

# **ENVIRONMENTAL AND OPERATIONAL BENEFITS FROM THE TECHNOLOGICAL RENOVATION OF THE PORT AUTHORITY OF SANTA MARTA (COLOMBIA)**



## **CONTACT PERSON:**

### **MAURICIO SUAREZ RAMIREZ**

CEO Sociedad Portuaria de Santa Marta

[msuarez@spsm.com.co](mailto:msuarez@spsm.com.co)

PBX: +57-5-4217970 FAX: +57-5-4212161

### **RAUL ALEJANDRO MAESTRE**

Corporate Security Director

[rmaestre@spsm.com.co](mailto:rmaestre@spsm.com.co)

PBX: +57-5-4217970 FAX: +57-5-4212161

## ENVIRONMENTAL MANAGEMENT STRATEGY IN THE PORT SOCIETY OF SANTA MARTA



The Maritime Terminal in the Port Society of Santa Marta (SPSM) is located in the bay of Santa Marta; on the northwestern side of the city, at coordinates 11 ° 15 '18 N latitude and 74 ° 13' latitude 30 west. To the north the hills of San Martín, eastward to the hills of San Martín, south of Railroad Avenue and the Caribbean Sea and to the west by the Ancon hill and Taganguilla Cove. Thanks to its strategic location overlooking the Caribbean Sea and the natural depth of the bay, is now regarded as one of the most important in this economic activity of great importance for Colombia. Currently SPSM is formed by 3 companies specialized subsidiaries in handling different types of cargo where CARBOSAN is the managing company of subterminal coal SIMTCO is the administrator of subterminal OPERLOG Container and is the administrator of subterminal bulk.

The Terminal has seven specializations in handling different types of cargo to the attention of its clients and users 24 hours a day and also offering the benefits of a secure storage in its warehouses and yards docks. Therefore, the constant mobilization and cargo handling through the port samarium are of tremendous importance for the economy of the region. At this point, the Port Society of Santa Marta, Port administrator for over 12 years, constitutes the main company locally, mobilizing through its areas all goods export and import of this part of the country .

Aware of the benefits that bring the operational improvements, the Port has made significant investments to industrial upgrading the terminal and its subsidiaries, where the implementation of clean technologies has generated significant operating efficiencies and reduce pollution, consumption resources and in the same way, increases in social benefit employment generation and a healthy environment for communities.

The ongoing commitment to the environment and communities is reflected in the objectives established in the 2012-2013 period. This involves the alignment of the operation with the reduction of environmental impact associated with it, which has led us to be worthy, of awards at national and international level:

- SGS certification, Integrated System ISO 14001 and ISO 9001 management.



- ECOPORTS environmental certification in 2013, which made us the first Eco port outside Europe globally to receive this certification from the European Association of Ports (Espo) through the accreditation body worldwide Lloyd's Register
- The Organization of American States (OAS) elected the Port of Santa Marta and its subsidiaries as the winner of the First Prize of the Americas Maritime, in the category of Corporate Social Responsibility in ports in June 2014.

Environmental responsibility has been a corporate priority since the beginning of operations of the organization. The strategy has sought to gain operational efficiencies and friendly and sustainable environmental practices. Which has done, our subsidiaries, be consolidated for efficiency and sustainability, so that they are recognized nationally and internationally for achieving their operations efficiently and amicably with the environment, having as premises:

***Technological renovation and implementation of clean technologies in the terminal in the port of Santa Marta, that allow reduction in fuel consumption, energy, and water and declining concentrations of particulate matter in the air.***

#### I. ENVIRONMENTAL AND OPERATIONAL BENEFITS FROM THE TECHNOLOGICAL RENOVATION OF THE PORT TERMINAL

##### ➤ TECHNOLOGICAL RENOVATION OF THE CONTAINER SUBTERMINAL

At the beginning the operation was carried out as follows:



This operation generated the following impacts:

1. Fuel consumption
2. Emission of gas and particulate matter
3. Water consumption

Project objectives:

- Reduce fuel consumption and hence the emission
- Operational efficiency and security and coexistence of tourism activities in the bay.

