Solution

If heat of combustion of waste is like to wood $\lambda = 21.7 MJ / kg$ we have the energy which produced of burning of m=230 million tones with 20% efficient, is

$$Q = 0.2 \cdot 21.7 MJ / kg \cdot 2.3 \cdot 10^{11} kg = 9.98 \cdot 10^{17} J = 2.77 \cdot 10^{11} kW \cdot h$$

a) From hence, it is near ***Q/E=0.073*** of total electric energy which produced in USA (***E=3.8trillion kWh***).

b) It is 8766 hours in year. From hence we get power $W = \frac{2.77 \cdot 10^{11} kW \cdot h}{8766 \text{h}} = 3.15 \cdot 10^{10} W$. It is needed more than ***31 1GW*** plants.

Answer:

a) $Q = 0.2 \cdot 21.7 MJ / kg \cdot 2.3 \cdot 10^{11} kg = 9.98 \cdot 10^{17} J = 2.77 \cdot 10^{11} kW \cdot h$
Q/E=0.073

b) $W = \frac{2.77 \cdot 10^{11} kW \cdot h}{8766 \text{h}} = 3.15 \cdot 10^{10} W$
It is needed ***32 1GW*** plants.