Application of risk analysis to improve environmental sustainability of forest yards in wood-energy chain

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Thermal plants using wood biomass have been strongly supported in recent years by the European Union. The design solution deemed more sustainable for the environment involves the construction of small plants, whose needs can be guaranteed by timber coming from the surrounding territory. Often this solution can not be deemed as the most compatible with the requirement of safety. For small size wood-energy chain the implementation of the best available technology regarding occupational and environmental safety implies an higher economic charge compared to large systems based on major capital investments.

Purpose of this study is the application of a methodology designed for the analysis of risk in order to identify and to assess the impacts on the environment. This analysis will be applied to forest yards, corresponding to the first phase of the forest - wood – energy chain, i.e the raw material procurement. Based on the feedback received, adjustments to the methodology will be identified to permit an easier application both to occupational risk analysis and to environmental impact assessment. It will therefore be possible to optimize the identification of the procedures to implement. A future goal is the application of the method to the entire supply chain, from timber's procurement to the plant's realization and implementation.

After identifying the criteria to determine the most suitable operating procedures (according to the characteristics of the examined wooded lot), the individual work phases have been divided into sub-phases and elementary processes. For each elementary processing the main sources of risk have been identified. They were divided into employed equipment, materials (raw and complementary materials, waste and products), work environment and organization. Keeping this division for each source of risk the related hazard's factors, the possible impacts on the surrounding environment deriving from them and the procedures to minimize them have been identified and verified on real cases.