

Value of a kilowatt-hour of electricity

“Power” is a technical word in physics that refers to the rate at which energy is used. A common unit of power is a “Watt” which is defined as

$$1 \text{ Watt} = 1 \text{ Joule/sec}$$

Leaving a 100 Watt light bulb burning for one hour uses up 100 Watt-hours of electrical energy, and

$$100 \text{ Watt-hr} = 100 \times 3,600 \text{ sec} \times 1 \text{ Joule/sec} = 360,000 \text{ Joule.}$$

Also, 1,000 Watt-hours is 1 Kilowatt-hour = 1 kwh of electrical energy.

If I were given the task of lifting 360,000 1 kg blocks from the floor to the top of a table 1 m above the floor (perhaps in one hour), then this task would require precisely $3.6 \times 10^6 \text{ J}$ which is equivalent to 1 kwh of energy.

As the cost of 1 kwh is between 10 and 20 cents, I would make a sincere effort to find some method to use electrical energy to do the work for me.