

task_f64r8g2jf4pdomfi_with_calculation

Student Group

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Table of Contents

Exercise E16 Conversion: Energy, Power and Area 2

conversions, energy, power, area, chapter1 1

Exercise E16 Conversion: Energy, Power and Area

2. The number of solar panels and their total area of the consumption of electricity (in kWh) is 100. The car has an usable battery capacity of 60 kWh. Solar panels produces per 1 m² in average in December 0.2 kWh/m². The car is driven 50 km per day. The size of a distinct solar module with 460 Wp (Watt peak) is 1.9 m times 1.1 m.

Result:
$$N = \frac{460 \text{ Wp} \cdot 20 \text{ m}^2}{460 \text{ Wp}} = 20 \text{ panels}$$

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

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

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

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