

task_f64r8g2jf4pdomfi_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

Table of Contents

Exercise E9 Conversion: Energy, Power and Area 2

conversions, energy, power, area, chapter1 1

Exercise E9 Conversion: Energy, Power and Area

2. The number of solar panels and their size depends on the consumption of electricity. A car with an average 100~{\rm km} per day 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}\over{\rm 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:
$$N = 482.00 \text{ panels} \quad \text{and} \quad A = 915.80 \text{ m}^2$$

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

Solution:
$$P = \frac{W}{t} = \frac{60 \text{ kWh}}{24 \text{ h}} = 2.5 \text{ kW}$$

$$N = \frac{W_{\text{car}}}{W_{\text{panel}}} = \frac{16 \text{ kWh}}{0.033 \text{ kWh}} = 482 \text{ panels} \rightarrow 20 \text{ panels}$$

$$\begin{aligned} \frac{W}{t} &= \frac{16 \text{ kWh}}{100 \text{ km}} = 0.16 \text{ kWh/km} \\ W &= 50 \text{ km} \cdot 0.16 \text{ kWh/km} = 8 \text{ kWh} \end{aligned}$$

From:

<https://wiki.mexle.te.hs-heilbronn.de/> - MEXLE Wiki

Permanent link:

https://wiki.mexle.te.hs-heilbronn.de/ee1/task_f64r8g2jf4pdomfi_with_calculation

Last update: 2023/07/21 13:56

