

**LIHEAP Data Integrity Case Study:  
Understanding Montana's Performance Measures Results for  
Propane-Heated Households**

The goal of the Performance Management Implementation Work Group's (PMIWG's) Data Reliability Project Team is to assist state grantees with identifying and conducting additional research and analysis to understand their Performance Measures data and results, including identifying specific data limitations, the impact of unique program design or implementation approaches, and other important details that aid correct interpretation of the data or require further research.

This case study will present an example of how Montana investigated findings from their FY 2016 Performance Measures results for propane-heated households.

**Montana's Propane Results: What the Data Showed**

While examining the FY 2016 data, Montana identified that their energy burden results for propane-heating households were lower than for any other fuel type, including households that heat with fuel oil. Table 1 shows Montana's FY 2016 data for propane and fuel oil main heat households. Although propane and fuel oil-heated households had similar average annual incomes, average annual energy bills, and average pre-LIHEAP energy burdens, the average annual total LIHEAP benefit for propane-heated households was \$415 less than the average benefit for fuel oil-heated households. As a result, propane-heated households had a higher average energy burden after LIHEAP and a lower percentage of their bill paid by LIHEAP compared to fuel oil-heated households.

**Table 1  
Montana Energy Burden Results for All Households with 12-months of Bill Data -  
Fuel Oil Households and Propane Households, FY 2016<sup>1</sup>**

	FY 2016	
	Fuel Oil	Propane
Annual Household Income	\$14,710	\$14,552
Total Residential Energy Bill	\$1,692	\$1,547
Average Burden before LIHEAP	12%	11%
<b>Total LIHEAP Benefit</b>	<b>\$1,045</b>	<b>\$630</b>
<b>Average Burden after LIHEAP</b>	<b>4%</b>	<b>6%</b>
<b>Percent of Bill Paid by LIHEAP</b>	<b>62%</b>	<b>41%</b>

<sup>1</sup> Reported in the *LIHEAP Performance Data Form* – Module 2, Section V, Part B.

Table 2 shows that these differences were more pronounced for Montana’s high burden propane households. Although the average energy burden before LIHEAP for high burden propane households was eight percentage points higher compared to that of high burden fuel oil households, high burden propane households still received a smaller average total LIHEAP benefit. As a result, high burden propane households had a nine-percentage point higher post-LIHEAP burden and a smaller percentage of their bill paid by LIHEAP compared to high burden fuel oil households.

**Table 2  
Montana Energy Burden Results for High Burden Households with 12-months of Bill Data -  
Fuel Oil Households and Propane Households, FY 2016<sup>2</sup>**

	FY 2016	
	Fuel Oil	Propane
Annual Household Income	\$9,088	\$6,386
Total Residential Energy Bill	\$1,978	\$1,881
Average Burden before LIHEAP	22%	30%
<b>Total LIHEAP Benefit</b>	<b>\$1,211</b>	<b>\$796</b>
<b>Average Burden after LIHEAP</b>	<b>8%</b>	<b>17%</b>
<b>Percent of Bill Paid by LIHEAP</b>	<b>61%</b>	<b>42%</b>

Montana also found that similar trends existed in their FY 2017 data for all propane main heat households and high burden propane main heat households.

### **Investigation and Analysis of the Data**

Montana worked with APPRISE to investigate Montana’s results for propane-heated households and address three questions the results raised:

1. How are propane benefit levels determined?
2. What role do actual propane prices play and how do prices vary over time?
3. Do results for different regions in Montana provide insight into the overall results?

#### *How are propane benefit levels determined?*

Montana determines baseline LIHEAP benefit levels for propane households each year based on projected propane prices for the upcoming winter heating season. The projected prices are calculated using data collected from an annual propane vendor survey, which collects information from a sample of Montana propane vendors each summer on their projected winter prices. Montana aggregates these to the regional level and uses them to estimate prices and to calculate the appropriate benefit level to reach burden reduction goals.

<sup>2</sup> Reported in the *LIHEAP Performance Data Form* – Module 2, Section V, Part C.

*What role do actual propane prices play and how do prices vary over time?*

Unlike other heating fuels, propane prices vary substantially across Montana. In the western portion of the state, propane prices can be as high as \$4 per gallon compared to prices below \$2 a gallon in the eastern portion of the state. In addition to variations across the state, prices can also change considerably year-by-year. This means that the Performance Measures data findings for propane households from one year may not be applicable for the following year due to large increases or decreases in heating costs.

*Do results for different regions in Montana provide insight into the overall results?*

APPRISE worked with Montana to do a regional analysis of the data to better understand the high costs and low benefits for propane households. Montana divided the state into three regions where propane prices differ substantially and used their data system to replicate the Performance Measures results separately for each of those regions.

The results of this analysis did not provide any clear explanations and instead raised additional questions. For example, the region with the lowest expected propane costs was found to have the highest energy expenditures. Overall, the results indicated that the projected propane prices are not a strong approximation for actual annual energy expenditures based on energy usage.

### **Findings and Next Steps**

Montana's use of propane price projections to calculate baseline benefit levels for households that heat with propane can result in benefit levels that do not align well with actual annual energy expenditures. Their Performance Measures data indicate that benefit levels for propane households were low compared to fuel oil households. Regional analysis indicated that differences in projected prices compared to actual expenditures can be dramatic.

Montana is considering two potential approaches to improve outcomes for propane households:

- Montana could use energy cost data from the previous year to determine benefit levels rather than projecting energy costs.
- Montana could look at actual energy expenditure data for each household when determining benefit levels.