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NEW STRUCTURAL DESIGN FOR GREEN SUPPLY CHAIN MANAGEMENT: THE CASE OF THE ALUMINUM INDUSTRY

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Abstract. The implementation of green design is now required for humanity's sustainable future. The global importance of green supply chain management (GSCM) is burgeoning in this regard. Developing critical strategies for GSCM and regulating its activities within the corporate structure are pressing issues. The global business sphere and scientific research institutions can not ignore global climate change, especially for the aluminum sector, which alone is responsible for 3% of carbon emissions from direct industry worldwide. The EU, US, and UN charters that aim to reduce carbon emissions by 2050 can not be implemented without green design and structural management innovations. Despite the abundance of scholarly research on the application of green principles and strategic roadmaps in management, there is a dearth of studies that specifically focus on the formulation of strategic methodologies customized to meet the particular needs of the aluminum industry. The strategic landscape of this industry is beset with substantial structural management challenges that necessitate expeditious action through the adoption of innovative and sustainable ideas. To this end, this research presents a novel eco-design model and innovative green strategies, which are uniquely customized to tackle the distinct challenges faced by the Ganja Aluminum Complex.

Keywords: *eco-design, industrial design, green supply chain management, sustainability, aluminum industry.*

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1. Introduction

Supply chain management is ingrained in the fundamental organizational structure of any manufacturing company, public or private, global or local. The operation of economic institutions provides a fundamental foundation for the effective organization and management of the traditional supply chain system. From this perspective, the presence of supply chain management departments or units in a company's organizational management structure is required. The procurement process serves as the foundation of the management system. The acquisition of appropriate equipment, materials, and services are the basic elements involved in the performance of the purchasing function to meet the needs of the organization (Locke, 1996). Traditional supply chain management entails a series of steps, such as purchasing materials and services, converting them into final products, and delivering them to customers. Logistics and procurement specialists are key players in this management process, and these employees are in charge of

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managing and delivering all contracts and day-to-day procurement operations, from the starting point of the supply chain system to the end user (Lyons, 2015a).

Green supply chain management (GSCM) is gaining traction in academia and industry, and as the literature grows, identifying new directions and future objectives by judgmentally evaluating research is critical to advancing knowledge in the field (Sarkis *et al*., 2011). The incorporation of green principles into supply chain management is relatively recent, and there are still problems with its overall structural organization. It progressed in stages until some systematic structuring was achieved. In 1998, ISO, a global standardization organization, developed an international standard called 14040, a package of eco-system analyses. In this procedure, a set of systematic analyses was formed to design and verify the inputs and outputs of materials and energy and their environmental impacts (ISO 14040, 1998). GSCM entails considering supply and procurement system innovations in an environmental context (Green *et al*., 1996). The organization of the structural design of GSCM at the global level is a more relevant problem for today and an important research object open to new ideas.

2. Material and methods

2.1. Literature review

The main thesis of the study is the dissemination of green economic ideas into the realm of management. The crucial aspect of this process is the unavoidable necessity of green integration, and several existing studies have been reported on the key concept. Heizer analyzes comprehensively the general outcomes of sustainable supply chain management (Heizer *et al*., 2017). Trends and future challenges have been illustrated (Tseng *et al*., 2019), and a performance model for GSCM practices has been proposed (Green *et al*., 2012). Article written by Diane Holt and Abby Ghobadian (2009) presents valuable perspectives on the implementation of GSCM and the factors that influence its efficacy. It serves as a useful guide for organizations looking to embrace sustainable supply chain practices and surmount the obstacles that may arise during implementation. Sang M. Lee et al. (2012) explain an extensive examination of the current state of research on GSCM and provides meaningful insights that can be beneficial to both scholars and practitioners who wish to deepen their understanding of this crucial field.

The study gives substantial weight to the use of practical examples, in conjunction with theoretical foundations, to articulate innovative eco-design models and strategies. The main illustration of this paper is to open a bridge for green management and convert traditional supply chain management to GSCM. As a theoretical approach, it is able-bodied literature that forms the basic structure of GSCM (Zhu & Sarkis, 2004). Taiwan's innovative research is one of the most prominent practical examples of the transition to a strategic green management system. A new GSCM model for Taiwan's electronic industry could be proposed as one of the projects ahead of schedule in sustainable strategies (Hsu & Hu, 2008). The scientific investigation of green management models and strategies for the specific area of aluminum, which is considered the metal of the future for most industries, is one of the unique topics. As a practical approach, it is a beneficial example to follow the sustainability roadmap of the industrial organization, which is the global American brand (Alcoa, 2021). The innovative evolution strategies and models for the classic form have been designed in this scientific work, and an assessment of the LiDS wheel model for the aluminum sector has been implemented as a new example.

