1. $\frac{75\,W}{1} \left| \frac{1\,J}{1\,W\cdot s} \right| \frac{60\,s}{1\,min} \left| \frac{25\,min}{1} \right| \frac{1\,kJ}{1000\,J} = 112.5\,kJ$

2. a) $\frac{1355\,kwh}{1} \left| \frac{3413\,BTU}{1\,kwh} \right| \frac{1.05\,kJ}{1\,BTU} = 5.0 \times 10^6\,kJ$

b) $\frac{5.0 \times 10^6\,kJ}{30\,days} \left| \frac{1000\,J}{1\,kJ} \right. = 1.7 \times 10^8\,J/day$

c) $\frac{1355\,kwh}{1} \left| \frac{\$0.0749}{1\,kwh} \right. = \$105$

3. a) $\frac{100\,W}{1} \left| \frac{1\,J}{1\,Ws} \right| \frac{60\,s}{1\,min} \left| \frac{60\,min}{1\,hr} \right| \frac{12\,hr}{1} = 4.3 \times 10^6\,J$

b) $4.3 \times 10^6\,J \times 0.20 = 8.64 \times 10^5\,J$

c) $\frac{4.32 \times 10^6\,J}{1} \left| \frac{1\,kJ}{1000\,J} \right| \frac{1\,BTU}{1.05\,kJ} \left| \frac{1\,kwh}{3413\,BTU} \right. = 1.2\,kwh$

OR $100\,W \times 12\,hr = 1.2\,kwh$

4. a) $\frac{4000\,W}{1} \left| \frac{1\,kW}{1000\,W} \right| \frac{1\,hr}{1\,load} \left| \frac{5\,loads}{1\,wk} \right| \frac{4\,wk}{1} = 80\,kwh$

$\frac{80\,kwh}{1} \left| \frac{3413\,BTU}{1\,kwh} \right| \frac{1.05\,kJ}{1\,BTU} \left| \frac{1000\,J}{1\,kJ} \right. = 2.9 \times 10^8\,J$

b) $\frac{80\,kwh}{1} \left| \frac{\$0.0758}{kwh} \right. = \$6.06$

5. $\frac{600\ kwh}{1\ yr} \left| \frac{860\ kcal}{1\ kwh} \right. = 5.16 \times 10^5\ kcal/yr$

$\frac{1880\ kwh}{1\ yr} \left| \frac{860\ kcal}{1\ kwh} \right. = 1.6 \times 10^6\ kcal/yr$

6. a) $\frac{7.25\ kwh}{hr} \left| \frac{24\ hr}{1\ day} \right| \frac{137\ days}{1\ yr} = 2.4 \times 10^4\ kwh/yr$

b) $\frac{2.4 \times 10^4\ kwh}{yr} \left| \frac{\$0.0825}{1\ kwh} \right. = \$1980$

c) $\frac{2.4 \times 10^4\ kwh}{yr} \left| \frac{860\ kcal}{1\ kwh} \right. = 2.1 \times 10^7\ kcal/yr$

d) $\frac{2.4 \times 10^4\ kwh}{yr} \left| \frac{3400\ BTU}{1\ kwh} \right. = 8.2 \times 10^7\ BTU/yr$

7. a) $\frac{400 W}{hr} \left| \frac{1 J}{1 W s} \right| \frac{4 hr}{1 day} \left| \frac{365 days}{1 yr} \right| \frac{60 s}{1 min} \left| \frac{60 min}{1 hr} \right| \frac{1 kJ}{1000 J} \left| \frac{1 BTU}{1.05 kJ} \right| \frac{1 kwh}{3400 BTU}$

$\frac{400\ W}{1\ day} \left| \frac{4\ hr}{1000\ W} \right| \frac{1\ kW}{1\ yr} \left| \frac{365\ day}{} \right. = 584\ kwh/yr \approx 590$

(400-60W) =>

b) $\frac{340 W}{1 day} \left| \frac{4 hr}{1000 W} \right| \frac{1 kW}{1 yr} \left| \frac{365 day}{} \right. = 496 \approx 500\ kwh/yr$

90 kwh/yr saved

c) more efficient bulb = longer / more savings

8. a) $\frac{1 yr}{1 yr} \left| \frac{52 wks}{1 wk} \right| \frac{5 trips}{1 trip} \left| \frac{7.2 mi}{22 mi} \right| \frac{1 gal}{} = 85\ gal$

b) $\frac{85 gal}{yr} \left| \frac{32000\ kcal}{1 gal} \right. = 2.7 \times 10^6\ kcal/yr$

c) manufacturing, packaging, agricultural costs

d) shop local, grow own vegetables, etc.