WindEurope Response to The Circular Economy Act Public Consultation

Introduction

The European wind industry **welcomes the European Commission's initiative** for a Circular Economy Act. We **strongly support its objectives** to accelerate Europe's transition towards a more circular economy while enhancing the EU's **economic security, resilience, competitiveness, and decarbonisation efforts**.

We particularly welcome the Act's ambition to **create a Single Market for secondary raw materials**, to increase the supply and demand of high-quality recycled materials, and to **position Europe as a global leader in the circular economy by 2030**, in line with the Competitiveness Compass and the Clean Industrial Deal.

WindEurope is the voice of the European wind industry. We represent more than 600 organisations active in the wind energy sector in Europe. Our members deliver affordable and secure energy and wider social and economic benefits for Europe's companies and citizens.

About wind energy in Europe

Wind energy is a clean, free, and sustainable renewable energy source. In 2024 wind energy saved 142 million tonnes of CO_2 in Europe and could save up to 270 million tonnes in 2030 – the equivalent of Spain's annual CO_2 emissions. Wind does not need to be mined or shipped and the more we use, the closer Europe gets to real energy independence.

Operating wind turbines do not emit greenhouse gases like carbon dioxide (CO_2) or any other air pollutant such as nitrogen oxide (NOx), sulphur oxide (SOx), or particulate matter. And although there are CO_2 emissions associated with the construction, transport, operation and dismantling of wind turbines these emissions are paid back in less than one year of operation.

That's why governments turn to wind energy for their energy demand. Wind energy avoids, expensive and polluting fossil fuel imports. It boosts local economies, especially in rural and coastal areas, through job creation and tax revenues. And it is a key driver to decarbonise all other economic activities.

With 291 GW of installed capacity, wind covers approximately 20% of the EU's electricity demand. We now expect the EU to have 344 GW of wind capacity installed by 2030. And according to the Commission the EU will need 1,300 GW of wind energy installed capacity to reach net-zero by 2050.

As Europe's wind fleet matures, a growing number of turbines will reach the end of their operational life. In 2024, 26 GW of installed wind capacity was at least 20 years old. By 2030, this figure could rise to 60 GW, of which 2.8 GW will be offshore. We expect up to 22 GW could be decommissioned over the next six years.

Decommissioning will therefore become a critical step in the wind energy lifecycle and an important segment of the wind industry. Almost all this decommissioned capacity will come from onshore wind, with only about 85 MW of offshore wind likely to be decommissioned in Europe before 2030.

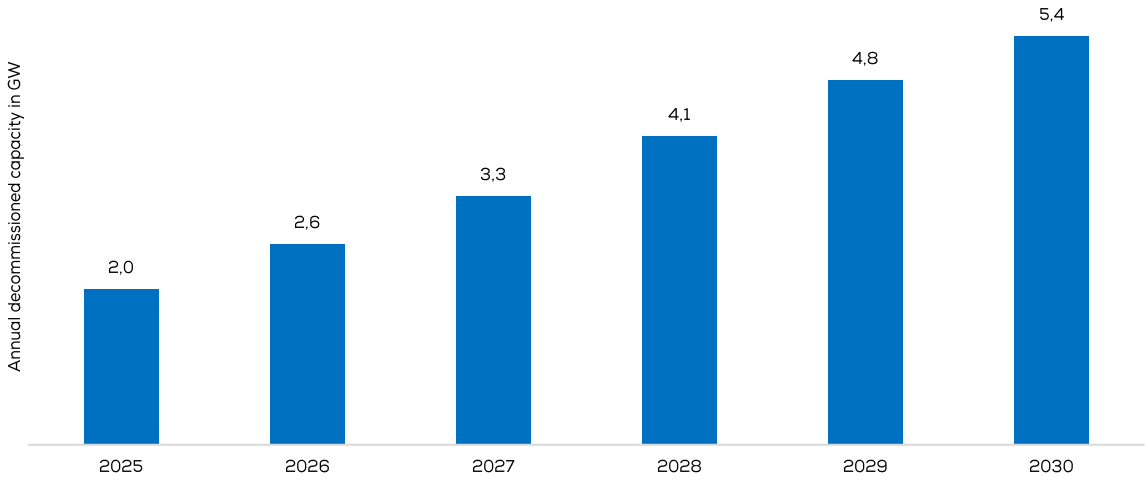

Figure.1 WindEurope forecast of annual decommissioned wind energy capacity in Europe (in GW)