2.2. Forming a new division for GSCM in the organization's structure

In order to implement the structural arrangement as a special activity unit of GSCM, it is imperative to study the first management system and decision-making institutions and conceivable to come to rational conclusions about the evaluation of studies using the example of companies with practical activities or experience in the global business sphere.

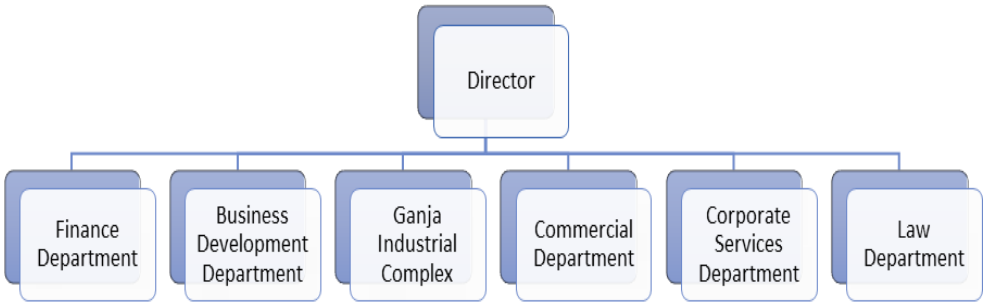

Figure 1. Corporate structure of Azeraluminium LLC*. Formed by the authors
*The only producer of primary and semi-finished aluminum products in the South Caucasus region.

Following an overview of the corporate structure, the main departments and divisions can be included in GSCM's action plan are determined. The major sections are as follows: 1.Ganja Industrial Complex (GIC); 2.Commercial Department (CD); 3.Business Development Department (BDD).

GSCM is more dependent on the GIC and CD sectors. On BDD, the current relationship is more peripheral, but the business strategy for this department is also very multilayered. The subdivisions of the structural system must be planned in order to specify the possible directions of action for GSCM and determine the effective green economic vectors. After conducting a scientific-analytical review of the specific from a general perspective, it can be determined that the structural affiliation of GSCM extends to the production, energy, technology, HSE, and transport departments of GIC, all departments of CD, and the scientific and strategic research departments of BDD. The organization of GSCM can be accomplished in a synthesis or hybrid form, with all related departments acting freely in the corporate structure.

In the modern world, it is necessary to regulate green standards, which are increasingly important, in an official procedure to form GSCM on a structural basis for global integration and development of business activities. The establishment of GSCM in all organizations as a special department in the corporate structure can be organized either under the processes of production, commercial, or business development departments. Regardless of whether it is directly subordinate to a special section, GSCM should work in tandem with others.

2.3. The main strategies of GSCM

GSCM is a strategic approach that businesses use to minimize the environmental impact of their entire supply chain, from the initial sourcing of raw materials to the disposal or recycling of finished products. There are several strategies available for organizations to adopt in implementing GSCM:

- Green Procurement
- Green Production
- Design for Environment
- Reverse Logistics
- Green Marketing

