

# Tracking down “energy hogs”

An experiment for determining the power and energy consumption of electrical devices.

## 1 Apparatus and materials

- 1 desktop PC
- 1 digital electric power consumption meter
- 1 television
- 1 hotplate
- 1 immersion heater
- 1 pot
- Water
- 1 electric kettle
- Optional: stereo system, notebook, charger (for smartphone, tablet, or notebook)



Mobile phone that is connected to an electric power consumption meter during charging.

### 1.1 Safety instructions

- Carefully connect the devices to the power supply.
- In some cases the devices become very hot!
- Be careful around boiling water!
- Use the school's own devices carefully.

### 1.2 Conducting the experiment

Measure different electrical devices according to the following table and enter the results in the table. (Further devices can also be added to the measurement series.)

### 1.3 Questions

- How do you explain the differences when heating water with different devices?
- Based on general sources and your measurements, what percentage of the annual energy consumption of a household do you estimate could be saved by switching off all stand-by devices?
- How could energy consumption by PCs be decreased?
- How can you reduce power consumption at home?

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Device	Rated power as stated on device	Actual power output as measured	Measurement period	Energy consumption for specific task	Energy consumption over measurement period	Energy consumption in one hour	Energy consumption in one year
Immersion heater							
Boil 1 liter of water with immersion heater							
Boil 1 liter of water with electric kettle							
Boil 1 liter of water with pot and hotplate							
Television in operation							
Television on standby							
Stereo system (audio system) in operation							
Stereo system on standby							
Desktop PC in operation without activity							
Desktop PC in operation with 3D or HD video playback							
Desktop PC on standby							
Notebook power supply unit in no-load operation							

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Device	Rated power as stated on device	Actual power output as measured	Measurement period	Energy consumption for specific task	Energy consumption over measurement period	Energy consumption in one hour	Energy consumption in one year
Notebook power supply unit when charging							
Mobile phone charger							
40 W incandescent lamp							
35 W low-voltage halogen lamp with transformer							
Low-voltage halogen lamp with transformer in no-load operation alone							
Energy-saving light bulb equivalent to 7 W							