<b>Office</b>	<b>Applications</b>	<b>Initial Review Sample</b>	<b>Final Review Sample</b>
<b>Carson City</b>	13,345	131	131
<b>Las Vegas</b>	10,465	120	120
<b>Total</b>	23,810	251	251
<p>Note: For this table, the applications are shown for the office where processed. The entry for Carson City includes 3,000 Las Vegas cases transferred due to a shortage of staff in the Las Vegas office.</p>			

**Table 56: Review Sample: Energy Assistance Program.**

<sup>105</sup> For the Welfare analysis, the evaluation team requested that Welfare pull the cases from the files. For SFY 2003 and 2004, the evaluation team had pulled the files for Las Vegas, and Welfare for Carson City.

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**Case Documentation:** Cases should include verification documentation. Of the 251 sampled cases, 11 cases (4%) did not include a utility bill sample. However, all 11 of the cases above were customers of one of the three large utilities (Nevada Power, Sierra Pacific Power and Southwest Gas). As the welfare case workers have electronic access to usage data through these companies these 11 cases will not be considered as missing any information.

**Arithmetic Calculation:** Approximately 43% (107 of 251) of the sample of cases reviewed had Fixed Annual Credits that had to be manually changed by \$1.00 due to a bug in the computer system that causes a rounding error. This percentage is considerably more than that found in the SFY 2003 and SFY 2004 evaluations. No case in the random sample shows an increase to the Fixed Annual Credit caused by the bug.

Since the error causes rounding down to the nearest dollar in the Fixed Annual Credit, the size of the problem for any individual household is minimal. However, the manual “fix” for the number of households affected does take staff effort, and the computer should calculate correctly (this is a deficiency in the original computer programming for the program in SFY 2003). The Welfare Division has identified the calculation error as a problem and has added it to a list to be fixed by the IT programmers. This percentage error will eventually go to zero as the computer correction takes effect.<sup>106</sup> The evaluation team does not regard this as a serious problem, but it is problem that should be fixed.

### ***F. Informal Compliance***

With regard to informal compliance, that is, meeting expectations that are outside formal requirements, the Energy Assistance Program reached a full level of activity in SFY 2005, sufficient to turn the corner in fully expending program funds. With activity at this level, the “carry forward problem” of the first few program years will be entirely resolved by the end of SFY 2006 or SFY 2007.

**Advice & Planning:** The Welfare Division and the Housing Division carefully coordinated activities and shared data to provide services during SFY 2005. Planning activity was jointly coordinated, as envisioned in the legislation for the program. There was also an active Advisory Committee, and consultation.

### ***G. Calculation of Median Energy Burden***

Central to the Energy Assistance Program is the calculation of a state wide median energy burden to determine what the average household spends on energy. This is

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<sup>106</sup> The “rounding down” error was reported in previous evaluations. It continued in SFY 2005 because it was of lower priority than other needs for IT support. It is expected to be fixed during SFY 2006.

accomplished by a simple but effective formula. The major utilities provide program staff with average usage data in dollars.<sup>107</sup> These figures are then compared to the state-wide median income for the program year to find a median energy burden for the customers of each utility. Those burdens are then averaged to find a state-wide mean energy burden.

The energy burden for FY 2005 was calculated as follows (Table 59):

<b>Median Household Energy Burden</b>	
NEVP - Electric	\$974.03
SW Gas - South	410.53
<i>Subtotal Southern Nevada</i>	<u>\$1,384.56</u>
Average % Energy Burden	3.11%
(\$1,384.56 / by \$44,581)	
SPPC - Electric	\$716.73
SPPC - Gas	589.51
<i>Subtotal SPPC-Northern Nevada</i>	<u>\$1,306.24</u>
Average % Energy Burden	2.93%
(\$1,306.24 / by \$44,581)	
SPPC -Electric	\$716.73
SW Gas - Gas	\$681.58
<i>Subtotal Northern Nevada</i>	<u>\$1,398.31</u>
Average % Energy Burden	3.14%
(\$1,398.31 / by \$44,581)	
<b>Statewide Median HH Energy Burden for Electricity and Natural Gas</b>	<b>3.06%</b>
<i>Median HH Electric Energy Burden</i>	<i>1.529%</i>
<i>Median HH Natural Gas Energy Burden</i>	<i>1.529%</i>

**Table 57: Energy Burden Calculation.**

Each utility was required to submit a full accounting and estimate of their customers' annual usage. The median income was acquired through the US Census Bureau. The method is sound on its face.

<sup>107</sup> Note that the calculation goes into effect for the succeeding state fiscal year and is based on utility calendar year data. The overall lag, then, is about one and one-half years for a household entering the program at the beginning of a new fiscal year. This self-updating feature of the Nevada legislation is a notable advance. Many states have not included a self-calibrating factor in their program definitions, and states that do not do so encounter substantial problems as costs and incomes change over time.

In SFY 2003, the mean energy burden (4.27%) was higher than subsequent years (2.90% in 2004 and 3.06% in 2005) due to the Welfare Division being given only partial utility data and due to using a lower average income. Both of these issues were dealt with and are not present in improved calculations for FY 2004 and FY 2005.

### H. Staffing Analysis

Prior to the UEC, the Welfare Division operated the statewide program from Carson City with a staff of five state employees. The UEC brought a very substantial increase in caseload. Due to the need for a Las Vegas office to service the increased caseload for UEC a Las Vegas office was opened.

The basic structure for the Welfare Division implementation for UEC (and for continuing LIHEA services) is shown in Figure 33.

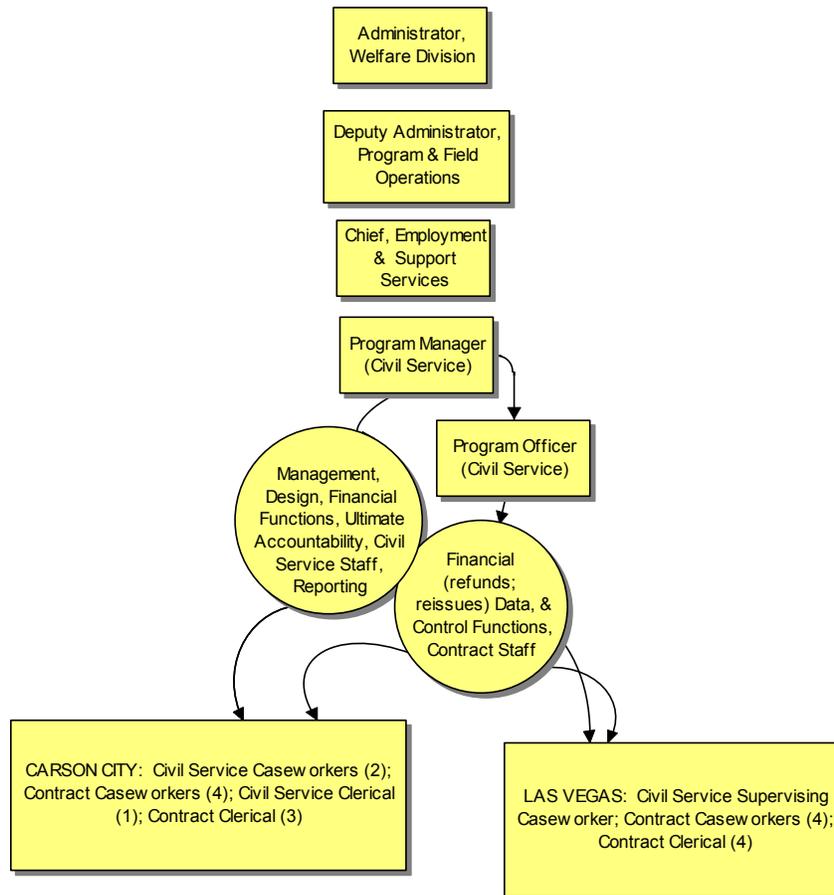


Figure 33: Staffing Structure.

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With this staff size and composition, the Welfare Division will be able to cover the caseload, including additional caseload that is being developed from marketing and other efforts. As in the FY 2003 and FY 2004 evaluations, there is no recommendation at this time to increase staff.

However, as previously recommended, the Welfare Division should move toward converting the eight casework positions and the seven clerical positions from contract staff to Civil Service.

It is reasonable to use contract staff on a short term basis for program start-up. However, the need now is for a staff of the current size that will stay with the program and allow it to mature. Certainly some turnover will necessarily be accommodated. However, contract staff tends to become experienced with Civil Service requirements and modes of operation and then, with this familiarity (and with growing experience), bid on Civil Service positions in other agencies as open-competitive positions occur over time. While the state may not lose the investment in training and experience for contract staff in an overall perspective, it is important in insuring program stability and eventual maturity of operations to maintain a core staff with the appropriate experience and skills. The contract workers attain the specific skills and experience required by serving in the contract positions. Accordingly, the recommendation in this area is to move towards converting the contract staff positions to Civil Service positions.

