Energy Resources and Generating Electricity

Energy · 4 questions · step-by-step answers at the end

Name: Date: Score: / 4

USEFUL EQUATIONS

efficiency = useful power out / total power in $E = Pt$

Questions

Show your working in the space under each question.

1. A solar panel of area 1.6 m² receives 1000 W/m² of sunlight and is 20% efficient. What is its electrical power output?

2. A 2.0 MW wind turbine produces, on average, 30% of its maximum output. How much energy does it generate in a day, and how many homes using 10 kWh a day could it supply?

3. Give one advantage and one disadvantage of tidal power.

4. Why can't a country rely on solar power alone?

Step-by-step answers

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1. Power in = 1600 W; output = 0.20 × 1600 = **320 W**.

2. 1. Average power = 0.30 × 2000 kW = 600 kW.
   2. Energy in a day = 600 × 24 = **14 400 kWh**.
   3. Homes supplied = 14 400/10 = **1440**.

   Answer: 14 400 kWh; about 1440 homes

3. Advantage: **predictable** and renewable. Disadvantage: few suitable sites, and barrages **damage estuary habitats**.

4. It generates **nothing at night** and little in cloudy weather, so supply would not match demand without storage.