

INNOVATIVE FUTURE-PROOF TESTING METHODS FOR RELIABLE CRITICAL COMPONENTS IN WIND TURBINES



ININTERESTING ID

Acronym

Horizon 2020 - ININTERESTING

Program

The European Union's Research and Innovation Program Horizon 2020 LC-SC3-RES-1-2019-2020
Developing the next generation of renewable energy technologies

Duration

January 2020 - December 2022

Main objective

To accelerate wind energy technology development and to extend the lifetime of wind turbine components by developing innovative virtual and hybrid testing methods for prototype validation of pitch bearing and gearbox components.

Partner countries

Belgium, Finland, Spain

UPCOMING EVENTS

- 9th and 10th of September: ININTERESTING 1st stakeholder consultation meeting
- 1st and 4th December 2020: Participation in Wind Energy Hamburg

EDITORIAL

Welcome to the most ININTERESTING project of the Horizon 2020 Program! With this first newsletter we would like to introduce the project and its objectives for the next 3 years and beyond.

Within the bi-annual newsletter we will keep you up to date about the latest developments and initiatives related to ININTERESTING, aiming to share our achievements and lessons learned.

This 1st edition of the Newsletter is intended to get you familiarized with the consortium and with the activities carried out during the first semester of the project. At the end of the Newsletter, we offer you a short overview on upcoming events and initiatives related to the ININTERESTING topics.

It needs to be raised that the COVID-19 pandemic situation that hits the world puts now the project and all the overall working scheme in a different perspective, and many activities and meetings have been postponed or changed into online formats.

In the meantime, the consortium is being keep working and sticking to the work program as good as possible, but some modifications will be necessary.

In the following issues we will share with you more of our achievements and fruitful results, and we will inform you about project milestones and events.

For more information and news about ININTERESTING project, please see our website:

www.ininterestingproject.eu/project/

We hope you will enjoy reading this first issue of ININTERESTING Newsletter.

Your feedback and comments are always welcome!

The consortium

PROJECT PRESENTATION

MOTIVATION

The state-of-the-art in validation tests of wind turbine components requires full scale testing in ad-hoc test-benches. With wind turbines becoming larger and larger each year, there is need for increasingly larger test-benches -some examples are the recently built ones of ORE CATAPULT at its Blyth premises, or WINDBOX at the Basque Country- that in turn must carry out rather big testing campaigns. This process implies several disadvantages in terms of testing time, costs and energy consumption.

More demanding requirements in wind energy



LONGER
LIFETIME



CAPEX/OPEX
REDUCTION



BETTER
RELIABILITY



ENVIRONMENT
INTEGRATION



SOCIAL
ACCEPTANCE

Need for
larger/more
expensive
test benches



To tackle this challenge, the ININTERESTING consortium is working on the development of new concepts and technologies for larger turbines (disruptive technologies for new pitch bearings -CS1- and gearboxes -CS2-, and a third case -CS3- for significantly extending the lifetime of existing pitch bearings) while also defining a new hybrid methodology to demonstrate the reliability of these systems without the need of building new large and expensive test-benches.



> **CS1** is based on an innovative pitch bearing concept that will be installed in a 20 MW offshore wind turbine from the year 2030 onwards (hub height of 160 m, rotor diameter of 276 m and the pitch bearing diameter of 7 m). The turbine will be installed in a wind farm with a size of 2.04 GW with 102 turbines.

> **CS2** is based on a new gearbox concept that will be installed in a 10 MW onshore wind turbine from the year 2030 onwards (hub height of 119 m, rotor diameter of 202 m and a torque density up to level of 200Nm/kg). The wind turbine will be installed in a farm size of 100MW with 10 turbines.

> **CS3**: in this CS, a 3,4 MW wind turbine will be installed in 2020, and the pitch bearing will fail at an early stage of the lifetime (<10 years): a reparation and stiffening solution will be required in the pitch bearing.