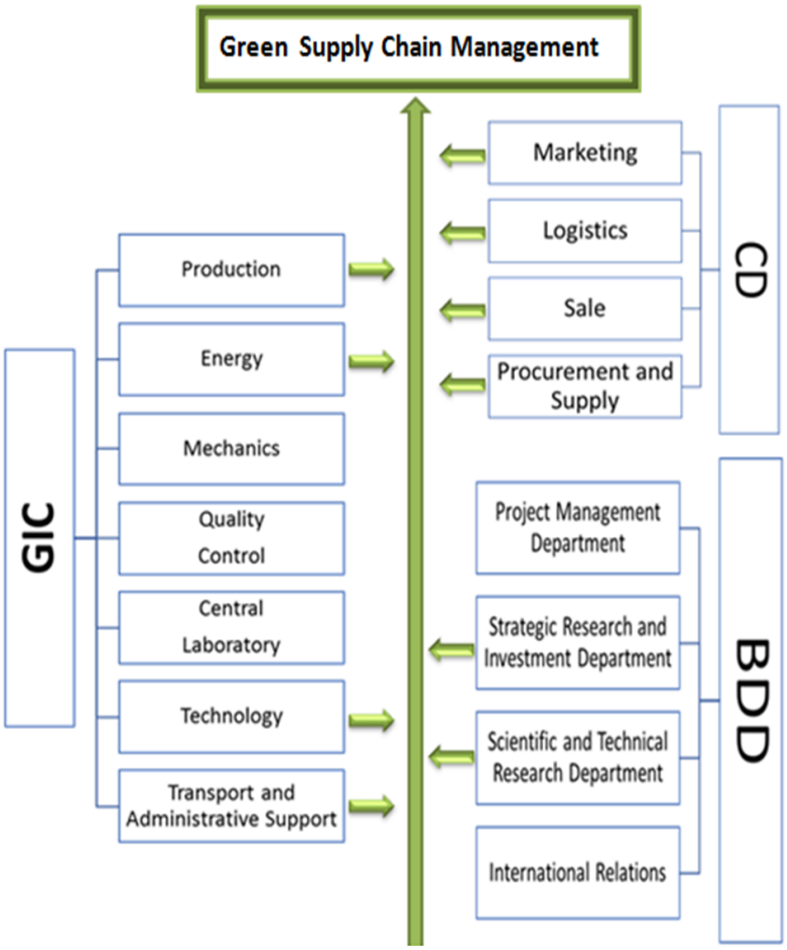

Figure 2. Spinal column of green management: Structurally connected sections to GSCM. Formed by the authors

By adopting these strategies, organizations can significantly reduce their environmental impact, enhance their reputation with stakeholders, and attain long-term sustainability. The basic planning of activity directions is established after determining the position of the GSCM department within the corporate structure. The plan should be developed as a part of other day-to-day business platforms, based on the use of all existing structures, and implemented in the enterprise. One of the top priorities is to increase the efficiency of the organization and management processes. Fulfilling these principles requires effective management of available internal and external resources.

Manufacturing processes are the broadest platform of the aluminum industry. Manufacturing is also the largest sector in terms of green standard implementation. Although in a traditional supply chain system there are necessary interdependencies between the production, supply, and marketing departments, these bodies have free self-management systems. In the management structure of GSCM, these connections are more

complex and determine their strategies in general harmony without direct corporate dependence on any specific department. In order for the production to reach the global product markets in a convenient form, the product must be "green" labeled and certified. The primary function of the GSCM department in the corporate structure is to accomplish this strategic activity.

Green production strategies are essential in the GSCM system. Additionally, it is imperative to possess a thorough understanding of the market dynamics, suppliers' characteristics, the nature of materials involved, and suppliers' procurement capabilities, prior to formulating and creating potential contractual requirements aimed at acquiring strategic goods through environmentally sustainable alternatives. Green strategies must be defined within or in collaboration with the purchasing and supply department. GSCM requires the development of action plans that include resource delivery services that are in line with the company's economic and environmental needs.

A business development agency's plans should be in line with current trends in green strategies. The formation of long-term strategies and the sustainability of any company are two of the main activities of the various departments in this sector. In this regard, the positive strategic correlation of GSCM`s structural connections with this section is significant.

All process participants must understand the eco-economic essence from global to local in order for GSCM to have a high useful work coefficient within the overall complex. Some statistics provide a green light for ensuring the importance of this business activity. According to CDP, the world's leading carbon disclosure project, 1.8 billion CO_2 savings in 2021 would result in a $29 billion benefit to the global economy (CDP, 2023). Green strategy makers must be able to convert emissions savings into business gains rather than simply complying with environmental regulations.

The most important aspect of the green economy is energy. In addition to being the primary driver of macroeconomics, energy is the primary cause of global climate change by emitting the greatest amount of greenhouse gases into the atmosphere. The aluminum industry is also powered by electricity, and the green strategy is based on energy assessments. Because of electricity, production is regarded as the most prominent stage in GSCM. The aluminum manufacturing industry is assessed using practical indicators from the production and energy departments. At the same time, these departments are implementing green action plans, strategies, and fundamental innovations.