Wind energy contributions to the circular economy

The volumes of decommissioned wind turbines expected in the coming years represent a major opportunity for the European wind industry to contribute to the circular economy. Wind turbines are already **around 85% recyclable**, mainly thanks to steel and other metals, which are recycled through well-established industrial practices. The remaining challenge to 100% circularity lies in **composite materials coming from decommissioned wind turbine blades**, as well as in the **recovery of permanent magnets**. It is important to note that composite waste from wind turbines and boats represents only a very small fraction of overall composite waste in the EU — around **30 kt out of 440 kt of total composite waste**, or less than **0.1% of all plastic waste**. Nevertheless, the wind industry is committed to addressing this challenge and driving circularity for these specific high-value and easily traceable composite streams.

Both composite materials and permanent magnets require supportive policy measures to ensure their reuse, recovery and recycling at scale. But it is important to recognise their **different market dynamics**.

Permanent magnets have **inherently high economic value** due to the cost of the rare earth elements they contain. This creates by default a **stronger market incentive** for their collection and reuse. In contrast, **composite material waste coming from decommissioned wind turbine blades** (and boats) has lower intrinsic economic value. Therefore, end-of-life composite materials require **targeted policy actions** to stimulate investments in reuse, recovery or recycling and market uptake.

To support the industry in its efforts to the circular economy we call on the EU to

1. Set **progressive reuse and recycling targets for composite materials** under the Waste Framework Directive;
2. Establish **dedicated waste codes** for **composite material waste coming from decommissioned wind turbine blades and boats** and permanent magnets in the European List of Waste;

3. Introduce a **Europe-wide landfill ban** on **composite material waste coming from decommissioned wind turbine blades and boats**;
4. Enable cross-border transportations through **dedicated waste shipment codes** for composites and permanent magnets;
5. Ensure **timely and consistent transposition and enforcement** of EU waste legislation across Member States.

These recommendations are very much **interconnected**. Progress in one area depends on action in the others. For example, a **landfill ban for composites** requires **dedicated waste codes** to enable proper classification and enforcement.

Above all else, **dedicated and exclusive codes for composite material waste and permanent magnets across EU waste legislation** are needed to ensure market visibility, allow pooling of waste streams from all sectors, and support the development of recycling markets.

For composite materials we expect 50,000 tonnes to be decommissioned each year by 2030. By 2040 this will increase to on average 80,000 tonnes a year. For permanent magnets we expect just 80 tonnes to be decommissioned by 2030. Looking at the wind turbines installed in the period 2006-2010 we can expect a total of up to 500 tonnes of permanent magnets could be decommissioned between 2030 and 2040.

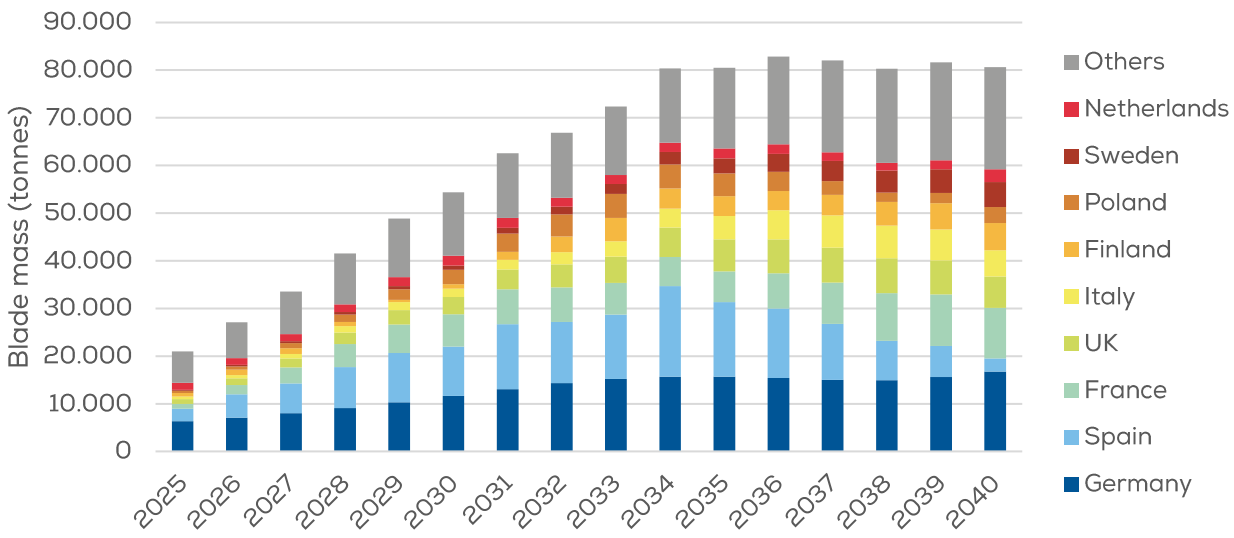

Figure 2 Forecast of annual decommissioned wind turbine blade mass in Europe (in tonnes)