#### Container Project: A successful project

During 2012 The Port Of Santa Marta grew by 13% in charges for containers, bulk cargo, vehicles and general cargo. The Port of Santa Marta made an investment of \$ 48 million in the sub terminal container which in 2012 represented a 44% increase in the movement of containerized cargo.

#### Cleaner Production Engineering

The SPSM in its desire to increase its presence in the global container market, developed a port expansion plan which included increased physical area of Sub terminal container and the use of specialized equipment in the operation of containers, such as gantry cranes piers 2 and 3, and RTG's on patios. With these works, the Terminal not only increased its annual capacity to handle containers which went from 100,000 TEUs to 300,000 TEUs, but also managed to reduce fuel consumption and thereby reducing emissions.



The modernization of the container Terminal was a project that began its construction in 2010 and started its operation in 2012. To the attention of motorboats were acquired two Gantry Cranes Postpanamax 100% electric, 4 RTG's 6 + 1100 electric%, both teams with energy regeneration system that allows recirculation of the regenerated energy in the same systems, which contributes to the reduction in electricity consumption. Furthermore, 6 top Loaders 1 Side Pick for handling empty containers; 20 Yard trucks and 14 Bomb Carts were acquired. Additionally, software developments for service improvement were made, and to ensure the safety of the Port, technical and electronic equipment were acquired.



#### ➤ TECHNOLOGICAL RENOVATION OF THE BULKS SUBTERMINAL

In the beginning, bulk cargo operation was performed as follows:



This operation generated the following impacts:

1. Fuel consumption
2. Emission of gas and particulate matter.
3. Product falling into the sea.

Project objectives:

- Reducing fuel consumption.
- Minimizing emissions of particulate matter.
- Operational efficiency, security and coexistence of tourism activities in the bay.

### **Bulk Project: A successful project**

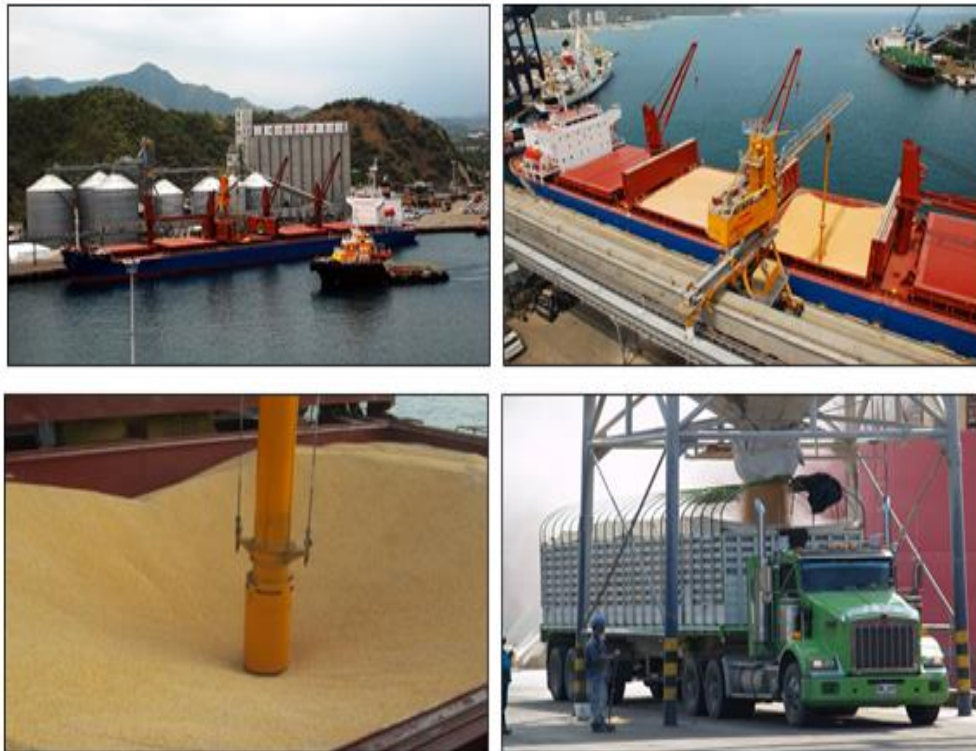
In 2012 while the domestic market bulk import decreased 3%, the Port of Santa Marta grew by 10% in this type of load and this year they managed to unload 28,000 tons of clean bulk only in 46 hours, setting a historical precedent for port efficiency in the country.

