

Decembre 2022

IEA Wind TCP Task 45

Preliminary summary of policies, legislation, guidelines and initiatives that address the end-of-life of wind turbine blades



iea wind

WIND TURBINE BLADES AT END-OF-LIFE

A preliminary summary of policies, legislation, guidelines, and initiatives that address reuse, recycling, repurposing, and disposal

IEA Wind Task 45 – Work Package 4.1

December 2022

EXECUTIVE SUMMARY

This document represents the ‘6-month preliminary report’ deliverable from the Work Package 4 working group. The purpose of this report is to review and summarize *existing* legislation, standards, and certification schemes related to recycling glass fiber composites. Readers should consider this report a current ‘snapshot in time’ of legislation, policies, rules, and standards – to the extent they exist – in various countries around the world. This preliminary report is intended to help inform members in other Work Package groups about the state of the policy and regulatory landscape related to blade recycling. The information assembled herein does not reflect an exhaustive review of legislation and policies in every country but reflects the conditions in select major wind energy markets. The WP4 working group acknowledges the lack of content from Asia Pacific, Africa, and Indian subcontinent countries, with hope for expanded participation from industry members in these regions.

In the process of performing this task, the working group identified a wide range of legislation, policy, regulations, standards, industry initiatives, company goals, and procurement tenders that sought to influence and increase recycling efforts while also adding restrictions on landfill disposal. Due to the wide variability of the information, we elected to broadly organize the findings in the following groups:

- “Hard Law” Measures – Correspond to enforceable laws or regulations where civil or criminal legal actions could result from lack of compliance. Technical design standards are included here given their role for ensuring safety and reliability is achieved in wind turbine designs and standards are ‘enforced’ via the certification process.
- “Soft Law” Measures – Corresponds to publicly announced, non-binding initiatives from turbine manufacturers, project owners, industry organizations, governments, and/or environmental organizations. This category also includes guidelines and recommended practices.
- Tender Requirements – Increasingly, tenders for procuring electrical power, are including provisions that attempt to address end-of-life actions when the wind power project(s) needs to be decommissioned. Tender requirements are an interesting area where recycling, reuse, and/or landfill ban requirements can be established relatively easily as contractual obligations that must be met during decommissioning.

Four observations may be made in respect of the findings of this preliminary study.

1. Landfilling and incineration remain the most common disposal practices for turbine blades in many countries, including most Member States within the EU and across North America. Few jurisdictions have a legal regime in place that is dedicated specifically to decommissioned turbine blades. Within the European Union, for instance, as a general observation, there is, at present, limited legislation in place to regulate treatment of composite or blade waste, both at EU and Member State level. French law provides the exception for blade waste explicitly and directly and may be considered a global leader in this regard.
2. It was found to be far more common for legal jurisdictions to deploy their general ‘waste’ laws to deal with the treatment of composites at end-of-life, but without making specific reference to turbine blades within the legal framework or associated guidance for industry.
3. A handful of EU Member States – Germany, Austria, the Netherlands, and Finland – have not only enacted rules making clear references to composite waste in their domestic waste laws but have prohibited the landfilling and incineration of composites. However, as has been

recognized in the Netherlands, with rising incineration costs and industrial scale alternatives often being unavailable, a landfill ban will have significant financial implications for the sector.

4. Despite the lack of legislation in many countries dealing with end-of-life turbines, a number of companies within the sector have committed to an array of voluntary initiatives in this regard. These measures include immediately ceasing the landfilling of blades, recyclability targets for blades that increase with rigor over several years, prohibiting export to foreign markets for landfilling or disposal, and a drive for fully recyclable blades by a specified deadline (e.g., 2030). The Corporate Social Responsibility (CSR) practices of the sector, thus, provide a crucial means of addressing the gap in ‘hard law’ measures across the globe.