

## **Green Ports: Going beyond Renewable Energy Generation**

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**Date:** 16 May 2016

Maritime India Summit (MIS) 2016 which is an endeavour of the Government of India to promote growth of the maritime sector in the country was held in Mumbai from 14-16 April 2016. Various initiatives such as port modernization, new port development, inland waterways, hinterland connectivity & multimodal logistics, international & coastal shipping, ship building, ship repair & ship recycling, port led industrialisation, cruise shipping & lighthouse tourism and green initiatives in ports are being showcased to attract investors and to explore the potential business opportunities in the maritime sector.

While promoting the maritime sector, the ministry of shipping also launched 'Project Green Ports' in January 2016 and integrated twelve 'Green Ports Initiatives' with the existing 'Swachh Bharat Abhiyaan'. The Green Port Initiatives include aspects such as preparation and planning for monitoring environmental pollution, acquiring pollution monitoring equipment, acquiring dust suppression system, setting up of sewage/waste water treatment plants/ garbage disposal plant, setting up projects for energy generation from renewable energy sources, completion of shortfalls of Oil Spill Response (OSR) facilities (Tier-1), prohibition of disposal of almost all kind of garbage at sea and improving the quality of harbour wastes.

As a part of the above drive, green initiatives in ports are also being encouraged as a sunrise segment in MIS 2016 in order to ensure environmentally benign operations and sustainable development of ports. 135 MW of solar power projects across eight major ports and 50 MW of wind energy projects across three major ports are planned to be installed by 2020. The shipping ministry has also introduced an incentive scheme to promote the use of green energy at major ports and will share up to 50% of the total cost for waste water treatment projects and to promote the use of bio-diesel. As a part of

these incentives, each port will be given a financial grant up to Rs 25 crore (US\$ 4 Million) for undertaking these projects. Certain measures for monitoring pollution of marine environment and issue of anti-fouling certificate to Indian ships above 400 Gross Tons (GT) has also been proposed. While it is a good start, green port initiatives needs to move beyond the physical generation of RE in port premises and the principles of environmental sustainability have to be enshrined in the planning, development and operation of ports.

Green ports have a small ecological footprint. Such ports are sustainable and balance the economic, environmental and social dimensions of development. The design and construction of these ports promote low energy operations, maximize resource efficiency, increase productivity and activities undertaken at these ports have minimal environmental impact. Green ports extend the above concepts to all port users including maritime transport and multimodal transportation which are used for hinterland connectivity. These ports are a key component of 'Blue Economy' and are commercially attractive for shipping due to the environmental benefits they create, balancing the investments and cash flows. Green ports pay emphasis on spatial planning including its surrounding areas, are highly networked and use integrated information and decision support systems for planning and execution of the logistics chain. These ports maintain stringent environmental standards for limiting water, land and air pollution and are adaptive as they include climate change mitigation and adaptation strategies.

Activities undertaken at green ports can be divided into two categories: those undertaken by ships berthing in the ports and those undertaken by port administration for providing port services. Both of these are driven by green policies and incentives and green technologies become enablers for green ports. Major actors in green ports include ship owners, ship operators, marine fuel suppliers, shipyards, port terminal operators, classification societies and contractors providing utility services in the ports.

A green port utilizes renewable energy and has net zero energy buildings. However, every port jurisdiction may not be endowed with renewable energy sources such as solar irradiation and wind energy. Additionally there may be constraints on the area available for installation of solar panels and issues of intermittency of renewable energy. Hence Indian green ports must look beyond physically setting up RE facilities inside the port areas and could be mandated to buy 'virtual green energy' in the form of 'Renewable Energy Certificates' (RECs), as a fixed share of the total consumption of electricity. Additionally Power Purchase Agreements (PPA) must be made with RE generators for a

contracted amount of power using the provisions of 'Open Access' of electricity, which enables any consumer to procure power from any producer of energy across India, irrespective of the place of generation or consumption. This electricity can be then extended to the ships while they are berthed in a port. This will lower emissions of SOx, NOx and Particulate Matter (PM) when ships are berthed alongside and would improve the air quality inside the port while building a green image.

Port administrators need to involve various stakeholders in discussion and should reach necessary agreements regarding the provisioning of port services by establishing the demand for energy services and by building the necessary, logistics chains and infrastructure for delivery of these services. Port design and planning also plays a very important role in ensuring port efficiency and there should be optimal use of space by building multi user and networked terminals. Transport planning for smooth movement of ships when entering and leaving the port will minimize the turnaround time and will lead to improvement in port productivity while lowering the environmental impact while the ship is in the port premises. Waste minimization as well as treatment of water (including ballast water) is to be specially emphasized and habitat management needs to be addressed so as to cause minimal impact to marine organisms.

Port governance and port management plays an important role in ensuring green ports and incentives such as reduction in port charges for environment friendly ships, as extended by other ports in the world such as Rotterdam and Hamburg will go a long way to promote green ports in India. San Diego, Singapore, Gothenburg, Vancouver and Hong Kong are examples of ports which are adopting green initiatives on similar lines.

Green Ports play an important role in the growth of India's maritime sector. This concept therefore needs to move from the fringes to the centre of port operations and needs to be integrated in the planning process to ensure sustainable development of the Indian maritime sector.

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