Trinomics

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Study on Establishing a Dedicated European Fund for Wind Research & Competitiveness

Policy Summary

1. Introduction

This paper summarises the policy findings of the study on the **establishment of a dedicated European Fund for Wind Research & Competitiveness (the Wind Fund)**, envisioned as an integrated, European-level instrument designed to strengthen research and innovation, enable industrial scale-up and ensure the competitiveness of Europe's wind value chain.

Wind Fund benefits compared to a scenario without the Fund by 2040:

+€33bn/y	+180 thousand	+€12.6bn/y	89.4%	+70 bcm/y
Gross value added	Jobs	Export value	EU-sourced equipment & services	Gas imports displaced, or 700 LNG shipments

1:7/y Each euro of public funding returns €7 every year

Current challenges faced by the wind sector

- **Intensifying global competition** for the European wind sector, including due to unfair practices
- EU funding and policy frameworks **lack focus and do not adapt quickly enough** to achieve industrialisation
- **Insufficient European and national public support** for wind innovation and competitiveness, particularly for industrial scale-up
- **EU R&I instruments too fragmented and slow** to respond to the urgency of the challenge

Why a European Wind Fund?

- **Europe needs EU-level industrial leadership and funding to face global challenges** Individual Member States cannot address challenges alone
- **The next Multiannual Financial Framework is a unique opportunity** to link EU funding with the industrial objectives required for Europe's industrial leadership and resilience
- **A Wind Fund would enable a more strategic use of EU funding**, prioritising what works for Europe and strengthening European industrial capabilities

Study approach

1. Context, contributions and challenges

- Assesses the contributions as well as the challenges hindering innovation and competitiveness of the European Wind Sector
- Analyses existing EU policy and regulatory frameworks relevant to wind energy, as well as the strengths and risks of the proposals for the next MFF

2. Need for policy action at EU level

- Evaluates the rationale for policy action at the EU level, considering shortcomings of existing EU and national frameworks, and benefits of EU action
- Assesses how the absence of coordinated EU action could threaten Europe's manufacturing base and technological sovereignty.

3. Design of the Wind Fund

- Covers research programming, design and implementation of specific funding instruments, and Wind Fund governance
- Builds principles for the Wind Fund to follow to maximise its impact
- Considers measures to mitigate risks to the Fund efficiency and effectiveness

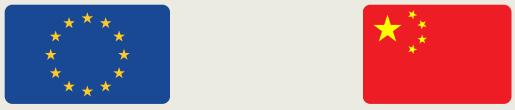
4. Assessment of expected impacts

- Examines the potential contributions of the Wind Fund in comparison with a baseline scenario according to scientific/technological, economic and societal impact criteria

2. The European wind sector faces innovation and competitiveness challenges driven by structural issues and external competition distortion, especially for industrial scale-up

Wind innovation and industrial scale-up require **large upfront capital, long lead times** and involve exposure to significant **technology and market risks.** Yet European public instruments insufficiently address these risks, limiting the bankability of and industry willingness to invest in projects across the innovation stages and wind value chain.

The European wind sector faces intensifying global competition, particularly from China, whose manufacturers benefit from higher levels of public support



17% **45%**

Captured venture capital/private equity investment since 2019[4]

- **European OEMs face rising input costs, higher interest rates, supply chain disruptions and tightening liquidity.** This has weakened their financial resilience and reduced their capacity to invest in innovation and industrial expansion. Since 2010, around 100 wind manufacturing sites have closed in Europe , and more recently some manufacturers have delayed or cancelled planned investments because of weak or uncertain demand conditions in the European market.

- **Meanwhile, higher public support to Chinese manufacturers and other advantages give them greater ability to invest, export and further target European markets.** OECD analysis shows that Chinese turbine manufacturers received 2–5% of annual revenues in public support between 2006 and 2023 (including through grants, concessional loans and tax concessions),[1] whereas support for EU manufacturers was less than 1% in 2021-2024. The European Commission opened an investigation into Chinese subsidies for one manufacturer potentially distorting competition in the EU internal market. Chinese manufacturers furthermore capture a larger share of global venture capital/private equity investment, and maintain more stable cash flow positions and lower costs.

