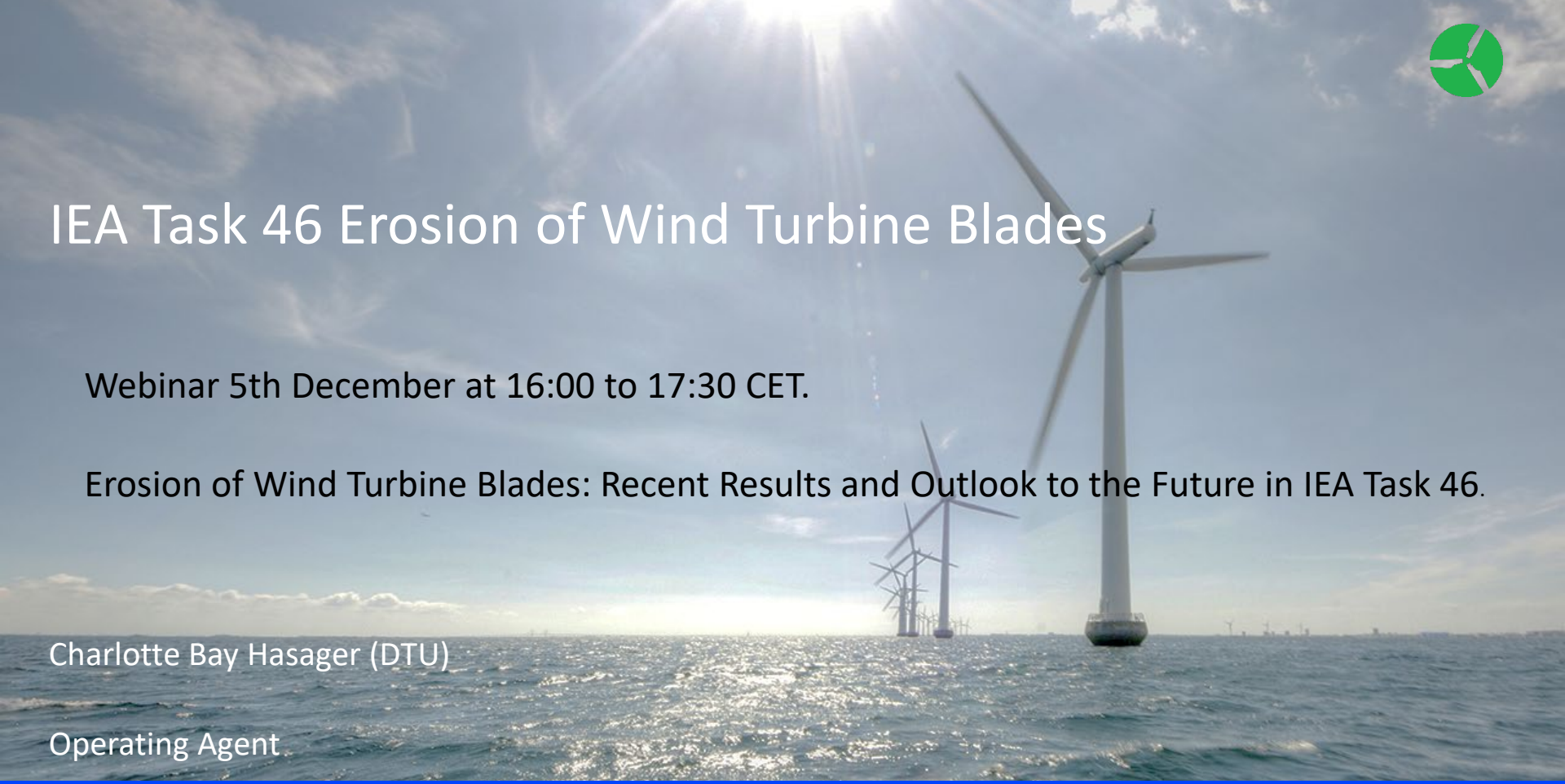

IEA Task 46 Erosion of Wind Turbine Blades

Webinar 5th December at 16:00 to 17:30 CET.

