Energy, Power, Carbon Practice

Physics and Mathematics of Sustainable Energy

College of the Atlantic. September 19, 2019

1. You have a slow car whose speed is 70% of a standard car. If you drive this car for 6 hours, how far have you gone?

2. A plane travels a distance of 20 car-hours in 3 hours. What is the average speed of the car?

3. A small electric tea kettle draws 0.7 kW when on. If you keep the tea kettle on for 6 hours, how much energy have you used?

4. An electric dryer uses 20 kWh in 3 hours. What average power does the dryer draw during this time?

5. Referring to the problems above, how much would it cost in Maine to run the electric dryer for 3 hours? How much would it cost for the tea kettle?

6. Referring to the problems above, how much CO_2 is emitted as a result of generating the electricity needed to run the dryer? Make the tea?

7. Suppose that in your house you have 8 lightbulbs that are on an average of 10 hours each day, and that each lightbulb draws 25 W when on.

   (a) How much energy does this use in one year? Express your answer in and kWh.

   (b) How much would this electricity cost in Maine?

   (c) How much CO_2 is emitted as a result of generating this electricity? Is this a little or a lot? Put this number in perspective.

8. A typical Maine home uses 520 kWh of electrical energy in a month.

   (a) Estimate the average power drawn by the house. Express your answer both in Watts and kWh per day.

   (b) How much CO_2 is emitted in a result of one year as a result of generating this electricity? Is this a little or a lot?