Waste Framework Directive

The Waste Framework Directive sets the overarching framework for waste management in the EU, including the **waste hierarchy** (prevention, reuse, recycling, recovery, disposal) and targets for preparing waste for reuse and recycling. It provides the legal basis for promoting resource efficiency and circularity across sectors, including renewable energy technologies such as wind.

We call on the EU to introduce **specific targets for the reuse and recycling of composite materials** under Article 11(2) of the Directive. These targets would create clear incentives for innovation in **blade recycling technologies** and support their recovery within the broader circular economy framework.

We also call for **harmonised end-of-waste criteria** for recovered composite materials in the Waste Framework Directive, favouring high-quality products. This will reduce regulatory barriers for material off takers, stimulate the secondary raw material market and empower Member States to incentivize high-value recycling.

European List of Waste

The List of Waste establishes a common EU classification system, assigning six-digit codes to waste streams based on source and composition.

Currently, **composite material waste** coming from decommissioned wind turbine blades and boats lacks a **dedicated code**, leading to inconsistent classification across Member States. Up to eight different codes are currently used, many of which fall under *construction and demolition waste* (e.g. 17 02 03 and 17 02 04), which together account for 30% of the EU's annual waste generation.

This inconsistency hampers **traceability, pooling, and transport**, preventing recyclers from sourcing sufficient and reliable composite material waste.

Similarly, **permanent magnets** lack dedicated waste codes, limiting traceability, collection, and the ability to recover these highly strategic **critical raw materials** from secondary sources.

We call on the EU to create **dedicated waste codes** for **composite material waste** coming from decommissioned wind turbine blades and boats and **permanent magnets** in the European List of Waste. These codes will enable the wind energy and the recycling industries by:

- Providing legal certainty for shipments and cross-border movement;
- Increasing visibility of EU waste volumes;
- Facilitating separation, collection, and recycling; and
- Ensuring reliable quality and transparency for waste treatment.

We recommend adding a new four-digit chapter heading for composite material waste. And at least two six-digit codes to clearly identify the relevant types of composite material waste in the European List of Waste under chapter 16.

16	Wastes not otherwise specified in the list
16 12 (New)	Fibre reinforced polymer composite material waste
16 12 01 (New)	Fibre reinforced polymer composite material waste from decommissioned wind turbine rotor blades and nacelles
16 12 02 (New)	Fibre reinforced polymer composite material waste from decommissioned boats

Meanwhile, to **cover the transitional period**, the European Commission should **issue guidance** to Member States on which codes to use for composite material waste. Given the high fibreglass content of decommissioned blades, the industry considers **17 02 02 (construction and demolition waste – glass)** the most suitable interim option.

Landfill Directive

The Landfill Directive regulates waste disposal to prevent environmental harm. It establishes technical requirements, waste acceptance criteria, and bans for specific waste types.

We call for the Landfill Directive revision to include a **ban on landfilling composite material waste** under Article 5(3). A Europe-wide landfill ban would provide regulatory certainty, stimulate investment in recycling capacity, and ensure that end-of-life blades are managed within the EU circular economy.

The **European wind industry has already voluntarily committed** to reuse, recycle, or recover **100% of blades as of 2026** and to **avoid any export of blades for landfilling outside Europe**. Enshrining this commitment into European regulation is needed for full implementation and enforcement.

Waste Shipment Regulation

The Waste Shipment Regulation implements the **Basel Convention** within the EU and governs the **transboundary movement of waste** to ensure environmentally sound management. It defines two main procedures for shipments:

- The **notification procedure** (for hazardous waste or disposal); and
- The **Annex VII procedure** (for non-hazardous waste destined for recovery or recycling).

Composite materials are **non-hazardous** and should therefore be eligible for shipment under the **Annex VII ("green list") procedure**. However, the lack of **dedicated waste codes** creates legal uncertainty and logistical barriers for transporting composite material waste coming from decommissioned wind turbine blades and boats across borders for recycling.