Erosion of Wind Turbine Blades: Recent Results and Outlook to the Future in IEA Task 46.

Charlotte Bay Hasager (DTU)

Operating Agent

Agenda

IEA Wind TCP

16:00 Introduction to IEA Task 46 and future Phase 2, Charlotte Hasager, Operating Agent, DTU

16:15 Climatic conditions driving blade erosion, Sara Pryor and Rebecca Barthelmie, WP2-leaders, Cornell University

16:30 Wind turbine operation with erosion, David C. Maniaci, WP3-leader, Sandia National Laboratory

16:45 Laboratory testing of erosion, Nicolai Frost-Jensen Johansen, WP4-leader, DTU

17:00 Erosion mechanism and material properties, Fernando Sánchez, WP5-leader, Universidad CEU-Cardenal Herrera

17:15 Discussion

17:30 End of webinar

The purpose of IEA Task 46 is to

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- improve understanding of the erosion driving factors,
- develop datasets and model tools to enhance prediction of leading-edge erosion likelihood,
- identify damage at the earliest possible stage and,
- advance potential solutions.

Timeline (year #4)

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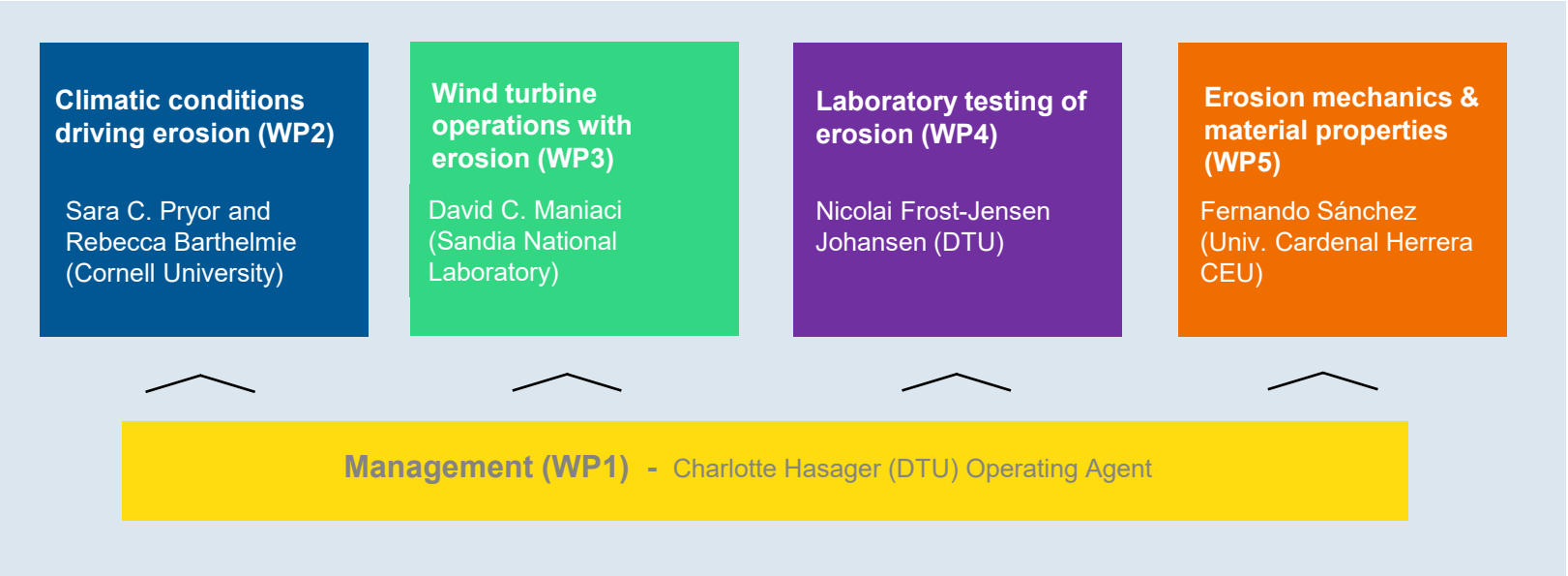
Date	event	status
31/03//2023	Invoicing year # 4	August 2024
18/04/2024	7th bi-annual plenary meeting (online)	online
21-24/05/2024	Task 46 presents in ExCo #94 (Italy)	Face-to-face ExCo
Aug/2024	Quarterly coordination telco (WPLs & OA)	
17-18/09/2024	Presentation at Blade workshop, NM, USA	Face-to-face public
19/09/2024	Special Session from Task 46 Albuquerque, NM, US - Sandia as Host	Face-to-face public
19-20/09/2024	8th bi-annual plenary meeting in Albuquerque, NM, US - Sandia as Host	Face-to-face task participants
Autumn 2024	ExCo #95 (online)	online
Nov/2024	Quarterly coordination telco (WPLs & OA)	online
5 Dec/2024	Dissemination public webinar	online
Feb/2025	Quarterly coordination telco (WPLs & OA)	online
4-6/02/2025	Final presentations 6th Erosion symposium	Face-to-face public
7/2/2024	Workshop DTU for Task 46	Face-to-face task participants
March/2025	Final bi-annual plenary meeting (online)	online
14/03/2025	FINAL REPORT	

