

6. DZ

1. $A = 83 \text{ ha} =$

$M = 7 \text{ t/ha}$

$\text{plošnosť} = w = 0,46$

$H = 20 \text{ MJ/kg}$

$W = ?$

$m = A \cdot M$

$$W = (1 - w) \cdot m \cdot H = (1 - w) \cdot A \cdot M \cdot H = 0,54 \cdot 83 \cdot 7 \cdot 10^3 \cdot 20 \cdot 10^6$$

$$= 6275 \text{ GJ}$$

2. $W = 16848 \text{ MWh}$

$A = 1109 \text{ ha}$

$\eta = 0,33$ $f = 1,1$

$H = 16 \text{ MJ/kg}$

$M = ?$

$$M = \frac{W_{\text{gepl}} \cdot f}{A_{\text{ok}} \cdot H \cdot \eta} = \frac{16848 \cdot 10^3 \text{ kWh} \cdot 3,6 \text{ MJ/kWh} \cdot 1,1}{1109 \text{ ha} \cdot 16 \text{ MJ/kg} \cdot 0,33}$$

$M = 11,39 \text{ t/ha}$

3. $a = ?$

$$a = \frac{A_{uk}}{W_{e, \text{pot}}}$$

$$= \frac{A_{uk} (\text{ha}) \cdot 10^4 \frac{\text{m}^2}{\text{ha}}}{W_{e, \text{pot}}}$$

$$W = P_{\eta} \cdot m \cdot T = 182 \cdot 10^3 \cdot 0,77 \cdot 8760 = 1,22 \cdot 10^9$$

$$A_{uk} = \frac{W \cdot \eta}{M \cdot t \cdot \eta} = \frac{1,22 \cdot 10^9 \text{ J} \cdot 3,6 \text{ MJ/L} \cdot 1,1}{5 \cdot 10^3 \text{ kg/ha} \cdot 11 \text{ MJ/kg} \cdot 0,31}$$

$$A_{uk} = 283,35$$

$$a = 2322 \text{ m}^2/\text{MWh}$$

4. $W_{\text{pot}} = \rho V g H$

$$W_{\text{el}} = \eta_{\text{el, inst}} \cdot W_{\text{pot}} = P_{\text{el}} \cdot t \Rightarrow W_{\text{pot}} = 7,33 \cdot 10^8 \text{ Wh}$$

$$W_{\text{pump}} \cdot \eta_{\text{pump}} = W_{\text{pot}} \Rightarrow W_{\text{pump}} = 1,14 \cdot 10^9 \text{ Wh}$$

$$W_{\text{el}} = W_{\text{pump}}, \quad W_{\text{t}} = \frac{W_{\text{el}}}{\eta_{\text{t}}}$$

$$m = \frac{W_{\text{t}}}{H}, \quad a = \frac{m}{M}$$

$$a = \frac{\frac{W_{\text{t}}}{H}}{M} = \frac{3,819 \cdot 10^6 \text{ kWh} \cdot 3,6 \text{ MJ/kWh}}{7 \cdot 10^3 \text{ kg/ha} \cdot 13 \text{ MJ/kg}}$$

$$a = 151,0989 \text{ ha}$$

$$a = 1,51 \cdot 10^6 \text{ m}^2$$

$$g. V = \frac{m \cdot P \cdot 8760 \cdot 3600}{\eta \cdot H} = 1,71 \cdot 10^8 \text{ m}^3 = 1,71 \cdot 10^{11} \text{ dm}^3$$

$$m = \frac{V_G \cdot M(\text{CO}_2)}{V_N} = \frac{1,71 \cdot 10^{11} \text{ dm}^3 \cdot 44 \text{ g mol}^{-1}}{22,4 \text{ dm}^3 \text{ mol}^{-1}}$$

$$m = 3,36 \cdot 10^8 \text{ kg}$$

$$6. m_G = \frac{m \cdot P \cdot 8760 \cdot 3600}{\eta \cdot H} = 6,856 \cdot 10^8 \text{ kg}$$

$$m(\text{CO}_2) = m_G - m \cdot \left(1 + \frac{32}{12}\right) = 1,58 \cdot 10^6 \text{ t}$$

$$8. V = \frac{W_t}{H} = \frac{\frac{W_p}{\eta}}{H} = \frac{m \cdot P \cdot 24 \cdot 3600}{\eta \cdot H} = 9,26 \cdot 10^5 \text{ m}^3$$