The main research here is conducted on what energy resources are used, the amount of energy consumption indexed to a fixed amount of production, carbon dioxide emissions, greenhouse gases coming out directly from the production process, and the amount of CO2 emitted from the plants that provide energy for the production. The Dow Jones Sustainability Index conducts the most significant green index evaluations in the world (Spglobal, 2023). This sustainability index annually selects among thousands of companies the most efficient green index in the world, taking into account economic, environmental, and social criteria. In 2021, Vedanta Aluminum was ranked among the top ten on this list. The company has managed to reduce greenhouse gas emissions by 21% over the past 10 years with innovative strategies (Vedanta, 2022). In order to have forward-looking indicators in global green indices, business strategies should be built on the following four main principles (Lyons, 2015b):

- Corporate sustainability: This strategy focuses on forming a business platform for long-term shareholder value by appreciating opportunities arising from economic, environmental, and social development and managing possible risks.

- Investment sustainability: This strategy aims to increase corporate sustainability and form an efficient eco-economic environment by making beneficial investments.
- Recognition: This principle can be realized by acting according to international assessment methodologies and achieving green certificates.

The strategies defined by University of Melbourne researchers D. Simpson and D. Samson for the GSCM claim should also be emphasized (Simpson & Samson, 2008):

- Risk-based strategies
- Efficiency-based strategies
- Strategies based on innovation
- Closed loop strategies

These strategies are complex, linking environmental performance to the entire supply chain, and the simplest is a closed-loop strategy that involves reclaiming recycled materials from end-of-life products and disposing of them (Chen, 2012). There is a need to develop a platform that identifies green research and strategies within business activities, builds on an existing database, works with changing statistics, makes rational recommendations, and monitors the entire chain system, especially for large, globally significant corporations. There are a number of internal and external factors that must be considered in order to create that platform.

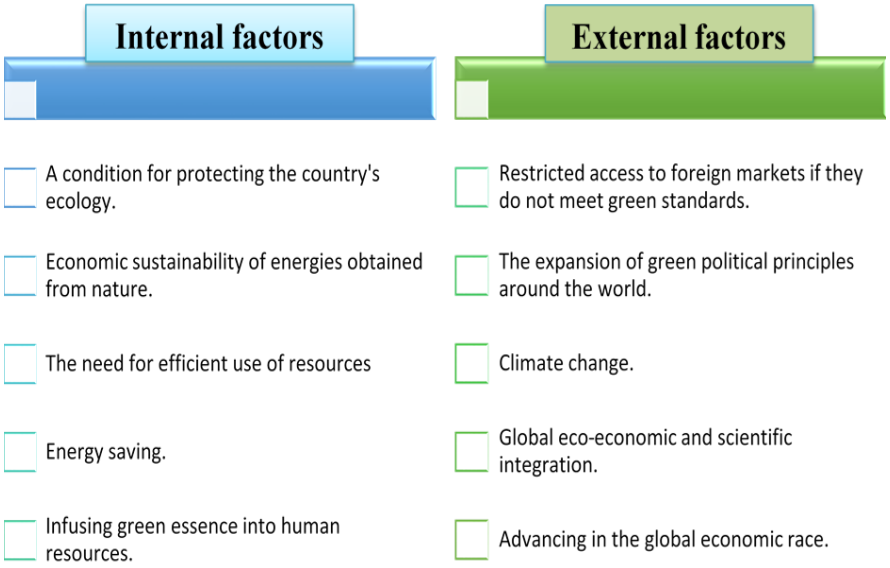

Figure 3. Internal and external factors that necessitate the activity of a body with a green platform in the field of management. Formed by the authors

A closer look at these significant criteria allows one to see the essence of GSCM in the company structure on a more epistemological level.

2.4. Eco-design for GSCM

Formulating green structures and strategies has become an important concern for global companies. The introduction and development of new green models within the management system have become urgent subjects. These principles are also based on the

development of a new eco-design model for companies as a component of business activity.

Eco-design is proposed to value best practices in the production of green products (Cicconi, 2020). The basic principle in traditional management and supply chain strategies is based on purely economic design. Economic design is based on the process of converting and selling the raw material entering the enterprise into a new commodity. In essence, the organization of eco-design is the modeling of green principles within the economic system. Eco-design is a necessary green injection into the economic sphere.

