LIHEAP ALLOCATION FORMULA
Description of Columns in the Formula Database

ATTACHMENT C

The following provides a summary of each of the columns in the FY 2012 LIHEAP formula database.

Column	Variable Name and Description
A	**List of States**

B   **Census Regions**

States are assigned to census regions based on information from the Bureau of the Census. States are in one of four regions, the Northeast (1), Midwest (2), South (3), or West (4).

C   **Heating AIA Zone**

The National Oceanic and Atmospheric Administration (NOAA) assigns states to weather zones, or AIA zones, based on heating degree days (HDDs).

D   **Cooling AIA Zone**

Same as Column C. NOAA assigns states to AIA zones based on cooling degree days (CDDs).

E   **Total HDDs – 2008**

Total heating degree days (HDDs) for calendar year 2008, as reported by the National Climatic Data Center's Historical Climatology Series 5-1. These data are available for free for all States other than Alaska and Hawaii at: http://www.ncdc.noaa.gov/oa/documentlibrary/hcs/hcs.html#51updates

For Alaska and Hawaii, it can be purchased at http://cdo.ncdc.noaa.gov/ancsum/ACS

F   **State 30-Yr Norm – HDDs – 1971-2000**

The 30-year average of HDDs, by state, as reported by NOAA. These data are available for free for all States other than Alaska and Hawaii at: http://cdo.ncdc.noaa.gov/climatenormals/hcs/HCS_51.pdf

For Alaska and Hawaii, it can be purchased at http://cdo.ncdc.noaa.gov/ancsum/ACS

COAL (CO) — Columns G through N

G   **SEDS 08– Coal (CO) – Million BTUs**

Residential coal consumption in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www.eia.gov/state/seds/seds-data-complete.cfm; the link to the raw data is at "Data Files (1960 – 2009) → Consumption in Btu", under the heading "Consumption Estimates"

H	**State 2005 – FO – % Heat**

Using the 2005 Residential Energy Consumption Survey (RECS) micro dataset, information is developed on the percent of fuel used for heating and cooling in each Census Region (region) and AIA Zone (zone) for fuel oil (FO), natural gas (NG), electricity (EL) for both heating and cooling, kerosene (KE), and liquefied petroleum gas (LPG), as shown in Table 17 for % heat and in Table 19 for % cool.

The 2005 RECS public use micro dataset available at: http://www.eia.gov/emeu/RECS/recspubuse05/pubuse05.html.

These percentages are adjusted to the state level using:

- percent of BTUs used for heating and cooling in the region/AIA zone (Tables 17 and 19)
- number of HDDs and CDDs in the region/AIA zone (Table 18)
- HDDs/CDDs for the state (columns E and BM).

The number of HDDs and CDDs in the region/AIA zone is also calculated using the 2005 RECS Microdata. RECS furnishes consumption data, providing the percent of BTUs used for space heating and cooling for all households for all fuel types by region and weather zone. [NOTE: This gives us the information needed later to determine low income consumption.]

RECS does not provide information on coal. Believing that the percent of coal used for heat is similar to fuel oil (FO), we used the fuel oil percentage from RECS for calculating the percentage of coal used for heat in each state.

Using Maine (ME) as an example, we note in Table 17 that Maine is in Region 1, AIA zone 1. It shows that 83.81 percent (0.8381) of the total BTUs in the region/AIA zone are used for fuel oil heat. The average HDDs for Region 1, AIA zone 1 (Table 18) is 7756. [NOTE: If a state is colder than the average for the region/AIA zone, it will use a higher percent of the total BTUs in the region/AIA zone for heat.]

$$\frac{7786 \text{ (Maine 2008 HDDs, col E, line 29)}}{7756 \text{ (region/AIA HDDs)}} = \frac{x}{0.8381 \text{ (ratio of FO heat for-region/AIA)}}$$

The "x" represents the percent of total average FO BTUs in the region/AIA zone for heat in the state of Maine. We use the following formula, or % heat equation, to get the % of BTUs in Maine for fuel oil heat. (NOTE: x= (0.8381*7786)/7756, which is the numerator of the equation below.]

$$\frac{(\; 0.8381 \underset{\text{\% heat – FO – region/AIA}}{*} \; \underset{\text{Maine HDDs (col E)}}{7786} \;)\; / \; \underset{\text{HDDs in region/AIA}}{7756}}{(\; 1 - 0.8381\;)\; + \; (\; 0.8381\; x\; 7786\;)\; /\; 7756}$$

