



CIRCULAR BUSINESS

FOCUS ON INDUSTRIAL SYMBIOSIS IN LOMBARDY

The cascading use of wood

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Best practices in the wood recycling sector

The entire Italian wood collection and recycling system stands upon the activities of Rilegno and of the particleboard panels production sector, with a production capacity of around 3,8 millions of cubic meters/year.

The article describes an example of European benchmark in the field of collecting, recovering and recycling of wooden packaging and waste, through the cascading use of wood.

Given the current technologies and opportunities, legislative orientation, research experiences and the supply of services, for a sustainable industrial economy is fundamental a new production model at all levels - theoretical and research, legislative and administrative, scientific and technical: the transition from the so-called linear economy to the circular economy.

The current model of production and consumption (I take raw materials, I produce and use products, I get away products that can no longer be used) is no longer sustainable, so what are the alternatives? How to manage the lack of energy and resources? How to reduce waste?

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Unlike the recycling of many other waste materials, wood recycling takes place for the most part within the plants of panel producing companies, with post-consumer wood entering a single process that ensures that waste is transformed into particleboard panels without undergoing intermediary steps. Due to this peculiarity, it is extremely difficult to standardize the waste material entering the process, while the quality of

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the end-product is ensured by the high quality treatment provided during the production process of the particleboard panel, which progressively sort and removes all impurities and unwanted materials.

The rate of recycling realized by Rilegno is allowed thanks to the synergy between organizational/logistic solutions and technologic developments, which together ensure a cost-effective collection system, an efficient treatment of materials (which allows for the recovery of almost all wood waste fractions available) and a competitive final product that conforms to relevant product standards and thus contributes towards an extended lifecycle of wood.

The activities of Rilegno ensure that today 1.793.748 million ton of wood (mainly from packaging but also other end-of-life wood products) enter the recycling system. Rilegno has progressively increased the range of recovery operations on the territory, which today include also wood waste fractions different from packaging waste, boosting the circularity of all kinds of wood wastes. It is also important to note that the use of post-consumer wood as a raw material

alleviates the pressure on virgin wood resources, which are then made available to other sectors of the woodworking value chain.

Thank to this dynamic network and the coordination of Rilegno, 1.793.748 million ton of wood waste (50% of which are wooden packaging), three-quarters of the total amount of waste wood collected and recycled in Italy, are sent to recycling for a total number of 100.000 shipments towards the recycling companies that are the backbone of circular economy. Wood wastes, after collection, enter recycling in 13 plants (2018) distributed all over the national territory, with a major concentration in the North of the country, and with the main destination being panel plants, whose output is then directed to the furniture and furnishing industry.

With the contribution of Rilegno the 62% of wood packaging waste are recovered and headed to mechanical recycling, almost exclusively for the production of wooden conglomerates (mostly particleboard panels and for a smaller part mdf).

The technological know-how developed by Italian companies allows for the recycling of a wide variety of wood waste materials, which would be difficult to recover otherwise. At the same time the final products fully comply with performance requirements set by European Harmonized Standards, including the HS required for CE marking.

The Rilegno system

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Materials

Rilegno has been founded in 1997 to solve the problem related to the disposal and reuse of wood waste derived in particular from the fruit and vegetable sector. Nowadays the associate recycling companies mainly operate in the sectors of particleboard and mdf panels production, pulp for paper mills, wood-concrete composites for construction and pallet elements. In the end of 2017, thanks to the activities of the associate companies, 2,946.347 tons of wooden packaging were placed on the market, with a share of 72% of new and regenerated pallets, 14% industrial packaging, 1% reel, 9% wooden crates for fruit and vegetables, and 4% packaging materials.

Pilot cases

On the basis of the numbers cited above, Italy is at the top with regard to recycling of wood compared to other European countries. There is now a new goal of the Consortium to identify innovative post-consumer wood applications. One of the future the design challenges on which Rilegno is working is indeed that of selecting partners between sector institutions and universities able to develop case studies on new ones possible applications for recycling wood collected from the network of platforms affiliated. The institutional interlocutor in charge will be proposed to conduct a research / observatory activity aimed at identifying applications for post wood alternative

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WORKING PROGRESS	
Municipalities	4437
Population served	41.400.000 (68,22% of Italian Population)
Private Conventional Platform	400
Consortium units	2367
Project funds	€ 22 million every year to co-finance collection and recycling activities

COMING RESULTS		
Impact	Value	Unit
Recycling of wood waste	1.793.748	ton/year
% of recycling in the packaging sector	62%	ton/year
Reduction of the emissions of CO₂	3.060.000	Ton/year
Reduction of water consumption	7.720.000	m ² /year



and non-substitutive consumption to current panel production, pasta cellulose for paper mills, wood-cement blocks and pallet blocks.

Today over 95% of post-consumer wood waste has been produced for the production of panels for the furniture industry. Among the main companies of the Rilegno Consortium, the Lombard companies are the leader: the **Mauro Saviola Group** (Viadana, Mantua) with 1,380 employees, 552 million turnover and one million dollars recycled each year and the **Fрати Group** (Pomponesco, Mantua) with a turnover of 300 million euros, 800 employees and a production capacity of over 4000 cubic meters of wood per day.

20 years of experience and the compliance with all relevant national and European quality standards have resulted in a progressive refinement of the control system in place, which involves both the producer of waste, who is pushed to verify and sort the fractions that are incompatible with recycling, and the recycler, who has the necessity to obtain clean and reliable secondary raw materials, and thus sets up a cleaning process finalized at the elimination of all contaminants that are not allowed by

environmental standards, and consequently are not compatible with the production of panels:

- Rationalization of the logistic chain, that allows for an efficient supply cycle that integrates logistics not exclusively aimed at secondary raw materials collection, and a reduction of the amount of land-filled waste.
- Selection of waste on the basis of its origin and production process, in order to exclude materials containing contaminants of chemical origin used for impregnation, varnishing, treatment.
- Management of the materials within the plant through physical separation of different kinds of wood wastes: pallets and packaging, bulky waste, post-consumer wood, manufacturing residues (pre-consumer)



- **Prevention of the production of waste**, with the aim of optimizing the performance of packaging, providing for and improving the use of packaging
- **Harvesting, collecting waste** from public areas and industrial and commercial sites
- **Recovery, extending raw material** from the collected volumes
- **Recycling and reuse**, to favor the economy of artifacts obtained from the recycling of wood

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