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A DECISION TOOL FOR WOOD WASTE VALORIZATION

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Abstract – Wood is an increasingly demanded biomaterial used in many fields: construction, materials, furniture, packaging, and energy. New consumption tendency indicates a major production of wood waste that is a starter for many processes. In Europe, about 54% of wood waste is incinerated, while 46% is recycled. In Italy, almost 95% of wood waste is used to produce chipboard and particleboard. There are many other processes available to improve wood recycling; however, it is important to identify the best treatment way depending on the source matrix. Wood waste is a heterogeneous material that contains contaminating materials, pollutants, and additives. Hence, wood waste management depends on material composition analysis. In fact, it gives significant suggestions regarding how to manage the waste. From this point of view, a decision tool (DT) regarding wood waste destiny hinging on chemical composition is proposed. In particular, the DT gives rapid recommendation based on the chemical results. The most relevant elements considered are cellulose, lignin and hemicellulose content. In addition, pollutants, additives, and other contaminants are crucial to find the best pathway. Some available technologies make it possible to use wood waste for energy and heat generation, pulping, mulching, animal bedding, and other. Utilizing such waste could create job opportunities and generate income for the local companies. The utilization of wood waste in recycling can minimize the gap from supply and demand of lignocellulosic matter. Moreover, it prevents deforestation and contributes to the CO₂ offset process. Furthermore, it is possible to obtain add-value materials utilizing the right process for each determined substrate.

Keywords – Cellulose; hemicellulose; impurities; lignin; wood lower heating value; pulping; recycling; waste-to-energy; wood contamination

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