% nonheat portion	formula in numerator of this equation

The result, 0.8386 is the percentage of FO BTUs used for heat in Maine in 2005. The formula for Maine, column H, line 29, reads:

= ((0.8381*$E29)/7756)/((1-0.8381)+(0.8381*$E29)/7756)

I   **2008 – All Coal Heaters**

This information is developed from the 2007-2009 American Community Survey (ACS) Public Use Microdata Sample (PUMS) data, available at: http://factfinder.census.gov/home/en/acs_pums_2009_3yr.html

J   **2008 – Low Income Coal Heaters**

This information is developed from the 2007-2009 American Community Survey (ACS) Public Use Microdata Sample (PUMS) data. "Low income" refers to households with income at or below the Federal maximum LIHEAP eligibility standard (i.e., the greater of 150 percent of the poverty income guidelines and 60 percent of State median income).

K   **2005 Average BTUs – LOTOALL – FO – by Region**

This factor considers the ratio of low income heating/cooling consumption to heating/cooling consumption for all households in the region (LOTOALL). The LOTOALL is derived from information in the 2005 RECS report- (Tables 4 and 5), developed from the 2005 RECS microdata . Recognizing that average low income consumption may differ from average consumption by all households, we adjusted estimated consumption by dividing the average low income consumption by the average consumption of all households for each census region. RECS provides information on percent of households using major types of heating fuels for all households, low income households, and LIHEAP recipient households. From this information, we are able to determine the LOTOALL factor for each state.

For coal, we use the fuel oil (FO) figures in Table 4 of the RECS report (see explanation for column H, above). Using Maine (ME) as an example, we note that Maine is in Region 1/Northeast. The average low income consumption for FO is 86.3 and the average consumption for all households is 94.4 percent. The formula factor for Maine, line 29, reads:

=86.3/94.4.

The result is a LOTOALL factor of 0.914194915 for coal for Maine and the other states in Region 1/Northeast.

L   **MBTUs CO – For Heat – Normal Year – Low Income**

The description for column L applies to all heating fuels except wood. This represents the number of BTUs (in millions) used from coal that are used for heat in a normal year by low income households. This estimate is obtained by multiplying five (5) factors:

- total residential coal consumption in 2008, by state (mBTUs, column G);
- the factor "normalizing" heating consumption based on the 30-year average of HDDs (column F divided by column E);
- percent of coal used for heat adjusted to the state level and to 2008 (% heat, column H);
- percent of coal heater households that are low income (column J divided by column I); and
- the factor considering the ratio of low income heating consumption to heating consumption for all households in the region (LOTOALL, column K).

Using Maine as an example, the formula in column L, line 29, reads:

=G29*(F29/E29)*H29*(J29/I29)*K29.

M   **Price – Coal – (Nominal $ /Million BTU) – 2008**

The most recent information on prices for each fuel, by state, was obtained from EIA's web page, All States by End-Use Sector. The page's URL is: http://www.eia.gov/state/seds/seds-data-complete.cfm; the link to the raw data is at "Data Files (1960 – 2009) → Prices", under the heading "Price and Expenditure Estimates."

N   **Expenditures – Low Income – Normal Year – Coal**

The number of BTUs for coal (column L) is multiplied by the average price for coal in each state (column M) to obtain the estimated total fuel expenditures by low income households for coal heating in a normal year (in dollars).

Using Maine as an example, the formula in column N, line 29, reads:

=L29*M29.

NATURAL GAS (NG) — Columns O through V

O   **SEDS 08– Natural Gas (NG) – Million BTUs**

Residential natural gas consumption in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www.eia.gov/state/seds/seds-data-complete.cfm; the link to the raw data is at "Data Files (1960 – 2009) → Consumption in Btu", under the heading "Consumption Estimates"

P   **State 2005 – NG – % HEAT**

See description for column H. That information also applies to natural gas.

Q   **2008 – All NG Heaters**

See description for column I. That information also applies to natural gas.

R   **2008 – Low Income NG Heaters**

See description for column J. That information also applies to natural gas.

S   **2005 – Average BTUs – LOTOALL – NG – by Region**

See description for column K. That information also applies to natural gas.

Using California (CA) as an example, we note that California is in Region 4/West (Table 4). The average low income consumption for NG is 28 and the average consumption for all households is 29.8. The formula factor for California, line 14, reads:

=28/29.8.

The result is a LOTOALL factor of 0.939597315 for natural gas for California and the other states in Region 4/West.

