

task_f64r8g2jf4pdomfi_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

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Exercise E1 Conversion: Energy, Power and Area

2. The car manufacturer states that the consumption of the car is \$160~{\rm kWh}\$ per \$100~{\rm km}\$ and an usable battery capacity of \$60~{\rm kWh}\$. Solar panels produces per \$1~{\rm m}^2\$ in average in December \$0.2~{\rm kWh/m^2}\$. The car is driven \$50~{\rm km}\$ per day. The size of a distinct solar module with \$460~{\rm W_p}\$ (Watt peak) is \$1.9~{\rm m} \times 1.1~{\rm m}\$.

Result: $A = 482.00~{\rm m^2}$ $N = 20~{\rm panels}$

.. What is the average power consumption of the car per day?

$$A = 20~{\rm panels} \cdot 460~{\rm W_p/panel} = 9200~{\rm W_p}$$

$$N = \frac{160~{\rm kWh/100~km}}{0.2~{\rm kWh/m^2}} \cdot \frac{50~{\rm km}}{100} = 40~{\rm m^2}$$

$$N = 20~{\rm panels}$$

$$\begin{aligned} \frac{W}{l} &= \frac{16~{\rm kWh}}{100~{\rm km}} = 0.16 \\ \frac{W}{l} &= 50~{\rm km} \cdot 0.16 \\ \frac{W}{l} &= 8~{\rm kWh} \end{aligned}$$

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