Coordination

IEA Wind TCP



Phase 2 is approved by IEA ExCo

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IEA Task 46 Phase 1 and Phase 2

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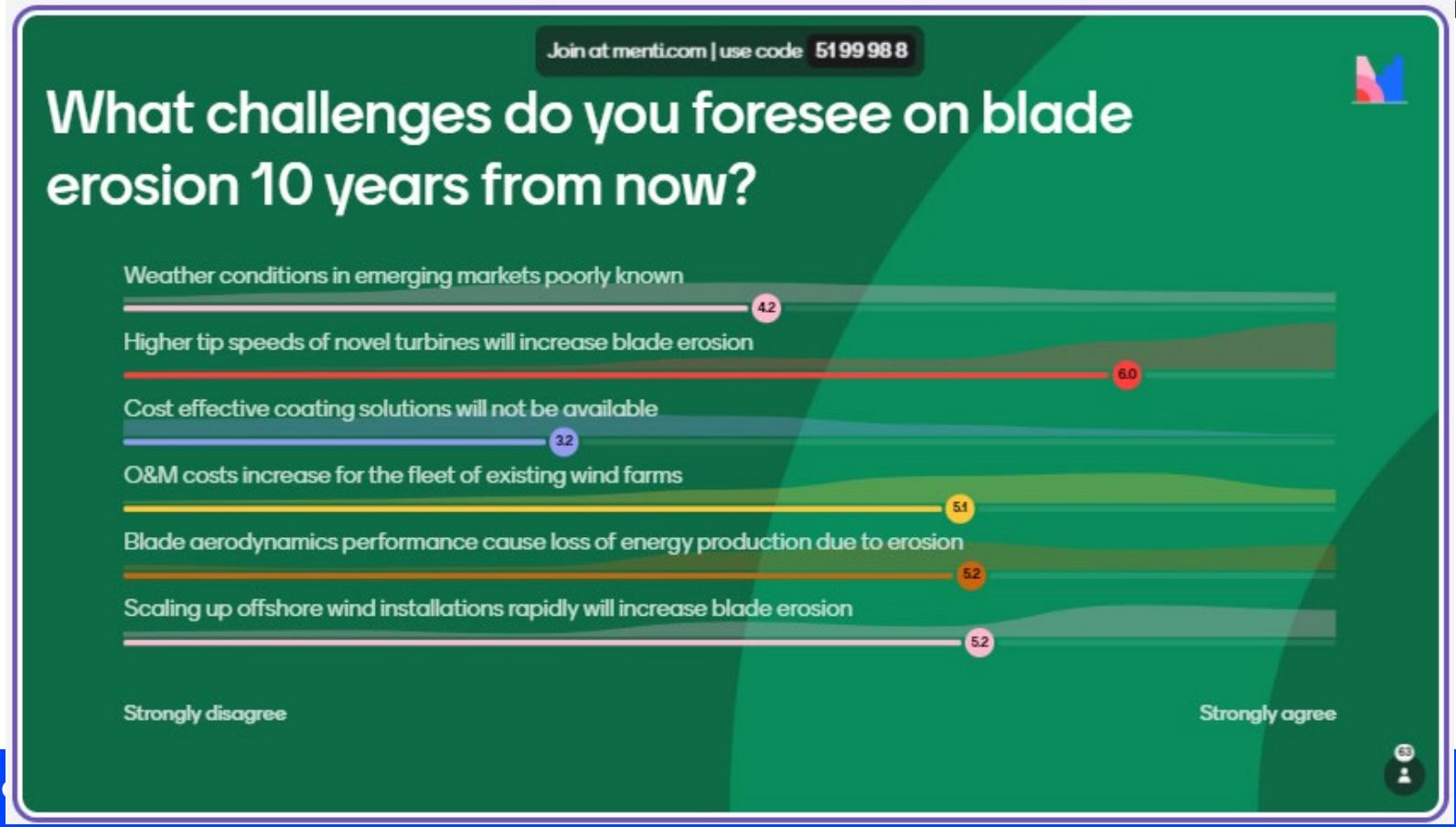
- Phase 1 started 15 March 2021 and end 14 March 2025
- Phase 2 starts 15 March 2025 and end 14 March 2029

