

www.irpwind.eu



The EERA Joint Programme for **Wind Energy**



About the EERA Joint Programme for Wind Energy

The EERA Joint Programme for Wind Energy (JP Wind) is a unique collaboration initiated and led by public research organisations with the aim of strengthening collaboration in European wind energy research.

The mission of JP Wind is to provide strategic leadership for the technical medium to long term research and to support the European Wind initiative.

A new level of coordination

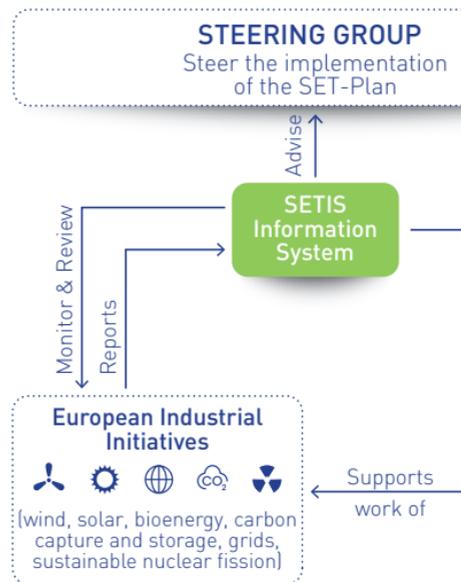
Traditionally, European research organisations have competed against each other with temporary collaborations in EU-projects or through bilateral agreements. With JP Wind we are moving towards a stable framework that enables our research labs to pool part of their

efforts invested in pre-competitive research.

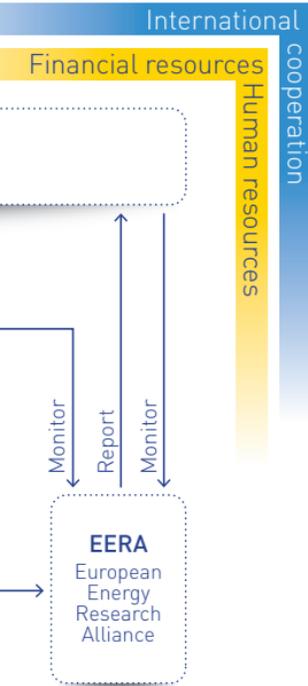
This allows for a better use of resources and ensures that new ideas are brought to a level of technological readiness that allows for industrial involvement. The ultimate aim is to develop a European Virtual research centre for Wind Energy.

JP Wind is one of 15 Joint programmes run by the European Energy Research Alliance (EERA). EERA is the public research pillar of EU's Strategic Energy Technology Plan (SET-Plan). The SET-plan is the EU's policy framework for accelerating the development of low carbon energy technologies to help build a low-carbon Europe.

SET-Plan method



IRPWIND - towards a European Virtual Research Centre for Wind Energy



The vision of the JP Wind is to develop a European virtual research centre for wind energy. The European Commission supports the realisation of this vision with the Integrated Research Programme for Wind (IRPWIND) supported under FP7. IRPWIND combines strategic research projects and supports activities within the field of wind energy research. Through IRPWIND we are moving beyond the delivery of individual projects towards the implementation of a research agenda aligned with the needs and wishes of the European industry.

A European virtual research centre for wind energy will enable us to work together in the early phase of development while maintaining a



healthy competitive environment as project ideas come closer to market. This will be built on three pillars.

- 1) **Exchange of knowledge and researchers**
- 2) **National alignment and access to research infrastructures**
- 3) **Collaboration with industry and strengthening global outreach**

The EERA Joint Programme for Wind Energy – making an impact

Since its start in 2010, JP Wind has created a platform for researchers to meet and exchange knowledge through workshops, conferences and biannual steering committee meetings. Through these activities, JP Wind has created the foundation to build from.

Today, JP Wind has become an important vehicle for building strong consortia to compete for FP7 and Horizon 2020 calls. INNWIND.EU, EERA DTOC and AVATAR are just a few examples of large EU projects initiated by JP Wind.

