ETIPWind Roadmap Executive Summary



EUROPEAN TECHNOLOGY & INNOVATION PLATFORM ON **WIND ENERGY**

etipwind.eu

Research & Innovation priorities 2020-2027

Technology Roadmap

I	High priority
	Medium priority
Ι	Low priority

Short-term 2020-2022

		Medium-term 2023-2024
	 Integrated forecasting of power production & demand Short-term energy storage 	Optimising transmission infrastructure
	 Lifetime assesment and condition monitoring Digital tools for control and monitoring 	 Dynamic cable repair solutions Digital solutions for smart operations Predicting environmental parameters
L	 Development and validation of components & materials Blade recycling demonstration Integrating wind energy in the surrounding natural and social environment 	 Development of sustainable materials Standards Manufacturing processes
		Cabling and connections
	 Lean production Validation of design tools Opnamic electric cables Control methods 	
	• Expand and harmonise wind energy teaching in Europe	Boost wind energy higher education
	Long-term energy storage	Quantification of system servicesSustainable hybrid solutions
	Robotic inspection and repair methods	 Decommissioning strategies and technology Solutions for operating in extreme conditions
	 New transportation methods for large components 	 Sensor technologies, diagnostics and response Next generation generators Noise reduction Reliability of components
	 Data availability & sharing Serial production – analysis of substructure production processes 	Material durability and protection
		 Integrated design process in supply chain
		 Joint academia-industry educational programmes
	 Multi-cultured wind farms Modelling future system needs 	
		 Floating installation, assembly and heavy maintenance

Medium-term 2023-2024

- Grid & system integration
- Operations & maintenance
- Next generation technologies
- Offshore balance of plant
- Floating offshore wind
- Skills & human resources



• Park level control

• Supply chain logistics (decommissioning)

Our climate is undergoing dramatic changes and the effects on our society are becoming more visible and more intense. To halt the disastrous effects of climate change most governments, including the European Union, have pledged to keep global warming well below 2° Celsius by 2100.

Achieving this goal will require a near complete decarbonisation of the energy system and a significant increase in renewable power generation. This energy transition must be swift, sustainable and fair. Wind energy is expected to become the flagship of this transition and provide for at least half of the EU's electricity demand. Deploying wind energy as part of the energy transition will bring several benefits to European citizens and businesses. Carbon emissions will drop, air quality will improve, the environmental impact of the electricity sector will reduce and thousands of new jobs will be created across Europe.

Still, the clean energy transition will require substantial Research & Innovation at all Technology Readiness Levels (TRLs). To deliver on the ambitious climate and energy targets Europe needs strong and fit-for-purpose industrial and research programmes to further develop and improve technology solutions and applications. And to support existing European supply chains. In particular, EU policy should underpin the immediate and large scale deployment of renewable energy technologies by supporting Research & Innovation to:

- improve performance and reduce cost of utilityscale renewable energy production and bring new concepts faster to market;
- enhance sustainability and promote circularity within European industries; and
- accelerate renewables-based electrification (direct and indirect) of hard-to-abate sectors.

Energy experts and policymakers expect wind energy to take a leading role in the power sector, with a total installed capacity of up to 1200 GW by 2050. Such ambitious targets need to be supported with a dedicated industrial policy on wind energy. Wind energy holds a unique place in the European industrial fabric. It is at the same time a high-tech green and heavy manufacturing industry. Innovation and technology development play a big part in the success of wind energy in Europe and further technology advancement will be essential for a successful and just energy transition.

To sustain this trend the industry needs continued support to design and manufacture new component structures and materials and develop new high precision manufacturing lines suited to mass production of larger and more efficient turbines. New materials and multimaterial solutions should reduce weight, increase durability and improve mechanical performance.

At the same time, the wind industry is committed to sustainable production by enhancing circularity and developing new materials. Improved and more cost effective recycling technologies will further reduce the ecological footprint of the sector. Critical materials such as glass and carbon fibres can be recovered and re-used in a circular economy. Research into new, more recyclable materials will reduce EU's dependence on rare earths and other critical raw materials.

Targeted R&I support will also strengthen the leading role of the European industry in the global market. Competition from non-EU players is rapidly increasing and the associated cost reduction pressures have a big impact on revenues and employment, especially in the European supply chain.

ETIPWind therefore recommends European and national governments to align their R&I funding programmes with the priorities laid out in this report.

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