T   **MBTUs NG – For Heat – Normal Year – Low Income**

See description for column L. That information also applies to natural gas.

Using California as an example, the formula in column T, line 14, reads:

=O14*(F14/E14)*P14*(R14/Q14)*S14.

U   Price – Natural Gas – (Nominal $ / Million BTU) – 2008

See description for column M. That information also applies to natural gas.

V   Expenditures – Low Income – Normal Year – NG

The number of BTUs for natural gas (column T) is multiplied by the average price for natural gas in each state (column U) to obtain the estimated total fuel expenditures by low income households for natural gas heating in a normal year (in dollars).

Using California as an example, the formula in column V, line 14, reads:

=T14*U14.

FUEL OIL (FO) — Columns W through AF

W   SEDS 08– Fuel Oil (FO) – Million BTUs

Residential fuel oil consumption in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www.eia.doe.gov/states/_ seds.html; the link to the raw data is under the heading "Data Files, All States and All Years."

X   Multi-Unit FO / Other FO

The multi-unit figures are derived from the 2005 RECS micro dataset, in a 2005 RECS tabulation, weighted, titled "RECS 2005, Households Using Fuel Main Heat, % Living in 5+ Unit Dwellings vs. Those Living in Other Dwellings, WEIGHTED."

The table shows the number and percent of households heating with fuel oil, by region, by type of housing unit (i.e., those living in buildings with five (5) or more residential units and those living in all other types of units).

The "multi-unit fuel oil factor" was calculated for each region by dividing the percent of households living in buildings with five (5) or more residential units by the percent of those living in other types of units.

Y   SEDS 05 – FO – Enhanced

Fuel oil consumption omits consumption by households in buildings with five (5) or more units. Therefore, we have to enhance (i.e., increase) the fuel oil consumption by such households.

Information is obtained from the 2005 RECS report (Table 16), weighted, using the 2005 RECS micro dataset. A percentage, otherwise known as the "multi-unit fuel oil factor", is derived by dividing the mean annual BTU consumption of fuel oil for multi family units by the mean for all other units, for all U.S. households (low income and non-low income). The multi-unit fuel oil factor/percentage for 2005 is 105.66 percent.

The first step in determining multi-unit consumption is based on the factor obtained in column X for each state. This factor is multiplied by 1.0566, and the resulting number is then multiplied by the fuel oil consumption figure in column W. Finally, that number is

added to the amount in column W to obtain the enhanced consumption of fuel oil for each state.

Using Illinois as an example, the formula in column Y, line 23 reads:

$$=W23+ ((X23*1.0566)*W23).$$

Z　　　**State 2005 – FO – % HEAT**

See description for column H. The information described for coal also applies specifically to fuel oil.

AA　　　**2008 – All FO-KE Heaters**

See description for column I. That information also applies to fuel oil. Census provides a combined household figure for fuel oil (FO) and kerosene (KE) heaters.

AB　　　**2008 – Low Income FO-KE Heaters**

See description for column J. That information also applies to fuel oil. Census provides a combined household figure for fuel oil (FO) and kerosene (KE) heaters.

AC　　　**2005 – Average BTUs – LOTOALL – FO – by Region**

See description for column K. That information also applies to fuel oil.

Using Illinois (IL) as an example, we note that Illinois is in Region 2/North Central (Table 4). The average low income consumption for FO is 85.7 and the average consumption for all households is 77. The formula factor for Illinois, line 23, reads:

$$=85.7/77.$$

The result is a LOTOALL factor of 1.112987013 for fuel oil for Illinois and the other states in Region 2/North Central.

AD　　　**MBTUs FO – For Heat – Normal Year – Low Income**

See description for column L. That information also applies to fuel oil, except that total residential fuel oil consumption from the SEDS is enhanced to reflect consumption by multi-unit households.

Using Illinois as an example, the formula in column AD, line 23, reads:

$$=Y23*(F23/E23)*Z23*(AB23/AA23)*AC23.$$

AE　　　**Price – Fuel Oil – (Nominal $/Million BTU) – 2005**

See description for column M. That information also applies to fuel oil.

AF　　　**Expenditures – Low Income – Normal Year – FO**

The number of BTUs for fuel oil (column AD) is multiplied by the average price for fuel oil in each state (column AE) to obtain the estimated total fuel expenditures by low income households for fuel oil heating in a normal year (in dollars).

Using Illinois as an example, the formula in column AF, line 23 reads:

$$=AD23*AE23.$$

AG   **SEDS 08– Fuel Oil (KE) – Million BTUs**

Residential kerosene consumption in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www .eia.doe.gov/states/_seds.html; the link to the raw data is under the heading "Data Files, All States and All Years."