### **Clean Production Engineering**

The port of Santa Marta to a more efficient operation, in which improvements were achieved in port logistics, material losses were reduced and the environmental impacts associated with the handling of bulk cargo were minimized, started in 2011 the project to extend battery Silos and the acquisition of modern technology for the operation of bulk cargo in the terminal.

This project involved the construction of a pile of silos with capacity for 17,500 a procurement of modern technology using this terminal for bulk operation which consists of a Belgian-made VIGAN suction equipment capable of carrying between 700 and 800 tons per hour, nonexistent in another port in the Colombian Caribbean, automated with spoons aid, a modern battery of 7 silos and 5 mechanized warehouses for storage, a fleet of mini mules and double shredding truck, wheel loaders, and professionalism of the employees.

The sub bulk terminal is an important achievement in efficiency that has made possible to move from a rate of discharge of 4000-12000 tons per day.



### ➤ **TECHNOLOGICAL RENOVATION OF THE COAL SUBTERMINAL**

In the beginning, bulk cargo operation was performed as follows:



This operation generated the following impacts:

1. Emissions of particulate matter
2. Visual Impact for the movement of barges and tugs at bay and loading into funding.
3. During operation, considerable volumes of water were consumed in pathways and patios irrigation in order to minimize the particulate matter generated by the manipulation and development of the operation of coal.

### Planning Direct Load Operation

**At the time of planning the Direct Load project, objectives were:**

- Minimizing emissions of particulate matter
- Elimination of 100% of the risk inherent in a transaction with barges,
- Reduction of water consumption, - Operational efficiency, security and coexistence of tourism activities in the bay.

### The direct loading of coal: A successful case in the country

The Ministry of Environment, taken as a case concerning the project "direct load of coal in the maritime terminal in Santa Marta", due to the positive results in just 3 years of operation of the project; That was how the Colombian government decided in 2007 that from July 2010, all the seaports of the country that undertake loading of coal, should have implemented a system of direct loading, relying belting encapsulated or other equivalent technological system.

The National Development Plan of the current government, which is law since June 2012, reaffirmed in Article 113 that "as from January 1, 2012, the sea and river ports that carry coal loading must do so through a direct loading system." "Given the failure of the other ports in the region, the Government has postponed until 2014 the permission for other ports to reach the legal standard.

### Clean Production Engineering

The Direct Load was conceived as an engineering project specially designed to minimize the impact that produced the coal operation in the Maritime Terminal of Santa Marta. Investment in resources was over US 25 million, and was thus from its origins Carbosan Ltda sub terminal is created, with clean production technology.

This project was framed in the port city concept within the local context, through the interaction of two activities seemed like tourism and coal so that the latter does not affect the interests of the first and conversely, could become an attractive more given the high level of specialization and the particular characteristics of the equipment operating there.

The direct loading system was designed with a capacity to accommodate vessels of up to 75,000 deadweight tons and 47 feet deep. The Direct Loading consists of two components: Receipt System and stacking and loading System.

The Receipt and stacking system has five overturning platforms with design capability to download 800 trucks a day and 28000 MT. These dumps with slope of 55 ° ensure the total



