Report 2021

Task 46

Wind turbine blade with leading edge erosion. *Photo: Jakob I. Bech*

Erosion of Wind Turbine Blades

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The purpose of the IEA Wind Task 46 is to improve understanding of the erosion driving factors, develop datasets and model tools to enhance the prediction of leading edge erosion likelihood, identify damage at the earliest possible stage and advance potential solutions.

THE SCOPE OF work is divided into four technical work packages:

- Climatic conditions driving erosion
- Wind turbine operations with erosion
- Laboratory testing
- Erosion mechanics and material properties

Task 46 is part of the Research Task "Advanced Technology" within the IEA Wind.

Introduction

The international collaboration on the erosion of wind turbine blades was initiated with a topical expert meeting in February 2020. The IEA Wind Executive Committee approved the Task in December 2020 and started its four-year term in March 2021. The deliverables planned are reports, recommended practices, available technologies

Table 1. Countries Participating in Task 46

	COUNTRY	TASK PARTICIPANT
1	**Belgium**	Engie
2	**Canada**	WEICan
3	**Denmark**	DTU Hempel Ørsted A/S
4	**Finland**	VTT
5	**Germany**	Covestro DNV Emil Frei Fraunhofer IWES Nordex Energy
6	**Ireland**	IT Carlow NUI Galway University of Limerick
7	**Netherlands**	Eneco Suzlon TU Delft TNO
8	**Norway**	Equinor University of Bergen
9	**Spain**	Aerox CENER Nordex Energy Spain Siemens Gamesa Renewable Energy Universidad Cardenal Herrera – CEU
10	**United Kingdom**	Lancaster University ORE Catapult University of Bristol
11	**US**	Cornell University Sandia National Laboratories 3M

reports, literature surveys, metadata, and models.

The 31 participating organizations from 11 countries represent the key wind energy actors relevant to the erosion challenge: owners, wind turbine manufacturers, leading edge protection suppliers, and the research community.

International collaboration remains key to learning from both experience and studies in different countries. A new country aims to join, most recently Japan.

Progress and Achievements

The spring meeting in 2021 and the autumn meeting in 2021 were both held online to enable participation as the Covid restrictions limited travel and physical meetings.

In 2021, there were presentations at the following events

- 2nd International Symposium on Leading Edge Erosion of Wind Turbine Blades, 2-4 February 2021, DTU Wind Energy (online)
- Falcon 30 50 Workshop European Energy Research Alliance EERA SP4 Aerodynamics Loads and Control, 25 February 2021, CENER (online)
- WESC Wind Energy Science Conference - Mini-Symposia Leading edge erosion of wind turbine blades, 25-28 May 2021, ForWind and Leibniz University Hannover (online)

Popular article
WindTech International 9 November 2021 https://www.windtech-international.com/editorial-features/erosion-of-wind-turbine-blades

Next Steps

The next steps in Task 46 will be to provide the first report. This is from WP2 on Climatic conditions. An online webinar is prepared for May 2022. The 3rd plenary meeting will be online in February 2022, and the 4th plenary meeting will be in Copenhagen, hosted by Ørsted.

Task Contact

The Task is coordinated by VTT (Finland) and DTU (Denmark).

The progress of the Task can be followed on the website https://iea-wind.org/task46/