

# **The model Pollutant Release and Transfer Register (PRTR) for quantifying the gases emissions and dangerous products in Public Ports Areas**

Washington Luiz Pereira Soares  
UNISANTOS  
[washingtoncbc@re7.com.br](mailto:washingtoncbc@re7.com.br)

## **Abstract**

The green strategies are required to control international organizations in developing strategies to reduce the environmental impacts. The model Pollutant Release and Transfer Register (PRTR) was developed in this context with aim of quantifying the gases emissions and dangerous pollutant transfers that may affect the environment and the living beings.

**Keywords:** Emissions Register Control, Environmental Management.

## **Introduction**

In several countries the emissions control processes may be associated with the guidelines of the National Plan on Climate Change, which is the main public policy arising from international agreements, produces territory national regulatory instructions, which should be properly regulated to what is determined comply with all international agreements toward best environmental practices. In the interest of minimizing the environmental impact in production scenarios seeks a more sustainable logistics globally.

The purchase of logistics services may require the control of air emissions in the understanding of the concept called sustainable logistics.

There from the environmental management and reverse logistics to describe the best methods of control the disposal of products and ways of how they should be consumed by the public sector, based on the proactive study of the product life cycle.

Concomitantly buying a service or product, you can apply emission control methods resulting in the shipment of waste, mainly from the construction of specific rules for the disposal of goods or services when buying public object, administrative procedure that contributes the environment in indirect management of energy.

With this new environmental legislation has tried to meet the new market rules and laws to adopt the example of the rules and guardianships public procurement to drive organizational behavior, what we call understanding of externalities which significantly without eco-efficiency in services and rules proper disposal of products can be harmful to the environment.

In this sense, in the direction of better environmental governance in the public sector, there are sanctions for cases of uncontrolled emissions in public services in ports.

However, the Brazilian port management there is no unanimity about which methods of measuring the emission control in Brazilian ports to more accurately based on a simple technology-based, you can establish an immediate improvement plan, is the representation of solutions and guidelines, given the diversity of port business.

For such reasons, to suggest some solutions by anomie standards, and in order to corroborate the transport systems, making them more eco-efficient from the control by public service areas, through to meet new environmental standards in order enclosed within public ports.

In this study, we highlight the proposal which aims to think strategically in organizational models emissions control in port areas in a mandatory way through the proposal of a public policy that will establish rules and guardianships the logistic processes from the port areas.

The authors begin with the premise of the international experience of companies which disclose the effectiveness of methods that contribute to environmental improvements, even in the absence of infrastructure, which is the main common point in comparing the Brazilian reality. The effectiveness of these international methods emission control is applied in environmental management when supported by public policies. The limitation of the research is in the anomie of standards for the productive sector, to support a legal doctrine focused discipline of environmental law business management issues in this important international governance scenario based on global environmental effectiveness, whereas the so-called developed countries are the main buyers of emerging countries which in most cases can not be signatories of effective methods or forms duly certified emission control, to assess the ways of giving transparency and sustainability forward in order to legitimize a sustainable logistics model.

In this exploratory research constructs applicable to environmental management, it is added that the limitation of knowledge management, collides with the Brazilian environmental legislation is insufficient to establish a mandatory protection corporations to apply a reliable emission control, the example of PRTR - emission register Pollutant Release and Transfer, which in environmental management helps to monitor and control the environmental impact and damage, and thus can be recognized by the Brazilian government for proper adhesion operators and port terminals, due to the emissions registry certified.

Finally, it appears that it is possible to conceive of this work forms of arguing about the legitimacy of a sustainable port, through the accreditation of emission control methods, port operators when emissions are properly scheduled for logistics project.

## **The inventory of PRTR - Emissions registration, transfers and Pollutants**

In managing a sustainable port development and implementation of the PRTR in Brazil favors the management on the generation, release and the fate of these releases and transfers of chemicals over time, to allow the analysis, review of progress in reducing of releases and transfers.

According to the Ministry of the Environment (2014), the Issue Log and Transfer of Pollutants can bring other benefits such as:

- ✓ Providing support tools for environmental management, assisting in the creation of government policies;
- ✓ Improvement of production processes;
- ✓ Ensure the commitment to citizenship through the public disclosure of data and its debate, and consequent initiatives from the information generated.

