



Bioenergy | Biofuels | Geothermal | Hydropower | Ocean | Solar PV | Solar thermal | Wind

OBJECTIVES

support within the EU over the past 20 years

A comprehensive study of wind energy research and development (R&D)

of the wind energy sector

Identify the impact of EU R&D support

Understand how the wind energy

sector has developed

METHODOLOGY

COLLECTION ACTIVITIES USING A RANGE OF METHODS

EFFECTIVE DATA













KEY FIGURES:

FUNDING OF R&D



wind energy projects funded through the

225

Framework

Programmes

(FP5-Horizon 2020) €164 m

R&D budget grew

from an average of

€68 m per year

the Framework **Programmes** (FP5-Horizon 2020)

EU funding through

€565 m

for wind technologies

turbines), followed by fixed-bottom offshore (20 %) and grid

23 %

of funding to component

development (e.g. large

integration (20 %) 82 %

of Member State



(1995-2008) to an average of €164 m per year (2008-2015)

The EU is the top region globally for wind energy R&D funding with an

3. UK 4. Netherlands 5. Spain

1. Germany

2. Denmark

Top 5

wind energy funding is from the top **5 Member States**

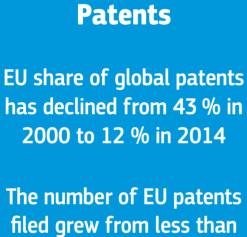


average of €126 m per year (1995-2015), followed by the USA with an

average of €55 m per year

IMPACT ON KNOWLEDGE

GENERATION



1 000 per year in the early 2000s to approximately 2 000 per year (2008-2012), after which

1500 per year

it declined to less than



Publications

EU-based authors were involved

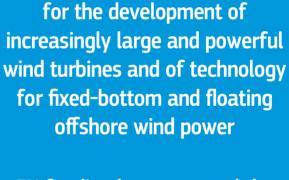
and China produce around 220 publications per year

four of the largest funders for R&D

IMPACT ON SECTOR

DEVELOPMENT

The top five Member States for publication development include



Additional impacts

EU-funded R&D has been crucial

EU funding has promoted the optimisation of offshore wind-farm design, maintenance and operation

(e.g. the Wind & Economy software tool), contributing to significant cost reductions

installed capacity for electricity gross final electricity generation in 2017, growing from consumption from 2 400 MW in 2000 wind energy in 2016

€9 billion

169 000 MW

average exports per year (2011-2015) to the rest of the world

300 000

people employed in the

EU wind energy sector

in 2016

€40 billion **EU** wind energy sector turnover in 2016

9.6%



Jobs

EXAMPLES OF IMPACT FROM R&D PROJECTS

© EDP Renewables **Demonstration of the WindFloat**

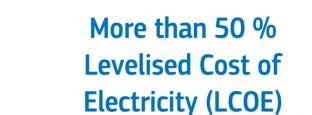
Technology (DEMOWFLOAT)

FP7 project that demonstrated

the performance and reliability

of the WindFloat technology with

- a 2 MW pilot turbine in Portugal WindFloat uses innovative floating structures that enable the harvesting of abundant wind
- resources in deep waters where bottom-mounted foundations are not feasible EU also supports the technology on its path to full
- commercialisation through the 25 MW WindFloat Atlantic project. It benefits from a EU-backed loan of €60 million by InnovFin Energy **Demonstration Projects**



Wind energy (onshore wind)

reduction between

2000 and 2017



Innovative Wind Conversion

Systems (10-20 MW) for Offshore

Applications (INNWIND.EU) FP7 project that designed models for state-of-the-art 10 MW to **20 MW offshore wind turbines**

substructures to reduce fatigue loading on the turbines while increasing energy production

drivetrain components and floating

Developed innovative rotors,