DISSEMINATION MATERIAL

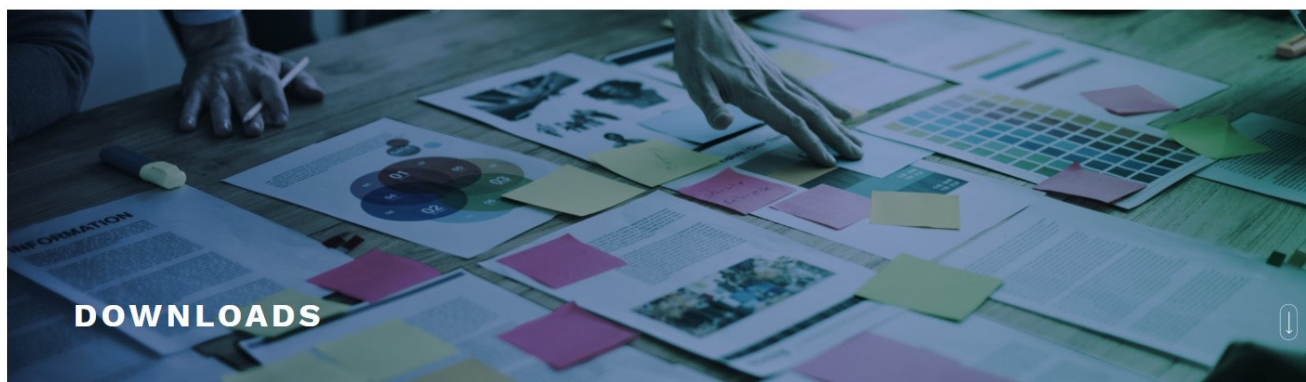
- Check the ININTERESTING dissemination material on the website!

www.ininterestingproject.eu

DOWNLOADS MEDIA CONTACT



PROJECT ADVISORY GROUP TECHNOLOGICAL APPROACH NEWS EVENTS



DOWNLOADS

We put at your disposal all the documentation related to the project

Search the documentation

SEARCH →

- LinkedIn and twitter accounts:



www.linkedin.com/ininteresting-eu



twitter.com/ININTERESTING_eu

- **Brochures** and a **roll-up** have been created so far



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CONTACT

MIREIA OLAVE IRIZAR
+34 943 71 24 00
molave@ikerlan.es

STAKEHOLDER ENGAGEMENT

In order to maximize the success potential of the project, ININTERESTING research and innovation activities will be driven by the opinion of stakeholders involved in the Stakeholder Advisory Board, which will be the main group supporting the consortium in providing expert advice to ensure consistency in the project outcomes in accordance with market expectations.

Stakeholders involvement will be key for validation and improvement at critical project stages, where checkpoints on the work performed are (and will be) required. In this sense, the advisory board will be divided into two main groups:

- Sustainability Advisory Group, which will help defining the necessary requirements for future wind turbines, to improve the social acceptance and to lower the environmental impacts of newly developed wind energy technology.
- Technical Advisory Group, which will consist of a limited number of experts who will support the technical advancement of the project and will support the consortium on its development.


A first stakeholders meeting will be held on 9th and 10th of September, which will be divided in two main sessions:

Technical session on 9th of September - led by IKERLAN


This session may only be joined on personal invitation due to its nature. If you consider you may make a contribution to this session, please send your motivation to MOlave@ikerlan.es and your participation will be considered.

Sustainability session on 10th of September - led by VITO

Presentation of the preliminary results of the LCSA will be given during this session. Topics that will be discussed interactively are the environmental and social requirements of future wind turbines and requirements to improve the future social acceptance of wind energy. Anyone interested in participating in this part will have the opportunity to do so [via this form](#) before the meeting. The Stakeholder Consultation Meeting will be held an online webinar.



The ININTERESTING Technical Advisory Group (TAG) is the main group supporting the consortium in providing expert advice to ensure consistency in the project outcomes in accordance with market expectations.



