

3S3 Supply chain transition: managing tools and sustainability assessment of innovations

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Manufacturing sectors and global supply chains play a crucial role in many of the most pressing environmental stresses and social concerns identified by the United Nations' Sustainable Development Goals (SDGs). Responding to calls from the society, governments and global community, companies are adopting a variety of voluntary innovative practices and actions to improve the environmental and/or social management of their suppliers' activities. Nevertheless, addressing the myriad sustainability challenges facing our world today is not a simple task. Many methodologies have been developed that measure either social, economic or environmental performance of companies and supply chains but for decision making all three need to be integrated. A techno-economic assessment (TEA) combines process modelling and engineering design with an economic evaluation at early stages of technology development providing an ex-ante or prospective assessment with clear linkages to the (early) stages of technology development. Expanding the scope of TEAs through the integration of the economic indicators of TEAs with environmental and social impacts would represent a powerful "sustainability toolbox" for companies. Furthermore, for real circular solutions, performance should not be optimized only for individual firms but for full supply chains including many loops. The challenge represented by supply chain transition requires the adoption of the correct and quantitative tools that need to be properly handled. This section will provide real cases applications, theoretical frameworks and tools for supporting the transition towards more circular and sustainable production and consumption pathways pointing out the challenges and opportunities of some innovative solutions of manufacturing sector.