

# Energy Evaluation Worksheet

## Step 1: Determining your household consumption and the Base and HVAC load

Column 1	Column 2	Column 3	Column 4
Month	Total Consumption	Base Load: From calculation below	HVAC Load: Total Consumption - Base Load
<b>Totals: add all 12</b>			

**Base load calculation:** Find the two lowest total consumption numbers from column 2. Add them together and divide by 2. This is your approximate Base load. Place that number in each cell in column 3, except the last cell (total cell).

$$\frac{\text{lowest from column 2}}{\text{lowest from column 2}} + \frac{\text{next lowest from column 2}}{\text{next lowest from column 2}} = \frac{\text{total}}{\text{total}} \div 2 = \frac{\text{monthly base load for column 3}}{\text{monthly base load for column 3}}$$

**HVAC Load calculation:** For each month, subtract the Base load from total consumption (Column 2 - Column 3). This is the approximate amount of energy used for heating and cooling that month (Column 4). If the number is negative, put it in anyway, you'll need that for your total. Sometimes it can be negative.

**Totals:** Add all 12 months up in each column. These are the annual usages for each column.

## Step 2: Determining your energy costs and where your money is going

**Calculate your electricity rate:** From your 12-Month Billing and Usage Chart, divide the total \$ Amount of FPL Bills by total KWH Used to determine your electric rate.

$$\frac{\text{total current electric charges}}{\text{total current electric charges}} \div \frac{\text{kwh consumption}}{\text{kwh consumption}} = \$ \frac{\text{rate for electricity (\$/kwh)}}{\text{rate for electricity (\$/kwh)}}$$

**Calculating annual costs:** Multiply the total consumption values by the electric rate you pay. This is your total annual cost, your annual cost for heating and cooling and your annual cost for base loads.

$$\begin{aligned} &\frac{\text{total from column 2}}{\text{total from column 2}} \times \frac{\text{rate}}{\text{rate}} = \$ \frac{\text{total annual cost}}{\text{total annual cost}} \\ &\frac{\text{total from column 3}}{\text{total from column 3}} \times \frac{\text{rate}}{\text{rate}} = \$ \frac{\text{annual cost for base load}}{\text{annual cost for base load}} \\ &\frac{\text{annual cost for base load}}{\text{annual cost for base load}} \div 12 = \$ \frac{\text{monthly cost for base load}}{\text{monthly cost for base load}} \\ &\frac{\text{total from column 4}}{\text{total from column 4}} \times \frac{\text{rate}}{\text{rate}} = \$ \frac{\text{annual cost for heating and cooling}}{\text{annual cost for heating and cooling}} \end{aligned}$$

**Calculate the ratio for heating and cooling:** Divide the total for HVAC from column 4 by the total annual consumption from column 2. This will give you the percentage of your total usage that goes to heating and cooling the home.

$$\frac{\text{total from column 4}}{\text{total from column 4}} \div \frac{\text{total from column 2}}{\text{total from column 2}} = \frac{\text{decimal \#}}{\text{decimal \#}} \times (100) = \frac{\text{percent for HVAC}}{\text{percent for HVAC}} \%$$

## Step 3: Building envelope inspection

**Air leakage inspection:** Inspect the home for places that can allow air to travel freely from inside the home to outside of the home and write down where those places are.

**Inspect and measure the attic insulation:** Go into the attic and measure the depth and overall quality of the insulation.

$$\frac{\text{insulation depth in inches}}{\text{insulation depth in inches}} \times \frac{\text{effective R-value per inch}}{\text{effective R-value per inch}} = \frac{\text{R-value}}{\text{R-value}}$$

### Step 4: HVAC system inspection

$$\frac{\text{return temperature}}{\text{supply temperature}} - \frac{\text{supply temperature}}{\text{supply temperature}} = \frac{\text{differential temperature}}{\text{supply temperature}} \quad (\text{should be } 14\text{-}22 \text{ degrees})$$

### Step 5: Checking for temperature and humidity variations

Use the Hygro-Thermometer to measure temperature and humidity levels throughout the home.

### Step 6: Finding out where base loads are going

**Water heating:** Assume 20% of base load for one person and 5% for each additional person in the household. So, for a family of two it would be 25% and for a family of four it would be 35%.

$$\frac{\text{number of people} \times 5 + 15}{\text{household \%}} = \frac{\text{monthly base load}}{100} = \text{decimal \#} \times \text{monthly base load} = \text{monthly water heating energy}$$

**Kill-A-Watt meter usage:** Use your Kill-A-Watt meter to determine what individual loads are consuming. Instructions for the Kill-A-Watt meter are in Appendix I and can also be found online at P3 International: [www.p3international.com/manuals/p4400\\_manual.pdf](http://www.p3international.com/manuals/p4400_manual.pdf)

#### Refrigerator

$$\frac{\text{date/time read} - \text{date/time installed}}{\# \text{ of days}} = \text{now take } \frac{\text{kwh used}}{\# \text{ of days}} = \text{kwh per day} \times 30 = \text{kwh per month}$$

#### Entertainment Center

$$\frac{\text{date/time read} - \text{date/time installed}}{\# \text{ of days}} = \text{now take } \frac{\text{kwh used}}{\# \text{ of days}} = \text{kwh per day} \times 30 = \text{kwh per month}$$

#### Other appliance/device: \_\_\_\_\_

$$\frac{\text{date/time read} - \text{date/time installed}}{\# \text{ of days}} = \text{now take } \frac{\text{kwh used}}{\# \text{ of days}} = \text{kwh per day} \times 30 = \text{kwh per month}$$

#### Other appliance/device: \_\_\_\_\_

$$\frac{\text{date/time read} - \text{date/time installed}}{\# \text{ of days}} = \text{now take } \frac{\text{kwh used}}{\# \text{ of days}} = \text{kwh per day} \times 30 = \text{kwh per month}$$

#### Other appliance/device: \_\_\_\_\_

$$\frac{\text{date/time read} - \text{date/time installed}}{\# \text{ of days}} = \text{now take } \frac{\text{kwh used}}{\# \text{ of days}} = \text{kwh per day} \times 30 = \text{kwh per month}$$

Once you have determined the approximate kwh per month that these individual appliances and devices are using, subtract it from your monthly base load and see what's left.

**Lighting Load:** Count the lights (bulbs) in your home and record their wattage. Put them in batches with the same wattage and guesstimate the run time for those lights. Calculate the approximate power used a month for lighting.

$$\frac{\text{Annual consumption}}{\text{12}} \times .10 \text{ and then } \div 12 = \text{kwh per month}$$

OR

$$\frac{\text{bulb wattage} \times \text{run time per day (hours)} \times 30}{1000} = \text{kwh per month}$$

$$\frac{\text{bulb wattage} \times \text{run time per day (hours)} \times 30}{1000} = \text{kwh per month}$$

$$\frac{\text{bulb wattage} \times \text{run time per day (hours)} \times 30}{1000} = \text{kwh per month}$$

}  
} total lighting load  
(kwh per month)

Once you have determined the approximate kwh per month that these individual appliances and devices are using, subtract it from your monthly base load and see what's left.

Please go to [www.EnergyUpgradeToday.com](http://www.EnergyUpgradeToday.com) to learn about energy saving strategies in each room of your home.