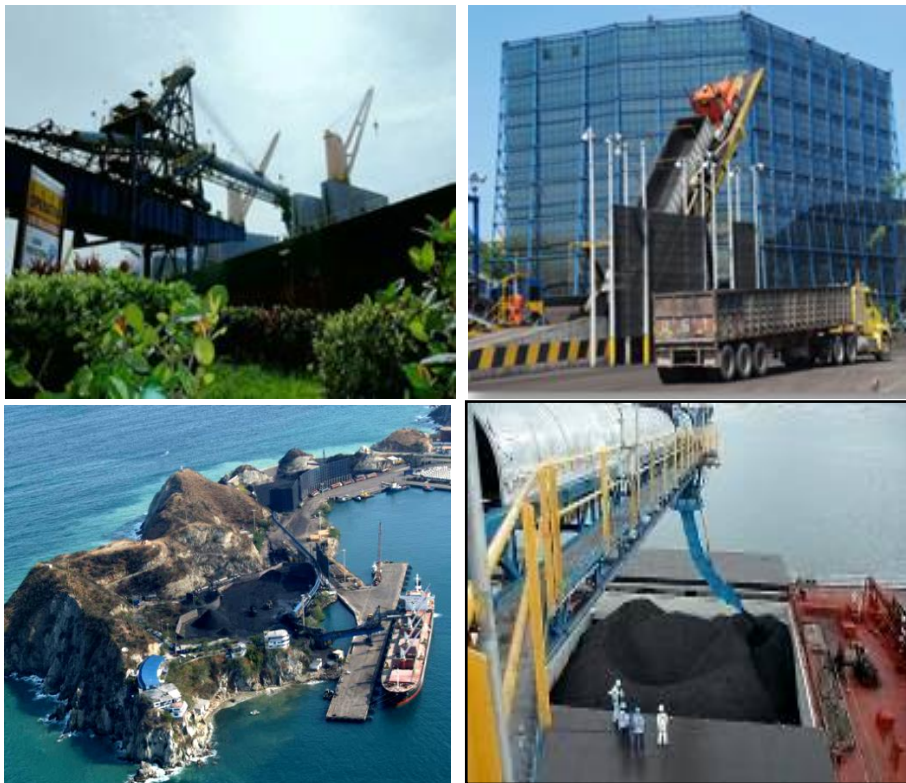
discharge of the mineral. Its performance reaches 12 trucks / hour and feed hoppers connecting with conveyors for storage on the patio. At the time of discharge, is applied a foaming agent to the coal and in the stacking a waterproofing agent. This ensures greater control of particulate emissions and significant reduction of water consumption.

The material is transported via covered transportation belts and conveyor pipe. It has three stackers, which make up the stack progressively as it grows, reducing at this stage dust emissions by falling coal.

During operation, the irrigation system with guns and hoses are maintained through the application of biodegradable chemicals that form a layer that protects the piles from wind action and prevents the stack emissions during coal stacking, in the transport by band and operational means. The storage yards are surrounded with windbreaker mesh to restrict the action of breezes.

The loading system consists of the ship loader, radial, the first of its kind on wheels, with a height of 29 meters, with band of 48 ", variable speed and a design capacity gross loading of 2000 tons / hour. Variable speed allows handling special coals with low degradation and low emission of dust.

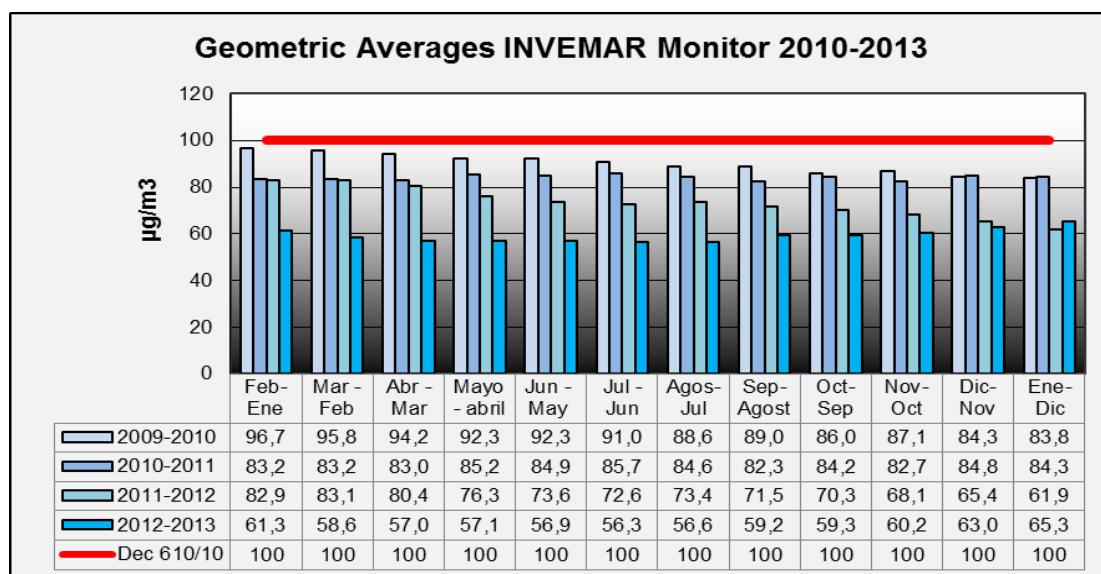
The charger has a remote control system operated from the ship's deck, ensuring the success of the operation. Its displacement is radial and may fill three wineries consecutively. This whole system completely eliminated the presence of barges on the Bay and its inherent risk and was fundamental to minimize emissions of particulate matter.



