



INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

CASTRO: The project will design, build, and validate a wind turbine with a new rotor design. The rotor design will enable commercially feasible wind turbines with an unprecedented high capacity factor.

The Innovation Fund is 100% funded by the EU Emissions Trading System

| Project Factsheet

The project will develop and validate a wind turbine with a novel rotor concept. This larger rotor will enable the construction of commercially viable onshore wind turbines with higher capacity factors, i.e., generating more electricity, which matters especially in areas with low and medium wind speeds. The higher production output is obtained by using a cable-stayed rotor design that distributes and reduces gravity loads to enable higher electricity generation. Compared to the reference scenario, the relative greenhouse gas (GHG) emissions would be avoided entirely.

CASTRO overcomes barriers that are currently limiting the size of rotors for onshore wind turbines. This breakthrough innovation can have a ripple effect, benefiting new supply chains and transportation means. It also offers a high potential for scalability. Overall, the rotor concept developed and validated by the project has the potential to significantly enhance the total renewable energy share in the electricity supply, thereby supporting the 2030 emissions

COORDINATOR

VESTAS WIND SYSTEMS A/S

LOCATION

Denmark

CATEGORY

Renewable Energy (RES)

SECTOR

Wind energy

AMOUNT OF INNOVATION FUND GRANT

EUR 20,000,000

EXPECTED GHG EMISSIONS AVOIDANCE

16,125 tonnes CO₂ equivalent

STARTING DATE

01 April, 2025

ENTRY INTO OPERATION DATE

30 September, 2028

FINANCIAL CLOSE DATE

30 November, 2027

** Calculated vs. the 2021-2025 ETS benchmark of 6.84 tCO₂e/tH₂, not taking into account additional carbon abatement due to substitution effects in the H₂ end use application, i.e. conservative estimate.*

reduction targets. The absolute GHG reduction over the first four years of operation of the single prototype wind turbine will be 16.125 tCO₂e, and it will annually generate electricity corresponding to the average electricity consumption of almost 6 000 Danish households.

The revised Renewable Energy Directive raised Europe's renewable energy target to at least 42.5% by 2030, aiming for 45%. It means almost doubling the existing share of renewable energy in Europe. CASTRO aligns with this goal, offering excellent prospects for replicability and increased adoption of renewable wind energy and bringing numerous benefits, including job creation, economic growth, and territorial development. The project's sizeable

onshore wind turbine rotors will help mitigate the intermittency challenge of wind power by generating energy even at low wind speeds, enhancing the overall reliability of wind as an electricity supply source.

CASTRO is well positioned to significantly impact the competitiveness of the European wind turbine manufacturing industry. The project could help maintain and create jobs and avoid dependency on third-country manufacturers. Ultimately, the widespread deployment of CASTRO-based wind turbines over the next decade could accelerate the energy transition and contribute to a more sustainable and affordable energy future with lower electricity prices.

| Participants

VESTAS WIND SYSTEMS A/S

Denmark