

(S8) Energy Consumption: Cold Shower TODAY'S
DATE

E.Q.: If an electrical heating coil (a type of resistor) were submerged in a container of water, and if a current were to flow through the coil to make it hot, what factors would affect the temp increase of the water

electric power companies usually charge for energy used in units of "kilowatt-hours" - 1 kilowatt = 1000 W (watts) = 10 100-W light bulbs in parallel = 3,600,000 J (joules)

change in heat (ΔQ)

$$\Delta Q = m \cdot c \cdot \Delta T$$

see S7 notes

energy used to heat an object (E)

$$E = V \cdot I \cdot t$$

where E = energy (J)

V = voltage (V)

I = current (A)

t = time (s)

factors that affect water temp^{max} include: mass of water, the specific heat capacity of the water, the energy applied to the water (i.e., amt. of voltage, current, and time), the efficiency of the system the water is in

efficiency

$$\text{efficiency} = \frac{\text{useful energy output}}{\text{total energy input}} \times 100\%$$