

Fuel Costs in the Weatherization Assistant Setup Library

April 1, 2016

The costs of fuels need to be collected and entered into the Weatherization Assistant's Setup Library. The fuel cost entered for a fuel should be the cost associated with a unit of consumption of that fuel (e.g., the cost per kilowatt hour for electricity, the cost per therm for natural gas). Fuel cost data should not include any cost that does not depend on the per-unit consumption of the fuel, such as a fixed customer charge, meter charge, or franchise fee. For electricity and natural gas, the fuel cost should be the marginal cost associated with these fuels. The marginal cost is the cost associated with the last increment of fuel use that would be saved by installing weatherization measures. For example, if the cost of electricity was \$0.10/kWh for the first 300 kWh and \$0.09/kWh for any additional use, then the marginal cost would be \$0.09/kWh.

A good place to start in determining fuel costs is information provided by the US Energy Information Administration (EIA) on its web site (www.eia.gov). As a minimum, the fuel costs provided in this web site should serve as a reality check on the fuel costs collected. To obtain state average costs for natural gas, fuel oil, propane, electricity, and kerosene, follow the following directions:

- **Natural Gas** – Click on the “Sources and Uses” tab at the top of the page, “Natural Gas,” “Natural Gas Monthly” in the right-hand column, and then “Table 20: Average Price of Natural Gas Sold to Residential Consumers, by State.” Select “Residential Price” in the “Data Series” field, select “Annual” in the “Period” field, and then use the values in the row for your state.
- **Fuel Oil and Propane** – Click on the “Sources and Uses” tab at the top of the page, “Petroleum & Other Liquids,” the “Data” tab at the top of the page, “Prices,” and then “Weekly Heating Oil & Propane Prices.” Select your state in the “Area” field, and then select the “View History” link in the right-hand column for either the “Residential Heating Oil” or “Residential Propane” row. Only selected states and selected fuels in some states are available.
- **Electricity** – Click on the “Sources and Uses” tab at the top of the page, “Electricity,” the “Data” tab at the top of the page, “Sales (consumption), revenue, prices, & customers,” and then “Average Retail Prices of Electricity to Ultimate Consumers by end use sector and state back to 2001 (INTERACTIVE).” Scroll down and above the table on the right-hand side click on the “Annual” button. Use the scroll bar on the right-hand side of the table to find your state. Use the values in the Residential column for your state.
- **Kerosene** – Click on the “Sources and Uses” tab at the top of the page, “Petroleum & Other Liquids,” the “Data” tab at the top of the page, “Prices,” and then “Refiner Petroleum Product Prices by Sales Type.” Select your state in the “Area” field and “Annual” in the “Period” field. Use the “Sales to end users: Kerosene” row.

In addition to using the EIA web site, there are several other approaches to obtaining fuel cost data:

- Call the utility company or fuel provider directly to discuss the actual costs associated with consuming the fuel in question.
- Search the web site of the utility company or fuel provider to identify published fuel costs.

- Examine actual utility or fuel bills obtained from low-income clients whose homes have been weatherized to calculate fuel costs. If such bills are difficult to obtain, bills from local weatherization agency staff who live in the local area could also be used.

Obtaining accurate fuel cost data is not as easy as it might first appear. Two or even all three of the above methods should be used for each fuel to ensure that accurate cost data are collected. When collecting fuel cost data, keep in mind the following points:

- Deregulation of the natural gas industry led to two costs being associated with residential natural gas costs: the cost for the gas itself, and the cost associated with the distribution (i.e., the delivery or transportation) of the natural gas. Both of these costs are typically charged on a per-unit consumption basis, so the total cost needed for natural gas must include both components. The cost of natural gas quoted by a natural gas company representative or its web site is often the cost for only the gas itself because a separate “distribution” company handles and charges for the distribution of the gas (although for billing purposes both costs are usually listed on a customer’s monthly billing statement). So be careful to get the full or total cost for gas. On natural gas company web sites, both costs often can be found.
- Fuel oil, propane, and kerosene are usually sold by multiple companies within a weatherization agency’s service territory rather than just one or two regulated utility companies. Costs for these fuels should be obtained from several companies within a geographic region and averaged. Several of the larger companies may be selected, and/or the companies used most frequently by low-income families being served by the weatherization program may be selected.
- Natural gas and electricity are usually provided by major utility companies. Since only a few such utilities are generally in any given state, costs for each should be determined. If there are many such utilities in a location, especially if electricity is provided through rural co-ops, then only a sample may be needed.
- In states where most of the cost savings from weatherization in a typical home are obtained from a reduction in heating energy use, then the fuel cost data collected should represent the costs for these fuels during the winter. This will generally be the case in most states except perhaps Florida and the southern half of the most-southern states. In cooling-dominated climates, it may be best to use the cost of electricity for the summer.