As noted in the prior evaluation, there is, of course, a “pro and con” on this recommendation. First, Civil Service staff cost more than contract staff. Based on Welfare Division records, a contract caseworker may cost approximately \$32,157 per year (52\*\$618.40). A Grade 29, step 9, caseworker will cost approximately \$54,430 per year (inclusive of benefits figured at 28%). The difference is \$22,273 per position moved from contract to Civil Service. Second, the state implicitly makes a long-term commitment to Civil Service staff, while a contract worker is a form of temporary worker, even if particular assignments turn out to become long-term.

Evaluators have to focus on what makes the organization more effective and efficient. From these perspectives, the cost advantage of contract workers is outweighed by other considerations.

- This program will be long-term. Our evaluation projections of need indicate that need for the program is large and will increase.<sup>108</sup> Given that definition of the program, positions should be gradually shifted into the Civil Service to provide for stability, continuity, long-term program control and accountability, and maintenance of the basic skills and knowledge essential to operate the program.

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<sup>108</sup> Please see sections on Need and Program Logic.

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- Depth of staff is essential to accommodate changes and challenges as need increases.
  - The change would provide family security to the staff in the form of Civil Service salary and benefits. These costs are small and easily accommodated within the recommendations of this evaluation in the area of administrative costs.<sup>109</sup>

There are three specific recommendations:

(1) The Welfare Division should move towards converting these positions from contract workers to Civil Service, providing opportunity for current staff to move to Civil Service where possible and consistent with Civil Service provisions and regulations.

(2) For the current time, at least five of the positions should be converted to Civil Service.

(3) If it is necessary to move very slowly in this direction, at least three positions should be converted now to insure stability and control of office functions.

### ***I. Payment Behavior***

This evaluation contains the second analysis of utility payments in the Energy Assistance program.<sup>110</sup> In the SFY 2004 evaluation, Nevada Power (n=175) and Sierra Pacific Power Company (n=138) households that received a Fixed Annual Credit in SFY 2003 were shown to have a meaningfully better percentage of bills paid in SFY 2003 over SFY 2002.<sup>111</sup> For Nevada Power customers, 53% of the annual billed amount was paid in SFY 2002 and 73% in SFY 2003. For Sierra Pacific Power, 59% of the annual billed amount was paid in SFY 2002 and 75% in SFY 2003. For the two companies together, the weighted average for SFY 2002 was 56%, and for SFY 2003 it was 74%.

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<sup>109</sup> As developed in the SFY 2003 evaluation, both the federal LIHEA program and the “best practice” state UEC programs allocate 10% of budget for administration. If Nevada implemented a similar provision and also removed the Public Utilities Commission percentage from this category the minimum staffing needs for both Welfare and Housing divisions could be met without difficulty.

<sup>110</sup> The first was in the SFY 2004 evaluation. For the next few evaluations, each analysis will go deeper. As is usually the case with evaluations of complex programs dependent on multiple data bases (here, data from the state of Nevada systems and the different utility data systems) it will take three or four evaluation cycle to adjust data constraints to reach the optimal analysis.

<sup>111</sup> Peach, H. Gil, Ryan Miller, Luisa Freeman and Anne West, *State Fiscal Year 2004 Evaluation of the NRS 702 Energy Assistance Program & Weatherization Assistance Program*. Beaverton, Oregon: H. Gil Peach & Associates LLC, April 2005, Pp. VII-11 to VII-13.

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In the current evaluation, the analysis is taken another step to look at what happens to payment patterns in Energy Assistance program by quarter.

### *1. Method*

The cases analyzed are Welfare Division Energy Assistance households with eligibility determinations during SFY 2004. All cases with utility data from Nevada Power or Sierra Pacific Power and with Welfare Division data were included in the analysis. Welfare Division information was complete. Completeness of utility data available varied by customer. The data window used for the payment analysis is March 2003 through July 2005.<sup>112</sup>

Data was received from three utility data extractions (May 2004, May 2005 and November 2005). Records from these extractions were merged. There were 3,023 customer accounts with complete FY2004 utility data. Of these accounts, 2,364 could be used in the analysis.<sup>113</sup>

Examination of the data showed that most Fixed Annual Credit payments were credited to the customer's account within one utility billing cycle after the Welfare eligibility determination date. The billing cycle that included the Fixed Annual Credit was identified and flagged. The analysis is carried out by quarters, with the quarter just before payment of the Fixed Annual Credit to the utility designated as "Q Pre," and the quarter within which the Fixed Annual Credit is received by the utility designated as "Q1."<sup>114</sup>

### *2. Results*

In the previous analysis of SFY 2004 Nevada Power and Sierra Pacific Power customer households for which data was available,<sup>115</sup> the percent of total bill paid over the year prior to receiving a household's first Universal Energy Charge Fixed Annual Credit was 58%, based on analysis of 313 households. In the current analysis, the percent of total bill paid in the quarter just prior to receiving the Fixed

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<sup>112</sup> This data window permits data for a "pre-quarter" for a customer served July 1, 2003 (the first day of SFY 2004) and four subsequent quarters for a client served on June 30, 2004, the last day of SFY 2004.

<sup>113</sup> Accounts retained for the payment analysis were each required to have data for the full data window (five quarters). A few cases with extreme values were also removed.

<sup>114</sup> The quarters are created separately for each account, and are not the conventional calendar quarters.

<sup>115</sup> The previous (SFY 2004) evaluation is based on Welfare Division eligibility determinations during SFY 2003.

Annual Credit is about 57% (Table 58). The current result is based on 2,364 households in the analysis.<sup>116</sup>

ALL CLIENTS IN ANALYSIS (n=2,364)					
	Q-Pre (Before FAC)	Q1 (FAC Credited)	Q2	Q3	Q4
<b>Billed</b>	\$526.06	(\$1,264.47)	(\$324.85)	\$278.14	\$419.00
<b>Paid</b>	\$300.35	\$28.85	\$111.69	\$241.27	\$442.61
<b>Paid (%)</b>	57.1%	-2.3%	-34.4%	86.7%	105.6%

**Table 58: Percentage of Bill Paid (All Clients).**

As shown in the table, the total billed amount the three months of Q1 is negative and the same is true of Q2. This reflects positive credit in each month of these quarters. Average customer out-of-pocket payment for Q1 and Q2 is relatively low (about twenty-nine dollars over the three months of Q1, and about one-hundred and twelve dollars for. In Q3, the portion of the bill not covered by the FAQ increases substantially, and increases to the full bill or nearly full bill in Q4. However, in Q4, customers are paying a little over 100% of amount billed.<sup>117</sup>

Leaving out clients whose utilities received the minimum Fixed Annual Credit of \$120 in SFY 2004, on average the Fixed Annual Credit created a credit balance in Q1 that was approximately equivalent to the total customer bill for six to seven billing cycles. As shown in Table 58, the credit typically lasted through Q1 and Q2, and lowered the remaining bill to be covered by the customer in Q3. On average, clients made no payment on the account while there was a credit balance.<sup>118</sup> However, in Q4, clients tended to pay the full bill.

For clients whose utilities received the minimum Fixed Annual Credit of \$120, the amount is too small to create a net credit for the quarter in which it is applied to the account (Q1), as shown in Table 59.

<sup>116</sup> For clarity, the current evaluation (SFY 2005) is based on Welfare Division eligibility determinations during SFY 2004.

<sup>117</sup> The overage represents payment of late fees that total on average in the neighborhood of six dollars for the quarter.

<sup>118</sup> Some customers, however, made regular payments across all quarters. Customers who did make payments were typically on budget billing or payment arrangements.

CLIENTS RECEIVING MINIMUM FIXED ANNUAL CREDIT (n=79)			
	Q-Pre (Before FAC)	Q1 (FAC Credited)	Q2
<b>Billed</b>	\$292.20	\$192.07	\$335.44
<b>Paid</b>	\$161.90	\$108.61	\$192.80
<b>Paid (%)</b>	55.4%	56.5%	57.5%

**Table 59: Minimum Fixed Annual Credit.**

### 3. Discussion

These results suggest that the program is working well for most households. While households tend not to pay when there is a credit on the utility bill, they do manage – on average – to make up the difference for the last quarter (Q4). This means that although it might be more desirable for customers to pay a regular amount on each bill, most do manage to meet their obligation to pay an amount equivalent to their Nevada median energy burden over the year.

### 4. Recommendations

While the payment analysis confirms that most households do meet the requirement to pay an amount equivalent to their Nevada median energy burden over the year, it is remains desirable for the utilities to innovate a way to combine the Fixed Annual Credit with budget billing to encourage households to make regular monthly payments. Most households pay other bills when a credit shows on their utility bill so that the Fixed Annual Credit amount runs out before they are eligible to reapply for the following year. Although, on average, households are finding ways to make this pattern work, some will have payment trouble in the final months of the year. For this reason it is recommended that the utilities continue to develop ways to encourage regular monthly payment.

- (1) We recommend that the utilities take up payment counseling/equal billing/and pro ration of FEAC amounts problem internally and see if there is a way to move forward to encourage households to make regular monthly payments.

## J. Effectiveness and Efficiency

The fiscal year effort is summarized in Table 60, which shows Energy Assistance Program funding and participation.