AH   **State 2005 – KE – % HEAT**

See description for column H. That information also applies to kerosene.

AI   **2008 – All FO-KE Heaters**

See description for column I. That information also applies to kerosene. ACS provides a combined household figure for fuel oil (FO) and kerosene (KE) heaters.

AJ   **2008 – Low Income FO-KE Heaters**

See description for column J. That information also applies to kerosene. ACS provides a combined household figure for fuel oil (FO) and kerosene (KE) heaters.

AK   **2005 – Average BTUs – LOTOALL – KE – by Region**

See description for column K. That information also applies to kerosene.

Using Massachusetts (MA) as an example, we note that Massachusetts is in Region 1/Northeast (Table 4). The average low income consumption for kerosene is 14.4 and the average consumption for all households is 15.7. The formula factor for Massachusetts, line 31, reads:

=14.4/15.7.

The result is a LOTOALL factor of 0.917197452 for kerosene for Massachusetts and the other states in Region 1/Northeast.

AL   **MBTUs KE – For Heat – Normal Year – Low Income**

See description for column L. That information also applies to kerosene.

Using Massachusetts as an example, the formula in column AL, line 31, reads:

=AG31*(F31/E31)*AH31*(AJ31/AI31)*AK31.

AM   **Price – Kerosene – (Nominal $ / Million BTU) – 2008**

See description for column M. That information also applies to kerosene.

AN   **Expenditures – Low Income – Normal Year – KE**

The number of BTUs for kerosene (column AL) is multiplied by the average price for kerosene in each state (column AM) to obtain the estimated total fuel expenditures by low income households for kerosene heating in a normal year (in dollars).

Using Massachusetts as an example, the formula in column AN, line 31, reads:

=AL31*AM31.

LIQUEFIED PETROLEUM GAS (LPG) — Columns AO through AV

AO **SEDS 08– LPG – Million BTUs**

Residential LPG consumption in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www.eia.doe.gov/states/_ seds.html; the link to the raw data is under the heading "Data Files, All States and All Years."

AP **State 2005 – LPG – % HEAT**

See description for column H. That information also applies to LPG.

AQ **2008 – All LPG Heaters**

See description for column I. That information also applies to LPG.

AR **2008 – Low Income LPG Heaters**

See description for column J. That information also applies to LPG.

AS **2005 – Average BTUs – LOTOALL – LPG – by Region**

See description for column K. That information also applies to LPG.

Using Ohio (OH) as an example, we note that Ohio is in Region 2/North Central (Table 4). The average low income consumption for LPG is 54.1 and the average consumption for all households is 63.1. The formula factor for Ohio, line 45, reads:

=54.1/63.1.

The result is a LOTOALL factor of 0.857369255 for LPG for Ohio and the other states in Region 2/North Central.

AT **MBTUs LPG – For Heat – Normal Year – Low Income**

See description for column L. That information also applies to LPG.

Using Ohio as an example, the formula in column AT, line 45, reads:

=AO45*(F45/E45)*AP45*(AR45/AQ45)*AS45.

AU **Price – LPG – (Nominal $ / Million BTU) – 2008**

See description for column M. That information also applies to LPG.

AV **Expenditures – Low Income – Normal Year – LPG**

The number of BTUs for LPG (column AT) is multiplied by the average price for LPG in each state (column AU) to obtain the estimated total fuel expenditures by low income households for LPG heating in a normal year (in dollars).

Using Ohio as an example, the formula in column AV, line 45, reads:

=AT45*AU45.

ELECTRICITY (EL) Heating — Columns AW through BD

AW   **SEDS 08– Electricity (EL) – Million BTUs**

Residential electricity consumption (combined heating and cooling) in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www.eia.doe.gov/states/_seds.html; the link to the raw data is under the heading "Data Files, All States and All Years."

AX   **State 2005 – EL – % HEAT**

See description for column H. That information also applies to electricity.

AY   **2008 – All EL Heaters**

See description for column I. That information also applies to electricity.

AZ   **2008 – Low Income EL Heaters**

See description for column J. That information also applies to electricity.

BA   **2005 – Average BTUs – LOTOALL – EL – by Region**

See description for column K. That information also applies to electricity.

Using Tennessee (TN) as an example, we note that Tennessee is in Region 3/South (Table 4). The average low income consumption for EL is 6.4 and the average consumption for all households is 7.5. The formula factor for Tennessee, line 52, reads:

=6.4/7.5.

