

Esercizio n° 18. T1.

Datos

$$m_c = ?$$

$$\eta = 25\%$$

$$P = 50 \text{ MW}$$

$$P_c = 8000 \frac{\text{kcal}}{\text{kg}}$$

t = 1 día

$$P_{\text{sum}} = ? \rightarrow \boxed{\eta = 25\%} \rightarrow P_{\text{util}} = 50 \text{ MW}$$

$$\eta = \frac{P_{\text{util}}}{P_{\text{sum}}} \cdot 100 \Rightarrow P_{\text{sum}} = \frac{P_{\text{util}}}{\eta} \cdot 100 =$$
$$= \frac{50 \cdot 10^6}{25} \cdot 100 = 2 \cdot 10^8 \text{ W}$$

$$1 \text{ día} = 24 \text{ h} \cdot \frac{3600 \text{ s}}{1 \text{ h}} = 86400 \text{ s}$$

$$E_{\text{sum}} = P \cdot t = 2 \cdot 10^8 \cdot 86400 = 1.728 \cdot 10^{13} \text{ J}$$

$$E_{\text{sum}} = m_c \cdot P_c \Rightarrow m_c = \frac{E_{\text{sum}}}{P_c} = \frac{1.728 \cdot 10^{13}}{3.334 \cdot 10^7} = 516746.41 \text{ kg}$$
$$= 516.74 \text{ Tm}$$

$$8000 \frac{\text{kcal}}{\text{kg}} = 8 \cdot 10^6 \frac{\text{cal}}{\text{kg}} \cdot \frac{4.18 \text{ J}}{1 \text{ cal}} = 3.344 \cdot 10^7 \text{ J}$$