B I.) $\hat{W} = \bar{W} = 112{,}5\ \text{kWh}$ $\quad s = 4{,}1\ \text{kWh}$ $\quad N_1 = 20$, $\Delta W_1 = \frac{s}{\sqrt{N_1}} \cdot \underbrace{t_{19;\,0{,}025}}_{2{,}093} = 1{,}9188\ \text{kWh}$

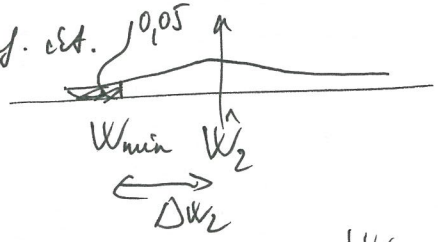
5

$$P\left[\hat{W} - \Delta W_1 < W < \hat{W} + \Delta W_1\right] = 1 - b \qquad b = 0{,}05$$

$$P\left[110{,}6\ \text{kWh} < W < 114{,}4\ \text{kWh}\right] = 95\,\%$$

2

Minimális fogyasztás: egyoldali konf. int. $0{,}05$



$N_2 = 12 \cdot 20 = 240$ $\quad \hat{W}_2 = N_2 \cdot \hat{W} = 27\ \text{MWh}$

$\sigma_1 \simeq s$ $\quad \Delta W_2 = \sqrt{N_2} \cdot \sigma_1 \cdot \underbrace{z_{0{,}05}}_{1{,}64} = 104{,}2\ \text{kWh}$

$$W_{min} = \hat{W}_2 - \Delta W_2 = 26{,}896\ \text{MWh}$$

2

Napi fogyasztás a $\pm 3\sigma_1$ tartományban: $\Delta W_3 = 3\sigma_1 = 12{,}3\ \text{kWh} \Rightarrow W \in [100{,}2\ \text{kWh},\ 124{,}8\ \text{kWh}] \simeq [100;\,125]\ \text{kWh}$

1

B II.) $$\frac{1}{R_3\left(G_x + \frac{1}{j\omega L_x}\right)} = \frac{R_2}{R_4 + \frac{1}{j\omega C_4}}$$

$$G_x = \frac{R_4}{R_2 R_3} = 100\,\mu\text{S} \quad (R_x = 10\ \text{k}\Omega)$$

$$L_x = R_2 R_3 C_4 = 87{,}5\ \text{mH}$$

2

$$\frac{1}{G_x + \frac{1}{j\omega L_x}} = R_5 + j\omega L_5$$

5

$$R_5 = \frac{\omega^2 L_x^2 G_x}{1 + \omega^2 L_x^2 G_x^2} = 4{,}834\ \Omega$$

$$L_5 = \frac{L_x}{1 + \omega^2 L_x^2 G_x^2} = 87{,}45\ \text{mH}$$

2

$h_1 = \Delta T \alpha_1 = 5\,^\circ\text{C} \cdot 50\ \frac{\text{ppm}}{^\circ\text{C}} = 250\ \text{ppm}$

$h_2 = \Delta T \alpha_2 = 5\,^\circ\text{C} \cdot 100\ \frac{\text{ppm}}{^\circ\text{C}} = 500\ \text{ppm}$

rendszeres hibák

$$\frac{\Delta G_x}{G_x} = h_1 - 2h_1 = -h_1 = -250\ \text{ppm}$$

$$\frac{\Delta L_x}{L_x} = 2h_1 + h_2 = 1000\ \text{ppm}$$

1