According to the Brazilian environmental legislation the corporate organizational innovation paths in public ports are increasingly becoming the essential mission control management for all port activities, including new port terminals with licensees areas outside the organized port. With respect, port terminals installed in organized ports, areas under the auspices of public management.

It is observed that the Law 12,815 / 2013 prevails with the premise of sustainable port operations in private hands, but with control of the granting authority.

Thus, the Brazilian environmental legislation should be applied in port operation of public ports, mainly through the private sector intervention, the business need is to meet specifically any productive sector.

The purpose of the culture of best practices aimed at eco-efficiency and sustainability of the sector, with appropriate administrative tools to control emissions. A private sector since taking over the port operations in public ports, has presented materials handling records now never seen in public ports Brazilians, however, these parameters to be distinguished should be analyzed and compared with the equality of technology both in the public or private sector, to legitimize through equality, the effectiveness of current results and better port productivity offered to the Brazilian economy in recent times.

Therefore, to ensure the definition of legitimacy the environmental management by giving transparency standards in Brazil.

It is in the port setting a constant search for methodological solutions, however, currently no unanimity of existing methods proposed to assess a model of sustainable management - as PRTR tool that generates data on emissions control transfers and pollutants.

The PRTR is an organizational management model that can discipline the activities guiding the performances of best practices in environmental management, based on measuring the emission control results by sector of production of port services.

The technical proposal of environmental engineering corroborates the administration section, to solve anomie more collaborative systems for emission control which in Brazil more evenly, not yet present or duly certified and accredited.

In Brazil, such bodies which INMETRO seek to harmonize the new products and services but time and the dynamics of technological change has been a great enemy of better performance, given the diversity of innovations launched in the market, which simultaneously to consumption, rely on new rules for the State's commitment, in line with the environmental public policies in force with the force of law.

In this lawless environmental standards, mandatory for judgment of appropriate environmental management model to meet emission control interests always more favorable and managers the best conditions of the environment.

It is noteworthy that the majority of the solutions to environmental crimes trials are due to studies of jurisprudence from foreign countries which produce legal rules, for disputes in international environmental law, with effect Hard Law, especially because effectiveness is recognized when sanctions and punishments are applied to those who do not comply with environmental legislation; and where it must be proved by positive results, best practices, or even to praise the benefits of environmental management in public and private spheres.

It is necessary to suggest immediately in port operations, the reflection on the best applicable and functional model of emission control operational methods, which applied when they should retain acceptable control data for various complex scenarios of logistics, sample activities port.

This imposing legally constituted as environmental protection of the logistics operator in Brazil is also necessary to discipline the best logistics management of emissions in cargo transportation by shifting loads between areas of ports. For this reason, it is suggested to first understand the transport system unimodal, multimodal modal or in combination; that when practiced by port logistics is possible to register the schedule accessibility respectively by mode of transport, environmental damage.

In this regard, we suggest the instrumental premise which is based on the inventory of PRTR - Emissions registration, transfers and pollutants that well effectively, can be nominated for a port system of an emerging country, where will the control measure the environmental eco-efficiency in public and private ports.

## **Legislation in the organizational model of the Environmental Law International**

The European Pollutant Emission Register (European Pollutant Emission Register - EPER) was established in 2000 by decision of the European Directive 96/61 / EC on integrated prevention and control of pollution, whose inventory was more detailed in Commission Decision 2000/479 / EC. From 2007, EPER was replaced by the European Registry of Pollutant Release and Transfer (European Pollutant Release and Transfer Register - PRTR). The new state governance by management model of the emissions control was admitted to the signing of the Aarhus Convention's Protocol which was the dissemination of public information where this event of the new European PRTR.

The European PRTR was concluded and adopted by the European Community, in particular, under Regulation (EC) 166/2006. The European PRTR on the impact or environmental damage control management is very important and useful in transfer operations, because it is a system of exchange of information on emission of pollutants from industrial activities set up under the IPPC Directive (Integrated Pollution Prevention and Control), 1996 (currently codified by Directive 2008/1 / EC). This policy also allowed the formulation of documents on Best Available Techniques (BAT - Best Available Technology) for adoption by Member States of the European Community (PRTR, 2014).

As Brazil (2014) the hierarchy of government activities to governance may result new legal rules on standards that guide the NPCC - National Policy on Climate Change. The study of new tools for sustainable management depend standards or state guidelines as well as the environmental legislation that deals with the sustainable logistics.

