### Calculating Your Energy Consumption

## How to calculate HP Workstation energy consumption:

With the correct tools, it is easy to calculate your energy consumption. First, it is important to know the daily power usage. A workstation's energy consumption varies based on what mode it is in. There are the following modes:

**Off/Standby** – the lowest power consumption mode; the computer is connected to main electricity but requires a complete boot to wake.

**Active** – the mode in which the computer, while connected to a power source, is producing useful work; for example, running typical application software.

**Idle** – the state in which the operating system and other software have completed loading, the machine is not asleep, and activity is limited to those basic applications that the system starts by default.

**Sleep** – a low power state that a computer enters automatically after a period of inactivity or by manual selection. A computer in sleep mode can quickly "wake" in response to inputs from network connections or user interface devices.

Each mode uses a different amount of energy. It is best to take an average power value over a period of time for each operating mode. This accounts for variations in power loading as the computer executes applications and tasks. For idle power, wait 15 minutes, without starting applications, after the operating system has finished loading.

In order to measure the energy, you will first need a power meter that is capable of measuring AC wall power. An example of a data logging power meter is the watts up?<sup>™</sup> meter located at the following website: https://www. wattsupmeters.com/secure/index.php. A typical configuration with a power meter and HP Workstation is shown in Figure 1. A power meter can measure and record the energy used by an HP Workstation as it operates in the different modes using your specific applications/loads. More sophisticated meters offer computer interfaces and data acquisition software that will allow an average power to be captured over a period of time.

An Excel spreadsheet file is attached to this document in order to assist in calculating energy usage. The calculator computes the energy consumption and allows the comparison of two configurations or usage scenarios.

# Follow these steps to calculate your energy savings:

Open the attached Excel file. The file format is depicted in Figure 2. Referring to the watts and hours columns, record the input power to the HP workstation as well as the operating time in each of these operating modes:

- a. Off/Standby mode
- b. Idle mode
- c. Active mode
- d. Sleep mode

Enter your local energy cost per kW-hr in the cell. This cost is provided on your energy bill.

FIGURE 1



Configura				Configuration 2				Configuration 2 consumes less ene
Daily:	Daily:							What is the cost per k
	Input Power Meter Reading (Watts)	Daily Operating Time in Hours	Resulting Power Consumption (Watt-hours)		Input Power Meter Reading (Watts)	Daily Operating Time in Hours	Resulting Power Consumption (Watt-hours)	Yearly cost for Configuration 1 for all Yearly cost for Configuration 2 for all
Off/Standby	2.3	0	0	Off/Standby	2.3	0	0	Energy Savings in
Active	260	4	1040	Active	260	4	1040	Yearly savings for all u
Idle	115	20	2300	Idle	115	4	460	
Sleep	2.6	0	0	Sleep	2.6	16	41.6	
	Daily Total Energy Co	nsumption in W-hrs:	3340		Daily Total Energy Co	nsumption in W-hrs	: 1541.6	
Yearly:				Yearly:				
	Days used per week: 7			Days used per week:			: 7	
	Weeks used per year: 52			Weeks used per year:			52	
	Additional holidays: 3			Additional holidays:			0	
	Yearly Total Energy Consumption in kWh: 1206			Yearly Total Energy Consumption in kWh:			561	
	Number of Units: 1			Number of Units:			: 1	
Carbon Footprint in kg CO2: 419			Carbon Footprint in kg CO2:			195		
Carbon Footprint in lb CO2: 923			Carbon Footprint in Ib CO2: 429			429		
Total Energy Consumption in kWh: 1206				Total Energy Consumption in kWh: 561				

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FIGURE 2



\$56.11 654.62 \$65.46

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