As shown in this table, funds were distributed almost evenly between the northern and southern regions of Nevada, although Fixed Annual Credit funds were distributed slightly more to Las Vegas/Henderson and about sixty percent (60%) of arrearage assistance to Northern Nevada. Households in northern Nevada had a somewhat higher average utility payment.

NEVADA STATE WELFARE DIVISION FY 2005 ENERGY ASSISTANCE PROGRAM STATISTICS July 1, 2004 through June 30, 2005						
CATEGORIES	STATEWIDE		By Region			
	TOTAL	PERCENT	South	Percent	***North	Percent
<b># HOUSEHOLDS APPLIED</b>	23,810		17,143	72.0%	6,667	28.0%
<b># HOUSEHOLDS SERVED</b>	17,557	73.7%	7,988	45.5%	9,569	54.5%
* Households with Elderly	7,061	40.2%	3,075	38.5%	3,986	41.7%
* Households with Disabled	8,200	46.7%	3,643	45.6%	4,557	47.6%
* Households with Children 6yrs & Under	3,477	19.8%	1,909	23.9%	1,568	16.4%
* Households with None of the Above	7,676	43.7%	4,154	52.0%	3,522	36.8%
**Households with SSI Recipient	4,329	24.7%	2,085	26.1%	2,244	23.5%
**Households with Social Security Recipient	11,063	63.0%	4,921	61.6%	6,142	64.2%
**Households with Earned Income	4,879	27.8%	2,173	27.2%	2,706	28.3%
**Households with Other Sources of Income	7,614	43.4%	3,435	43.0%	4,179	43.7%
Households that Rent	13,273	75.6%	6,502	81.4%	6,771	70.8%
Households that Buy/Own	4,284	24.4%	1,486	18.6%	2,798	29.2%
At or Below 75% of Poverty	5,212	29.7%	2,460	30.8%	2,752	28.8%
Between 76 - 100% of Poverty	5,033	28.7%	2,229	27.9%	2,804	29.3%
Between 101 - 125% of Poverty	4,181	23.8%	1,877	23.5%	2,304	24.1%
Between 126% - 150% of Poverty	3,131	17.8%	1,422	17.8%	1,709	17.9%
Households Using Electricity	8,528	48.6%	4,603	57.6%	3,925	41.0%
Households Using Natural Gas	8,055	45.9%	3,299	41.3%	4,756	49.7%
Households Using Propane	883	5.0%	84	1.1%	799	8.3%
Households Using Heating Oil	71	0.4%	1	0.0%	70	0.7%
Households Using Other Energy Sources	20	0.1%	1	0.0%	19	0.2%
<b>TOTAL FAC PAYMENTS</b>	<b>\$13,041,004</b>		<b>\$5,831,240</b>		<b>\$7,209,764</b>	
Number of Recipients	17,557		7,988		9,569	
Average FAC Payment	\$743		\$730		\$753	
<b>TOTAL ARREARAGE PAYMENTS</b>	<b>\$2,195,120</b>		<b>\$1,302,238</b>		<b>\$892,882</b>	
Number of Recipients	5,447		3,409		2,038	
Average Arrearage Payment	\$403		\$382		\$438	
<b>TOTAL ALL RECIPIENT PAYMENTS</b>	<b>\$15,236,124</b>		<b>\$7,133,478</b>		<b>\$8,102,646</b>	
UEC Recipient Expenditures	12,553,566		5,877,273		6,676,293	
LIHEA Recipient Expenditures	2,121,200		992,980		1,128,220	
HBOND Recipient Expenditures	561,358		262,512		298,846	
* These characteristics may include duplicate counts when appropriate (i.e., if a household member is elderly and disabled they are counted in both categories).						
** These characteristics contain duplicate counts because income types for all household members is counted.						
***Due to a shortage of Las Vegas EAP Office staff, the Carson City EAP office processed 3,000 Southern Region applications.						

**Table 60: Fiscal Year 2005 Program Statistics.**

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The practical program constraints involved in getting a fully functional computer support system in place in SFY 2003 were overcome by the end of SFY 2004. During this period, caseworkers were constrained in providing services because fully functional support technology had yet to be completed. By the end of SFY 2004, this program barrier had been eliminated for staff work in receiving and evaluating applications, with the management reporting piece to be completed in SFY 2005.

### ***K. Improvements and Plans***

The Welfare Division added two basic improvements to the program during SFY 2004, both of which took effect at the beginning of SFY 2005. These are the Arrearage Component and the Marketing arrangement with Vitalink Communications. These are discussed in other sections of the evaluation.

### ***L. Recommendations***

- (1) As previously recommended, the Welfare Division should move toward converting the eight casework positions and the seven clerical positions from contract staff to Civil Service (see subsection H).

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## XI. RESPONSES TO THE ENERGY ASSISTANCE CLIENT SURVEY

The Energy Assistance (payment assistance) mini-survey was sent in January and February 2006 to a random sample of households assisted by the Welfare Division during SFY 2004.<sup>119</sup>

### ***A. Survey Measures of Program Effectiveness***

Of those responding, ninety-four percent (94%) said they were having problems paying utility bills when they received Energy Assistance. Ninety-nine percent (99%) said the Energy Assistance Program was helpful to them in paying their energy bills. As expected, about ninety-four percent (94%) said that the Energy Assistance Program had the effect of helping them to better pay for other bills, such as food bills, medical bills, or bills for medical prescriptions.<sup>120</sup> These results indicate that the assistance is well-targeted.

### ***B. Problems with the Energy Assistance Program***

People who answered the survey were also asked, having participated in the Energy Assistance Program, if there is anything about the program that is a problem, and if there is anything that could be done to change the program to make it better. People's responses are listed below, and have been grouped into five perceived problem areas: The responses have been kept in people's own words so that their sense can be better expressed to the reader. The areas are listed in what appears to be their order of relative importance in perception of those responding.

- **Running Out.** The first problem is that the assistance runs out. Some people express this as a timing issue: In the South, people would like the program to cover the full summer's bills. In the North, people would like to have the whole cold season's bills covered.

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<sup>119</sup> The evaluation team first sent forty surveys for Northern Nevada and forty for Southern Nevada. We received no responses, and found that the evaluation computer program that assigned the address lines for the mailing envelopes was only partially correct addresses. After fixing this problem we repeated the initial wave of the survey, sending to fifty households in the North and fifty in the South, then expanded to a total of 250 North and 250 South. All were sent with a letter from Dr. Peach, the survey form, and with a stamped return envelope addressed to the evaluation office. Of these, one-hundred and nineteen were completed and returned (a return rate of about 24%).

<sup>120</sup> This is consistent with results of other studies which document the pattern, particularly for senior citizens, to pay mortgage or rent and utility bills first, and then skip required medicine, and cut back on food to make fixed income stretch.

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- **Fixed Income & Rising Utility Bills.** A second perceived problem is that for many people, incomes are fixed while utility costs are rising.
  - **Processing.** The third problem is the amount of time it takes to process applications.
  - **Eligibility.** A fourth problem is the cut-off level for participation.
  - **Paperwork.** Fifth, there is the paperwork problem for some people.
  - **Other.** Sixth, and last, are a few special problems that appear to require a special solution for a handful of particular households.

*1. Timing of payments; Payments running out*

Timing of payments and assistance running out appear to be two ways of expressing the same problem. Here are responses volunteered in this area:

- I am disabled and cannot work. My allotment runs out before I can re-apply and the small amount I receive from SSI isn't enough to pay for electric, water, rent and phone.
- Nevada Power Company takes my money so fast. Once they find out you have help they just start taking it. Once they take my money I don't know what to do. I am 62 years old and on disability, and can't get around too good to get other help.
- The funds are very much appreciated but do not seem to stretch far enough these days.
- I wish I could have help even in the winter. My electric bill is in \$242 area. I live in a small one-bedroom apartment and get Social Security and \$10 in food stamps
- I am disabled and cannot work. My allotment runs out before I can re-apply and the small amount I receive from SSI isn't enough to pay for electric, water, rent and phone.
- It is a wonderful service. I just wish it was enough for the whole year.
- Getting application so that power is paid during summer months when bills are absorbent [Southern Nevada].

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- I am eligible in February but the coldest months are November through March in Northern Nevada. By the time I get assistance, I've had to pay the biggest bills for the previous months.
  - The assistance is not sufficient to last for the length of the cold weather -- the winter is too long and too cold [Northern Nevada].
  - I seem to run out of energy assistance money in Dec/Jan each of the two years I've had it, just when it is coldest.
  - It is helpful, but they could do better (if they raised the amount). I am blind and on the fixed income I get from SSC.
  - The amount granted does not cover the entire amount, so "assistance" is the proper term. What we do get is greatly appreciated.
  - The assistance is too little.
  - I was told I could re-apply 2-7-2006. However, now they say I can't re-apply until May 5th. I need this; my last bill from Sierra Pacific was \$183.
  - Why, when you are on the program your electrical rate is one thing. Then when your benefit runs out, your electrical rate is almost doubled? Or was that the way it was designed?

People volunteered the following suggestions in this area:

- Try to allocate the funding during or on time for the cold months of winter.
- It would be better if most of it would go on the winter months as these are hard for us who are lowest in income. Thank you.
- Continue another month. It is quite cold as yet. Would be most helpful to many.
- You (should) only pay each month's bill and not send the whole amount to the utility to be spent quickly while it is available.