The result is a LOTOALL factor of 0.853333333 for electricity for heating for Tennessee and the other states in Region 3/South.

BB   **MBTUs EL – For Heat – Normal Year – Low Income**

See description for column L. That information also applies to electricity.

Using Tennessee as an example, the formula in column BB, line 52, reads:

=AW52*(F52/E52)*AX52*(AZ52/AY52)*BA52.

BC   **Price – EL – (Nominal $ / Million BTU) – 2008**

See description for column M. That information also applies to electricity.

BD   **Expenditures – Low Income – Normal Year – EL-Heat**

The number of BTUs for electricity (column BB) is multiplied by the average price for electricity in each state (column BC) to obtain the estimated total fuel expenditures by low income households for electricity heating in a normal year (in dollars).

Using Tennessee as an example, the formula in column BD, line 52, reads:

=BB52*BC52.

WOOD — Columns BE through BJ

BE **Mean Wood Consumption – Normal Year**

From the 2005 RECS report (Table 18) and information in a 2005 RECS tabulation, from the 2005 RECS micro dataset, titled "RECS 2005, Consumption of Wood by Region and AIA Zone," we obtain the mean wood consumption in a normal year for all households in each state, by region and AIA (weather) zone.

Using Connecticut (CT) as an example, we see from the tabulation that the state is in the northeast region, AIA zone 2, with a factor of 2.68. The 2.68 represents the average number of cords consumed by all households in this region/AIA zone. This figure is then "normalized" by dividing the 30-year HDD norm for each state – CT is 6068 (column F) – by the HDDs in the region/AIA zone – CT is 6123 (Table 18). The formula for CT in column BE, line 16, reads:

=2.68*(F16/6123).

BF **2008 – Low Income Wood Heaters**

See description for column J. That information also applies to wood.

BG **Cords / Low Income – Normal Year**

To determine wood consumption for low income households in a normal year, we multiply the mean wood consumption (column BE) by the number of low income wood heaters (column BF).

Using Connecticut as an example, the formula in column BG, line 16, reads:

=BE16*BF16.

BH **2005 – Wood – LOTOALL Factor**

This factor considers the ratio of low income wood consumption to wood consumption for all households in the region (LOTOALL). The LOTOALL factor for wood is derived from information in two 2005 RECS tabulations, "RECS 2005, Consumption of Wood by Region and AIA Zone" and "RECS 2005, Consumption of Wood by Region and AIA Zone, All Income Households Using Wood."

Using Connecticut (CT) as an example, we see from the latter-noted tabulation that the state is in the northeast region, AIA zone 2, with a factor of 3.18. The 3.18 represents the average number of cords consumed by all low income households in this region/AIA zone. The figure is divided by 2.68 (see description for column BE), to obtain the LOTOALL factor for the region/AIA zone. The formula for CT in column BH, line 16, reads:

=3.18/2.68.

The result is a LOTOALL factor of 1.186567164 for wood for CT.

BI   **2005 – MBTUs Wood – Normal Year – Low Income**

We multiply the wood consumption for low income households in a normal year (column BG) by the LOTOALL factor (column BH); further, this result is multiplied by the wood conversion factor of 20 (furnished by DOE/EIA). This gives us the consumption figure (in MMBtus) for low income wood heaters in a normal year for each state.

Using Connecticut as an example, the formula in column BI, line 16, reads:

   =BG16*BH16*20.

BJ   **Expenditures – Wood**

The most recent information on the average cost of wood in the U.S. was obtained from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The URL for the SEDS home page is: http://www.eia.doe.gov/states/_seds.html.

[NOTE: The URL for the web page containing this report is: http://www.eia.doe.gov/states/sep_sum/html/pdf/sum_pr_res.pdf.]

We multiply the consumption for low income wood heaters in a normal year (column BI) by the national average price per MMBtu of wood in 2008, which is 10.93. The amount represents the estimated total fuel expenditures by low income households for wood heating in a normal year (in dollars).

Using Connecticut as an example, the formula in column BJ, line 16, reads:

   =BI16*10.93.

BK   **Total Expenditures – HEAT**

This column is the combined total heating expenditures for the preceding fuels: coal (column N), natural gas (column V), fuel oil (column AF), kerosene (column AN), LPG (column AV), electricity for heat (column BD), and wood (column BJ).

Using New York as an example, the formula in column BK, line 42, reads:

   =N42+V42+AF42+AN42+AV42+BD42+BJ42.