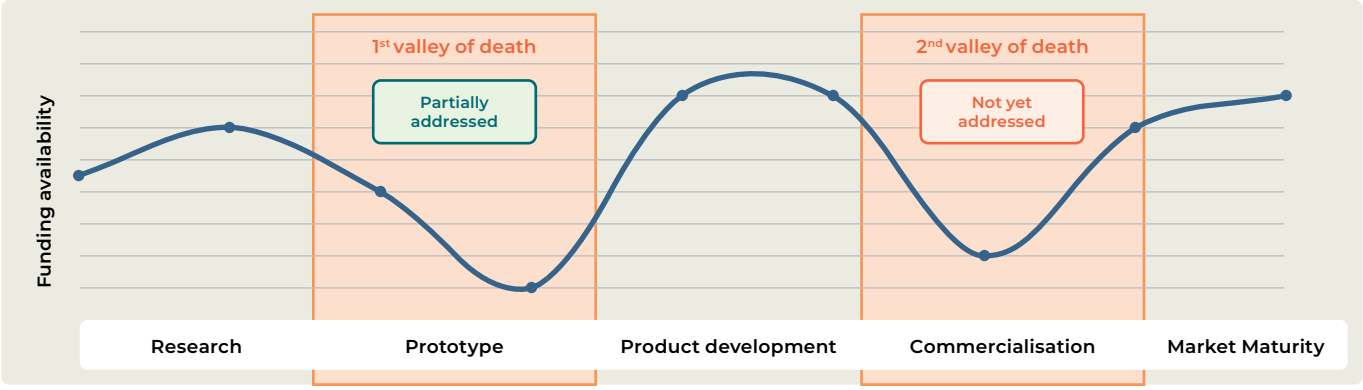
Combined with stricter market, regulatory, and State aid rules for European manufacturers, **these factors undermine EU-based investment, jeopardise industrial scale-up, and further weaken the position of European firms in both domestic and export markets**.

EU funding and policy frameworks for wind lack focus and do not adapt quickly enough to achieve industrialisation goals

- **The sector faces a number of challenges, yet existing European policies lack focus and have not adapted quickly enough**. Wind-related R&I is spread across 12 EU funding programmes, mostly operating through broad, technology-neutral calls. Only recently, once issues began to affect OEM balance sheets, delay investments, contribute to failed tenders and threaten the wider EU wind value chain, did the EU begin to respond through the Wind Power Action Plan.

- **Existing and proposed measures do not address financing for industrial scale-up**. While the Action Plan addressed deployment and market issues, it and other initiatives such as the Net-Zero Industry Act (NZIA) and the proposed Industrial Accelerator Act (IAA) do not provide a financing framework particularly at TRL 7-9, where demonstration, first industrial deployment, and manufacturing scale-up require targeted de-risking and investment support.

In other words, EU action has gone further in addressing the first valley of death for wind innovation, but has not adequately addressed the second valley of death associated with scaling up and commercialising technologies at higher TRLs.[7]

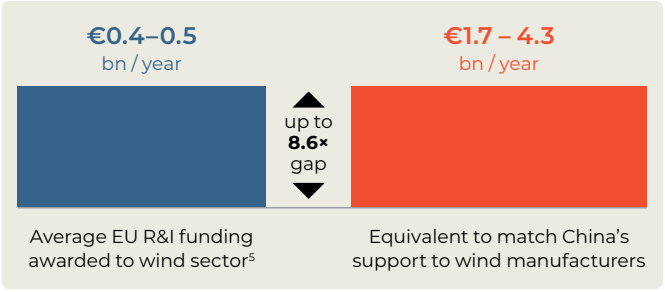


European and national public support for wind innovation and competitiveness is insufficient, particularly for industrial scale-up

- **When available, public support for wind remains insufficient**. Wind is typically awarded well under 2% of total budgets for the (technology-neutral) EU funding programmes it is eligible for. At national level, support is uneven: between 2021 and 2023, 75% of this funding came from just five countries.5

- **Support for industrial scale-up is especially lacking**. The Innovation Fund constitutes the only relevant EU instrument supporting wind manufacturing, and support is technology-neutral and subject to administrative complexity.

These issues not only limit overall funding volume but also fragment the innovation pipeline across Europe.



Wind is typically awarded **well under 2%** of total budgets in EU programmes it is eligible for

EU R&I instruments are too fragmented and slow to respond to the urgency of the challenge

- **European wind R&I applicants face long approval cycles, heavy administrative burden and fragmented eligibility criteria across programmes**. The multiplicity of instruments, each with different calendars, co-financing rules, reporting requirements and evaluation processes, creates significant barriers for wind companies, especially SMEs. Industry input is not consistently translated into fast updates of funding priorities or frameworks, leading to misalignment between emerging needs and available support.

