# Examination of Ecobutton Computer Shutdown Tool

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# Introduction

The Ecobutton is a computer accessory targeted at environmentally conscious computer users. Many people keep their computers running much of the day, but would like the computer to enter a minimum power consumption mode when not in use. It would seem that shutting the computer down and starting it up again would achieve the desired power savings, but stopping and starting the operating system takes a long time, and every program you were using must be started up again after the computer reboots.

The Ecobutton makes it easier to minimize power consumption during these idle periods. Simply press the button and the computer goes to sleep in about 5 seconds. Press the power key on your laptop computer, or any key on many desktop computers, and the computer comes back to life in about the same time. Everything that you were working on when the button is pressed is intact, so that you can continue working where you left off.

# Description of Product

The Ecobutton is supplied as a large button packaged with instructions. The instructions direct you to the internet website www.eco-button.com from which you must download and install the software package to support the button. The software downloading and installation process takes about 5 minutes. The button is then plugged into the USB port on your computer, and the system is ready for use.

# Theory of Operation

Sleep modes were added to Windows operating systems to conserve battery power in laptop computers, but is available to be activated for any computer. Typically, laptops enter sleep mode when the operating system is still running, but the cover is closed, waking up when the cover is opened again.

The Ecobutton exploits this built-in sleep mode. The button itself contains a small PCB with three green LEDs and a single chip. The chip contains USB communications support and discrete IO for the LEDs. There is also a momentary contact push button on the PCB. When you push the large domed button, the chip generates a message through the USB port to the Ecobutton software, which in turn puts the computer in sleep mode, recording the time sleep mode was entered.

Pressing the computer on button is the normal way to wake the computer up, and the Ecobutton software notes the amount of time the computer was in sleep mode and calculates the savings in dollars and $CO_2$. This calculation is based on data supplied by the user when the program is installed, including the power consumption of the computer components and the cost per kilowatt hour. This data can be updated at any time. The calculation is straight forward, but is only as accurate as the data supplied.

## Performance

The Ecobutton was installed on computers with both the Windows 2000 and Windows XP operating systems. It performed as advertised on each system, reliably putting the computer to sleep when the button was pressed, and reporting the savings when the computer was awoken again.

A Vista computer was not available for testing, but there is no doubt that the Ecobutton would have performed satisfactorily.

My commercially available watt meter (Kill A Watt model P4400) indicated that my Sony VAIO computer went from a working power level of approximately 49 watts to a sleep level of 2 watts after the Ecobutton was pressed. In addition, the flat screen display exhibited a normal working power level of 23 watts and went to a sleep level of 2 watts after the Ecobutton was pressed. This represents a savings in power consumption of 94% when the Ecobutton is in service.

## Projected Savings

The cost of power varies from state to state in the US, with the average cost being $ .0762 per KWh. The cost of electricity is significantly higher in New York ($ .1255) and California ($ .1145) as reported by the DOE in 2004.

In a work situation, if my computer consuming 73 watts was left on for 24 hours, 7 days a week, the cost of electricity in New York would be:

(52 x 168) (hours/year) *.073 Kw * .1255 (dollars/Kwh) = $ 80 per year

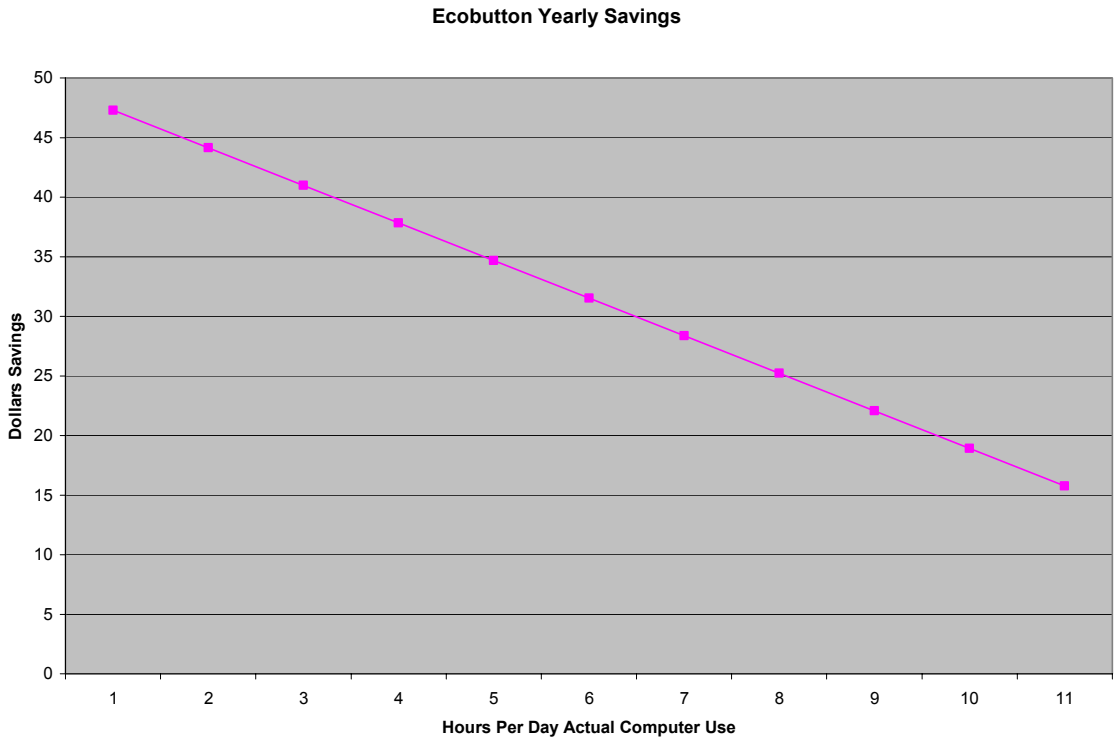
If the Ecobutton were used to place the computer in sleep mode after an eight hour work day during the week, and all day on weekends, the cost savings would be:

(52 x 128) (hours/year)*.069 Kw (saved) *.1255 (dollars.Kwh) = $ 58 per year saved

A home user might turn the computer on every day, but only use it for a few hours and turn it off at night. If my 73 watt computer was on for 16 hours a day then the cost of electricity in New York would be:

(52 x 112) (hours/year) *.073 Kw * .1255 (dollars/Kwh) = $ 50.50 per year

If the Ecobutton were used to put the computer in sleep mode when not in use, the savings would be shown by the following graph as a function of the time the computer is actually used:




Savings in other states is proportional to the cost of electricity in that state.

# Conclusions

Based on my review of the Ecobutton, I find that it utilizes a sound and efficient approach to its intended function. Using this product during down time on a PC effectively provides the user with a simple way to save power, then return to the tasks at hand by quickly waking the machine up from its sleep.

For those interested in keeping the planet green by reducing their computer's power consumption when they are not using it, the Ecobutton is ideal and easy to use. It is also easy to install.