



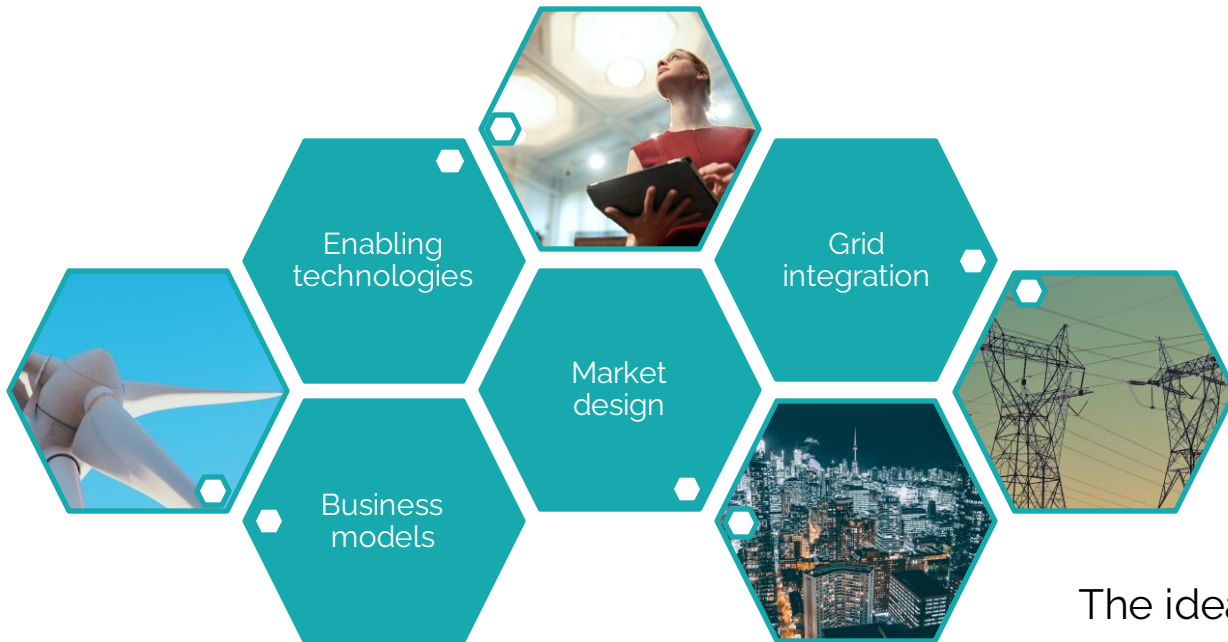
InductionZone
The wind energy innovation community

Become a founding member

15 July 2022

We want to get more innovations in to use in the wind energy sector

Designing, deploying, operating, and integrating 5x today's wind energy capacity by 2050 requires broad innovation across the sector.



RESEARCH

REVIEW SUMMARY

RENEWABLE ENERGY

Grand challenges in the science of wind energy

Paul Vass*, Katherine Dykes*, Eric Lantz*, Stephan Barth, Carlo L. Bottasso, Ota Carlson, Andrew Clifton, Johnny Green, Peter Green, Hannes Holstner, Daniel Lind, Ville Lohmaki, John K. Lundquist, James Maxwell, Melinda Marquez, Charles Meneveau, Patrick Moriarty, Zoltan Mundaca, Michael Muskulus, Jonathan Naughton, Lucy Rao, Joshua Pasante, Joachim Rahnke, Amy Robertson, Javier Sarr, Rodrigo, Anna Maria Semprini, J. Charles Smith, Aidan Tully, Ryan Wiser

HIGHLIGHTS: A growing global population and an increasing demand for energy generation are expected to result in substantial growth of clean energy systems. Wind energy is only playing a relatively minor role in the current energy mix. To meet the growing demand for clean energy, it is essential to develop and deploy new technologies and systems. This report identifies grand challenges in wind energy research that need to be addressed to enable wind energy to play a major role in the future energy mix.

ADVANCES: Drawing from recent international workshops, we identify three grand challenges in wind energy research that require further progress from the scientific community: (i) improved understanding of the physics of wind energy flow in the critical zone of wind power plant operation, (ii) multidisciplinary systems of wind turbine design, and (iii) optimization and control of fleets of wind plants comprising hundreds of individual generators working synergistically within the larger electric grid system. These grand challenges are interdisciplinary, requiring cross-disciplinary and multi-scale research across the entire field. Our vision for the wind power plant operation is the development of research in designing the next generation of ever-larger wind turbines and achieving dynamic control of the machine. Enhanced forecasting of the nature of the atmosphere inflow will also be a key challenge. The next generation of wind power plants will be designed to be more resilient to the variability of the wind. The next generation of wind power plants will be designed to be more resilient to the variability of the wind. The next generation of wind power plants will be designed to be more resilient to the variability of the wind.