Eco-design tools are used to manage important aspects of production, incorporate sustainability principles into design, identify areas for improvement in future products, and ensure that each type of existing product is more sustainable than its predecessor. (Donnelly, 2006). Impact on the macroeconomic environment, environmental trends, and international standards have expanded the application of eco-design models among industrial enterprises. For example, the provisions of the Eco-Design Directive and ISO 14000 in the European Union can be cited. The Eco-Design Directive sets the framework for performance criteria that manufacturers must meet in order to legally place products on the market (ECEEE, 2019). A number of companies require the participation of green suppliers for the eco-design process in the context of the growth of strategic manufactured goods. To define the principles of eco-design, it is imperative to first understand the essence and necessity, and then analyze the necessary tools, factors, challenges, and successes from global experience. Eco-design is a methodology for the design of industrial goods that takes the environment into account during the product development process as a new factor compared to traditional methods, and its purpose is two-fold: on the one hand, to reduce the impact of the product on the environment during its life cycle, and on the other hand, to provide more benefits to economic interests (Ecolan, 2019). Eco-design refers to the ecological design of a product or process and is aimed at reducing the impact of the product on the environment and preventing negative environmental factors before it is produced, sold, transported, and generally used (Duo *et al*., 2018). Most of the world's eco-economic problems are caused by not properly designing green principles.

While the traditional supply chain and economic design of the aluminum industry are organized around procurement, production, evaluation, and sales, the addition of eco-design to the system can be built through the effective application of modern green principles.

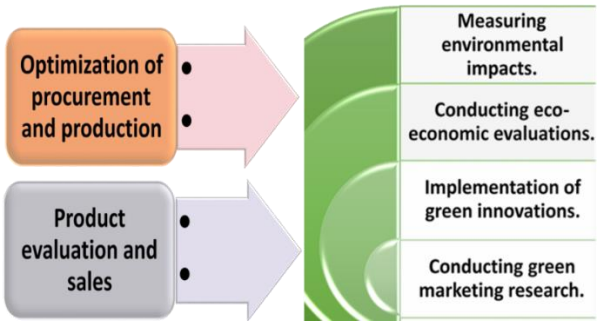

Figure 4. A model for adding eco-design principles to economic design processes.
Formed by the authors

The new eco-design model can be built in rational harmony with the traditional economic design that forms the basis of business, and the main goal should be the operation of a sustainable eco-economic system.

Since the late 20th century, the growth of research on eco-design has also increased in importance for practical applications in the 21st century. The United Nations Environment Program (UNEP), one of the leading environmental institutions in this direction, has defined six main strategic directions in its latest missions (UNEP, 2013):

1. Global climate change: conducting research on switching to technologies with minimal or zero emissions of carbon-containing gases and providing information to the public.
2. Post-conflict and disaster management: conducting environmental and legal assessments in countries experiencing crises.
3. Ecosystem management: implementation of ecosystem management methods and services based on sustainability principles.
4. Environmental management: creation of necessary institutions and development of programs and laws to ensure sustainable development from regional and global perspectives.
5. Harmful substances: limiting the use of substances that are harmful to the environment and directly to people's health, minimizing existing risks in this area.
6. Resource efficiency and sustainable consumption and production: controlling processes for efficient use, production, and consumption of exhaustible resources and natural resources, preparing proposals.

From a global perspective, it is the best tool of the UNEP platform for organizing eco-design. Eco-design strategies for the aluminum industry are organized in three main stages:

1. Entry and exit of resources into the system.
2. Energy consumption during production operations.
3. Carbon dioxide emissions and waste.

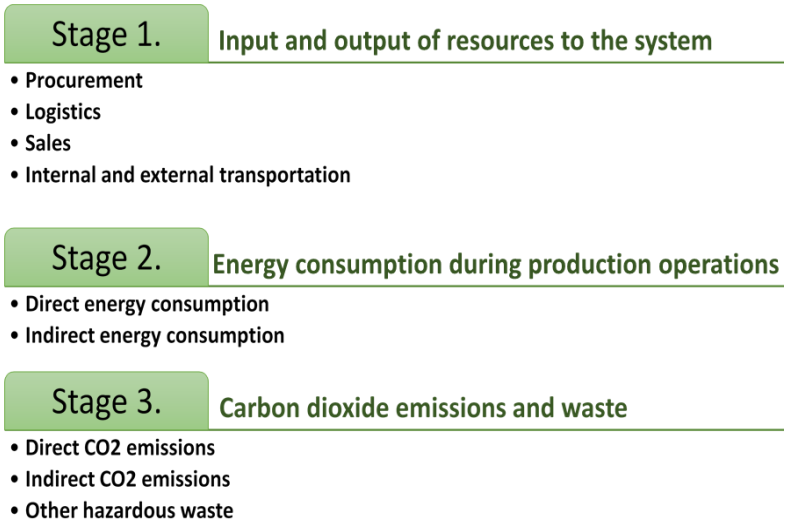

Figure 5. Eco-design stages in the aluminum industry. Formed by the authors

3. Main Research Findings

There are several tools for building eco-design, ranging from global to regional, general to specific, and the "LiDS wheel" model is the most effective. This model was originally formed to evaluate the environmental impacts of two different products, and the method of using the tool is to assess the new product while keeping the old design as a comparison (Chulvi, 2011). Based on the LiDS wheel, various strategies are classified into 8 main groups (Brezet, 1997):