## *2. Energy Bills Going Up, while Income is Fixed*

From an analytic perspective, rising energy bills are a function of energy supply, institutional arrangements, and the economy. From a household perspective the portion of bills not within their control is a problem. Because changes in rates and bills are not under their control and since income is often fixed, the situation is

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frightening as is revealed in the way some of the expressions are phrased. The following are people's expressions about energy bills

- Nevada Power Company takes my money so fast. Once they find out you have help they just start taking it. Once they take my money I don't know what to do. I am 62 years old and on disability, and can't get around too good to get other help.
- Thank you for the program. Because in the summer, my daughter and I would die. Nevada Power asks for another rise for power. I am very sick. I have asthma in the summer. Power bills are high, some times \$200 for one month.
- The bills in this place are so big.
- Allocate more funding. I am on a fixed income but utility bills continue to rise.
- Energy cost rose higher up this year than last year. Thank God for your help
- It seems like my energy bill keeps getting higher every year.
- I think the gas companies charge too much. I use the drapes in the pantry, living room and cover the widows with Afghans in the kitchen and dining room. I set the furnace to 64 degrees and the water heater to the lowest setting, use the microwave oven and eat TV dinners. I wear three layers of clothing. I am almost 85 years old. The mobile home is (supposed to be) weather proof but we cannot find where the cold air comes in.

People volunteered the following suggestions in this area:

- Reduce natural gas and electric rates.
- I did some energy conservation things around the house [and my energy assistance] went down \$300 in he second (last) year but then they raise utilities, and of course, everything else goes up as well. [Please don't lower the assistance to account for my conservation if they are going to be raising the rates at the same time.]
- With the increase in price of gas, the amount granted should be increased. I would be going into debt this winter without this assistance. Thank you...
- Increase the amount of help. The cost of power keeps going up and the amount of the award doesn't keep up with the cost of living.

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### 3. *Time it Takes to Process Application & Notice to Re-Apply*

There were a number of comments about the amount of time it takes to process an application. Some of these comments were casual, but others were fairly well focused:

- No problem, just takes too long to get approved.
- It takes too long to be approved
- Did not know if received the assistance [when] the power bill came. Had to pay power bill and not buy all [my] medicine.
- They don't send the application on time. The first time I applied I got it in September. Then now have us not eligible to apply until December 2006. (They) fib as to when it sent when I called.
- There seems to be a period of time that you had to want to apply and or get help. This is bad. My gas was shut off. It is important to get (help) quickly.
- Too slow in re-approval (2nd year), recertification, response. Being legally blind, my social worker helps me file for help.
- Yes, the very long wait each year after you send in your paperwork. Last year (2005) it took 11 weeks. Before, it took 3 or 4 weeks. The waiting period is very, very stressful.
- I thought they were supposed to send an application every year at the time I am eligible to apply again. I never got one. I was eligible in December 2005. I didn't get to reapply until February 2006.
- Not knowing when the due date is.
- (On reapplication for the next year) My question is, if there have been no changes, why does it still take 60 days to accept or decline? Shouldn't (the application) just pass right through?

People volunteered the following suggestions in this area:

- Maybe approve applications a little quicker.
- Faster turn-around.

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- Faster help is a must. I will say, though, once on the program it ran rally smooth with automatic applications.
  - Yes. Inform 81 year olds what to do to reapply on time as this is critical. Bills are skyrocketing. I get only \$1153 Social Security and going in the hole even with this program. I'm close to bankruptcy.
  - I would like to be able to apply for assistance before winter rather than in the middle of it. That is when energy bills are higher.
  - Send application on time and without having to call them. We sit with temperature on the thermostat at 62 degrees and still freeze. No money left to get prescriptions and food. My husband is blind and unable to work (he is 72). We need more help!
  - Better communication [about when to reapply].
  - More employees to help the process along.

#### *4. Cut Off too Low*

Since only households who had received energy assistance in SFY 2004 were sent surveys, these comments reflect perceptions of people who received help in one year but not in a subsequent year, due to a change in their income that was important according to the eligibility guidelines but did not seem important to the household, where people are conscious of continuing need.

- I only received it once. I currently need it. I was denied, and in bad health due to no help. I don't believe I will be poor enough (but) the cost of electric is too much.
- Yes, this year I didn't get any help. Your response was that I was over the limited income. I need some help from you.
- Our income went up, but so did our bills because we had to move into a bigger house. Two bedrooms and one bath is not enough for 5 people, especially when 2 of them are teenagers! We still need energy assistance even though our income is "too high."
- Yes. The income guidelines need to be raised. There are 3 in my family, all disabled on SSI at \$603 per month which is 1,809 per month. I can't get food stamps either, so after I pay rent and other utilities, buy food and the car payment, I have no money to pay the electric and gas bills.

People volunteered the following suggestions in this area:

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- The qualifying should be re-established at about \$35,000 per year. Cost of medical raises with electrical and gas bills. It is still hard to make electrical and gas monthly payments, especially during the winter months.
  - Yes, raise the income guidelines to help the poor more.
  - Don't only go by income, but by expenses also.

### 5. *Paperwork*

There were only a few reported problems concerning paperwork:

- No problems. [but just back from hospital, getting paperwork (copasetic.) was difficult]
- Some way this year my application was misplaced. Now I am in trouble paying my gas and lights.
- Filling out the same form every year.

There were no expressed suggestions in this area, but the implied recommendation is to see if for some categories of people, perhaps those returning from the hospital or those above a certain age and on social security (which changes, but not appreciably since, as one person put it, "what they give on social security, they take back right away on Medicare," there might be a short form procedure or an extended validation across some years without the need to re-apply each year.

### 6. *Special Problems*

The following are special problems that appear to require one-time special intervention:

- I do have a complaint. On 9/25/05 I got behind. I paid up the \$395.53 (copy of cancelled check enclosed) but they subtract it again from my 2006 credit. I send in the copy of the check I have enclosed but they just ignored me, what happened to the \$395.53? I want my money back or give credit for it. Thank you.
- The program is fine. However, getting my gas for my furnace is a problem with this gas company. I have a brand new gas furnace. However, getting gas to it requires moving the meter closer to the unit which has been in this park for 25+ years. Consequently, I have to use electric heaters in the winter. Every year I suffer with a bad cold among other things. The (Energy

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Assistance) even paid my \$80 deposit for gas. Because I couldn't afford their necessary charges the gas company sent me back the \$80 and the \$30 deposit I had given them. Maybe an ombudsman could intervene so I could enjoy a warm home this winter. Please? I am not getting any younger.

- I need a new application.
- My only income is Social Security so I cannot afford an energy efficient furnace. Mine is 30 years old. If I could get more help (to get a furnace) this would save money for everybody concerned.

### ***C. Additional Comments***

In addition to the responses to the request to help identify problems and suggest solutions, many people added expressions of thanks for the Energy Assistance Program. These were volunteered, and not asked for. Those who identified problems also usually included a “thank-you” to the staff for their direct help, or to Nevada for the program. The following are some of the expressions of thanks:

- Since I've been on the program, I'm OK, especially now that the Utility Company wants to increase the rates again. Thanks for the help.
- The program is very helpful because I was able to buy more food for my kids and I was able to take them to the doctor this time. I appreciate it because it helped me and my family in many ways.
- The program has been very helpful since living on a fixed income, it has been hard. I have a mortgage payment, property tax, and this leaves me with very little. I don't receive any other help. I also try to pay my utility bill all summer and use (the program assistance) only during the winter months.
- The program is fine and I am grateful for it
- No problems - so grateful, thank you!
- There is no problem. Without your help I would probably not have any electricity.
- No problems. The people were very nice and knew their jobs well.
- It helped me pay for the big bills. I am a 74 year old woman, 1 kitten, and \$509/month income. Without your help and the Catholic Food Bank; is the only way I've survived. Thank you very much.

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- No problems. I appreciate the assistance.
  - There is no problem. I am very grateful for the help. We are low income and on oxygen. If not for the help, we would not be able to make it. I am 68 years old, and my husband is 73 years.
  - I am grateful for your help, being a disabled widow and alone. Thank you.
  - The help I received was greatly appreciated. I couldn't have made it through the winter without (this) help.
  - No problems. I am disabled and the assistance was truly a blessing. Thank you so much.
  - The program has really helped us. We wouldn't be able to pay rent without it.
  - We are very thankful for the assistance.
  - A wonderful program.
  - E.A.P. is a life saver. I appreciate it very much.

