ASSESSING THE GLOBAL SUSTAINABILITY IMPACT OF IMPROVING THE SECONDARY STEEL PRODUCTION: LESSONS LEARNED FROM AN ITALIAN STEEL PLANT

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Abstract – This study presents a comprehensive sustainability assessment of a series of technical interventions aimed at improving a secondary steel production process using the Electric Arc Furnace (EAF) technology in a steel plant located in northern Italy. The assessment covers the environmental, social, and economic dimensions of sustainability by considering three sets of indicators and employing a multi-criteria decision-making approach. The results show that the considered interventions can lead to significant improvements in the sustainability performance of the EAF process. The study also highlights the trade-offs and synergies among the sustainability dimensions and provides recommendations for decision-makers to promote sustainable practices in the steel industry. Overall, this study underscores the importance of addressing the sustainability challenges faced by energy-intensive industries such as steel production.

Keywords – Electric Arc Furnace; life cycle sustainability assessment; multi-criteria decision-making; steel production