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# ADVANCING SUSTAINABLE CONSTRUCTION IN THE BALTIC REGION BY INDUSTRIAL BY-PRODUCTS AND WASTE VALORIZATION: A REVIEW

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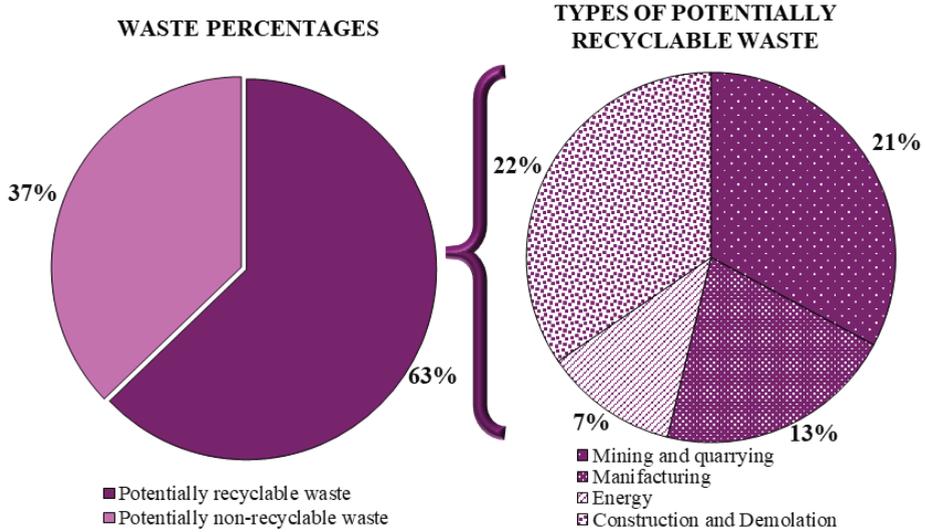
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**Abstract** – The Baltic region faces increasing challenges in managing industrial by-products and wastes due to growing industrial activity and stringent environmental regulations. At the same time, the construction industry is under significant pressure to adopt sustainable practices and reduce its carbon footprint. It is therefore essential to identify and summarize opportunities for the use of industrial by-products and waste in the Baltic Sea region in order to develop sustainable building materials that are in line with circular economy principles and carbon neutrality objectives. In the Baltic Sea region, 63 % waste is coming from mining and quarrying, manufacturing, energy production, and construction and demolition. These wastes can contain compounds containing Si, Ca or Al, which are essential for the production of building materials, thus giving these wastes a chance to be recycled again. In addition, the Baltic Sea region has a wide range of industrial residues and by-products, such as glass-based, clay-based and cement-based residues and by-products. By carefully identifying the current situation and studying the characteristics of waste and by-products, it is possible to identify innovation opportunities, including the development of region-specific formulations and the optimization of processing methods, to improve the economic and environmental benefits of waste valorization. It is possible to significantly reduce industrial waste, thereby saving resources and providing cost-effective alternatives to traditional raw materials. Summarizing the current research and practical achievements, a roadmap for the development of sustainable construction practices in the Baltic region has been developed. Also, future directions for research, policy initiatives and industrial cooperation to unlock the full potential of industrial by-products for sustainable construction has been proposed.

**Keywords** – *Baltic Sea Region; industrial by-products; recycling; sustainable building materials; wastes*



Waste distribution in the Baltic Sea Region  
according to potential use in the production of construction materials

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