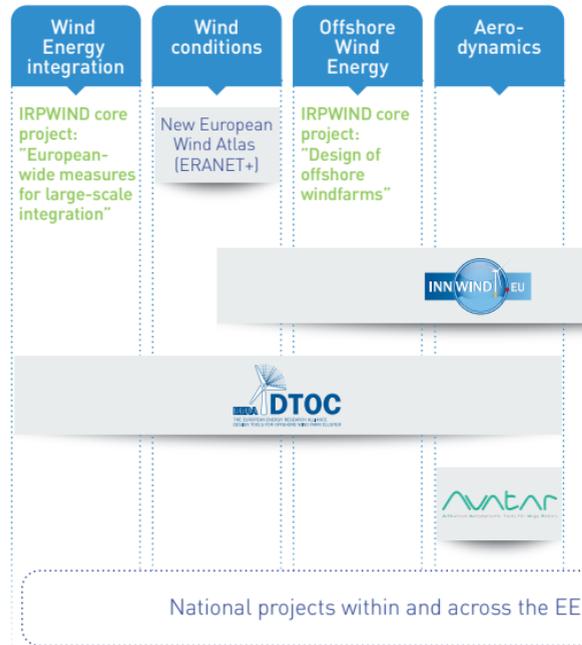
EERA Consortia are led by JP Wind partners, but always build with the strongest possible organisations and



industry including partners outside EERA who add specific value to the proposals.

Together with ongoing national projects, these large EU projects form a portfolio of research activities within the JP Wind research community that allows for easy dissemination of results.

Sub-programmes



Exchange of researchers – the IRPWind mobility programme

Structures & materials

Research Infrastructures

Economic and social aspects

IRPWIND core project: "Structural reliability of WT sub-components"

IRPWIND Research Infrastructures scheme



RA JP Wind subprogrammes



JP Wind is testing a new form of mobility scheme targeting senior researchers. With the mobility scheme JP Wind aims to:

- connect relevant national projects or initiatives to JP Wind with an eye to future emerging technologies and scientific topics; and
- conduct actions oriented to promote the concept of mobility of researchers as brain gain and foresight schemes to enable effective mobility.

The funding scheme, which is part of IRPWind consist of grants for a period length of 1, 3 and 6 months. A lump sum will cover travel expenses from/to home institution.

www.irpwind.eu/mobility

How does JP Wind add value to a project?

The bulk of research activities in EERA Joint programmes happen in competitively funded projects and in particular EU projects. The ability of JP Wind to positively impact project setup and outcome is therefore an important indicator of the effect of EERA JP Wind.

The EU project EERA-DTOC, funded under FP7 is a good example of how this works.

In EERA-DTOC JP Wind provided 4 important building blocks for the project to succeed in delivering a final result to the benefit of European industry:

- 1) a broad stakeholder consultation with industrial partners via our collaboration with EWEA;
- 2) this led to a gap analysis identifying the research need;
- 3) a European framework in the form of JP Wind with the necessary trust among partners to share knowledge and frame a solution;
- 4) National competences, models and standards to align EERA-DTOC is essentially about developing a common European standard to replace national tools with varying degrees of quality and user-friendliness.

Peter Hauge Madsen
Director of DTU Wind Energy and EERA JP Wind Coordinator



“JP Wind is managed by some of the leading research organisations in the world and brings all major research organisations in Europe around the same table. That is alignment.”

EERA-DTOC – a JP Wind success story

After 3 years of research and software integration, the *European Energy Research Alliance – Design Tool for Offshore Wind Farm Cluster project (EERA DTOC)* launched the result of the project in March 2015: the Wind & Economy Design tool.

Wind & Economy allows wind farm developers to comprehensively model the large-scale effects of clustered wind farms in order to optimise the wind farms' layout by calculating annual energy production, estimating losses and predicting costs.

The tool can also help strategic planners in defining potential areas for new offshore clusters, optimising onshore grid connections and simulating services such as power

“The EERA-DTOC project represents an exciting step towards the future of layout design within offshore wind technology”

Iberdrola Renovables



For more information visit
www.eera-dtoc.eu

balancing and voltage support from offshore wind farms.