#### ***D. Discussion***

These are very bright problem descriptions and suggestions. The language is clear and the ideas are often quite good. The concern for assistance running out is clearly important from a participant perspective. At the same time, there is a need for education as to customer responsibility for these bills, and for a monthly customer co-payment so that allocations can cover the bigger bills in the summer (Southern Nevada) or winter (Northern Nevada) months. The fact that energy bills have dramatically increased while incomes have remained fixed is a correctly identified problem that has to be worked with. The timing for processing applications, of course, varies according to the number of applications. In some months processing is quick due to a smaller number of applications; in others there will necessarily tend to be a lag. At the same time, the idea of some kind of short form or quick processing of persons who have been in the program and are on social security, or returning from the hospital might be explored. The cut-off for eligibility being set too low is something we have identified in the evaluation. America pretends that poverty ends at 100% of the federal poverty level. Nevada has correctly moved the cut-off above this, along with other states, to 150% of the federal poverty level. Some states are moving to 200% or the federal option for a percentage of median income. Our independent calculations indicated that 250% of poverty is about what 100% of poverty was in the mid-1960's or what 150% of poverty was in about 1992. The special problems do appear to require an ombudsman or someone who will act like

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an ombudsman and secure a rational resolution of the few cases of this type that will surface in any systematic program evaluation. Finally, the expressions of thanks are taken from throughout the comments. People who have been included in Energy Assistance are very thankful for the program, as they say directly in this section.

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## **XII. BEST PRACTICES COMPARISON (ENERGY EDUCATION)**

The SFY 2003 evaluation reported on “best practices” in the area of administrative cost. In the SFY 2004 evaluation, the best practices focus was on “equal payment” Arrangement (sometimes called “budget billing”). For the SFY 2005 evaluation, the focus is on education.

### ***A. Emergence of Residential Energy Education***

From the early 1900’s through the energy crisis in 1973, gas and electric energy education was primarily aimed at introducing and promoting the use of gas and electric appliances and also aimed at promoting knowledge and actions for energy safety. Over the decades when energy costs were low, energy education was not oriented towards energy conservation.<sup>121</sup> Weatherization and payment assistance became a significant energy focus in the US and Canada following the October 17, 1973 energy crisis. This “first” energy crisis was planned and developed by Arab members of the Organization of Petroleum Exporting Countries (OPEC) cartel, and supported by OPEC in an attempt to quadruple the price of oil.<sup>122</sup> It took some time for the effects for the “oil shock” to work through the US economy. But, almost immediately, assumptions about the abundance of energy supplies were called into question across the entire economy in a very practical way.

Utility rates and utility bills had been in a long-term decline due to increasing economies of scale and technical improvements in production. Until this point, the vision of the long term energy future had been of “energy too cheap to meter.” Suddenly, everything changed. Middle class families in all-electric homes found themselves struggling to pay winter heating bills. Many households began to experience payment problems. For a time, nearly every household and every business focused on rising energy costs.<sup>123</sup> As prices continued to increase, ways to reduce energy use became of increasing importance.

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<sup>121</sup> The exception was during World War II when several forms of rationing were introduced, including efforts to conserving materials and energy needed for the war effort,

<sup>122</sup> This economic leverage is the classic function of cartels. Another reason for the energy shock was to punish the Western countries for military and energy support to Israel against the interests of Arabs in the Yom Kippur war. However, the potential for cartel action had long been building, with the motivation to force prices upwards rooted in the economic disparity of rampant inflation in the cost of goods offered to the Third World by West, while holding prices of Third World exports to minimum levels. In part because the West is heavily dependent on oil, the cartel became an effective tool or mechanism for addressing this long-term imbalance. OPEC continues as a classic and effective cartel today.

<sup>123</sup> For the national response to the rapid escalation of energy prices see the section on “The Energy Crisis”, Pp. 58-70 in Hirsch, Richard F., *Power Loss*. Cambridge, Massachusetts & London, England: MIT Press, 1999.

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At the same time, the US had left the period of post World War II prosperity during the Vietnam War era of the late 1960's. From approximately 1972 through the present real hourly wage has declined. While in the middle 1960s one family member could support a family, today labor hours have approximately doubled to maintain approximately the same level of living.<sup>124</sup> This long term degradation of job structures, pay and benefits; a negative consequence of what economists term "globalization" has continues. It is the primary casual factor behind what many households encounter as problems of affordability.<sup>125</sup>

By the mid to late 1970's the first weatherization programs were underway in small scale learning experiments throughout the country as many utilities began to develop home weatherization as a customer service (later, in the 1980's, residential weatherization became a cost-effective form of Demand-Side Management). Federal Weatherization Assistance Program (WAP) funding began on a small scale in 1977, and the Low-Income Home Energy Assistance Program (LIHEAP) funding began in 1983.

The Carter administration (1977-1981) championed energy efficiency and began to put into place significant resources for payment assistance and weatherization. These efforts were continued in the Reagan administration (1981-1989). Also, in the early 1980's a few utilities across the country began to experiment with utility payment assistance programs of different kinds. In response to need, fuel funds were developed in many parts of the country, often with the support of utilities.

In all of these efforts, the questions were very practical. First, "what can we do?" Then, more directly, "what works?" Initial studies from the federal laboratories at Oak Ridge National Laboratory, Argonne Labs, Pacific Northwest Labs, and Berkeley began to measure and verify weatherization measures and household conservation practices, documenting the savings. Analysis was based on data from utility customer information systems on energy use and bills.<sup>126</sup>

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<sup>124</sup> Several of the economic and physical factors leading to our current energy crisis are discussed in this evaluation. See, in particular, Section IV, The Logic of the Program, Pp.37-44 and Section III, The Size of the Need, Pp. 19-36.

<sup>125</sup> John Kenneth Galbraith contrasts "conventional wisdom" and economic reality, developed into the concept of "innocent frauds." Going beyond Galbraith, the key US economic indicators, such as the quantitative series on unemployment, employment, poverty and the consumer price index are increasingly out of alignment with reality. It is sometimes said that the negative effects of globalization in the US are weak. But the negative effects are very strong. If effects shown by the official indicators are weak, it is because key federal indicators have been driven far out of calibration. Galbraith, John Kenneth, *The Economics of Innocent Fraud*. Boston & New York: Houghton-Mifflin, 2004.

<sup>126</sup> See "The Mainstreaming of Conservation, Pp. 135-167 in Hirsch, Richard F., *Power Loss*. Cambridge, Massachusetts & London, England: MIT Press, 1999.

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From the beginning of work in weatherization and energy assistance the role of education, communication, and promotion was seen as a key component to be developed. Today, with a new escalation in energy prices over the past few years and projections of a continued trend towards higher energy prices and tightening energy supply, we are in a new long-term energy crisis, complicated by what is happening to household income. In this context, it is timely to revisit what is known about energy education.

### ***B. The Value of Energy Education***

Education about what a household can do to save energy is essential to establishing proper actions in the household. Also, education about utility bills and sometimes assistance in establishing good payment practices can be essential to the household doing its part within the overall system of energy production and conservation.

There is virtually no question as to the theoretical value of energy education. The need for energy education is, in theory, a generally accepted proposition. While there is complete agreement on the theory of energy education (the “program logic”), the results of education programs have proven difficult to measure. What, for example, is the value of a workshop designed to help lower bills though teaching household conservation practices? The answer, of course, is that for some a few hours of effort in learning in these areas simply washes out against the background of other needs, concerns, responsibilities, and activities. Yet, for others, the information provided is put to direct use and can make a difference. By contrast, weatherization involves physical changes to homes, the basic physics of weatherization is understood, and results can be measured.

When “education” has been established as a program component, sometimes there is a program or regulatory expectation that explicit energy savings will result.<sup>127</sup> In this approach, education is seen as producing an increment of energy savings beyond the savings produced by physical installation of weatherization improvements in a home. In an alternative approach, education is understood as a kind of *necessary overhead* that is not expected to produce explicit or measurable energy savings, but is nonetheless integral to a successful energy conservation program. In this case, education is understood as an activity or investment with a long-term payoff. It is understood that while evaluation of learning is relevant, association of direct energy savings is not.<sup>128</sup>

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<sup>127</sup> This is the concept of “education as a measure,” in which education is assessed in terms of kWh or therms, as if it were a weatherization measure.

<sup>128</sup> A good example of the contrasting “classic” understanding of education as a necessary program component is a “schools” program in which children are introduced to energy savings and taught a few things they can help with in the home to conserve energy and to help their parent lower household energy bills. From a benefit-cost perspective, the classic approach sees energy education as a necessary and integral overhead expense. There is no expectation of specific kWh or therm savings

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There is no disagreement that some form of energy education is a necessary component of weatherization programs, but there are different perspectives on practical implementation and measurement of education results.

### **C. Best Practice Considerations**

In research for “best practices” in education, the evaluation team contacted the National Center for Appropriate Technology (NCAT).<sup>129</sup> We also consulted regarding leading programs in Ohio, Connecticut, Pennsylvania, New York, and New Hampshire. The key insight from this effort is, perhaps not surprisingly, that there are no *new* “best practices” in the education area. That is, the education part of energy assistance and payment assistance programs as well as residential Demand-Side Management programs has not evolved beyond the level of the innovations developed in the 1980’s and early 1990’s.<sup>130</sup>

There are, however, two trends to note as energy education resumes across the US:

- (1) There has been a gradual shift away from regarding education as an analog to a physical “measure.” That is, to be associated with a specific increment of energy savings as measured in an evaluation using utility usage and billing data.<sup>131</sup> Instead, education is viewed as a kind of cultural investment (or

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tied to education in this approach, and no evaluation effort is directed towards measurement of kWh or therms attributed to the effects of energy education.