However, internationally, sustainable logistics procurement of products depend on the effectiveness of actions and organizational control products from or destined to foreign trade.

However, public and private setting environmental management directed to foreign trade will depend on the measures developed by the Interministerial Committee on Climate Change (CIM); which consists of the Executive Group (GEx), both established by Presidential Decree No. 6,263 / 2007.

Internally, in Brazil through public policies can regulate the sector through legal instruments of prevention and precaution of environmental damage with constitutional power.

However, in terms of emissions control management by sector of economic activity, like legitimate priority measures or environmental standards.

According BRAZIL (2014), Law No. DOU, de 17 de junho de 1986, Seção 1, páginas 8792-8795 was established to strengthen the intent of the National Policy on Climate Change (NPCC).

In this way, through specific legislation, is reflected in building the important bases for emission control through building stronger public policies to force companies to report emissions of their respective activities, which should produce objectively affiliated products what determines the life cycle by following the legitimacy control of the market parameters as global environmental protection.

In terms of priorities and governance directed to better control and management through corporate environment. Brazilian public policies can advocate a voluntary commitment of Brazil to the UN Framework Convention on Climate Change. In fact, at the time, was stipulated voluntarily by the Brazilian Federal Government to cooperate fully with the primarily scientific point of view between the parties; which includes strategic sectors, the example of transport and ports sectors where the country with new methods to search the reduction of greenhouse gas emissions in the order of 36.1% and 38.9% considering the projected emissions by 2020.

## **The PRTR - Issue registration Pollutant Release and Transfer Ports**

In Brazil, the PRTR is a collection system, processing, access and public disclosure of data (alphanumeric information) and information (data processed and value judgment) on emissions and transfers of pollutants that cause or have the potential to cause harmful impacts for the environmental compartments air, water and soil, (PRTR, 2014). In Brazil the acronym is described as: PRTR - Issue Log and Transfer of Pollutants, whose main guideline it is an international commitment made during the Third Intergovernmental Forum on Chemical Safety, held in Brazil, precisely in the city of Salvador, state of Bahia in the year 2000. The PRTR in the corporate environment is related to the 4th Action Plan priority for the Ministry of Chemical Safety environment. The purpose of the Stockholm Convention, to be an important commitment of the Brazilian government admitted to the Stockholm Convention. The PRTR or Registration Pollutant Release and Transfer involves from the collection and dissemination of information on estimates of the annual quantities of emissions of chemicals listed in Annexes A, B or C, which establishes the released or disposed products.

The Stockholm Convention provides in Article 10, paragraph 5, each State Party shall endeavor to carrying out studies on the possibility of developing mechanisms, with regard to the better management of legal issue which must be aligned legislation site, to resolve questions to organizational models implemented where the example of Brazil, the PRTR is fundamentally guided by five points:

- 1) National Environmental Policy, Federal Law No. 6938 of August 31, 1981, which created an environmental system for the purpose of preservation, improvement and recovery of environmental quality, and defines as one of its instruments, the Federal Technical Registry of Potentially Polluting Activities and / or users of Environmental Resources.
- 2) Federal Constitution / 88, Article 225, paragraph 1, item V, citation in verbis: "V - control the production, marketing and use of techniques, methods and substances that represent a risk to life and the environment";
- 3) Federal Law No. 7347 of July 24, 1985, which governs the civil action of liability for caused to the environment and other measures;
- 4) Federal Law No. 10,165, of December 27, 2000, which regulates the potentially polluting activities and those that use natural resources, with emphasis on the Activities of the Manual of the Federal Technical Register / IBAMA;
- 5) Federal Law No. 10,650, of April 16, 2003, which provides for public access to data and environmental information in the organs and entities of the National Environmental System – SISNAMA (2014).

A priori, the main task of managing emissions link PRTR system - Emission Register Pollutant Release and Transfer involves the operational stage, tactical and strategic sustainable management provide administratively caution to the environment.

The order management and control emissions harmful to humans and the environment itself, where for that the main fact should reflect on ways to provide objective and reliable information of releases and transfers of selected pollutants, and prove scientifically through such collaborative management measures between the internal and external areas of a corporation, the dissemination of information on the chemical potential of a product or service which circumstantially when improperly applied in the logistics business, will cause damage to human and environmental health by the presence uncontrolled in productive activities through private or public organizations.