The advantages of the new design tool compared to previous ones are:

- Multiple heterogeneous tools have been developed into one common user-friendly shell.
- The wake models are validated based on offshore industry data from several large offshore wind farms. This in-depth verification ensures that the tool is robust and efficient.
- In addition to the lack of common standards, previous design tools were not very user-friendly.

National alignment

Europe is world leader in wind energy research and innovation, home to the largest industry and some of the leading research organisations in the world. JP Wind is also an instrument to maintain this position. An important aspect of this is the alignment of national activities as well as the coordination of activities across national borders.

JP Wind participants are organised in national clusters with one lead participant representing the cluster in the programme steering committee. In the framework of the IRPWIND project, each national cluster will establish national fora to help organise the coordination of national and EU priorities.

One of the key missions of JP Wind is to develop new projects building on the combined use of national and EU funding. This is a challenging exercise for both member states and JP Wind members, but work is ongoing to realise this potential.

The development of these new types of instruments shows the effect an EERA Joint Programme can have on institutional and national abilities to successfully drive collaboration in Europe.

William Kristensen

Deputy Director General,
Norwegian Ministry of
Petroleum and Energy



“The establishment of EERA and its joint programmes are important stepping stones towards a more integrated European research community. EERA and its members play an important role in developing the SET-Plan integrated roadmap and in joining forces to increase the effectiveness of national and EU energy research. JP Wind is a very good example of what can be achieved through joint efforts.”



NEWA - combining national and EU funding

The new European Wind Atlas

A good example of how EERA can help contribute to develop new projects combining national and EU funding is the New European Wind Atlas project (NEWA). NEWA is a so-called ERANET+ project. It is funded by the European Commission and 9 national funding agencies.

NEWA will provide a unified high resolution and free data-set of wind energy resources in Europe. The statistics in the atlas will cover Europe with a resolution 20-30 metres in at least 10 wind turbine relevant heights.

NEWA is based on improved modelling competencies on atmospheric flow, together with the guidelines and best practices for the use of data. It will become a key tool for manufacturers, developers, public authorities and decision-makers.

NEWA replaces the wind atlas published by Risø National Laboratory (DK) for the European Commission in 1989.

The team behind NEWA consists of 31 partners from 8 European countries.

www.neweuropeanwindatlas.eu

Collaboration with industry

Wind energy competes with both fossil fuels and other renewables for shares of the energy market.

Further improving the competitiveness of wind energy requires a clear strategy and strong execution of it. This is why JP Wind is collaborating closely with European industrial partners to set the priorities and find best ways to implement these.

In 2012, JP Wind signed a Memorandum of Understanding (MoU) with the European Technology Platform for Wind Energy (TPWind). The two organisations have been active members of the other's advisory board and core partners in the European Wind Initiative under the SET-Plan.

The collaboration between TP Wind and JP Wind developed into an important component of the alignment of R&I strategies across the entire European innovation chain for wind energy. It is a testimony to the importance of the SET-Plan as a policy framework and the willingness of both partners to collaborate to maintain Europe's global leadership in wind energy.

And of course, JP Wind also collaborates with many industrial partners in our European projects.

Iván Pineda
Dir. for Public Affairs,
EWEA



“In a time where the industry yearns for innovations and unites to drive down costs, we very much welcome JP Wind's initiative to unify research efforts to accelerate long-term technological development and to foster the global leadership of Europe's wind industry.”

Fort Felker

Director, National Wind
Technology Center,
NREL (US)



Global outreach

The coordination at EU level and within the national clusters in JP Wind has become a strong platform to represent European wind research abroad. On several occasions JP Wind has represented European wind research in collaboration with the European Commission.

In the coming years, JP Wind will invest more efforts in building its global network with a particular focus on Japan and the US. These two countries are selected due to the excellence of their research organisations in areas of particular interest to JP Wind.

A first step in this direction is the participation of Fort Felker from



the US National Renewable Energy Laboratory (NREL) in the JP Wind advisory board.

Interested in collaborating with EERA JP Wind?

EERA JP Wind is the one stop shop for European wind energy research and open to discuss collaboration with partners from outside of Europe. Please refer to our contact details on page 15.

“International teamwork is at the heart of JP Wind, and the programme will lead to increased collaboration between European wind energy research teams and their colleagues overseas.”