- **By contrast, China's rapid build-out is supported by far more agile instruments**. For example, the Chinese Science and Technology Exchange Centre indicates a 120-day time-to-grant target, with actual approval times for sampled projects averaging 4–5 months.

As a result, Europe is slow and lacks the coherence to address challenges such as manufacturing scale-up, which puts **European firms at a serious competitive disadvantage**.

> 9 months

Average time-to-contract in Horizon Europe and Innovation Fund

3. The challenges faced by the wind sector require coordinated action at the European level

The challenges faced by the wind industry cannot be addressed by individual Member States

- **Coordinate funding support**
  Funding coordination at the EU level is required to facilitate the objectives of the Wind Power Action Plan, NZIA and IAA and other wind related policy frameworks
- **European wind industry is structurally pan-European**
  No individual Member State can independently ensure the competitiveness or strategic autonomy of the European wind value chain
- **Provide long-term support visibility and funding volumes**
  EU capabilities exceed that of any individual Member State
- **Prevent misalinged or duplicated work**
  EU action ensures cooperation and efficient use of resources, reducing resource allocation assymetries and providing the scale advantages to compete globally

The MFF proposals represent a meaningful step forward in aligning European-level financing with industrial competitiveness and clean tech deployment

- **Industrial scale-up and deployment focus**
  including with tools to improve external competitivity
- **Better alignment between academia and industry**
  Across the pathway from R&I to commercial deployment
- **Coordination with Member States**
  Enhanced through approaches such as grant-as-a-service
- **Expert advice**
  Integrated through Strategic Stakeholders Board

However, the MFF proposals risks remain inadequate to address the challenges faced by the European wind industry

- **Lack of funding prioritisation**
  Industrialisation support remains largely technology neutral, with no dedicated envelopes to key net zero technologies
- **Funding allocation lacks long-term visibility**
  Funding continues to be defined through (bi)annual programmes
- **Fragmentation, complexity and delay**
  Risk that issues with current funding mechanisms remain, with instruments continuing to have divergent rules and with limited expected improvements in time-to-grant/contract and interoperability
- **Limited and non-systematic consultation**
  Annual work programmes are decided by the Commission, with the Strategic Stakeholder Board providing only high-level advice

4. A Wind Fund can efficiently allocate funding across the innovation and industrial scale up stages

Governance

Governing board sets direction and oversees performance

Management team runs calls, evaluations and monitoring

Staged funding tailored by innovation step and tech maturitycreating a pathway to commercial deployment through predictable tools

From long-term programming tailored to research ...

Early research

Mostly grant-based support, addressing high technological uncertainty / too high risk for commercial finance

Prototyping

Grants potentially combined with limited repayable elements addressing gaps between research and commercial finance

Product Development

Increasingly blended support use addressing reduced bankability gaps as capital needs rise and technical risks persist

Commercialisation

Risk-sharing instruments (guarantees, loans, grants in case of profitability gaps) crowding-in private lenders and reducing cost of capital

Market Maturity

Targeted guarantees, concessional loans, and (quasi)equity, addressing remaining risks and strengthening European industrial competitiveness and resilience