Mentimeter – Results From the Survey (September 18, 2024)

EA Wind TCP



IEA Task 46 Phase 2 coordination

Wind TCP

Work Package	Lead organization
WP 1: Management	DTU (DK) Professor Charlotte Bay Hasager (Operating Agent) Professor Christian Bak (Co-operating Agent)
WP 2: Climatic conditions	Cornell University (US) Professor Sara Pryor (WP-lead) Professor Rebecca Barthelmie (Co-lead)
WP 3: Wind turbine operation with erosion	Sandia National Laboratories (US) David Maniaci, PhD Rotor Blade and Wind Plant Aerodynamics Lead (WP-lead) CENER (ES) Beatriz Mendez, PhD Head of Aerodynamics and Hidrodynamics (Co-lead) University of Lancaster (UK) Sergio Campobasso, PhD Senior Lecturer (Co-lead)
WP 4: Laboratory testing of erosion and material blade integration	DTU (DK) Nicolai Frost-Jensen Johansen, PhD Development Engineer (WP-lead) AIST (JP) Motofumi Tanaka, PhD Senior Researcher (Co-lead)

IEA Task 46 Phase 2 project plan

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The approved Phase 2 project plan is available at

https://share.dtu.dk/sites/IEA_WIND_T46_493900/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FIEA%5FWIND%5FT46%5F493900%2FShared%20Documents%2FPhase%202%2FWork%20Plan

Participants

- The work plan is delivered by 41 organizations from 12 countries:
  - 1 certification body
  - 8 wind farm owners
  - 2 consultancy
  - 4 wind turbine manufacturers
  - 7 coating manufacturers
  - 19 academic/R&D organizations

Country	Contracting Party	Participant Organization
Belgium	Belgian Ministry of Economy	Engie
Canada	Natural Resources Canada	WEICan
Denmark	Danish Energy Agency	DTU , Hempel, Ørsted, PowerCurve, Siemens Gamesa Renewable Energy,
Finland	Business Finland	VTT
Germany	Federal Ministry for Economic Affairs and Energy	Fraunhofer IWES , Covestro, Emil Frei (Freilacke), Nordex Energy SE, DNV, Mankiewicz, RWE, Henkel
Ireland	Sustainable Energy Authority of Ireland	South East Technological University, University of Galway, University of Limerick
Japan	New Energy and Industrial Technology Development Organization	AIST, Osaka University, Tokyo Gas Co. Asahi Rubber Inc.
Netherlands	Netherlands Enterprise Agency	TU Delft, TNO
Norway	Norwegian Water Resources and Energy Directorate	Equinor, University of Bergen, Statkraft
Spain	Centre for Energy, Environmental and Technological Research	Aerox, CENER, Nordex Energy Spain, Universidad Cardenal Herrera - CEU
UK	Offshore Renewable Energy Catapult	ORE Catapult, University of Bristol, Lancaster University, Imperial College, Vestas UK, Ilosta
US	US Department of Energy	Cornell University, Sandia National Laboratories, 3M

Wind TCP

Who can participate in Task 46?