The ININTERESTING Sustainability Advisory Group (SAG) comprises all stakeholders from the target audience who supports the consortium to improve the social acceptance and to lower the environmental impacts of newly developed wind energy technology.

One of the objectives of the ININTERESTING project is to improve social acceptance of the newly developed designs, concepts and testing methods. For a better understanding of the concept of social acceptance a literature review has been performed. The complete overview with key messages from the literature review on social acceptance towards wind energy, including the definition and aspects of, and influences on social acceptance, and some examples of good practices, are included in [deliverable 1.1](#). The two main key messages found are:

- > The overall acceptance at society level needs to be increased, rather than at the level of individual projects;
- > There is a lack of comprehensive and systematic review to identify common findings and outstanding research questions. Important insights are produced, yet knowledge gaps remain.

Based on the literature review, no major difference is to be expected for social acceptance of the host community of a wind energy project with or without the solutions developed within ININTERESTING.

- > Research on the influence of wind farm lifetime on social acceptance is lacking.
- > Less maintenance and thus less idle time may lead to a stronger acceptance.
- > Further research to learn more about the difference in social acceptance of wind farms with an extended lifetime versus repowering is needed, as reports have shown that repowering can be highly effective in improving the social acceptance of a wind farm.

On the matter of social acceptance of wind energy projects more comprehensive studies of several years have been dedicated than the literature review done for ININTERESTING, therefore we are eager to engage interest groups, stakeholders, researchers, and others on this matter. Please feel free to share your knowledge and/or feedback on social acceptance of wind energy with the ININTERESTING project partners via de website. Or join us at the [first ININTERESTING stakeholder consultation meeting](#) on 10 September 2020!

17 January 2020 | LEUVEN: THE ININTERESTING PROJECT financed by the European Union's H2020 Research and Innovation Program officially launched

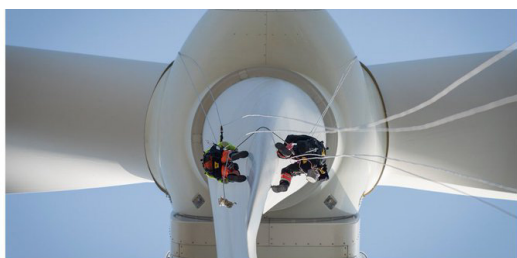
ININTERESTING, a project coordinated by the Technological Research Centre IKERLAN and formed by a consortium that brings together eight partners from three European countries, kicked off on the last 15th and 16th of January 2020 at KU Leuven facilities (Belgium).



The European project ININTERESTING aims to accelerate wind energy technology development and to extend the lifetime of wind turbine components by developing innovative virtual and hybrid testing methods for prototype validation of pitch bearing and gearbox components

18 March 2020 | ININTERESTING IN THE WIND EUROPE BULLETIN MARCH 2020

WindEurope Bulletin March 2020 included among its Members' News section a brief article about ININTERESTING, giving an overview of the project and mentioning its main objectives. It was published on the 8 March 2020 and it had a great impact among the viewers.



30 June 2020 | Submission of D1.1 Deliverable

Deliverable 1.1: "Technical, environmental and social requirements of the future wind turbines and lifetime extension" led by IKERLAN has been delivered and it can be found within the "downloads" section of the official [website](#). The document describes the technical, environmental, and social requirements of the future wind turbines (2030-2050), and more precisely for pitch bearing and gearbox for large wind turbines.



UPCOMING EVENTS

September 2020 | 1ST ININTERESTING STAKEHOLDER CONSULTATION MEETING

On 9th and 10th of September 2020, the ININTERESTING consortium will organise its first stakeholder consultation meeting with two main sessions: a technical session on the 9th of September and a sustainability session on the 10th. The main objectives are to overview the technical advancement of the project and to improve the future social acceptance of newly developed wind energy technologies, respectively. You can subscribe to the sustainability session using this [link](#).

