

Repurposing Wind Turbine Blades into durable trail bridges and furniture

Environment



Overview

This innovative project focuses on repurposing decommissioned wind turbine blades into sustainable public infrastructure and outdoor products. Developed through the Re-Wind Network—a research collaboration involving structural engineers from Munster Technological University and wind-industry and life-cycle assessment experts at University College Cork—the initiative explores new ways to extend the lifespan of turbine blade materials that currently have no viable recycling pathway. As part of the project, blades have been transformed into durable outdoor features such as benches, seating, and other public-realm elements.

Wind turbine blades are constructed from glass-fibre reinforced polymer, a material valued for its exceptional strength, weather resistance, and long life with minimal maintenance. However, despite these advantages, there is currently no commercially available recycling solution for this composite material. As a result, decommissioned blades are typically sent to landfill or transported to the UK for incineration, presenting ongoing environmental challenges. By creatively reusing these robust components, the project demonstrates a practical and sustainable alternative to disposal. It shows how circular-economy thinking can reduce waste, lessen environmental impact, and generate new, resilient infrastructure for communities. In doing so, it offers a scalable model for addressing the growing issue of wind turbine blade end-of-life management.

Objective

The objective of this initiative is to repurpose decommissioned wind turbine blades into durable, sustainable public infrastructure and outdoor products, reducing waste and decoupling renewable-energy production from landfill and incineration impacts. Through the development of innovative furniture designs—such as benches, picnic tables, and tri-benches—and the creation of Ireland's first pedestrian bridge made from turbine blades, the project aims to demonstrate practical circular-economy solutions while enhancing community amenities and showcasing new uses for composite blade materials.



Location:
Vandeleur Gardens,
Kilrush, Clare



Project Lead:
Clare Local
Development
Company



Cost:
€55,000

Tags:
Infrastructure, Trails, Walking
trails, Sustainability,
Environment



Opportunities

Ireland faces a rapidly growing challenge—and opportunity—as large volumes of wind turbine blades reach end of life. With turbines typically lasting 20–30 years, the country’s first offshore wind farm is due for decommissioning within the next three years, while many land-based wind farms are already replacing or retiring blades. By 2025, an estimated 11,000 tonnes of blade material will need to be managed, and by 2030, around 450 individual blades will have reached end of life.

This emerging waste stream presents a significant opportunity to scale up innovative repurposing solutions. Reusing blades in infrastructure and public products can divert large quantities of composite material from landfill and incineration, reducing environmental impact while showcasing Ireland as a leader in circular-economy practices. The growing availability of decommissioned blades also supports new green industries, fosters research and innovation, and enables local authorities and communities to benefit from durable, low-maintenance materials for public amenities. Ultimately, the volume of upcoming blade retirements positions Ireland to pioneer sustainable end-of-life solutions for the wind energy sector—both nationally and internationally

Challenges

- **Funding:** Securing a suitable funding source to support the development of the project was a key challenge. Identifying financial mechanisms that could accommodate innovation, sustainability goals, and the technical demands of blade repurposing required significant effort.
- **Site Selection:** Finding an appropriate location that could safely accommodate the BladeBridge presented another challenge. The chosen site needed enough space to handle the size and structural requirements of the turbine blades, while also remaining accessible for transport, installation, and public use.

Actions to support sustainability

BladeBridge supports sustainability by giving end-of-life wind turbine blades a second life as durable bridges, street furniture, and e-mobility infrastructure. This approach diverts composite materials from landfill and incineration while replacing high-carbon construction materials like steel and concrete. The project’s research-led method for testing blade strength and redesigning them for structural use ensures safe, long-lasting applications. By repurposing these robust components, BladeBridge advances circular-economy practice, reduces waste, and lowers the environmental footprint of new infrastructure.



Solutions

- **Funding:** The project secured funding through the Circular Economy Innovation Grant Scheme (CEIGS), an initiative of the Department of Climate, Energy and the Environment (DCEE). This scheme supports projects that advance circular-economy practices in Ireland and helps raise awareness of the need to transition away from linear, waste-generating models. CLDC and Coillte provided matching funding for the project.
- **Site Selection:** Working in partnership with Coillte, the project team identified Vandeleur Gardens in Kilrush as a suitable location. The BladeBridge was incorporated into an existing woodland trail plan, ensuring the site could safely accommodate the turbine blades while providing strong public access and integration within a well-used recreational setting.



More information

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