

**Example 8.6**

Using the data from the previous example, calculate the required energy demand for the oxidation of organic matter (assume  $1 \text{ kWh.kg}^{-1} \text{ O}_2$ ) and the potential for energy generation from sludge digestion (assume an efficiency of 33 percent).

**Solution:**

(a) Without primary settling:

$$mS_o = 0.52 \rightarrow \text{energy demand} = 0.52 \text{ kWh.kg}^{-1} \text{ COD oxidised}$$

$$mS_d = 0.093 \rightarrow mE_d = 0.093/1.5 = 0.062 \text{ g VSS.g}^{-1} \text{ COD}$$

$$P_{el} = R_{el} \cdot 5.25 \cdot mE_d = 0.33 \cdot 5.25 \cdot 0.062 = 0.107 \text{ kWh.kg}^{-1} \text{ COD}$$

(b) With primary settling:

$$mS_o = 0.36 \rightarrow \text{energy demand} = 0.360 \text{ kWh.kg}^{-1} \text{ COD oxidised}$$

$$mS_d = 0.25 \rightarrow mE_d = 0.25/1.5 = 0.167 \text{ gVSS.g}^{-1} \text{ COD}$$

$$P_{el} = 0.33 \cdot 5.25 \cdot 0.167 = 0.289 \text{ kWh.kg}^{-1} \text{ COD.}$$