In the current situation composite material waste shipped for recovery or recycling in Europe is either transported using codes for glass or plastics (EU3011) which is to an extent subject to interpretation and therefore not legally secure. Or they go through expensive and administratively heavy notification procedures not suited for the inert non-hazardous materials that they are.

We therefore ask to:

- Introduce **dedicated waste codes for composite material waste and permanent magnets** in the **Basel Convention** and, consequently, in the **Waste Shipment Regulation**. These codes should mirror the corresponding codes as proposed for the European List of Waste (see above).
- In the **short term**, provide Commission guidance recommending the use of **GE020 (Glass waste in non-dispersible form)** for composite materials to enable smoother transport.

In the long term, **composite material waste from blades and boats** should be **green listed**, enabling smooth transport for consistent and efficient recycling across Europe.

Waste from Electrical and Electronic Equipment Directive (WEEE Directive)

The WEEE Directive regulates **waste arising from electrical and electronic equipment (EEE)** and establishes **Extended Producer Responsibility (EPR)** schemes. These schemes make producers **financially and/or physically responsible** for the **collection, recycling, and treatment** of their products at end-of-life. The Directive is designed for **small, short-lived appliances** and is therefore **unsuitable for large-scale infrastructure** like wind turbines, which are capital-intensive and operate for 20–30 years.

Wind turbines are currently **exempt** as **Large-Scale Fixed Installations (LSFIs)**, which is appropriate and necessary. The conclusions of the WEEE Directive revision opens the door for the inclusion of **wind turbines** within the scope of WEEE Directive. This approach would be **structurally incompatible** with the nature of wind turbines and would bring negligible circularity benefits while adding administrative and logistical burdens. Wind turbines are and will remain for many years:

- Large, long-lived, and capital-intensive fixed installations;
- A negligible contributor to EU e-waste;
- Already part of efficient recovery chains for metals through existing value chains.

The inclusion of wind turbines under the WEEE scheme would create significant financial and logistical burdens, adding unnecessary administrative complexity without delivering meaningful circularity benefits.

The stated objective of the inclusion of wind turbines under the next WEEED is to recover **permanent magnets.** But this would lead to **double regulation for end-of-life permanent magnets**. The **Critical Raw Materials Act (CRMA)** and its dedicated articles to permanent magnet circularity provide a more appropriate framework for rare earth element recovery. Regulatory overlap will not work in practice and would risk adding unnecessary costs and complexity to the sector.

Permanent magnets in wind turbines contain rare earth elements critical for the energy transition but are present in **very low volumes**. Recycled content obligations or EPR schemes for turbines are therefore **premature and unworkable**, risking perverse incentives, higher costs, and distorted investments. Projected recovery from end-of-life turbines before 2030 is **~80 tonnes**, compared to a total EU demand of **25,000 tonnes**.

Implementation and enforcement

EU waste legislation requires transposition and enforcement at national level. Delays or inconsistent implementation hinder progress towards circularity and create uncertainty for investors. Regulatory consistency and transparency are essential to stimulate investment in recycling technologies, ensure fair competition, and achieve the objectives of the circular economy.

It is essential to ensure **timely, clear, and harmonised transposition** and **enforcement** of EU waste legislation across Member States.

Conclusion

The upcoming **Circular Economy Act** represents a pivotal opportunity to strengthen Europe's industrial resilience, resource efficiency, and climate leadership. WindEurope fully supports its ambition to create a **Single Market for secondary raw materials** and to make Europe a frontrunner in sustainable, circular industries.

For wind energy, the Act can provide the clear policy direction needed to scale up recycling and recovery solutions, particularly for **composite material waste coming from decommissioned wind turbine blades** (and boats) and for **permanent magnets**.

To unlock this potential, Europe should:

1. Set **targeted reuse and recycling objectives** for the suggested composite material waste under the Waste Framework Directive;
2. Establish **dedicated waste codes** to ensure consistent classification and traceability;
3. Introduce a **Europe-wide landfill ban** for composite materials;
4. Facilitate **cross-border shipments** for recycling through clear and harmonised rules; and
5. Guarantee **timely and uniform implementation** of EU waste legislation across Member States.

By embedding these principles in the Circular Economy Act, the EU will not only advance circularity in wind energy but also reinforce its broader goals of **competitiveness, sustainability, and strategic autonomy**.