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Essential factors for the implementation of sustainable port logistics operations

- Prof. PhD. Rui Carlos Botter
 - University of São Paulo – São Paulo - Brazil
- Prof. PhD. Delmo Alves de Moura
 - Federal University of ABC – São Paulo – Brazil

Sustainable logistics systems in port operations

- Many ports around the world are deploying sustainable logistics systems in their port operations.
- It is necessary to know the current state of a port and the role of the Port Authority to achieve logistically sustainable operations.

Sustainable logistics systems in port operations

- Several factors interfere in achieving an international sustainable port certification, such as: the port's relationship with the local community, noise pollution, air pollution, use of non-renewable energy (fossil fuel), if the port pollutes the soil, water etc.

Sustainable logistics systems in port operations

- The self-diagnosis method is a system to assist managers in periodically re-viewing their environmental management programs and thereby assess how much a port is engaged in a sustainable operations system.
- Noise: According to the Self-Diagnosis Method, noise is an unwanted sound. Sound pollution has increased dramatically in ports.

Sustainable logistics systems in port operations

- The source of noise pollution in ports is the traffic of ships, trucks and equip-ment used to move goods/products.
- The vessels contribute to noise pollution from engines/propulsion engines, auxiliary engines, propellers, heating and air conditioning systems. Road traffic includes passenger cars, trucks and tractors used at the terminals.

Methodology

- The methodology used in this work was the bibliographic review on the researched topic.
- Survey: interview with people with practical experiences with the problem researched and analysis of examples that contribute to the understanding of the problem.

Definition of Relevant Indicators

- The management of a sustainable port should define qualitative and quantitative indicators.
- Some important qualitative indicators are:
 - The port should set objectives for improving environmental management.
 - The port should set goals for its purposes.

Definition of Relevant Indicators

➤ To reduce CO₂ emissions, the demand for non-renewable energy needs to be lower. For this, efficient energy management is a crucial strategy to be achieved through redesigning processes, changing employee behavior and converting to greener technology.

Definition of Relevant Indicators

- The Carbon Footprint is a measure of the total amount of greenhouse gas emissions (GHG) that is directly and indirectly caused by activity.
- Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6).

Definition of Relevant Indicators

Noise indicators (Quantitative factors):

- Noise level at the terminals (day and night).
- Maximum noise level at the terminals.
- Frequency of noise measurements.
- Frequency of verification of the noise zoning map.

Sustainable logistics systems in port operations

Solid waste Indicators

- Total annual port waste collected by type.
- Annual amount of recycled solid waste.
- Annual amount of recycled liquid port waste.
- Annual amount of recycled non-hazardous industrial waste
- Existence of separate containers for the collection of port waste.

Key factors in the green port establishment

➤ There are three environmental standards mainly used at ports; these are The International Organization for Standardization (ISO) 14001, the Eco-Management and Audit Scheme (EMAS) Regulation and the Port Environmental Review System (PERS).

Key factors in the green port establishment

- Different countries in the World are deploying their green port concepts in different ways.
 - Port of Antwerp in Belgium, Port of Rotterdam in the Netherlands, Port of Shanghai in China and Port of Singapore in Singapore.
- Every port applies the green port concept through different ways, but these four ports apply practices that are equal or similar.

Key factors in the green port establishment

- Different actions are applied by ports, and among these initiatives, it is possible to mention some of them, these are:
 - The utilization of low-sulfur fuel in the main engines, as well as the incentive to the use of Liquefied Natural Gas (LNG).
 - The Green Flag Program: The vessels arriving in some ports were encouraged to reduce their speed when coming closer to the port, to reduce air pollution.

Key factors in the green port establishment

- Different actions are applied by ports, and among these initiatives, it is possible to mention some of them, these are:
 - The Clean Truck Program - This program consists of the prohibition of trucks manufactured before 1989. With the implementation of this program in 2008, the pollution levels were successfully reduced.

Conclusion

➤ Port authorities, particularly in the relevant countries of the European Com-munity and the United States and Canada, became familiar with the components of Environmental Management Systems (EMS) and the industry adopted well-established methodologies for port environmental management, such as the Self Diagnosis Methodology (SDM) or the Port Environmental Review System (PERS).

Conclusion

- It is not simple to make the transition from a current port infrastructure, which uses, for example, fossil fuel in its day-to-day operations, to the deployment and development of clean and sustainable renewable energy use.
- Having public policies and involving all the actors that operate in the segment of port activities is an essential condition for achieving progress with this system.

Conclusion

- Understand the current reality and be willing to face the new technological challenges and a level that requires a lot of work, planning, and involvement in various areas of Port management.
- Knowing in detail all current port energy use, having key performance indicators that portray the current reality of the energy consumption of operations, having indicators of current environmental management is key.

Thanks Very Much for Your Attention!

Prof. PhD. Rui Carlos Botter

University of São Paulo - USP



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