The vision of the management of prevention to the environment should always be holistic, mainly because the PRTR is an emission control instrument to be permanently improved and controlled under the SISNAMA to generate reliable information on emissions and shipments of certain pollutants and thereby improve the quality of human and environmental life.

As a rule the general objective is to capture information about emissions and selected transfers of pollutants derived from production processes on an annual basis and to promote the wide dissemination, free and unrestricted of the information provided.

Collaboratively, even in Brazilian ports with current environmental legislation, enforcement is lacking in the practice of emissions control management.

In terms of the field of environmental law, the hierarchy of government priorities does not favor projects towards promoting environmental policies. In matters of jurisprudence is little fact that penalize the forms of environmental damage generator where there are few evidence for the lack of inventory, is in order to give transparency to society, to force the logistics and port operator to hire resources appropriately in the ports public sector, environmental action emission control, to publish and disclose the inventory and or emissions report. One of the ministerial environmental requirement can be requested as effect law force to get managing possible practices of public ports when providing care and environmental control established by constitutional law.

With this understanding it is understood that the sustainable management of a port terminal with the PRTR can be a usefull tool that helps public administration, in procurement activities of logistics services in public ports.

The organizational concept like the PRTR can help decision-modal decision to transport and comes instruct the tenants of these port areas to monitor environmental performance by management actions and emissions control which cause environmental damage.

In comparison to more developed countries practices to control emissions is essential to legitimize the control model for management in ports which lack of sustainable practices, especially in emerging countries, where it is expected in the absence of adequate infrastructure, the best emission control strategic activities of state control, whose activities have been presented in the past and perhaps future will be international conventions object.

## **Brazilian Regulation – Multimodal Legislation and Environmental Law**

In regarding the Modal Shift studies which has been proposed for transport practices. Hochhaus and Wild (2008) has explained that ship and air transport are the most used worldwide. If the costs and CO2 emissions per tonne-kilometer of these two are compared, clear values are obtained. Comparison of fuel usage and emissions, as follow:

Modal Transport	Fuel Consumption	CO2 Emission	Kind of Fuel
Parameters	g/t km	g/t km	
Airplane	100 - 200	315-630	kerosene
Truck	24	70	diesel
Train		25 - 50	Eletricity/Diesel
Ship - Conventional refrigerated	7,5	24	bunker oil
Ship - Full container / 4.500 TEU's	6,2	20	bunker oil
Ship - Full container / 8.500 TEU's	3	10	bunker oil

Search: Dr. Hochhaus e Dr.Wild - Market Analysy - 05/08 => Adapted by Authors

A container ship that can transport 4,500 containers (TEU) burns about 6.2g of oil per tonne of transported goods per kilometre. This leads to CO2 emissions of 20 g per tonnekilometre. In comparison, a jumbo-jet burns 100 – 200 g of kerosene per tonne of freighted goods per kilometre and produces 315 – 630g CO2 (HOCHHAUS & WILD, 2008).

The management research environment and the harbor reveal normal operational resources such as trucks, locomotives, barges and ships which can be own vehicles, or outsourced, however, regardless of the modal emissions from these modes must be controlled - which in most often are not managed as priorities of port terminals - as appropriate for the administration of the port terminal - because they do not make use of appropriate technology to minimize CO2 emissions.

So for better port management for new public policies, the State may reflect to build new environmental guardianship which are mandatory technological changes, in order to control environmental damage and innovative way can be a port management control model, for constitute the legitimate sustainable transport systems.

However, to apply the PRTR in a sustainable way in environmental legislation, the great challenge is to meet the environmental management, it is expected first to follow based on corporate social responsibility, existing environmental standards, which already guide humanely, environmental law the citizen, based on regional technological reality, due to the technological control emissions.

Thus the environmental management model PRTR with appropriate technology, can get benefits from the implementation of the organizational model when deployed in management for:

- a) For contributing to the creation of government policies because it provides an important support tool for environmental management and risk management.
- b) Subsidizing corporate decisions in their social and environmental actions (creating economic, environmental and social values).
- c) Improve the production processes with the use of the best available practices.
- d) Improving the exercise of citizenship, through the public disclosure of data and its debate, and consequent initiatives from the information generated.

Table 1 - Support Legislation to implement the PRTR in Brazil

**Legislation:** - Brazil's Federal Constitution 1988 Article 225, paragraph I, section V.

**Objectives:**

- ✓ "V - Control the production, marketing and use of techniques, methods and substances that represent a risk to life and the environment."