- Development of a new concept.
- Selection of goods with low impact on the environment.
- Reducing the amount of material used.
- Selection of environmentally efficient production technologies.
- Selecting environmentally efficient distribution methods.
- Reducing the impact on the environment during the use phase.
- Optimizing initial lifetime.
- End-of-life optimization.

The LiDS wheel has a broad range of applications, and the strategies it contains are general in nature. The framework of this tool can be applied to that specific field for the design of modern eco-design for green supply chain management in the aluminum industry.

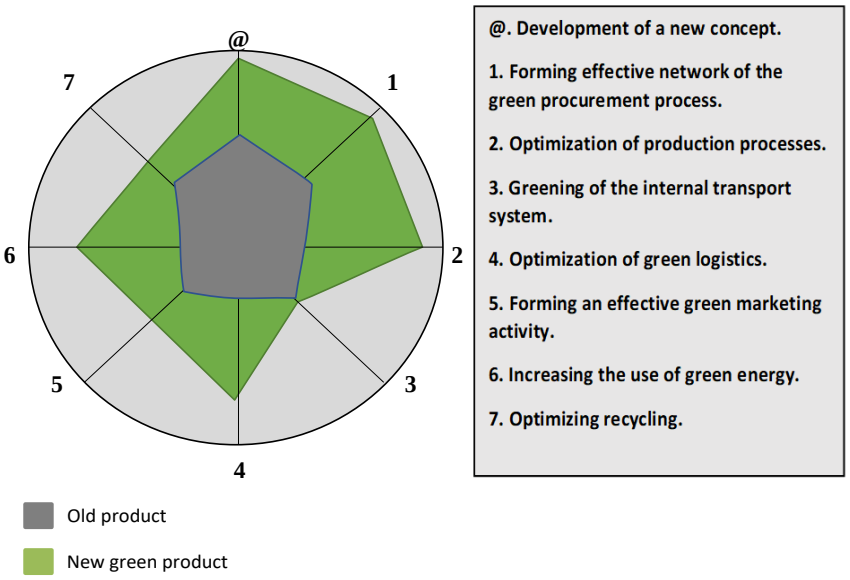

Figure 6. A new forming model of the LiDS eco-design strategy wheel for the aluminum industry. The authors transformed and designed it to be applicable and effective in the context of the aluminum industry

Development of a new concept is the starting point of the evolutionary model.

1. Forming effective network of the green procurement process - This phase should be designed in accordance with green design principles. A sustainable and efficient supply of critical raw materials for the aluminum industry, such as alumina, anodes, and cryolite, is required.

2. Optimization of production processes - Manufacturing processes are the most extensive platform in the field of heavy industry. The phase where green principles should be considered the most is production. From CO2 emissions to energy consumption, the

electrolysis production process is considered to be the most important area, and new technologies such as inert anodes are among the main futuristic targets for GSCM.
3. Greening of the internal transport system - Internal transportation will be converted to electric vehicles in this phase. In particular, vehicles carrying alumina, anodes, and liquid aluminum. Compared to other stages, the volume of greenhouse emissions is not so massive.
4. Optimization of green logistics - Across the aluminum industry, logistics shipments cover large geographic areas. The primary green priority is to increase the use of rail and ship transportation.
5. Forming an effective green marketing activity - When compared to other competitors, aluminum is considered a green metal in the global market. The main stages of the wheel are considered to be developing effective green marketing strategies and implementing appropriate sales of aluminum alloys.
6. Increasing the use of green energy - Because the aluminum industry uses a lot of energy, fuel-fired power plants emit more carbon into the atmosphere than the manufacturing processes. Among the main GSCM strategies against global climate change are the development of alternative energy plants and the use of green energy sources in the aluminum industry.
7. Optimizing recycling - Aluminum has a promising industrial recycling potential, according to statistics. More than 95% of aluminum products have remanufacturing potential. The primary goal of remanufacturing optimization is to keep this quantity as constant as possible.

