Power Plant Calculations

1) $P = \frac{E}{t}$

$E = Pt$

3 hours → 18 W = 0.018 kW

21 hours → 12 W = 0.012 kW

$E_{total} = E_3 + E_{21}$

$= (0.018\ kW)(3\ h) + (0.012\ kW)(21\ h)$

$= 0.306\ kWh$

2) $P = \frac{E}{t}$

$P = \frac{0.0044 kWh}{0.5 h}$

$= 0.0088 kW$

$= 8.8 W$

kWh is a unit of Energy!

1,000,000,000,000 W = 1 TW

1,000,000,000 W = 1 GW

1,000,000 W = 1 MW

1000 W = 1 kW

1 W

3) conversion → $\frac{1 \text{ house}}{x \text{ kWh/month}}$ OR $\frac{x \text{ kWh/month}}{1 \text{ house}}$

$$\frac{1 \text{ MW}}{300 \text{ houses}} = \frac{1000 \text{ kW}}{300 \text{ houses}} = 3.33 \text{ kW/house}$$

$$\left(3.33 \frac{\text{kW}}{\text{house}}\right)\left(\frac{30 \text{ days}}{1 \text{ month}}\right)\left(\frac{24 \text{ h}}{1 \text{ day}}\right) = 2400 \frac{\text{kWh/month}}{\text{house}}$$

4)

$$\#\text{houses} = \left(\frac{1\ \text{house}}{1900\ \text{kWh/month}}\right)\left(5{,}000\ \text{MW}\right)\left(\frac{720\ \text{h}}{\text{month}}\right)$$

$$= \left[\frac{1(\text{house})(\text{month})}{1900(\text{kW})(\text{h})}\right]\left(5{,}000{,}000\ \text{kW}\right)\left(\frac{720\ \text{h}}{1\ \text{month}}\right)$$

$$= 1.9\text{E}6\ \text{houses}$$