$$7. H = 25 \text{ MJ/kg}, \quad W_{el} = 12 W_h = 3,6 \cdot 10^6 \text{ J}$$

$$w = 0,01$$

$$\eta = 0,36$$

$$m(\text{SO}_2) = ?$$

$$W_t = \frac{W_{el}}{\eta} = 10^7 \text{ J}$$

$$m(\text{SO}_2) = \frac{W_t}{H} \cdot 2 \cdot 0,01 = 0,008 \text{ kg}$$

$$10. \quad m = 2,28 \text{ kg/s}$$

$$P = Q - A = m c (\bar{T}_1 - \bar{T}_2) - m \bar{T}_2 (S_1 - S_2)$$

$$P = m \left(c (\bar{T}_1 - \bar{T}_2) + \bar{T}_2 \cdot c \ln \frac{\bar{T}_2}{\bar{T}_1} \right)$$

$$P = 2,28 \cdot 4186 \left(100 + 293,15 \cdot (-0,2935) \right)$$

$$P = 133,22 \text{ kW}$$

$$16. \quad Q = \frac{P_{el}}{\eta_G \cdot 9810 \cdot H} \quad , \quad \eta_G = 1 - 0,17$$

$$Q = 405,29 \text{ m}^3/\text{s}$$

$$15. \quad W_{\text{PUMPAWA}} = ?$$

$$m = \frac{t \cdot x}{x_m}$$

$$W_{\text{PROIZV.}} = P_{el} \cdot t_x =$$

$$W_{\text{PUMPA}} = \frac{W_{\text{PROIZV.}}}{\eta_m \cdot \eta_p} = 496 \text{ MWh}$$

$$14. \quad P_{\text{HEB}} = ?$$

$$P_H = \frac{P}{\eta} \left(1 - \frac{T_2}{T_1} \right)$$

$$P_H = 4,6 \cdot 10^3 (1 - 0,943) = 261,159 \text{ W/h}$$

$$13. \quad P = \frac{(h_{\text{VLAZ}} - h_{\text{IZLAZ}}) \cdot \dot{m}}{\frac{\eta}{1000}} = 17,22 \text{ MW}$$

$$12. \quad m = \frac{P}{c(T_1 - T_2)} = 3,83 \text{ kg/s}$$

$$11. \quad \eta = ?$$

$$\eta = \frac{h_{\text{VLAZ}} - h_{\text{IZLAZ}} - P}{h_{\text{VLAZ}} - h_{\text{PIZLAZ}}} = \frac{85350}{515400} = 0,1267$$

$$19. W_{el} = W_p \cdot \eta \Rightarrow W_p = 448,24 \text{ MWh}$$

$$W_{el} = P \cdot t = 381 \text{ MWh}$$

$$W_p = \rho \cdot V \cdot H \cdot g \Rightarrow H = \frac{W_p}{\rho V g}$$

$$H = \frac{P}{\eta \cdot \rho \cdot g \cdot m} \quad , \quad \eta = (1 - \eta_g) = 0,85$$

$$H = 84,61 \text{ m}$$

$$18. W = P \cdot T$$

$$\eta_{el} = \frac{W}{W_p} = \eta_g \Rightarrow m = \frac{W}{(1 - \eta_g) g H} = \frac{P \cdot T}{(1 - \eta_g) g H} = 1,92 \cdot 10^9$$

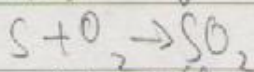
$$\rho = \frac{m}{V} \Rightarrow V = \frac{m}{\rho} = 1,92 \cdot 10^6 \text{ m}^3$$

$$17. W_{el} = P \cdot t = 6,876 \cdot 10^{11} \text{ Wh}$$

$$W_t = \frac{W_{el}}{\eta} = 1,72 \cdot 10^{12} \text{ Wh} \cdot 3600 = 6,19 \cdot 10^{15} \text{ J}$$

$$m_s = \frac{W_t}{H} = 2,475 \cdot 10^8 \text{ kg}$$

$$m(S) = m_s \cdot w(S) = 1,48 \cdot 10^7 \text{ kg}$$



$$n(S) = \frac{m(S)}{M(S)} = 4,64 \cdot 10^8 \text{ mol}$$

$$n(S) = n(SO_2)$$

$$m(SO_2) = n(SO_2) \cdot M(SO_2) = 2,97 \cdot 10^{10} \text{ g} = 2,97 \cdot 10^4 \text{ t}$$

$$m_{ox} = 2,97 \cdot 10^4 - 10395 = 19310,53 \text{ t}$$

$$\eta = \frac{19310,3}{2,97 \cdot 10^4} = 0,65 \cdot 100\% = 65\%$$