ELECTRICITY (EL) Cooling — Columns BL through BU

BL   **SEDS 08– Electricity (EL) – Million BTUs**

Residential electricity consumption (combined heating and cooling) in 2008, by state, in million BTUs, based on information from the Energy Information Administration's (EIA) State Energy Consumption, Price, and Expenditure Estimates (SEDS). The page's URL is: http://www.eia.doe.gov/states/_seds.html; the link to the raw data is under the heading "Data Files, All States and All Years."

This is the same information as is contained in column AW for electricity for heating.

BM   **Total CDDs – 2008**

Total cooling degree days (HDDs) for calendar year 2008, as reported by the National Climatic Data Center's Historical Climatology Series 5-2. These data are available for

free for all States other than Alaska and Hawaii at: http://www.ncdc.noaa.gov/oa/ documentlibrary/hcs/hcs.html#52updates

For Alaska and Hawaii, it can be purchased at http://cdo.ncdc.noaa.gov/ancsum/ACS

BN   **State 30-Year Norm – CDDs – 1971-2000**

The 30-year average of CDDs, by state, as reported by NOAA. These data are available for free for all States other than Alaska and Hawaii at: http://cdo.ncdc.noaa.gov/ climatenormals/hcs/HCS_52.pdf

For Alaska and Hawaii, it can be purchased at http://cdo.ncdc.noaa.gov/ancsum/ACS

BO   **State 2005 – EL – % COOL**

See description for column H. That information also applies to electricity. [NOTE: RECS Tables 18 and 19 apply to cooling.]

BP   **2005 Average BTUs – LOTOALL – EL – Cooling by Region**

See description for column K. That information also applies to electricity. [NOTE: RECS Table 5 applies specifically to cooling.]

Using Florida (FL) as an example, we note that FL is in Region 3/South. The average low income consumption for EL is 11.2 and the average consumption for all households is 14.1. The formula factor for FL, line 19, reads:

=11.2/14.1.

The result is a LOTOALL factor of 0.794326241 for electricity for cooling for Florida and the other states in Region 3/South.

BQ   **2008 – Low Income Households**

This information is developed from the 2007-2009 American Community Survey (ACS) Public Use Microdata Sample (PUMS) data.

BR   **2008 – Total Households**

This information is developed from the 2007-2009 American Community Survey (ACS) Public Use Microdata Sample (PUMS) data.

BS   **MBTUs EL – For Cool – Normal Year – Low Income**

This column displays the number, in millions of BTUs, used for electricity for cooling in a normal year by low income households. This number is obtained by multiplying five (5) factors:

- total residential electricity consumption in 2008 by state (mBTUs, column BL);
- the factor "normalizing" cooling consumption based on 30-year average of CDDs (column BN divided by column BM);
- percent of electricity used for cooling adjusted to the state level and for 2008 (% cool, column BO);
- the factor considering the ratio of low income cooling consumption to cooling consumption for all households in the region (LOTOALL, column BP); and

- the percent of low income households in each state (column BQ divided by column BR)

Using Florida as an example, the formula in column BS, line 19, reads:

=BL19*(BN19/BM19)*BO19*BP19*(BQ19/BR19).

BT   **Price – EL – (Nominal $ / Million BTU) – 2008**

See description for column M. That information also applies to electricity. The state prices in this column are the same as those listed under column BC, electricity for heat.

BU   **Expenditures – Low Income – Normal Year – EL – Cool**

The number of BTUs for electricity for cooling (column BS) is multiplied by the average price for electricity in each state (column BT) to obtain the estimated total electricity expenditures by low income households for cooling in a normal year (in dollars).

Using Florida as an example, the formula in column BU, line 19, reads:

=BS19*BT19.

BV   **Expenditures – Heat + Cool**

This column sums the total heating expenditures for all fuels (column BK) and the total cooling expenditures for electricity (column BU) to obtain the estimated total expenditures for all fuels, heating and cooling, by low income households in a normal year (in dollars). Using Alabama as an example, the formula in column BU, line 10, reads:

=BK10+BU10.

BW   **New Formula Factors**

Each state's share, expressed as a factor, of the total of all states' heating and cooling expenditures (total at the bottom of column BV). Using Alabama as an example, the formula in column BW, line 10, reads:

=BV10/BV62

BX   **Percent of Home Energy Expenditures**

Each state's share of the total of all states' heating and cooling expenditures (column BW) expressed as a percentage. This is the allotment percentage for each state under the "new formula" before applying the hold harmless provision.