

## **Waste generation from energy transition: a focus on wind turbine blades and photovoltaic panels recycling and recovery**

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The European plans and legislative packages of recent years are clearly aimed at increasing the share of renewable energy in EU by 2030. The rationale underlying this strategy is twofold: to achieve a reduction of EU emissions by at least 55% by 2030, with the objective of making the EU climate-neutral by 2050, and to reduce the dependency on imported fossil fuels. As part of this energy transition context, Member States are required to provide a National Energy and Climate Plan (ENCP) that outlines their national strategies to meet the overall greenhouse gas emissions targets.

In Italy, wind and solar power are promising sources of renewable energy that are expected to continue and accelerate their growth in terms of installed capacity in the coming years. According to last version of the ENCP, wind power and photovoltaic capacity are projected to grow by +135% and +220%, respectively, with respect to the power capacity in 2022, as reported by IRENA.

However, the decarbonization of the energy system also brings along the generation of significant waste streams. With a useful life span of 20 - 30 years, every installed wind turbine or photovoltaic (PV) panel will eventually become waste and should be properly treated.

This research activity, conducted within the MatER Study Center and the AWARE Research Group of Politecnico di Milano, aims to study the relationship between energy transition and waste generation and management. So far, the focus has been on identifying the state-of-the-art management options, particularly technologies for recycling and recovery, in order to assess the benefits, drawbacks, and expected performance of the identified technologies. The ultimate goal of this research is to estimate the wind turbine blade and PV waste material reaching their End of Life (EoL), according to the projections for renewable capacity in 2030 for Italy. The presentation will showcase the progress of the project and outline future research.