<sup>129</sup> The National Center for Appropriate Technology (NCAT) maintains state data profiles on low-income programs for the US Department of Health and Human Services, Administration for Children and Families (<http://www.ncat.org/liheap/www.htm>). This data archive of program information is essential in helping to identify best practices. We would, in particular, like to thank Kay Joslin, Director, LIHEAP Clearinghouse for identifying the “best practices” information required for this section of the evaluation.

<sup>130</sup> Until about 1995 there was active national discussion and there were several evaluations of energy education. When the first Demand-Side Management era ended in the rise of the Deregulation era this discussion largely disappeared back to a few localities. With the passing of the Deregulation era in most of the US and the current energy crisis, energy education has again become an important and recognized topic.

<sup>131</sup> Many studies and evaluations report that clients who received energy conservation education show greater savings on their utility bills than those who did not receive an education session. One such study in New York State, the Niagara Mohawk “Power Partnerships” showed savings of 13.8% after the base load weatherization measures were installed. An additional 12.6% savings was achieved due to energy education alone, bringing the total savings to almost 24% savings. Three years later the average energy savings for the same customers were still 8.3% due to the initial energy education sessions, which had now manifested into long-term self-reliant behavior change. In Minnesota, the Weatherization Assistance Program (WAP) education was felt to reduce payback benefit measured in years by at least one half the payback of customers not receiving education. In Pennsylvania, Penelec’s evaluation of its “Smart Decisions” weatherization program showed an additional 8.4% savings due to energy education. The WAP program in the Ohio Department of Energy Efficiency

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integral overhead cost) to facilitate the social learning of households to implement, support, and maintain the physical conservation measures and associated conservation practices.<sup>132</sup> Education is not treated as an analog to a physical “measure” but is part of weatherization programs because it is logical and sensible to help households understand conservation practices and energy efficiency.

- (2) There has been a gradual shift away from the “how to handle money” education components originally associated with some energy payment assistance programs, as it has been realized that most households in the programs today are lifelong working people, often with high school or college education. This change represents a shift in who is served by the programs.

Most households in the programs would not have required the programs under the employment, pay, and benefit conditions of the 1960’s under which they would be income self-sufficient. They know how to handle money but don’t have money.

This is not to say that “how to handle money” is not an important education need of some households, but that the households in the programs today are typically middle class and working households that are simply more impoverished than similar households twenty or thirty years ago (due to the changes in jobs, pay, and benefits). They already know how to handle a household budget, but do not have the money to pay all of their core bills.

#### ***D. Why Include Energy Education in Low-Income Weatherization Programs?***

Client Energy Conservation Programs have been effectively delivered since the start of the DOE WAP programs in the 1970’s. The utility-funded and sponsored weatherization programs in the 1980’s also provide information on what works in low-income client education programs.

Energy education programs are generally conducted as part of a weatherization package where specific installations are done to the house. Program designers and

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measured an additional 6.9% savings because of the delivery of energy education. The “Weatherwise Partners” WAP program in Iowa East Central Community Action had an additional 5% energy savings due to energy conservation education. However, such results are sometimes questioned as not as “solid” as results due to installation of equipment and materials. Today, an evaluation of energy education typically simply measures an increase in learned information rather than kWh or therms.

<sup>132</sup> Thus, for example, the DC Commission has recently exempted education programs from the modified benefit cost tests derived from the earlier model of the California Demand-Side Management tests.

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implementers have learned over the years that clients benefit from energy education in the following ways:

1. Clients become aware of energy related *health and safety* issues in their homes.
2. Education is more effective when it helps to identify the client's own self-interest in the learning process.
3. Energy education gives the opportunity to clarify information and actions that support energy savings.
4. Energy education can help household members to see the big picture on energy and transform personal anxiety about the current energy crisis and payment problems into social awareness and actions to save energy and reduce household bills.

#### ***E. Other Factors in Energy Education***

1. Energy education does not need to be elaborate or have a high cost, but it does need a budget line item.
2. Sometimes energy education can be delivered by a subgrantee weatherization worker or an inspector. However, many weatherization workers are oriented towards the physics of buildings and may not be "people persons." This means that a central staff member at a subgrantee agency must take responsibility for coordinating energy education and continually evaluating staff to find the right people to deliver the conservation message.
3. Sometimes energy education is set up in a traditional classroom format, and clients are required to attend as a condition of receiving weatherization services. This approach only works for a subgrantee with an urban or limited suburban service territory, where it is easy for clients to come to a common location.
4. Adults retain and remember information gained through a hands-on approach or "practice by doing". Action cannot take place until the client sees a personal benefit. In most cases the personal benefit is staying comfortable while reducing the utility bills.
5. Motivation to learn new material is enhanced if the information is presented in a variety of formats, including vivid, colorful and credible illustrations, examples of expected behavior change, testimonials (the Social-Diffusion Model), and hands-on demonstration. The Social Diffusion Model simply states that peers are more widely believed than "experts".

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6. Giving out Information about the program and providing clarification of what the client can expect is done adequately in an office setting. However, handing clients a booklet and expecting them to be motivated to effect behavior change is inadequate and ineffective. Experiential learning has to take place. The best place for this to happen is during the audit, the weatherization installations and the final inspection in the clients own home.
  7. Home visits during the weatherization process are the standard method of delivery of education in most programs. The auditor or energy educator allocates a certain amount of time during the audit to conduct the energy education session in the home. It is of great benefit to trouble-shoot together why/how the problem areas exist. These client-friendly walk-thru audits build on teachable “ah-ha” moments of self-discovery.
  8. Workshops can be effective in a setting where a large multi-family complex is being weatherized. These complexes usually provide a convenient community space in which to gather, assuring that more clients attend because of the close proximity.
  9. An action plan helps formulate clear, realistic and measurable goals for the client to achieve, based on customer-identified priorities with guidance from the educator. The Action Plan can be 3-8 definitive goals.

#### ***F. Recommendations***

1. **Housing Division & Welfare Division:** The primary recommendation is to work with an education consultant and/or a broad-based committee to scope out an *education philosophy* and an *education plan*. It is likely that the plan will have to be fairly minimalist – for the most part, simply intentionally orienting current program components from an education perspective.
2. **Welfare Division:** On the payment assistance side, it may be possible to further orient some program materials to provide further education regarding payment. Realistically, the models of education with meetings and direct classroom training will not be applicable, given that Nevada has a great geographic area and the contacts for the payment assistance program are by telephone and mail rather than face-to-face in an office setting.
3. **Housing Division:** All Subgrantees are currently providing brochures to all clients, as documented in the BWR data base. On the weatherization side, currently one subgrantee has a requirement for participation in conservation education. That work should be continued. And, each subgrantee should be tasked to develop an education *plan* to use existing program elements to carry

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out energy education. The plan should take into account limitations imposed by geographic service area.

4. **Housing Division:** Funding for additional education effort should be identified. The focus for more intensive education efforts should be targeted to the “high energy user” customers. This may be an area in which the utilities could provide the educational component.

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### XIII. APPENDIX 1. SFY 2005 RECOMMENDATIONS

#### A. Overall Recommendations

- (1) **Increase Eligibility.** With the support of the Governor's Energy Office, the Welfare Division should develop a proposal to increase the eligibility level and funding for the Energy Assistance program. At the most, eligibility should be increased to 250% of poverty, the approximate the level at which family income self-sufficiency occurs. A smaller step, and one permitted for federal funds so that federal and Nevada programs could continue to work in exact parallel, is to move eligibility to 60% of Nevada median income. A yet smaller step is to create an inclusion provision for all households, regardless of income, with demonstrated need in a temporary emergency such as loss of work, death of an income earner, or similar emergency. This recommendation would require both study and consultation with interested parties. Putting this modification into effect would require action by the legislature. The Welfare Division should collaboratively study the problem of increasing eligibility as energy costs continue to increase. [Page 38]
- (2) **Continue to develop and implement a Communications Campaign.** Due to recent rate increases and projected rate increases for both gas and electricity, households will probably be increasing responsive to the programs. They need to know that the programs exist, know how to apply, and they need to be encouraged to feel comfortable in making an application. Within the plan for a continuing campaign, local alliances should be a focus to develop community recruitment. Vitalink notes that the next strategic direction would be "...a slight shift in resources to increase the emphasis on public relations and developing strategic alliances on the local level." Local strategic alliances and a yearly communications campaign are logical places to work to develop awareness. Also, the campaign should consider some direct buy communication and leveraging of outside resources. [Page 18]
- (3) **Collaborate on increasing LIHEA.** With the support of the Governor's Energy Office, the Welfare Division and the Housing Division, should coordinate with the major utilities to work towards making the annual federal LIHEA funding both more dependable and more sizable for Nevada. More adequate federal funding can increase the joint effects of the Fund for Energy Assistance and Conservation and LIHEA. [From page 38]
- (4) **Education Plan.** An education *philosophy* and *plan* covering a small number of messages for payment, conservation, and health and safety

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should be developed, working with either an education consultant and/or with a broad-based committee to scope out an education philosophy and plan. It is likely that the plan will have to be fairly minimalist – for the most part, simply orienting current program components from an education perspective. [Page 170]

### ***B. Welfare Division***

- (1) As previously recommended, the Welfare Division should move toward converting the eight casework positions and the seven clerical positions from contract staff to Civil Service. [Page 150]
- (2) The Welfare Division should add the zip code to the standard format of data transmitted to the evaluation team. [From Page 59]
- (3) Downloads from the Welfare Division to the Housing Division should always include customer account numbers to support identification. [From Page 120].

