

## PHYS-E6572 Advanced Wind Power Technology

Remote, open book exam, MyCourses 10.12.2020 Hannele Holttinen

NOTE: Plagiarism (copy-paste) not allowed, exam will be rejected if many direct sentences found.

1. This task is testing the knowledge and understanding of important characteristic figures in wind power. There may not be just one accurate correct value, or a specific value may not have been given on the course material, but by using analytical thinking you should be able to give an acceptable answer. Give the answers as a numbers (or range) and the related units, and/or short explanation if needed. Note that in some points several values are being asked.

A. What is the typical/average capacity of a wind turbine today?

B. What are reasonably good values of full load hours and capacity factor for a commercial wind turbine?

C. Betz limit and its relation to commercial wind turbines?

D. What is wind power production cost, and at which price wind power is bid to the electricity market (e.g. Nordpool)?

E. What is considered as a significant share of wind power in power system that will see system impacts of wind power?

F. What is a minimum distance from a wind turbine to a dwelling/house?

2. Production estimates for wind power plants and their error sources?

3. Control of wind turbines and wind power plants

4. Tell about the features and tasks included in a wind power project and how a wind power project progresses

5. Connection of different size wind power plants to the grid