

The logo for the Kill A Watt™ meter is positioned vertically on the left side of the page. It features the words "Kill A Watt" in a large, bold, blue font with a white outline, and "Meter" in a smaller, white font with a blue outline. The text is set against a background of a blue and white electrical plug and a blue and white electrical outlet.

## ***How to Use and Get the Most out of Using the Kill A Watt™ Power Monitor***

The purpose of this document is to instruct the user on the use of the Kill A Watt™ meter as well as how to analyze the data gathered from its use. The meter can help you understand the electricity consumption of appliances in your home and assist you in devising an energy-saving strategy for your household.

The Medfield Energy Committee (MEC) has purchased several Kill A Watt™ meters and placed them in the library so that they can be loaned out to anyone with library privileges. MEC's objectives are to bring energy efficiency awareness to the general public by teaching consumers how they use energy and pointing to actions they can take to reduce energy use and reduce greenhouse gas emissions. Your participation is greatly appreciated. Energy management is used by commercial and industrial facility managers to ensure that energy is being used efficiently. Energy managers first have to measure energy use. "You can't manage something if you can't measure it". We hope that through the exercise of using the Kill A Watt™ meter, you will become a better steward of the earth's environment. \*\*This document does not address home heating which is another form of energy consumption that creates greenhouse gases.

### ***What are the objectives of using the Kill A Watt™?***

- To understand energy and how it is consumed by electrical appliances
- To measure how much electricity appliances use over time
- To reduce greenhouse gas emissions... mainly CO<sub>2</sub>
- To save money by reducing energy usage... since energy is made by burning fossil fuels that produce CO<sub>2</sub>
- To help Medfield residents spread the word about ways to save electricity

### ***Electricity is not the easiest concept to understand (you can't see it)***

Let's start with the basics so we can get a sense of what you will be measuring. Take out your electric bill so you can see how much you are paying and note your monthly consumption.

- Watts or Load – this is the wattage of appliances or horsepower of equipment (if you think in terms of water it is how many gallons per minute are flowing)
- Time – how long is the Load on (like how long is the water running)
- kWh – short for kilowatt hour – in simple terms this is the equivalent of operating a 1,000 watt lamp for 1 hour or a 100 watt lamp for 10 hours. (In our water example, flow rate multiplied by time will give you total usage.)



### **What does the Kill A Watt™ measure?**

- **Volts** – this is the electrical force that pushes electricity through your Load (like pressure).
- **Current** – this is the actual flow rate of electricity in amperes (Amps) and the amount that the Load can use at any given moment (like gallons per minute).
- **VA or Apparent Power** – this is Volts times Amps, which is the available power supplied to an electrical device.
- **Power Factor (PF)** – this is a ratio (from 0 to 1) of the amount of available power being used by an electrical device. This number is 1 when measuring a resistance heater or an incandescent bulb but when measuring fluorescent lamps and motors it is usually less than 1. In the case of a motor, the Power Factor could range between 0.5 and 1 depending on how fully loaded the motor is: the higher the load the higher the Power Factor.
- **Watts** – this is an instantaneous electrical unit of energy which is equal to Volts times Amps times Power Factor so if you have 120 Volts and 2 Amps of electrical power supplied to an appliance with a Power Factor of 1, the appliance will use 240 Watts of electricity. In reverse, if you have a 100 Watt incandescent lamp (Power Factor of 1) operating on 120 Volts of electrical power, the amount of current is 0.83 Amps (100 watts divided by 120 Volts divided by a Power Factor of 1).
- **Frequency** – should always be 60 and it is the number of cycles or times per second that electricity alternates between positive and negative, this is why it is called Alternating Current or AC. (So current goes back and forth 60 times per second as it is consumed by a Load)
- **kWh** - this is the number of units of electrical energy that flowed through the meter over time. It is much like how many gallons of water went through a meter.

### **What should I measure and for how long? What is meaningful?**

One wants to measure the appliances or loads that are used most or for the longest time. Some examples are:

- Refrigerator
- Freezer
- TV and entertainment (measure usage while using and when not using to see if there is significant usage while not in use)
- Computers – Turn off when not using.
- Plug in lamps, fans, air cleaners, chargers, etc... remember energy is recorded during the hours it is on.
- Washer (try per load and different size loads or vary the type of washing cycles) For example, we just purchased a new washer and we found that it could do much larger loads and the spin cycle was so effective that we saved gas during drying since it took less time. You might want to measure watts when the washer is OFF to see how much the controls use... same for dryer.
- Dryer (Gas only as electric is 220 Volts and Kill A Watt can only measure 120 Volts)
- Ironing... you can do by time or number of shirts and pants etc. Also see how much it uses when you take breaks... probably best to turn it off when taking breaks.
- Vacuum cleaner
- Hobby tools – glue guns, chargers