

Homework 3

The solutions will be released on Monday, October 9, 2017

Quiz Date: Thursday, October 12, 2017 during class

The quiz is based on the following material: Lecture 7, Lecture 8, and the problems in Homework 3.

Problem 1: Which of the following is not one of the beneficial impacts of wind?

- a. No air pollution
- b. No CO₂ emissions
- c. Large water requirements
- d. Net decrease in pollution due to displacement of energy from fossil-fired sources

Problem 2: Assume that you are the grid operator of a system with a deep wind penetration.

State the key conditions that you need to ensure with regards to the generation, load, and frequency of the grid. **Consider** the graphs on slides 22, 27, and 28 of Lecture 7. **State** your approach that you need to pursue as the grid operator, in order to ensure a reliable operation of a grid with deep wind penetration.

Problem 3: What is the cumulative US wind capacity by the end of 2016?

- a. 8.21 GW
- b. 82.1 GW
- c. 821 GW

Problem 4: Which of the following states has the highest cumulative wind capacity by the end of 2016?

- a. Illinois
- b. California
- c. Texas
- d. Massachusetts

Problem 5: What is the global cumulative wind capacity by the end of 2016?

- a. 4.87 GW
- b. 48.7 GW
- c. 487 GW

Problem 6: Which of the following countries has the highest wind capacity additions in 2016?

- a. US
- b. China
- c. Turkey