...to more agile allocation responding to industry needs

Fund aligned to **sector-led focused Strategic Research & Innovation Agenda**

5. A Wind Fund would bring significant benefits to the EU economy and resilience

	The wind sector today **already makes significant contributions** to the EU economy and resilience	Lack of EU action risks a **relative sectoral decline** where industry grows but loses market share at home and globally	A **Wind Fund would strengthen the contributions** of the wind sectaor to the EU economy and resilience	
	The EU wind sector today 2025 unless indicated	**Scenario without Wind Fund** 2040	**Wind Fund Scenario** 2040	**Comparison** 2040
INDUSTRIAL AND ECONOMIC CONTRIBUTIONS Wind industry activities boost economic growth, providing high-value jobs and constituting a key exporting industry				
Average gross value added	**€59 bn/y**	€90 bn[+]	**€123 bn/y[+]**	**€33 bn/y[+]**
Jobs supported*	**338 thousand[*10+-]**	580 thousand	**760 thousand**	**+180 thousand**
Wind equipment export value	**€5.3 bn/y**	€4.5 bn/y	**€17.1 bn/y**	**€12.6 bn/y**
Global market share of production	**~21%[4+-]**	8.3%	**29.6%**	**3.5x**
ENERGY SECURITY & OPEN STRATEGIC AUTONOMY CONTRIBUTIONS The wind sector supports the deployment of wind farms with a very high domestic content, which in turn substitute fossil imports and reduce energy & technological dependence				
Share of EU electricity supply	**~19% of EU supply**	>30% of EU supply	**>40% of EU supply**	**+10%**
Equivalent imported natural gas displaced	**>85 bcm/y** (850 LNG shipments)[#]	>330 bcm/y	**>400 bcm/y**	**+70 bcm/y** (700 LNG shipments)
Cumulative installed wind energy capacity	**246 GW[10]**	561 GW	**655 GW**	**+94 GW**
Annual electricity production	**465 TWh/y[10]**	≥ 1800 TWh/y	**≥ 2100 TWh/y**	**+300 TWh/y**
EU sourced equipment & services	**92.3%**	47.1%	**89.4%**	**1.9x**
SCIENTIFIC & TECHNOLOGICAL CONTRIBUTIONS The sector fosters innovation, with European companies leading in research and development, manufacturing, and deployment of cutting-edge wind technologies				
Patents and publications	**700 patents, 600 peer-reviewed articles** Leading in high-value patents and second in publications[4]	Moderate growth but **losing ground** to competing economies	**Strong increase with better positioning** in strategic areas, high-value and applied innovation	
CLIMATE CONTRIBUTIONS Wind power is pivotal in achieving EU climate targets, being a key technology to reduce greenhouse gas emissions				
Avoided emissions through fossil fuel substitution	**142 $MtCO_2/y$[11,+-]** (>4% of total EU emissions)	>680 MtCO2/y	**>800 MtCO2/y**	**+120 MtCO2/y** (>10% of gross EU emissions)[12]

Own calculations based on study assumptions except where indicated

* Includes direct and indirect jobs
\+ Average over 2031-2040 decade
+- 2024 value
Assuming an average LNG carrier capacity of 0.1 bcm

5. Scope and Methodology

The study focuses on innovation and industrial scale-up financing. The Fund is a critical piece but cannot alone resolve all challenges for achieving European industrial, technological, energy and climate goals; other national and EU policies are required but lie beyond the scope of this study.

Extensive consultation activities were carried out to ensure a comprehensive and balanced assessment. These included interviews and meetings with representatives from across the wind energy sector. The input gathered from these engagements was instrumental in shaping the analytical framework, validating key findings, and informing the recommendations, while maintaining confidentiality and neutrality regarding specific contributors.

The **impact assessment** methodology compares a baseline (continued EU wind support via existing instruments, without structural change) against a Wind Fund scenario using a mix of quantitative and qualitative analysis based on assumptions aligned with EU scenarios.

6. References

[1] OECD (2025) Trade policy paper, No. 288 - Government support in the solar and wind value chains

[2] Based on public funding figures of ETIPWind, EERA JP Wind, IWG Wind (2025) From innovation to industrial competitiveness and industry revenues of ETIPWind (2025) European Wind energy competitiveness report

[3] European Commission (2026) Commission opens in-depth foreign subsidies investigation into Goldwind's activities in the EU wind sector

[4] JRC (2025) Clean energy technology observatory: Wind energy in the European Union - 2025 status report on technology development, trends, value chains and markets

[5] ETIPWind, EERA JP Wind, IWG Wind (2025) From innovation to industrial competitiveness

[6] European Commission (2023) European Wind Power Action Plan COM/2023/669 final

[7] For more on the pre-commercialisation and scaling gaps, see European Commission (2025) The EU Startup and Scaleup Strategy - Choose Europe to start and scale COM(2025) 270 final

[8] European Commission (2025) Impact Assessment Report on the European Competitiveness Fund SWD(2025) 555 final

[9] Heinrichs, G. et al., (2020) Comparison of innovation systems China and Germany, No. 9-2020 (in German)

[10] WindEurope (2026) Wind Energy in Europe - 2025 Statistics and the outlook for 2026-2030

[11] ETIPWind (2025) European Wind energy competitiveness report

[12] Assuming EU gross GHG emissions of 850 MtCO2-eq in 2040 to achieve the 2040 EU climate target, as per European Commission (2024) Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society COM/2024/63 final

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This study has been developed **independently by Trinomics, with the support of DTU Wind, based on a commission from WindEurope**. Trinomics managed and led implementation of the overall project, and bears final responsibility for the study results. DTU provided wind sector insights, shared experiences from participating in EU-funded wind research projects, supported the economic impact assessment, and provided overall technical quality assurance.

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