### ***C. Housing Division***

- (1) A repair fund should be established [From Page 120].
- (2) Cost-effectiveness should be coordinated to the extent possible with applicable utility DSM programs. At the same time, if the utilities are able to provide additional DSM support, the Housing Division should try to insure that a portion of the DSM support covers the incremental resource required for implementation. [Page 120].
- (3) The Housing Division should revise the BWR data collection format to add two fields for utility name to go with each of the two fields for utility account numbers. [From Page 57]
- (4) The BWR database planning estimates for therms and kWh saved should be “trained” according to actual weather normalized savings, once a substantial number of completed cases can be matched across from the BWR “JOB ID” to utility records of energy use for a full baseline and post period. Although the value of the planning estimates in developing prescriptive paths for homes is not affected by this training, planning estimates should be modified over a period of two to three years to align with savings produced, and the model appropriately adjusted. [Page 117]
- (5) The Housing Division should develop and add a standard BWR report to show weatherization jobs by utility. Running this report once a month or every quarter will help maintain subgrantee focus on entering utility account numbers

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as time goes by and there are staffing changes, and insure that data entry problems are flagged on a near-current basis. [Page 57]

- (6) When the Housing Division requests downloads from the Welfare Division, the requests should include the utility customer account numbers to support later identification and cross-matching of the Welfare Division UPI number, the Housing Division Job number and the utility account numbers. [Page 120].
- (7) Request that training and technical assistance be reviewed by the appropriate legislative committees to add a subsection to NRS 702.270 (2). The subsection would read: "(f) Pay for training and technical assistance." [Page 117]
- (8) All Subgrantees are currently providing brochures to all clients, as documented in the BWR data base. On the weatherization side, currently one subgrantee has a requirement for participation in conservation education. That work should be continued. And, each subgrantee should be tasked to develop an education *plan* to use existing program elements to carry out energy education. The plan should take into account limitations imposed by geographic service area. [Page 170]
- (9) Funding for additional education effort should be identified. The focus for more intensive education efforts should be targeted to the "high energy user" customers. This may be an area in which the utilities could provide the educational component.

#### ***D. Evaluation***

- (1) The fit of planning estimates (AEC estimates) to utility data should be further developed in the next evaluation (SFY 2006), and continued as a focus into subsequent evaluations. [Page 116]

#### ***E. Utilities***

- (1) We recommend that the utilities take up payment counseling/equal billing/and pro ration of FEAC amounts problem internally and see if there is a way to move forward to encourage households to make regular monthly payments. [Page 151 (this recommendation is also continued from the SFY 2004 evaluation)]

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- (2) For coordination of DSM and low income programs, the electric utilities should include an appropriate kW estimate to accompany the kWh estimates in cost justification.
  - (3) The utilities should look at the energy and payment and health and safety elements of program energy education and participate in helping formulate a limited number of key messages and materials, and otherwise look at the possibility of funding, carrying out, and/or assisting energy education.

## XIV. APPENDIX 2. SFY 2004 RECOMMENDATIONS

### A. Overall Recommendations

There are no new recommendations in this area. However, there are three recommendations from the SFY 2003 Evaluation that we want to re-emphasize.

- (1) The SFY 2003 Evaluation contains a recommendation to treat the Public Utility Commission administrative costs outside the administrative costs of the Fund for Energy Assistance and Conservation budget. This is because the Commission responsibilities are for collecting funds, not for program. In addition, it is recommended to raise the overall administrative cap for program (including Welfare Division, Housing Division, and Governor's Office) to 10% as a "best practice" consistent with the parallel federal program and with best practice in to other states. This recommendation is shown in Table 24.

<b>Recommended Funding Allocation</b>			
<b>Responsibility Area</b>	<b>Current</b>	<b>Proposed</b>	<b>Net Change</b>
<b>Collection of UEC (UEC)</b>			
<b>Public Utility Commission</b>	3.0000%	2.0000%	-1.0000%
<b>Subtotal, Collection</b>	3.0000%	2.0000%	-1.0000%
<b>Program Administration (FEAC)</b>			
<b>Governor's Energy Office</b>	0.0000%	2.0000%	2.0000%
<b>Welfare Division Admin.</b>	2.1825%	5.4000%	3.2175%
<b>Housing Division Admin.</b>	1.4550%	2.6000%	1.1450%
<b>Subtotal, Administration</b>	3.6375%	10.0000%	6.3625%
<b>Program (FEAC)</b>			
<b>Welfare Division</b>	70.5675%	65.0000%	-5.5675%
<b>Housing Division</b>	22.7950%	22.0000%	-0.7950%
<b>Housing Repair Fund</b>	0.0000%	1.0000%	1.0000%
<b>Subtotal, Program</b>	93.3625%	88.0000%	-5.3625%
<b>Total</b>	100.0000%	100.0000%	0.0000%
Note: Entries in the table are percents of the yearly UEC.			

**Table 61: Recommended Funding Allocation**

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While the legislative intent in “capping” administration was a good one, the specific formula for calculating administrative percentages happened to be set too low in NRS 702. From an evaluator’s perspective, both the Welfare Division and the Housing Division need somewhat more for administration to insure adequate program control. This is one of the most effective things that can be done to strengthen the program within its existing overall budget. [Note: It is reasonable to keep the funding for the collection operation of the Public Utility Commission of Nevada in the budget legislated for the program. The earlier recommendation was based on “best practice” in other states, but, in retrospect, including the collection function budget in the same legislation as the program budget may actually be a better practice. However, the collection budget percentage should be in addition to the 10% “best practice” precedent for program administration as set by the federal model and in other state programs – recommendation modified for SFY 2005 evaluation report.]

Using the 10% federal precedent and the 10% “best practice” from other states would provide for the necessary resource. While the provision for outreach, program design, and evaluation outside the cap was a very useful innovation, some states had no cap on administration for the start-up period. In a way this is a “chicken and egg” problem and for the Welfare Division it is important to have the staff to be able to meet the program objectives. For the Housing Division (see that section) dollars would be much more effectively spent in Nevada if the additional technical position could be authorized.

- (1) For the SFY 2004 evaluation we also reaffirm the SFY 2003 Evaluation recommendation that the Welfare Division Accounting section and the Commission Staff responsible for the collection function re-establish the quarterly “true-up” meetings that existed at the start of the UEC collections, and continue to meet quarterly.
- (2) In the SFY 2003 evaluation, and again in the SFY 2004 evaluation (Section II, E, Number of Eligible Households; F, Another Approach to Need – Self Sufficiency vs. Percent of Poverty; G, Comparison of Alternative Eligibility Levels; and H, Summary) eligibility is reviewed. The point of the review is that the federal calculation of the “poverty level” is so far out of calibration as not be valid, as indicated by the shift to 150% of poverty in Nevada, 175% in New Jersey, and 250% or 275% for some program components in other states. It is really 250% today that corresponds to the 100% in 1965 and “self-sufficiency income” is a better metric than “federal poverty level.” However, we recommend that eligibility be raised towards 250% of poverty in a conservative first step to sixty percent of Nevada median income. As shown in Table 3, Page II-12, this would correspond to 200% of poverty for a family of one to 156% for a family of eight. Then it might be useful to run the program at that level for three years and assess when to move up another step.

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## ***B. Housing Division Recommendations***

- (1) The primary recommendation in this area is to add a Technical position to the staff. This position would take over the training function and some inspection functions and it would add to the effectiveness of the program at a small cost since most of the dollars that would fund this position are now spent yearly on out-of-state consultants (See Chapter VI, Section I). [The Technical position was subsequently added in SFY 2005.]
- (2) “Gap” funding from Sierra Pacific is currently provided to weatherize homes between 150% and 200% federal poverty level. Both southern Nevada agencies had waiting lists for households in this poverty range because they had run out of Gap funds and these households were over income for UEC funds. Especially in southern Nevada, increasing the income eligibility to use UEC funds would be helpful because the Area Median Income (AMI) is higher than in other areas of the State. An AMI of 60% is equivalent to about 200% poverty level in this area. Increasing the eligibility to 50 or 60% AMI would allow agencies to treat more homes, especially if Gap funding is also available to leverage.
- (3) Downloads from the Welfare Division should always include customer account numbers to support identification (please Chapter VI, Section F).
- (4) A repair fund should be established (please see Chapter VI, Section H).
- (5) Cost-effectiveness should be coordinated (please see Chapter VI, Section H).
- (6) Staff persons at the various Subgrantee offices have varying levels of experience using databases. While all the Subgrantees appreciated the changes to the BWR database, some felt they could not fully utilize the reporting functions without some training or instruction. We recommend training on the use of the BWR database reporting functions be made available to agencies.
- (7) Agencies all report good communications with Housing, finding staff accessible and responsive. Still, there were mixed reactions to the frequency of meetings with the State. These meetings are designed to share information between agencies, the inspection contractor and the State. It was suggested the meetings be increased to quarterly meetings and include a half day with administrators and a half day, or more as needed, with contractors, Housing, and the inspection firm.

