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## The Virgin Island Energy Office

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### Estimating Appliance Energy Use

If you're trying to decide whether to invest in a more energy-efficient appliance or you'd like to determine your electricity loads, you may want to estimate appliance energy consumption.

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### Formula for Estimating Energy Consumption

You can use this formula to estimate an appliance's energy use:

$(\text{Wattage} \times \text{Hours Used Per Day} \div 1000 = \text{Daily Kilowatt-hour (kWh) consumption})$   
(1 kilowatt (kW) = 1,000 Watts)

Multiply this by the number of days you use the appliance during the year for the annual consumption. You can then calculate the annual cost to run an appliance by multiplying the kWh per year by the Water and Power Authority's rate per kWh consumed.

Note: To estimate the number of hours that a refrigerator actually operates at its maximum wattage, divide the total time the refrigerator is plugged in by three. Refrigerators, although turned "on" all the time, actually cycle on and off as needed to maintain interior temperatures.

Examples:

#### **Window fan:**

$(200 \text{ Watts} \times 4 \text{ hours/day} \times 120 \text{ days/year}) \div 1000$   
 $= 96 \text{ kWh} \times 50 \text{ cents/kWh}$   
 $= \$48/\text{year}$

#### **Personal Computer and Monitor:**

$(120 + 150 \text{ Watts} \times 4 \text{ hours/day} \times 365 \text{ days/year}) \div 1000$   
 $= 394 \text{ kWh} \times 50 \text{ cents/kWh}$   
 $= \$197/\text{year}$

#### **Wattage**

You can usually find the wattage of most appliances stamped on the bottom or back of the appliance, or on its nameplate. The wattage listed is the maximum power drawn by the appliance. Since many appliances have a range of settings (for example, the volume on a radio), the actual amount of power consumed depends on the setting used at any one time.

If the wattage is not listed on the appliance, you can still estimate it by finding the current draw (in amperes) and multiplying that by the voltage used by the appliance. Most appliances in the United States use 120 volts. Larger appliances, such as clothes dryers and electric cooktops, use 240 volts. The amperes might be stamped on the unit in place of the wattage. If not, find a clamp-on ammeter—an electrician's tool that clamps around one of the two wires on the appliance—to measure

the current flowing through it. You can obtain this type of ammeter in stores that sell electrical and electronic equipment. Take a reading while the device is running; this is the actual amount of current being used at that instant.

When measuring the current drawn by a motor, note that the meter will show about three times more current in the first second that the motor starts than when it is running smoothly.

Many appliances continue to draw a small amount of power when they are switched “off.” These “phantom loads” occur in most appliances that use electricity, such as VCRs, televisions, stereos, computers, and kitchen appliances. Most phantom loads will increase the appliance’s energy consumption a few watt-hours. These loads can be avoided by unplugging the appliance or using a power strip and using the switch on the power strip to cut all power to the appliance.

### **Typical Wattages of Various Appliances**

Here are some examples of the range of nameplate wattages for various household appliances:

Aquarium = 50–1210 Watts

Clock radio = 10

Coffee maker = 900–1200

Clothes washer = 350–500

Clothes dryer = 1800–5000

Dishwasher = 1200–2400 (using the drying feature greatly increases energy consumption)

Dehumidifier = 785

Electric blanket- Single/Double = 60 / 100

### **Fans**

Ceiling = 65–175

Window = 55–250

Whole house = 240–750

Hair dryer = 1200–1875

Clothes iron = 1000–1800

Microwave oven = 750–1100

### **Personal computer**

CPU - awake / asleep = 120 / 30 or less

Monitor - awake / asleep = 150 / 30 or less

Laptop = 50

Radio (stereo) = 70–400

Refrigerator (frost-free, 16 cubic feet) = 725

### **Televisions (color)**

19” = 65–110

27” = 113

36” = 133

53”-61” Projection = 170

Flat screen = 120

Toaster = 800–1400

Toaster oven = 1225

VCR/DVD = 17–21 / 20–25

Vacuum cleaner = 1000–1440