For defining green strategies, there are numerous contentious vectors and discussion objects. Due to global climate change, emissions of waste gases are reduced based on eco-design strategies. Carbon eco-design strategies for the aluminum industry can be defined using GHG protocols (GHG Protocol, 2023). As a first step, the list and classifications of the main waste gases for all stages of primary aluminum production processes are determined. The areas with the most and least carbon emissions are investigated in the following stage. In the next stage, problems and opportunities are evaluated in light of the real situation, and a strategic zero map on carbon emissions is prepared. Finally, a plan of goals for the short and long term is prepared. Finally, a goal-setting strategy for the short and long term is developed.

While many global projects, such as the GHG protocol, aim to reduce carbon emissions by 2050, methodologies for selecting potential alternatives are in the minority (Taborga, 2018). The application of methodologies related to specific eco-design strategies for the aluminum industry, a specific sector, is critical in this regard. The long-term green strategy is to maintain 0% emissions in the aluminum production technology. The key solution to this issue is “inert anode” technology. The main aluminum companies and institutions conduct research about this revolutionary project.

GSCM involves the conscientious handling of supply chain operations in a manner that prioritizes environmental responsibility. This type of laconic classification should be discussed in management planning as a special eco-design strategy, and as a proposal, it would be more effective if presented to global management and green economics desks. Proposing an innovative eco-design model and outlining strategies for the implementation of the GSCM system in managing the aluminum industry holds significant socioeconomic value. By adopting sustainable practices, businesses have the potential to lessen their ecological footprint, enhance their reputation among the public, decrease expenses, improve working conditions, and comply with environmental regulations.

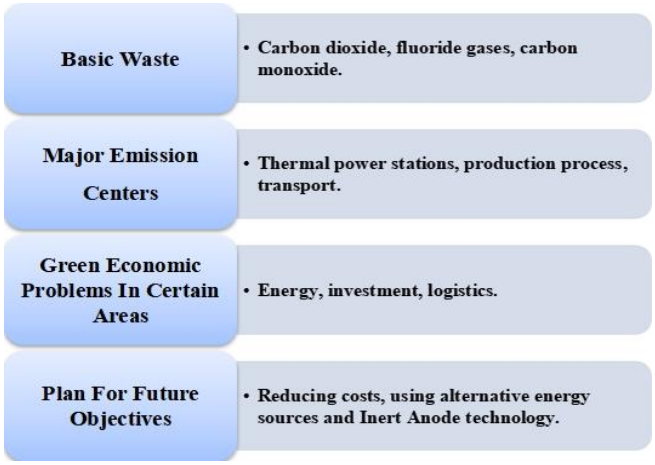

Figure 7. Under the GHG protocol, key stages of eco-design strategies for carbon emissions in primary aluminum production. Formed by the authors

4. Conclusion

This paper seeks to delve deeply into the underlying concepts of green principles in the realm of management. The article presents a comprehensive examination of the organizational structure and expounds on the essential tenets in detail, in order to provide a nuanced understanding of the application of green principles in management. This meticulous examination endeavors to offer a significant addition to the current body of knowledge on the topic and enhance our understanding of sustainable practices in the relevant field.

The study outlines a strategic roadmap for the management sphere, which is deemed crucial for the effective implementation of the GSCM system. The primary outcome of the article is the proposal of an innovative eco-design model for managing the aluminum industry, which is anticipated to have a crucial impact on the promotion of a sustainable future for humanity. The newly proposed GSCM structural design is presented from the perspective of spinal foundations, and critical green strategies for the aluminum industry are outlined in order to shape structural design performance. The eco-design platform, developed as a synthesis of the LiDS wheel system, is expected to make significant contributions to green management.

References

Alcoa (2021). Sustainability Report, Reinventing for a sustainable future. https://www.alcoa.com/sustainability/en/flipbook/index.html

Brezet, H. (1997). Ecodesign, A promising approach to sustainable production and consumption. United Nations Environmental Programme (UNEP).