## ***C. Welfare Division Recommendations***

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- (1) Continue to move towards conversion of contract staff positions to Civil Service status. This is essential to hold on to staff and for program control. If it is not possible to move fully in this direction, then convert the most essential positions. See Chapter VII, Section H.
  - (2) Convene a second conference meeting on payments to further explore the relation of payment counseling, budget billing and pro-ration of the Fund for Energy Assistance and Conservation payments for FEAC amounts over a set amount. See Section VIII.

***D. Utility Recommendations***

- (1) We recommend that the utilities take up payment counseling/equal billing/and pro ration of FEAC amounts problem internally and see if there is a way to move forward. See Section VIII.

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## **XV. APPENDIX 3. SFY 2003 SUMMARY OF RECOMMENDATIONS**

This is a summary of recommendations from the SFY 2003 Evaluation. Page and section references are to the SFY 2003 Evaluation.

### **A. Statutory Recommendations**

- (1) Change the statutory cap on the administrative costs for the Public Utilities Commission from (3%) to (2%) of the UEC. (Section I, Page 2)
- (2) Place the administration costs for the Public Utilities Commission outside the administrative cap for the programs. Fund administration and collection is a separate work and different in kind from the work of providing services using the Fund for Energy Assistance and Conservation (FEAC) to deliver payment assistance and weather assistance and conservation services. This factual difference in works should be recognized in statute. (Section I, Page 2 and Footnote 6)
- (3) Change the total cap for the Public Utilities Commission, the Welfare Division and the Housing Division from a total administrative cap of 6.6375% of the UEC to a combined total cap of 10% of the UEC, leaving other provisions unchanged. (Section I, Page 2; see also entire Section VIII, Best Practices)
- (4) Move the eligibility level for program participation upwards from 150% of poverty, to 60% of Nevada household energy burden. (Section I, Page 3; Section III, Page 8, "Eligibility Level"; also see Table 1 at Section II, Page 5; and Appendix A)
- (5) That the calculation of assistance be based on the actual customer bills, which includes fixed (customer charge) portion of utility bills and the variable (commodity charge) portion of energy bills. As is currently the case, supplementary fees or penalties would not be included. (Section I, Page 2; also see Appendix B)
- (6) Task a position in the Governor's Energy Office. (Section I, Pages 3 &4)
- (7) Provide provision for flexibility for the Welfare Division to designate additional funds for the Housing Division when this is jointly agreed between both Divisions. The level of activity across years should be sustained and not reduced, but slowly expanded as the UEC collection amount slowly grows. (Section VI, Page 17; Section VII, Pages 19 & 20)

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### **B. Welfare Division Recommendations**

- (1) The Welfare Division should move towards converting the positions that deal with energy assistance from contract worker status to Civil Service, providing opportunity for current staff to move to Civil Service where possible and consistent with Civil Service provisions and regulations. At least five of the positions should be converted. (Section VII, Page 14)
- (2) Based on the SFY 2003 implementation and performance, State Welfare Division should adequately fund development of the computer systems, taking a more client oriented approach to meeting the needs of LIHEA Program Manager and Officer. Programmers dedicated to LIHEA should be assigned or hired. (Section VII, Page 12)
- (3) That the Welfare Division Accounting section and the Commission re-establish the quarterly “true-up” meetings that existed at the start of the UEC collections because it has become apparent that there are very small differences between the numbers maintained by the Commission and the numbers maintained by the Welfare Accounting Section in DAWN. (Section V, Pages 8 & 9)
- (4) The Welfare unique identifier, the UPI Index<sup>133</sup>, and the utility account numbers (sometimes two) should be included in the download to Housing. With this information, the weatherized homes that also receive Welfare LIHEA program assistance can be easily identified for analysis. Housing should broaden the download criteria, below a FAC benefit of \$600.<sup>134</sup> (Section VI, Page 26)

### **C. Housing Division Recommendations**

- (1) There should be a staff of at least four people to oversee the WAP effort that would include two significant new positions; a Technical Officer and a Program Research Assistant. (Section VI, Pages 36 & 37)
- (2) Providing the weatherization work effort with access to a Housing Repair Fund that could cover necessary home repairs that would be outside the UEC guidelines. A significant problem encountered in the field installation effort is old rural homes that do not meet current architectural code. (Section VI, Page 17; Section VI, Page 45)

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<sup>133</sup> The UPI Index number is unique to the client and is used in all Welfare Division-programs where the client receives services.

<sup>134</sup> A Work Order was entered in March 2005 to include the recipient’s UPI and the utility account numbers in the automated monthly transfers. This will greatly facilitate evaluation data requests to the utilities.

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- (3) The per-home funding limit should be reviewed and raised if an additional designated fund for housing rehabilitation can be made available. In addition, the evaluation concurs with the Housing Division policy of implementing a control tool to cap weatherization dollars per home. (Section VI, Pages 16 & 17)
  - (4) Liability insurance should be created as a separate budget category, outside the administration category and cap. (Section VI, Page 18)
  - (5) A one-time audit of the subgrantees should be conducted to establish if the 10% administrative cap is realistic or should be changed. (Section VI, Page 18)
  - (6) A protocol should be set up so that all revisions include a cover page that lists all changes made, including the page number and section changed. (Section VI, Page 19)
  - (7) Each job done by Housing should have a unique number. (Section VI, Page 30)
  - (8) The utility account numbers that qualify the client for FEAC funded weatherization should be input on the form. This data was not required in SFY 03 and only exists in hard copy in the file, if at all. (Section VI, Page 30)
  - (9) Number fields in the forms filled by subgrantees should always be filled, even if it a 'zero' quantity. (Section VI, Page 30)
  - (10) The agencies should check the client application and BWR against the Housing list of clients with a fixed annual credit of \$600 or more before checking the high energy use box and/or using it to prioritize the order of weatherization jobs. (Section VI, Page 31)
  - (11) The BWR should be changed to allow more choices for siding and foundations, attic existing insulation levels, provide more spaces for notes, more standardized options for certain fields, have internal checks of inconsistent data and have a checkbox for 'combustion appliance present' to remind weatherization technicians to perform the appropriate tests (Section VI, Pages 31 & 32). *Note: Housing Division has pointed out that allowing more choices in BWR inputs for siding, etc. would not change the underlying energy savings calculations. That is, for the basic purpose of the BWR, finer choices are not relevant. Also, Housing Division notes that a technician has to know when they need to do a CAS test on a unit with a combustion appliance, so a check box would not be needed. These are good points. Accordingly, the evaluators will modify this recommendation as part of the SFY 2005 Evaluation to lower its priority. Rather than a recommendation that "the BWR*

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*should be changed,” we recommend that these items, including the possibly redundant checkbox, be considered the next time Housing Division does a systematic revision to the BWR.*

- (12) Demand-Side Management Funds should be developed and made available both as an energy use component and a separate demand component to this funding because the residential weatherization work creates both values for the utilities. (Section VI, Pages 45-46)
- (13) Screen doors often need to be replaced after work is done to a home, but it is not currently covered. If the screen door could be justified as an energy measure, the problem could be solved. However, since it is not, this cost would be an administrative need, that is, an addition to program overhead. (Section VI, Page 46)
- (14) The Housing Division should continue to work with stakeholders and advocates in the area of alternative energy sources. With the growing capability of community-based organizations, it may be that a way can be found to combine an organizational framework, and ownership framework, and a service capability to make these approaches completely workable. (Section VI, Pages 46-47)
- (15) Funding for Housing should be continued, and slowly increased over the years. The continuity of funding without “ups” followed by “downs” is important (Section VI, Page 47).

#### ***D. Evaluation Recommendations***

- (1) Modify the plan for evaluations to take account of the lag problem with parts of the analysis dependent on utility supplied customer information system data. This will mean that evaluation reporting will need to lag by one year, similar to the way that federal Weatherization Assistance Program reporting always lags by one to two years. Thus, the SFY 2004 evaluation report will contain the SFY 2003 quantitative analysis of utility consumption and energy savings data; the SFY 2005 evaluation report will contain the SFY 2004 analysis, and so on. (Section VI-38)
- (2) Modify the plan for evaluations to take account of constraints in the utility data systems. To work around the constraints, the evaluation for each State Fiscal Year should begin in December of that year, rather than the following July. The SFY 2005 evaluation would start in December 2004; the SFY 2006 evaluation would start in December 2005, and so on. (Section VI-39).

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- (3) The next evaluation (for SFY 2005) should resolve any residual problems of expenditure numbers reported by the Housing Division and the numbers in the DAWN system. The discrepancies are not large enough to result in any difference in substance in evaluation results but the source of these differences should be resolved (Section V-9, discussion of Line 39).

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