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Events planned in Phase 2

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- Wind Europe 18-20 April 2025 in Copenhagen
  - Oral presentation *Hasager et al.*

- Wind Energy Science Conference (WESC) 24-27 June 2025 in Nantes
  - Mini-Symposion: Leading Edge Erosion: An Aerodynamic Perspective

The call for abstracts is open up to 15 January 2025 **https://wesc2025.eu/**

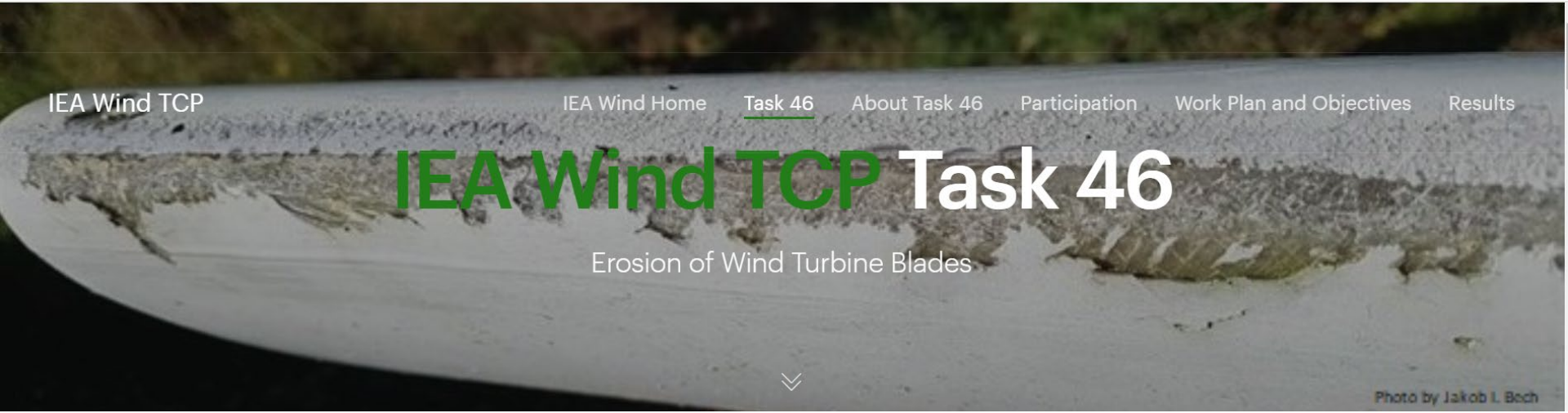
MS#03.2 Leading Edge Erosion: An Aerodynamic Perspective

IEA Wind TCP

- **F. GRASSO[1], D. MANIACI[2], G. SCHEPERS[3], A. OLSEN[4]**
  [1] Vestas Technology Centre Porto|[2] Sandia Lab|[3] TNO|[4] DTU Dept of Wind and Energy Systems

- **Aerodynamics, aeroelasticity and acoustics**
  The erosion of the leading edge is a critical issue which reduces the lifetime of the blades. Tailored maintenance strategies and protective solutions for the leading edge became more and more popular development topics. The symposium focuses on the impact of the erosion on the rotor performance and its implications in terms of aerodynamic modelling and blade design strategy.
- The IEA Task 46 (Erosion of wind turbine blades), the IEA Task 47 (TURBINIA TURBulent INflow Innovative Aerodynamics), and the Danish project LERCat (Leading Edge Roughness Categorisation) jointly organize the mini-symposium.

https://iea-wind.org/task46/



Thank you!

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IEA Wind TCP functions within a framework created by the International Energy Agency (IEA).

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IEA Wind is part of IEA's Technology Collaboration Programme (TCP).

Contact

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