GLOBAL: Meeting the grand research challenges in wind energy research will enable the wind power plant of the future to supply a significant portion of the world's electricity needs in a low-carbon, sustainable, and resilient manner. This requires research efforts in interdisciplinary and multi-scale research across the entire field. Our vision for the wind power plant operation is the development of research in designing the next generation of ever-larger wind turbines and achieving dynamic control of the machine. Enhanced forecasting of the nature of the atmosphere inflow will also be a key challenge. The next generation of wind power plants will be designed to be more resilient to the variability of the wind. The next generation of wind power plants will be designed to be more resilient to the variability of the wind.

THE SCIENCE OF WIND ENERGY: GRAND CHALLENGES

The science of wind energy research is a multi-scale, multi-disciplinary field. It spans from weather systems at a global level down to the boundary layer of a wind turbine airfoil and time scales from seasonal fluctuations in weather to sub-second dynamic control and balancing of electrical generation and demand must be understood and managed.

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Source: DOI [10.1126/science.aau2027](https://doi.org/10.1126/science.aau2027)

Getting fit for 55 and set for 2050

Electrifying Europe with wind energy

June 2021

etipwind.eu • windeurope.org

ETIP Wind
EUROPEAN TECHNOLOGY PLATFORM FOR WIND ENERGY

Wind
EUROPE

Source: ETIP Wind (etipwind.eu)

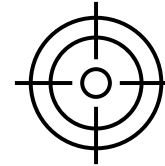
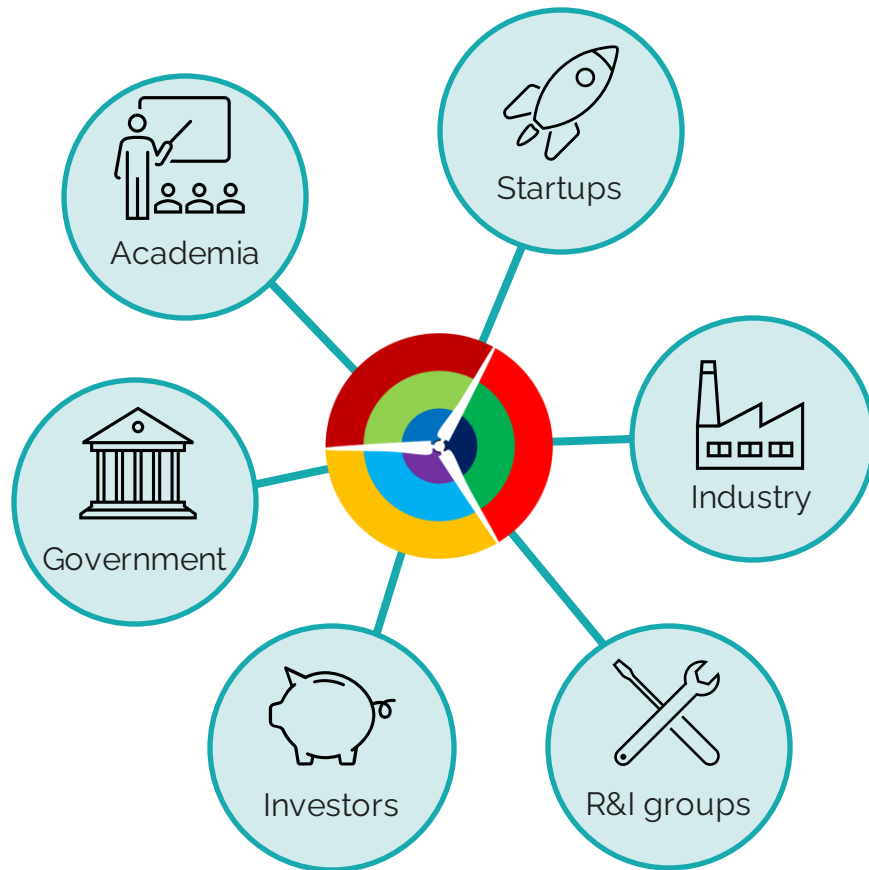
The ideas and research are there, but they need help to be adopted. **Let's work together to get more innovation into use.**

Our solution:

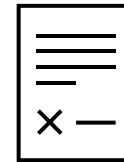


InductionZone e.V.

