

EFFECTIVE SUSTAINABLE VALUE CHAIN PRACTICES FOR METALLURGICAL INDUSTRY PERFORMANCE IMPROVEMENT

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Introduction. In the context of the concept of sustainable development, current and future social, environmental, and economic problems are interrelated and should be addressed in an integrated manner. Achieving sustainable consumption and production is an integral component of the Sustainable Development Goals (SDGs). Sustainable consumption and production are reflected as a means of intersectoral interaction to achieve many of the SDGs and directly Goal 12: “Responsible consumption and production” – SDG 12 (Department of Economic and Social Affairs, 2021).

It should be noted that industrial enterprises in Ukraine are leading in the world in terms of specific energy consumption and resource intensity of products, as evidenced by the GDP per unit of energy use. The reason for this situation there is the lack of a well-grounded state energy policy, which assumes the presence of established industry indicators of energy intensity; the state relevant body responsible for compliance with the established rules; an effective policy of taxation and subsidies for industrial enterprises; principles of responsible environmental management in society.

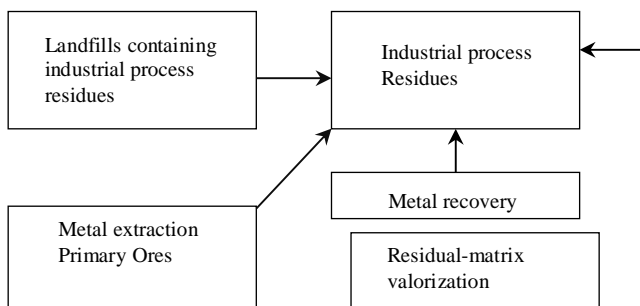
Presentation of the main research. The value chain management paradigm based on sustainable development initiatives has led to further changes in business behaviour regarding the strategy of enterprise interaction in the supply chain. Traditional theories cannot provide a comprehensive explanation of sustainable development management in these chains. The modern theory of supply chain management is unable to explain and predict the behaviour of the original sources of sustainability (Acharyulu et al., 2015).

A value chain model developed by Porter with five main activities and four supporting activities can be used as a common one. This model cannot be used directly in the metallurgical sector, as the

expansion of metallurgical plants has become a constant process of their growth and survival. Due to the nature of the activity, another variant of the value chain for the metallurgical industry is being developed with five main activities and six auxiliary activities (Acharyulu et al., 2015). In integrated metallurgical plants steel is manufactured from basic raw materials like iron ore. The main production units are the raw material handling plant, coke ovens. In addition to these main production units, there are several auxiliary units like power plants. Four technical work packages examine various aspects of waste-free assessment of industrial process residues (see Figure 1).

Figure 1

Mapping of flow sheets (Acharyulu et al., 2015)

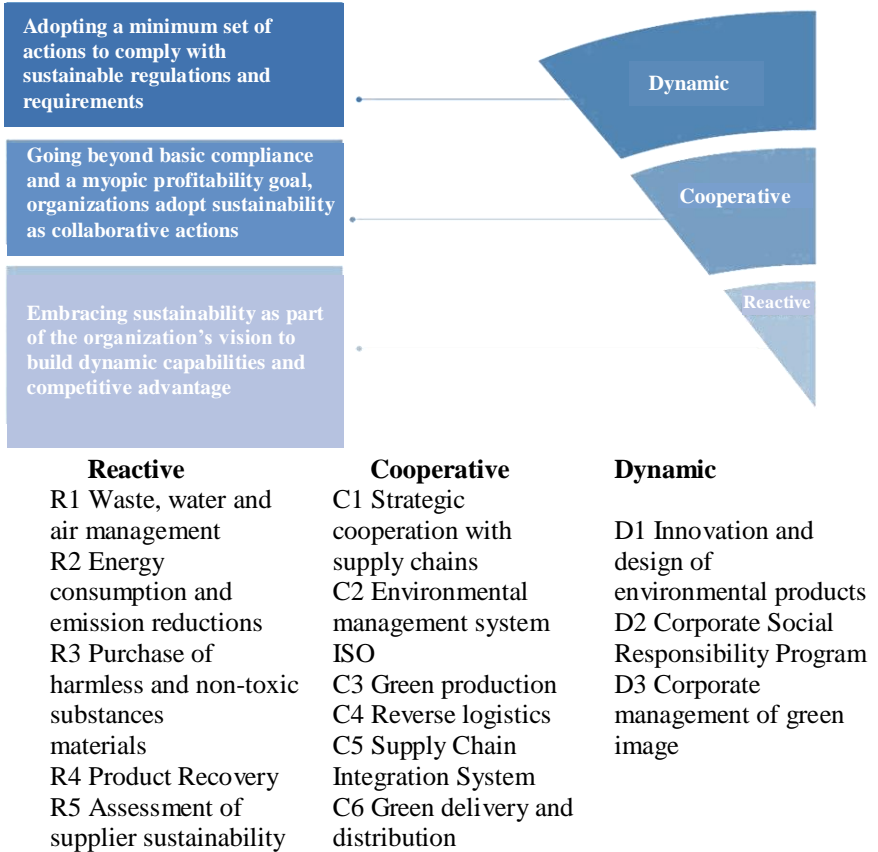


Natural resources, especially metals, are gradually depleting from the crust. Therefore, secondary sources such as industrial residues, waste and side-streams could potentially act as a more sustainable critical metal supply. This approach is at the very heart of the circular economy principles and, actually, from that point of view, European countries have ‘inherited’ a large quantity of industrial waste (Kuvaieva et al., 2021).

Sustainable practices must meet two criteria: (1) they must improve environmental health, meet ethical standards to enhance social justice and increase economic viability; (2) the environment must be a priority, then society and the economy (see Figure 2).

Figure 2

Types of value chains (Kuvaieva et al., 2021)



The efficient use of energy, or energy efficiency, has been widely recognized as cost-efficient means to save energy and to reduce greenhouse gas emissions. Up to 1/3 of the worldwide energy demand in 2050 can be saved by energy efficiency measures (Kuvaieva, 2021). Energy management systems offer a structured and integrated approach to improving energy efficiency. Cooperative value chain includes the

introduction of ISO 14001. ISO 50001 is based on the continuous improvement management system model, which is also used for other well-known standards such as ISO 9001 or ISO 14001. This makes it easier for organizations to integrate energy management into their overall efforts to improve quality and manage the environment.

Ukrainian metallurgical enterprises also have experience in creating sustainable value chain through ISO standards. Azovstal was the first among enterprises in the metallurgical industry in Ukraine that proceeded to new standard implementation, having concluded contract for certification conduct with auditing company «TÜV SÜD Ukraine», and the first enterprise that passed certification audit for compliance with international standard ISO 50001:2011.

Conclusions. In the context of supply chain management, sustainable supply chain management (SSCM) is a management concept that goes beyond supply chain performance indicators – cost, time and flexibility. SSCM considers the management of the integration of economic and non-economic issues into the supply chain. The implementation of these practices includes use of high quality components, ensuring longer product life; optimization of packaging design: compliance with the rules and use of the service life of packaging material; elimination of toxic materials and reduction of emissions; cooperation with suppliers who follow the basic guidelines for sustainable development.

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