

Carbon Intensities and Capacity Factors

Physics and Mathematics of Sustainable Energy

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1. A home in Texas, USA, uses 800 kWh of electricity a month.
 - (a) What are the emissions associated with this electricity?
 - (b) Put this number in perspective.
 - (c) If you have time, compute the emissions for another state or country.

2. A 2MW wind turbine has a capacity factor of 0.32.
 - (a) How much energy does this turbine generate in a year?
 - (b) How many Maine homes could this turbine power?

3. The Hoover Dam in the Southwestern US has a nameplate capacity of 2080 MW. The average annual energy generated by the power plant from 1947 to 2008 was 4.2 billion kWh. What is the average capacity factor for the Hoover dam for this time period?