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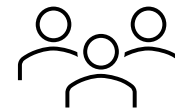


Our mission: Induction Zone brings the wind energy technology transfer community together to get new innovations into use quickly.



Legal Structure: We plan to form a registered, not-for-profit society in Germany (*gemeinnütziger e.V.*)*, with professional business management.

* Subject to approval by tax authorities



Members: Anyone interested in enabling innovation in wind energy can become a member.



Covering our costs: Income from a membership fee, sponsoring, and grants will support events, fund staff, and help us achieve our goals.

3 ways Induction Zone will get innovations into use



A remote-only **wind energy incubator** to turn research and ideas into businesses. We provide the wind energy context to startups through mentoring and connections to the Induction Zone community. Participants pitch at high-profile wind-energy industry events.



Communications to provide a voice to startups, innovators, and early adopters in the wind energy sector. We'll produce reports, position papers, social media, conference contributions, and participate in working groups.



We plan to run an **IEA Wind Task on technology transfer and adoption*** to identify how to get more innovations into use. A Topical Expert Meeting (TEM) is in planning for Q4 2022.

* Subject to approval by IEA Wind TCP and members

Progress and plans

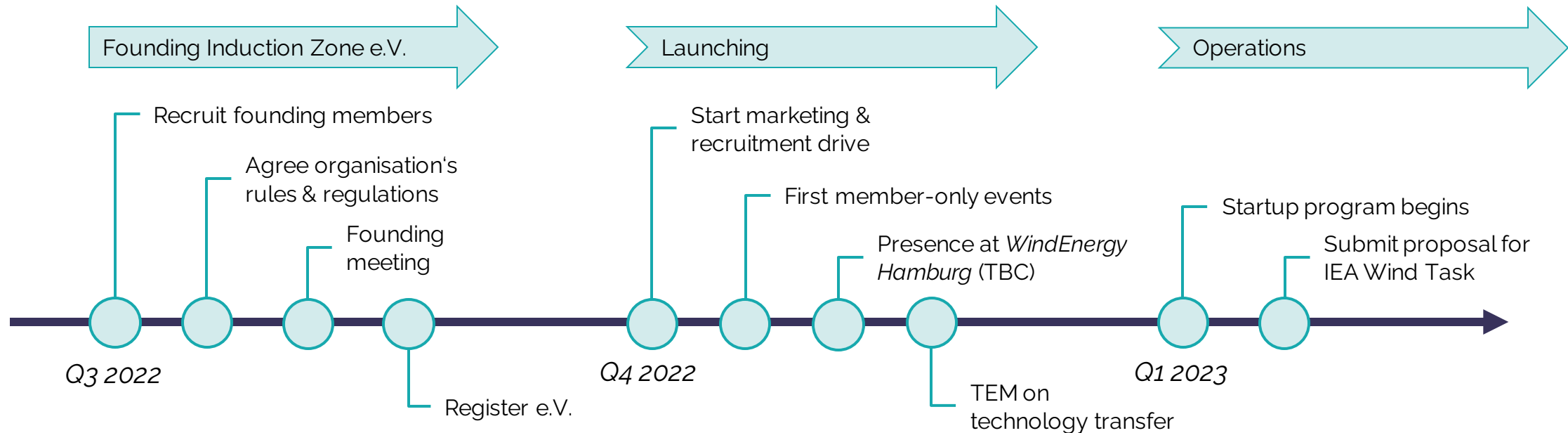
Our progress so far:

2019: started mentoring startups

2022: discussions with stakeholders in industry, startups, academia, government, investors, ...

Q2 2022: applied for grant funding; submitted proposal for an IEA Wind TEM.

Our plans:



Become a founding member



Who: Anyone with a strong interest and time to help shape the association



What: Help define our goals, rules, & regulations; sign the articles of the association



Time commitment: Series of meetings in Q3 2022



Questions: [contact us by email](#), or come to one of our webinars



Webinars:

- 19th July, 16:00 Berlin
- 26th July, 16:00 Berlin
- 3rd August, 16:00 Berlin

[Click here to register for a webinar](#)

Induction Zone is an initiative from enviConnect, led by:



Dr. sc. Andy Clifton

Andy has over 20 years of experience in the energy sector. He recently led the wind energy research cluster WindForS and IEA Wind Task 32 on Wind Lidar. He's also been active in the Power Curve Working Group, CFARS, EAWWE, and other R&D communities.



Dr.-Ing. Ines Würth

Ines has 10 years of wind energy R&D experience and launched her own start-up in 2020. As a researcher she lobbied for more diversity in STEM subjects and led the TryScience team at her university department.





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inductionzone.org

Induction Zone is an initiative of enviConnect

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