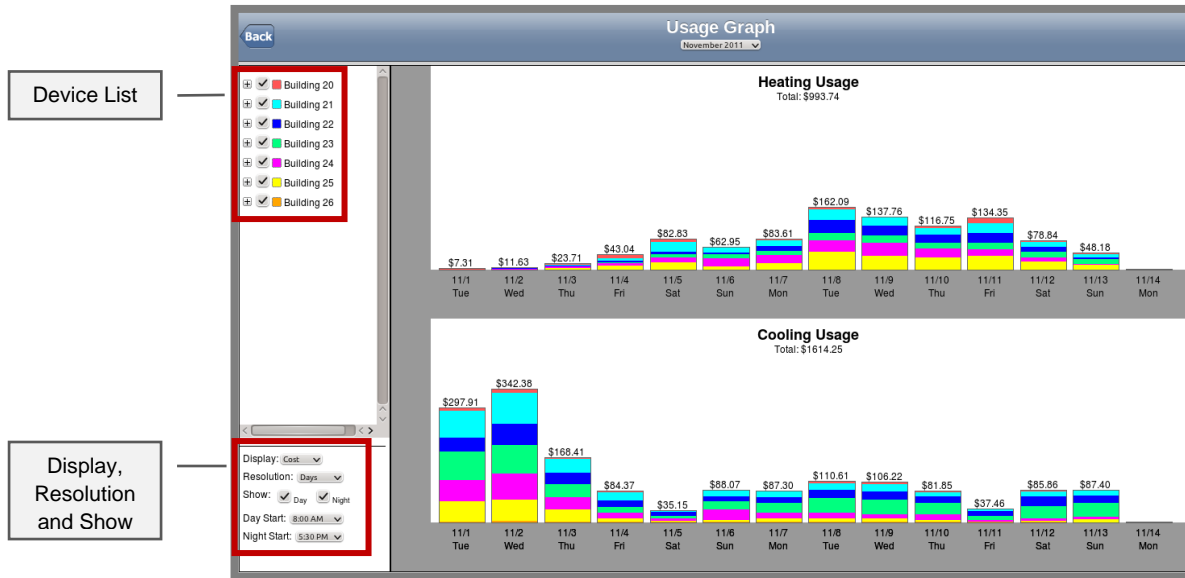


# Understanding the Power of Founten's Energy Usage Graphs

## Introduction

Founten provides its customers with the ability to view historical energy consumption. This report is available from the Founten Internet Site Manager main menu by selecting "Usage Graphs". The usage graphs allow customers to view summary usage for hours, days, or months.



## Report Options

The Report Options on the left side of the graph allow the user to filter what is displayed.

### Device List

- **Device Selection:** All of the active HVAC units are listed. Placing a check next to any device will include that device in the graph.
- **Color Selection:** User assignable different colors for each device. This will display stacked bars of different colors in the graph.

### Display

- **Time:** This option sets the unit of measure to "run time" in hours and minutes.
- **Power:** This option sets the unit of measure to "power consumption". The Cooling Usage Graph will display kilowatt hours. If the installed HVAC units use electric heat (heat pump or electric coil) the unit of measure for Heat Usage will be in kilowatt hours, otherwise the unit of measure will be in therms.
- **Cost:** This option sets the unit of measure to "dollars".

### Resolution

- **Hours:** Displays a single day's usage in 15 minute increments.
- **Days:** Displays daily usage for a single month.
- **Months:** Displays monthly usage for a single year.

### Show

- **Day/Night:** Usage can be filtered to show only the Day time usage, the Night time usage or both Day and Night usage.
- **Day Start:** When filtering for Day/Night usage, the time to use for the start of the day can be set.
- **Night Start:** When filtering for Day/Night usage, the time to use for the start of the night can be set.



# Understanding the Power of Founten's Energy Usage Graphs

## Energy Calculations

The Founten energy management system automatically calculates both power consumption and cost based on actual run time data and system configuration data.

## Power Usage

Power usage is based on the measured run time multiplied by the user configured rate of consumption. For electrical consumption the formula is:

$$\text{kWh} = \text{kW} \times \text{h}$$

where:

**kWh = kilowatt hours**

$$\text{kW} = (\text{kilowatts}) = \frac{\text{Volts} \times \text{Amperes} \times \text{Power Factor}}{1000}$$

**h = hours**

The Founten energy management system captures the actual number of minutes the HVAC unit is running and divides by 60 to get hours (h). The kilowatt rate (kW) is configured for each HVAC unit under the **Admin** → **Thermostat Setup** window of the Founten Site Manager. The Cooling Size and Heater Size fields should be set to the correct value for the HVAC unit. For the most accurate calculation, the kilowatts should be measured on each HVAC unit while it is running and that value should be entered. Alternatively, the Founten Site Manager will convert watts or tons to kilowatts. The conversion formulas are:

$$\text{kW} = \text{watts} / 1000$$

$$\text{kW} = \text{tons} / 1.2 \text{ (Note: this assumes an EER of 10)}$$

For natural gas or oil consumption the formula is:

$$\text{Therms} = \text{Btu/hr} \times \text{h}$$

where:

**Therms = units of energy**

**Btu/hr = British Thermal Units (Btu) the HVAC unit consumes per hour**

**h = hours**

The Founten Wireless HVAC Energy Management Solution captures the actual number of minutes the HVAC heater unit is running and divides by 60 to get hours (h). The Btus are configured for each HVAC unit under the **Admin** → **Thermostat Setup** window of the Founten Site Manager. The Heater Size field should be set to the correct value. For the most accurate calculation, the HVAC unit's Btu rating should be used. Alternatively, the Founten Site Manager will convert tons to Btus. The conversion formula is:

$$\text{Btu} = \text{tons} \times 12,000\text{b}$$

## Cost Calculations

The Founten Wireless HVAC Energy Management System will display energy cost based on the configured energy rates charged by the local utility. The energy rates are entered into the system using the **Admin** → **Site Configuration** window. Two fields should be entered: Cost/Kwh and Cost/Therm. For the most accurate estimate, a recent utility energy statement should be consulted. The average **Cost/Kwh** and **Cost/Therm** can be calculated by dividing the charged amount on the energy bill by the total energy usage on the bill.

Energy costs are simply the average rate charged multiplied by the energy consumed:

$$\text{Electrical Cost} = \text{kilowatt-hours (Kwh)} * \text{Cost/Kwh}$$

$$\text{Gas/ Oil Cost} = \text{Therms} * \text{Cost/Therm}$$