## MODERNIZATION OF THE PORT TERMINAL, IMPACT INDICATORS

## AIR QUALITY

The Port Society of Santa Marta is part of the Monitoring Air Quality System (ACLS) of the district of Santa Marta and the municipality of Ciénaga where all ports and companies are linked that somehow have an impact on Air Quality of the city. Here are presented the results of the geometric average of PST from 2010 to 2013 of INVEMAR monitoring station, which is taken as a reference for the control of port activities.



By 2013 there was a reduction of 22% in the annual geometric mean of the concentrations of particulate material, relating to operations during the same period in the year 2010. Additionally throughout the monitoring period of the concentrations of particulate matter, it remained below the permissible maximum limit established in the regulations (Decree 610 of 2010) which corresponds to 100µg / m<sup>3</sup>.

YEAR	ANUAL GEOMETRIC AVERAGE	Maximum Permissible level Dec 610 de 2010	VARIATION	% Percentage equivalent
2010	83,8	100	18.5	22%
2013	65,3	100		

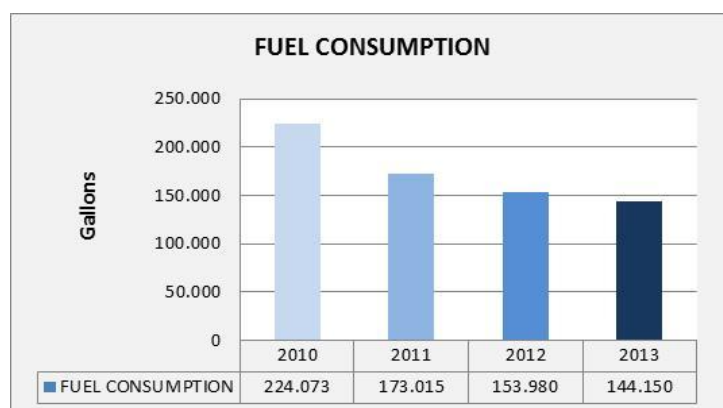


## FUEL CONSUMPTION

The greenhouse gas emissions caused by motor vehicles are a major source of air pollution. By reducing fuel consumption it contributes to reducing emissions, mitigate climate change, improve air quality and protect health in general.

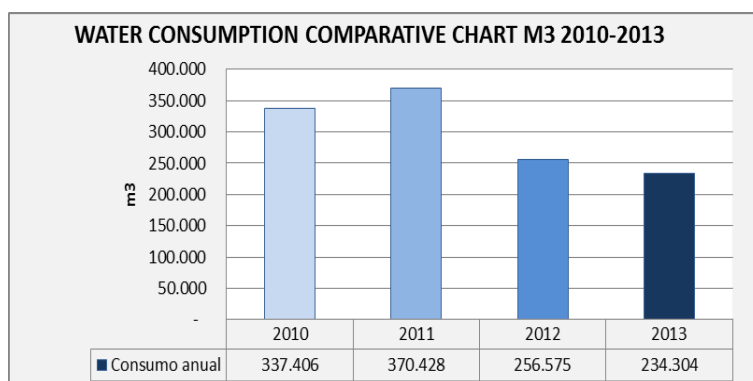
The SPSM aware of the environmental impact that CO<sub>2</sub> emissions in the atmosphere, produce, proposed to reduce fuel consumption in the port operation, for which it invested in the acquisition of new equipment such as gantry cranes, RTG and VIGAN equipment for the port operation of maritime containers and bulk cargo terminal specifically, which merged with electricity.