1-4 December 2020 | Wind Energy Hamburg

ININTERESTING will be represented within the Wind Energy Hamburg event, the global gathering of the wind industry. For the first time, it presents a revised conference concept with a more focused high-level programme and a new part open for all visitors under the theme #climatefirst: there will be three stages set-up for keynotes and panel discussions featuring international experts in the middle of the exhibition halls.

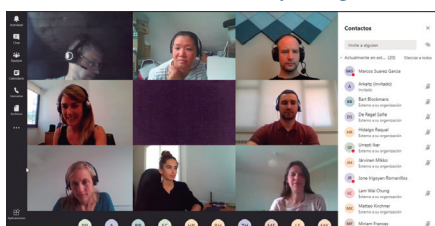
The Basque Energy Cluster will have its own stand, where the ININTERESTING roll-up and video will be continuously displayed and brochures will be distributed to anyone that raises interest in the project.



The global on & offshore event

30 June - 1 July 2020 | 2nd Consortium meeting

2nd ININTERESTING plenary meeting – All partners met again for collaborative planning and tasks updating in an online format event. The first day was focussed on WP1 (Requirement and Concept Developments), WP6 (Environmental, Social and Economic Assessment) and WP7 (Dissemination & Exploitation), which have been the focus of this first semester, while the second day was fully dedicated to technical work packages and discussions.



Check these and more ININTERESTING stories in www.ininterestingproject.eu

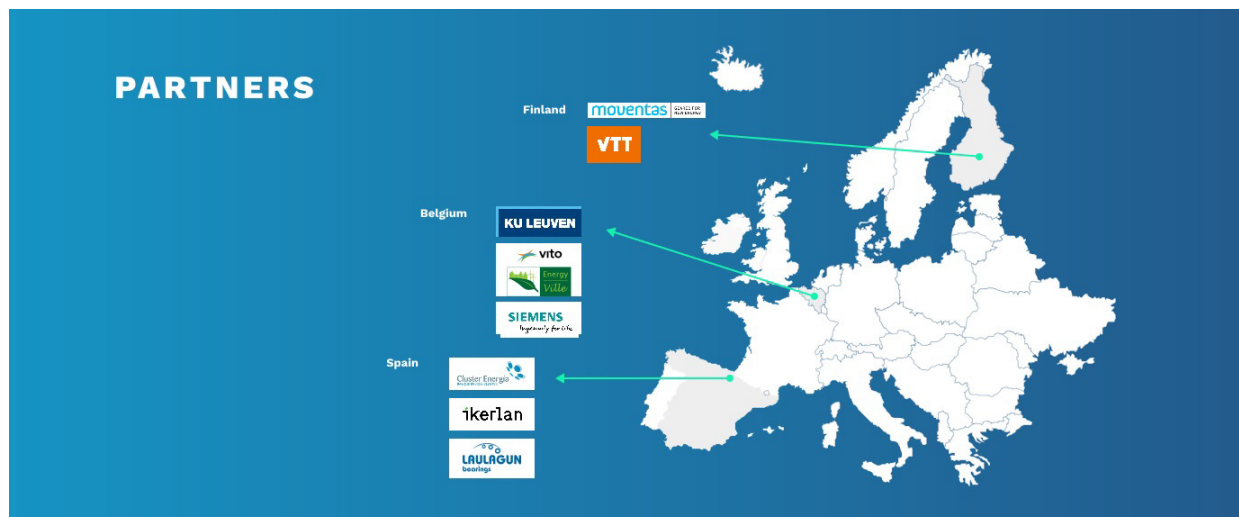


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CONTACT

MIREIA OLAVE IRIZAR
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molave@ikerlan.es

PROJECT PARTNERS



IKERLAN (LEADER)

IKERLAN is a leading knowledge transfer technological centre providing competitive value to companies since 1974. Thanks to a unique cooperation model, which combines technology transfer activities, internal research and training of highly qualified personnel, IKERLAN is currently the trusted technological partner of major companies. With a long background in European projects, it coordinates the ININTERESTING project, where it will also contribute to the development of innovative virtual reliability methodologies, simplified testing procedures and demonstrate the feasibility of new lifetime extension concepts for pitch bearings.