EERA JP Wind organisation

JP Wind is organised in 7 Sub-programmes coordinated by leading senior researchers. The Programme is coordinated by Peter Hauge Madsen, Director of the DTU department for Wind Energy.



SP1 Wind Conditions - Hans Ejsing Jørgensen, DTU (DK)

The Sub-Programme on Wind Conditions is succeeding in coordinating and contributing to several European projects aiming to fill main gaps in atmospheric science and thereby enhancing the technology readiness levels of the present wind modelling chains and measurement ability.



SP2 Aerodynamics - Peter Eecen, ECN (NL)

JP Wind aerodynamics experts collaborate to reliably design huge turbines. The collaboration is visible by large European projects such as the development of innovations in rotor technology in INNWIND.EU and the future advanced design codes developed in AVATAR.



SP3 Off Shore wind - John O. Tande, SINTEF (NO)

The overall objective is to lay a scientific foundation for industrial development of cost effective offshore wind farms enabling large scale deployment at any type of sea. This includes design optimisation, characterisation of wind, wave and current, control, operation, maintenance and novel concepts. The sub-programme is multidisciplinary in its approach linking closely to the other sub-programmes of JP Wind.



SP4 Grid Integration – Kurt Rohig Fraunhofer, IWES (DE)

The experts of the SP are involved in all important discussions and work of the grid and system development. A closed co-operation with EERA JP smart grids is granting co-ordinated results to all topics of grid integration.



SP5 Research Facilities - Felix Avia, CENER (ES)

The SP5 coordinates Networks on relevant Research Infrastructures (Wind Turbines for aerodynamics and loads studies, Wind Tunnels and Grid Integration Laboratories) with a general mandate to facilitate access as well as support for use, exchange data and develop best practices.



SP6 Structural design and materials - Denja Lekou, CRES (GR)

In SP6 the participants have found the ideal platform to prioritise, plan and execute collaborative actions bringing us faster to the target. In addition to IRPWIND and other EU projects, an example is activities undertaken for Glass and Carbon pre-preg material characterization including environmental effects. Combining own funded efforts we have created research databases that are otherwise hard to access due to industrial confidentiality issues.



SP7 Wind integration – economic and social aspects - Poul Erik Morthorst, DTU (DK)

This SP explores major economic and social challenges for wind energy and investigates how they can be addressed and mitigated. The SP aligns research activities to lay a scientific foundation for the long term cost-effective development of wind energy and its successful deployment in energy systems.

EERA JP WIND MEMBERS

BERA (BE)
CATAPULT (UK)
CENER (ES)
CIEMAT (ES)
CIRCE (ES)
CNR (IT)
CMR (NO)
CRES (GR)
CTC (ES)
DHI (DK)
DLR (DE)
DTU Wind Energy (DK)
ECN (NL)
FhG IWES (DE)
Forwind/Univ. of Bremen (DE)
Forwind/Univ. of Hannover (DE)
Forwind/Univ. of OldenburG (DE)
IEn (PL)
IFE (NO)

IK4Alliance (ES)
IREC (ES)
LNEG/INETI (PT)
NTNU (NO)
MARINTEK (NO)
Middle East Technical University – Center for Wind Energy (TR)
Politecnico di Milano (IT)
RWTH University Aachen (DE)
SINTEF Energy Research (NO)
SINTEF MC (NO)
Technical University of Delft (NL)
TECNALIA (ES)
TUBITAK (TR)
TUM München (DE)
University College of Dublin (IR)
University of Aalborg (DK)
University of Athens (GR)
University of Bergen (NO)
University of Porto (PT)

University of Stuttgart (DE)
University of Strathclyde (UK)
VTT (FIN)
WMC (NL)

PARTICIPANT/ASSOCIATES IN PROGRESS

EPFL (CH)
RSE (IT)
University of Loughborough (UK)

Contact details for
EERA JP Wind

The JP Wind is supported
by a secretariat located
at DTU Wind Energy and
led by **Søren S. Knudsen**



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Turbine pictures except page 9 in the brochure are courtesy of Vestas Wind Systems A/S

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