CDP (2023). Tackle your environmental risks, achieve your sustainability goals and make your business more resilient. Unlock the power of your supply chain. https://www.cdp.net/en/supply-chain

Chen, C. C., Shih, H. S., Shyur, H. J., & Wu, K. S. (2012). A business strategy selection of green supply chain management via an analytic network process. *Computers & Mathematics with Applications, 64*(8), 2544-2557. https://doi.org/10.1016/j.camwa.2012.06.013

Chulvi, V., Vidal, R. (2011). Usefulness of evolution lines in eco-design. *Procedia Engineering*, 9, 135-144. https://doi.org/10.1016/j.proeng.2011.03.107

Cicconi, P. (2020). Eco-design and Eco-materials: An interactive and collaborative approach. Sustainable Materials and Technologies, 23, e00135. https://doi.org/10.1016/j.susmat.2019.e00135

Donnelly, K., Beckett-Furnell, Z., Traeger, S., Okrasinski, T., & Holman, S. (2006). Eco-design implemented through a product-based environmental management system. *Journal of Cleaner Production, 14*(15-16), 1357-1367. https://doi.org/10.1016/j.jclepro.2005.11.029

Dou, Y., Zhu, Q., & Sarkis, J. (2018). Green multi-tier supply chain management: An enabler investigation. *Journal of Purchasing and Supply Management, 24*(2), 95-107.

ECEEE (2019). Eco-design Directive. https://www.eceee.org/ecodesign/process/

Ecolan (2019). Ecodesıgn - Ecologıcal Desıgn. https://www.ecolaningenieria.com/en/environmental-engineering/ecodesign.html

Green, K., Morton, B., & New, S. (1996). Purchasing and environmental management: interactions, policies and opportunities. *Business Strategy and the Environment, 5*(3), 188-197.

Green, K.W., Zelbst, P.J., Meacham, J., & Bhadauria, V.S. (2012). Green supply chain management practices: impact on performance. *Supply Chain Management: An İnternational Journal, 17*(3), 290-305. https://doi.org/10.1108/13598541211227126

Heizer, J., Render, B., & Munson, C. (2017). *Operations Management*. Pearson Education.

Holt, D., Ghobadian, A. (2009). An empirical study of green supply chain management practices amongst UK manufacturers. *Journal of Manufacturing Technology Management, 20*(7), 933-956. https://doi.org/10.1108/17410380910984212

Hsu, C.W., Hu, A.H. (2008). Green supply chain management in the electronic industry. *International Journal of Environmental Science & Technology*, 5, 205–216. https://doi.org/10.1007/BF03326014

ISO 14040 (1998). Life cycle assessment - principles and framework.

Lee, S.M., Kim, S.T., & Choi, D. (2012). Green supply chain management and organizational performance. *Industrial Management & Data Systems, 112*(8), 1148-1180.

Locke, D. (1996). *Global Supply Management: A Guide to International Purchasing*. NAPM Professional Development Series.

Lyons, K.L. (2015a). *A Roadmap to Green Supply Chains. Using Supply Chain Archaeology and Big Data Analytics*. Industrial Press, Inc.

Lyons, K.L. (2015b). *A Roadmap to Green Supply Chains. Using Supply Chain Archaeology and Big Data Analytics*. Industrial Press.

Sarkis, J., Zhu, Q., & Lai, K.-H. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics, 130*(1), 1-15. https://doi.org/10.1016/j.ijpe.2010.11.010

Simpson, D., Samson, D. (2008). Developing strategies for green supply chain management. *Decision Line, 39*(4), 12-15.

Spglobal (2023). Dow Jones Sustainability World Index https://www.spglobal.com/spdji/en/indices/esg/dow-jones-sustainability-world-index/#data

Taborga, C.P., Lusa, A., & Coves, A.M. (2018). A Proposal for a Green Supply Chain Strategy. *Journal of Industrial Engineering and Management, 11*(3), 445-465. http://dx.doi.org/10.3926/jiem.2518

Tseng, M. L., Islam, M. S., Karia, N., Fauzi, F. A., & Afrin, S. (2019). A literature review on green supply chain management: Trends and future challenges. *Resources, Conservation and Recycling*, 141, 145-162. https://doi.org/10.1016/j.resconrec.2018.10.009

UNEP (2013). UNEP: United Nations Environment Programme. https://www.un.org/youthenvoy/2013/08/unep-united-nations-environment-programme/

Vedanta (2022). Vedanta Aluminium breaks into Dow Jones Sustainability Index (DJSI) 2021 Top 10 rankings. Vedanta Aluminium, Press Releases.

https://vedantaaluminium.com/media/press-releases/list/vedanta-aluminium-breaks-into-dow-jones-sustainability-index-djsi-2021-top-10-rankings/

Zhu, Q., Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, *22*(3), 265-289. https://doi.org/10.1016/j.jom.2004.01.005