Analysis of actual monthly utility bills is a good way to determine actual fuel costs, but the analysis must be performed correctly. Privacy can be maintained by marking over or removing the customer’s name, street address, account number, and other personal identification information. The name of the utility and the customer’s city should remain visible. For all fuels other than electricity, a bill for a winter month should be used because the higher fuel consumption and associated cost will improve the accuracy of the analysis. For electricity, a winter bill should be used if the cost of electricity associated with heating savings is desired, and a summer bill should be used if costs associated with air-conditioning are desired. The analysis of two sample utility bills is discussed below to demonstrate the analysis method to be followed to calculate fuel cost using the information provided on a utility bill.

Figure 1 is a sample electric bill for a weatherization client served by Utility A. Analysis of this bill would proceed as follows to calculate the marginal per-unit cost of electricity:

- The customer charge of \$10.00 is ignored because it is a fixed cost.
- The costs associated with the Energy Charge (\$25.66) and Fuel Charge (\$38.39) are directly dependent on the 669 kWh consumption for the month. On this bill, the unit costs for these two items are already provided (\$0.03835/kWh and \$0.05738/kWh, respectively). If they hadn't been provided, they could have been calculated by dividing \$25.66 and \$38.39, respectively, by 669 kWh.
- The costs associated with the Storm Restoration Charge and Storm Tax Credit include both a fixed cost of \$2.00 and \$1.00, respectively, and a per unit charge of \$0.00094/kWh and \$0.00058/kWh, respectively. Note that the Storm Tax Credit is a credit to the occupant, not a charge. The fixed costs for these two items will still be charged or credited to the occupant even if weatherization reduces the electricity consumption of the house; thus the fixed costs should not be included in the marginal cost for electricity. The per-unit charges and credit associated with these two items should be included in the marginal cost. If the fixed cost and per-unit costs associated with each item had not been documented on the bill, it would have been difficult to know if the total costs associated with these items (\$2.63 and \$1.37 credit, respectively) were fixed or dependent only on the 669 kWh consumption. In this case, an assumption would have to be made or, better, the utility would have to be called for clarification.
- It is unclear if the City Franchise Fee of \$1.51 is a fixed cost or a percentage of the Electricity Charges (the subtotal of the Customer Charge, Energy Charge, Storm Restoration Charge, and Storm Tax Credit). The \$1.51 is exactly 2% of the \$75.31 Electricity Charge (\$1.5062 rounds up to \$1.51), which strongly indicates that it is a percentage of the Electricity Charge, although the utility could be called for clarification. Thus, in determining the marginal cost for electricity, the per unit charges for the Customer Charge, Energy Charge, Storm Restoration Charge, and Storm Tax Credit should be multiplied by 1.02 to account for the City Franchise Cost that will be saved as the electricity consumption is reduced.
- Thus the marginal cost of electricity based on this monthly electric bill can be rounded to \$0.098/kWh for future analysis purposes ($\$0.03835/\text{kWh} + \$0.05738/\text{kWh} + \$0.00094/\text{kWh} - \$0.00058/\text{kWh} = \$0.09609/\text{kWh} \times 1.02 = \$0.098012/\text{kWh}$).

This is more involved than just taking the total amount billed the customer for the month (\$79.00) and dividing by the total consumption (669 kWh), which would have resulted in a cost of \$0.118087/kWh, because of fixed costs associated with some charges and the use of a Budget Account by the customer.

Figure 2 is another sample electric bill from a weatherization client served by Utility B. Analysis of this bill would proceed as follows to calculate the marginal per-unit cost of electricity:

- Electricity consumption for the month is calculated on the bill to be 2888 kWh.
- The rate schedule applicable to this bill is identified in the Meter Reading section of the bill to be LA_RS. Examination of this rate schedule on the utility's web confirmed that the Energy Charge of \$160.40 is related to the amount of electricity consumed for the month (2888 kWh) and thus should be included in the calculation of the marginal electricity cost. However, examination of the rate schedule also revealed that the Energy Charge includes a \$4.46 Customer Charge. Thus the per-unit cost for the Energy Charge is \$0.053996/kWh ($\$160.40 - \$4.46 = \$155.94 \div 2888 \text{ kWh} = \$0.053996/\text{kWh}$).
- As indicated on the bill, the Fuel Adjustment and Environmental Adjustment costs of \$94.08 and \$0.03 are directly related to the month's electricity consumption. Their per-unit costs are listed on the monthly bill as \$0.03257/kWh and \$0.000012/kWh, respectively. If these per-unit costs had not been listed on the bill, they could have been calculated by dividing their cost by 2888 kWh, although it would have been hard to determine if they were per-unit costs or fixed costs without consulting the utility or the utility website.
- By reviewing a line item explanation for a sample bill on the utility website, four of the entries listed on the bill were interpreted to be fixed costs independent of the actual kilowatt electricity consumption for the month: Louisiana PSC Case Credit, Hurricane Offset Charge, Municipal Franchise Fee, and LURC Hurricane Charge (even though this charge is listed as being 10.2877% of some unknown quantity). Therefore, these costs should not be included in the calculation of the marginal cost of electricity.
- The marginal electric cost based on this bill is \$0.086578/kWh, which could be rounded to \$0.087/kWh for future analysis purposes ($\$0.053996/\text{kWh} + \$0.03257/\text{kWh} + \$0.000012/\text{kWh} = \$0.086578/\text{kWh}$).

Again, this is more involved than just taking the total amount billed the customer for the month (\$55.08) and dividing by the total consumption (2888 kWh), which would have resulted in a unit cost of just \$0.019072/kWh because of fixed costs associated with some of the cost items, an Assistance Payment of \$200, and a small difference between the Previous Balance and the Payment Received.

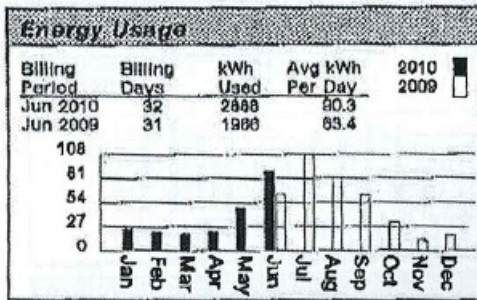
Billing Detail

Rate Code	Meter Number	Days	Read Date	Previous Reading	Current Reading	Read Code	Unit Type	Multiplier	Units Used
100	058804072	30	06/04/09	37590	38259		KWH		669

Billing Charges

Rate Code	Description	Units Used	Charges
100	CUSTOMER CHARGE		\$10.00
	ENERGY CHARGE (\$0.03835 PER KWH)	669	\$25.88
	FUEL CHARGE (\$0.05738 PER KWH)	669	\$38.38
	STORM RESTORATION CHARGE (\$2.00 + \$0.00094 PER KWH)	669	\$2.63
	STORM TAX CREDIT (\$1.00 + \$0.00058 PER KWH)	669	\$1.37CR
ELECTRICITY CHARGES			\$75.31
	CITY FRANCHISE FEE		\$1.51
New Charges			\$78.82
Budget Account Balance		\$45.88	Budget Amount Due
BALANCE FORWARD			\$79.00
Total Due Now			\$79.00
Amount Due After June 25, 2009			\$82.95

Figure 1. Sample electric bill from Utility A.



Account Summary for		
Account # 70488063	Mail Date 06/25/2010	QPC 07000
Invoice # 15002673820		Cycle 18
Amount Due by 07/19/2010		\$55.06
Amount Due after 07/19/2010		\$88.15

Important Messages

Real-Time Payment Options:
 - My Account Online at entergy.com
 - By Phone at 800-584-1241 for a small fee

Worry Free, Clutter Free, Postage Free.... Go PaperFREE! Sign up on My Account Online at entergy.com.

Reduce your summer bill with Level Billing and pay about the same amount each month. Find out your Level Billing amount today on My Account Online at entergy.com.

Please add \$1 to total bill amount for The Power to Care. Learn more at entergy.com.

Account Detail	
Previous Balance	136.05
Payment Received (06/20/2010)	-141.80
Assistance Payment (06/04/2010)	-200.00
Remaining Balance	-\$206.75

Current Charges	
Energy Charge	160.40
Louisiana PSC Case Credit	-3.57
Hurricane Offset Charge @ -4.1747%	-5.76
Fuel Adjustment 2888 kWh @ \$0.03257	94.08
Environmental Adjustment 2888 kWh @ \$0.000012	.03
Municipal Franchise Fee	2.45
Total Metered Charges	\$247.61
LURC Hurricane Charge @ 10.2877%	14.20
Current Month Energy Charges	\$261.81
Total Amount Due	\$55.06

Meter Reading	
Meter # 880588	Rate : LA_RS
Total Days (32)	
Current Meter Reading (06/21/2010)	39597
Previous Meter Reading (05/20/2010)	- 36709
kWh Metered	2888

Figure 2. Sample electric bill from Utility B.