KU LEUVEN

KU Leuven brings into ININTERESTING its expertise in flexible multibody dynamics and smart system dynamics. High fidelity modelling of bearings, model order reduction techniques, and virtual sensing (techniques and sensor sets for parameter estimation, load estimation and crack estimation) will be instrumental to advanced tools for ensuring reliability of pitch bearings, and will pave the way to extrapolations towards upscaling for hybrid accelerated testing.

LAULAGUN

Laulagun Bearings has designed, manufactured and marketed special large diameter bearings and slewing rings since 1973. Laulagun is one of the two industrial partners included in the consortium and leads the case study one, which is the pitch bearing on a wind turbine and will be used during the different work packages of the project. It also provides the patent for the case study 3 (pitch bearing lifetime extension concept), which will be led and developed by IKERLAN. Besides this, Laulagun is responsible of the work package where physical testing will be carried out for the validation of the proposed new approach.

MOVENTAS GEARS

MOVENTAS GEARS OY is a Finland based company who develops and manufactures wind turbine gearboxes and related technologies and offers service for wide range of different brand products on the market. In ININTERESTING project, role of Moventas will be to develop a new onshore wind gearbox concept including novel gearing and bearing technologies. Based on this concept a virtual and actual prototype demonstrator gearbox will be build, and both will be tested.

PROJECT PARTNERS

SIEMENS INDUSTRY SOFTWARE

SIEMENS INDUSTRY SOFTWARE NV is a leading provider of simulation and test software, hardware and services. The Simcenter portfolio includes a complete suite for test-based engineering, an integrated 3D simulation and analysis platform and a multi-disciplinary system performance simulation platform, complemented by Simcenter Engineering Services. In the framework of the ININTERESTING project, Siemens Industry Software is a key contributor with respect to development of advanced CAE techniques, in particular for multibody dynamics and acoustics. The combination with Test expertise makes SISW in the perfect spot to contribute to the development of advanced virtual sensing techniques.

VITO/ENERGYVILLE

VITO is a leading European independent research and technology organisation in the areas of cleantech and sustainable development, elaborating solutions for the large societal challenges of today. VITO provides innovative and high-quality solutions, whereby large and small companies can gain a competitive advantage, and advises industry and governments on determining their policy for the future. The business units "Sustainable Energy and Built Environment" and "Sustainable Materials" of VITO are involved in the ININTERESTING project in order to assess the sustainability of the newly to be developed components and testing methods. The unit "Sustainable Energy and Built Environment" is part of the "EnergyVille" collaboration on sustainable energy with the University of Leuven (KU Leuven), University of Hasselt (U Hasselt) and the R&D centre IMEC.

VTT

VTT Technical Research Centre of Finland Ltd is a state owned non-profit company. VTT is an RTO whose activities are focused on three areas: Knowledge intensive products and services, Smart industry and energy systems, and Solutions for natural resources and environment. VTT is impact-driven and takes advantage from its wide multi-technological knowledge base to strengthen Finnish and European industrial competitiveness. VTT has a staff of 2054, net turnover in 2018 was 159,7M€ and other operational incomes 81,2M€. Over the years, VTT has gained vast experience from participation and coordination of numerous European projects including R&D Framework Programme projects and other thematic frameworks. In December 2017, VTT has been recognised with the "HR Excellence in Research" award by the European Commission.

BASQUE ENERGY CLUSTER

The Basque Energy Cluster is an association formed by companies, RTOs and public administration of the Basque energy sector, with over 100 organisations working on wind energy. The Basque Country is one of the largest industrial clusters in Europe, with a long tradition in the wind energy sector, making it one of the regions of the world with a highest concentration of companies working in this field. In ININTERESTING, it will be responsible for the implementation of the Communication and Dissemination Strategy.

We hope that you enjoyed the ININTERESTING Newsletter and already look forward to the next editions.

The consortium.



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