With technological improvements and investment in terminal equipment working with electricity the port achieved a 35% reduction in fuel consumption from 2010 to 2013 and 7% reduction in fuel consumption from 2020 to 2013.



## WATER CONSUMPTION

As part of the objectives and goals of the Environmental Management System of the company it has set a target of reducing water consumption in the operation of the port. This objective aims to minimize water consumption and give the resource an efficient use; it has obtained to reduce consumption by 30% since 2010-2013. The minimization is mainly explained by the use of biodegradable chemicals to control emissions, water recycling processes in coal storage yards, recirculation in the process of washing vehicles and containers, recirculation of water from treatment plants wastewater for irrigation of green areas and gardens, installation of air and water pressure in the washing water container.

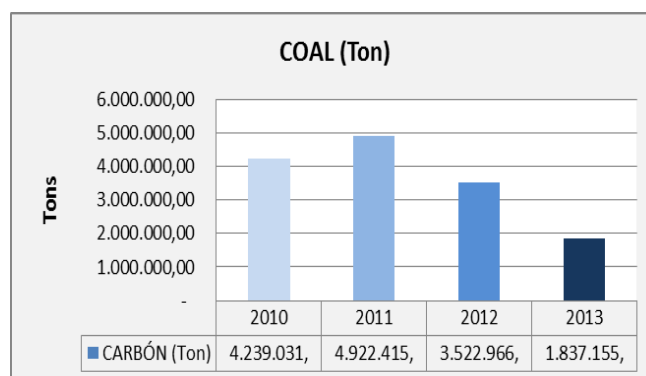
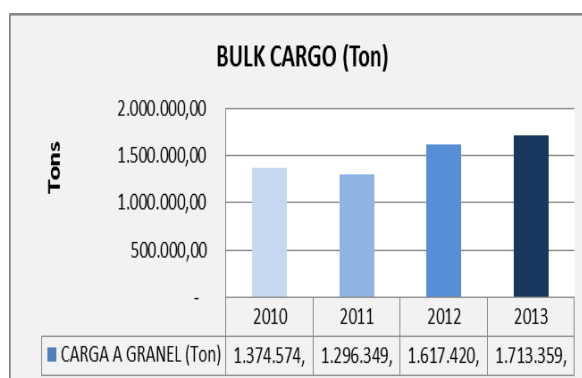
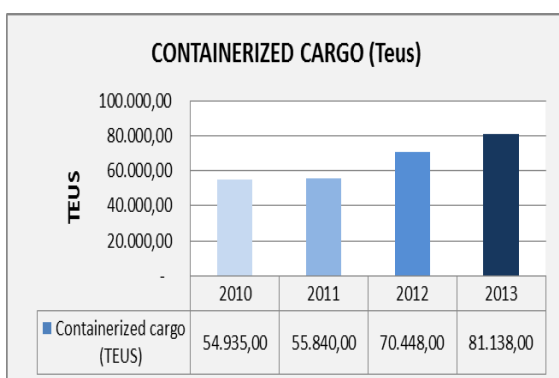


## EFFICIENT OPERATION

With the modernization of the port terminal, the Port Society of Santa Marta (SPSM) is consolidated as strategic collection center, equipped with computers and technology that enable better serve our customers, reducing time and operational costs.

By 2013 the port managed to increase by 15% the movement of containerized cargo and 10% of bulk related to the operation of the previous years. Related to the operation of coal this was growing until 2013 achieving a maximum export of 5 million tons in 2011.

Concerning the export of coal, the SPSM and its subsidiary Carbosan were the first port in the city of Santa Marta and the second in Colombia in implementing the system of direct loading of coal, which made this terminal in a model to go to other ports in the region and the country. Since the entry into operation of the system of direct loading the port increased its export capacity achieving in 2012 an export maximum of 4,922,415 tons / year. Notwithstanding the foregoing, with the entry into operation in 2013 of direct loading systems of neighboring ports the volume of coal moved through the SPSM decreased by 30%.



## CONTINUOUS IMPROVEMENT

The preservation and protection of the environment are among the priorities and responsibilities you have the port of Santa Marta for the period 2013-2020, for which it has established projects to adapt and optimization of its port infrastructure, which will be a driving factor development, modernization and environmental protection.