**Legislation:** - Federal Law No. 7347 of July 24, 1985.

**Objectives:**

- ✓ Regulates the civil action of liability for caused to the environment and other measures.

**Legislation:** - Federal Law No. 10,165, dated December 27, 2000.

**Objectives:**

- ✓ Changes the National Environmental Policy, regulates and potentially polluting activities using natural resources, with emphasis on the Activities of the Manual of the Federal Technical Register / IBAMA.

**Legislation:** - Federal Law No. 6938 of August 31, 1981.

**Objectives:**

- ✓ It counts on the National Environmental Policy that created a system for the purpose of preservation, improvement and recovery of environmental quality.

Source: ENVIRONMENT MINISTRY (BRAZIL, 2010, p.13-14)

However, the paradox in Brazil remains on technological standards anomie because there is more grounded way in environmental legislation, a tool or feature any single control in the port perspective.

In this regard the state with the inertia of public agencies which are supposed to regulate and standardize the practice of publishing emissions reporting mandatory form within the public port can be conniving to environmental damage.

This is based on the triggering event of inertia that the negligence of regulatory agencies in the public sector which do not monitor the emissions control not hold specific guidelines aimed at port reality.

Thus the State corroborates the anomie of standards aimed at environmental protection of the port sector for lack of determining emissions control guidelines for port operators and tacitly, becomes increasingly precarious environmental management without environmental technology to monitor the actions properly, which only prevails in public ports, doubtfully, most often by the greenwashing effect, with green marketing strategies, through voluntary perspective of the private sector - without mandatory emissions control technologies for areas holdings of public ports.

## **Considerations**

The Brazilian port public services when hired through grant a sustainable logistics model. In terms of private ports management toward sustainable practices has not advanced to reach one kind of system to control the environmental control emissions for every port activity.

For reaching the sustainable management of roadway transport with eco-efficiency in case of the fuel consumption economy applied during ground transportation in the loads distribution. In transport terms is necessary to decrease air emissions to create the PRTR which proposes a feasible monitoring control model. For emerging countries to this organizational practice, it depends on to create specific environmental law, which requires a more appropriate management with emissions record, to legitimize the effectiveness environmental from ports emissions.

Based on emission of pollution reports coming from ports, one can establish the strict liability of a port operator, especially to preview a possible environmental damage.

The PRTR's management system can contribute with environmental legislation besides technologic ways that control the management emissions from heavy vehicles so which will be important to monitor the impact of emissions inside of port activities.

## **Conclusion**

In Brazil, the emissions control management model has come in due course, the commitments made to the United Nations Framework Convention on Climate Change.

This way toward keeping initiated the commitment of the information referred to serious involvement with the appropriate environmental agencies, which determine the study of strategic objectives for better governance of the Brazilian productive sustainability.

However, we can see with this study, to follow a global model of eco-efficiency as well as being required to practice a sustainable management model, it relies heavily on reliable results of organizational models of studies for benchmarking the environmental management intermodal transport systems from public ports through multimodality practices or the study of the Soares' concept of Modal Shift in Brazil (SOARES,2014).

However, if on the one hand some international models are scientifically associated with managing environmental control unimodal emissions in Brazil by the lack of land-based multimodal integration infrastructure, sustainable practices can be more complex.

Propose verify that the PRTR can provide more safely environmental control emissions, which has been tested and approved based on the results of environmental foreign policy, which is observed in the current form, the version applied in environmental management through the European PRTR.

Thus, organizational innovations proposed in this article involve the PRTR directing the suggestion of application for managing container terminals in Brazil. Above all, a corporate form, where this environmental management system can work well, to legitimize the emissions control, particularly in terms of sustaining port transport practices being a methodological paradigm ideal for utility purchases when supported by the legislation of a logistics sustainable.

The study of the relevance of this administrative tool can be important to guide the emissions control guidelines in ports, where at the time, the Ministry of Environment aims to provide environmental protection for the immediate start of sustainable best practice through the stakeholders and shareholders of port sector.

The article presents the PRTR as an environmental management tool model facing ports that can function as a guideline aimed at competitiveness, reconcile and harmonize the effects of externalities to the processing of international environmental rules for proper marketing and legitimacy of a sustainable port.

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