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Efficiency in the management of civil construction waste with the adoption of the integrated waste exchange system in Brazil

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ABSTRACT

Federal Law No. 12,305/2010, which provides for the National Solid Waste Policy, establishes that: "Civil Construction Waste (RCC) originates in the construction, renovation, repair and demolition of works, as well as those resulting from the preparation and excavation of land for construction". In addition, the legislation specifies the responsibility of waste generators for collection, transportation, transshipment, and final disposal, aiming at reduction, reuse, recycling, proper treatment of waste and a lower environmental impact. Currently, some industry federations have platforms that aim to promote and facilitate transactions related to the waste produced by their members, however, most operate in isolation. The National Confederation of Industries (CNI) has created a web platform developed for integrated operation that allows the adhesion of state industry federations. Of the twenty-seven federative units of Brazil (Federal District and twenty-six states), the states of São Paulo, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and Mato Grosso do Sul (about 19% of the total) have isolated (non-integrated) Recyclables/Waste Bags and only the states of Paraná, Minas Gerais, Bahia, and Sergipe (15%) participate in the Integrated Waste Exchange System (SIBR) of the National Confederation of Industries. This research aims to present the positive points of the integrated system and propose the use of SIBR in all federative units of Brazil. Initially, it was found that the SIBR system, in addition to facilitating and enabling the execution of transactions such as the intermediation of the sale, exchange, and donation of materials / products, also provides the reduction of costs and time, because of the integration, also contributing to the correct disposal of waste and, consequently, to environmental preservation.

Keywords: Integrated Waste Exchange System, Sustainable Management of CCRs, National Confederation of Industries, Civil Construction, Brazil.

1 INTRODUCTION

As civil construction is one of the industries that most impacts the environment in all its phases, whether in the use of raw materials, transportation and in the production process, especially due to the large generation and disposal of waste, it is of great importance to create tools that streamline the process of negotiating construction waste.

The Integrated Waste Exchange System of the National Confederation of Industries integrates the existing isolated systems, creating a single national platform, presenting a significant reduction in operational and personnel costs, streamlining information on all waste available nationally, resulting in economic gains and environmental benefits.

2 CONSTRUCTION WASTE AND BRAZIL'S NATIONAL SOLID WASTE POLICY

According to Resolution No. 307/2002 [4] and amendments by the National Council for the Environment – CONAMA of Brazil, civil construction waste is waste from construction, renovation, repair and demolition of works from civil construction, preparation and excavation of land and materials such as bricks, ceramic blocks, wood, concrete, plaster, soils, tiles, rocks, metals, etc. resins, glues, paints, glass, and others.

Federal Law No. 12,305/2010 [2] established the National Solid Waste Policy (PNRS) in Brazil with very modern concepts for a new waste management, proposing the practice of sustainable consumption, including the increase in the reuse of solid waste, reinforcing the hierarchy of avoid, reduce, reuse, recycle and finally adequate treatment. The PNRS brought the shared responsibility of everyone in the waste generation chain, manufacturers, importers, distributors, among others, considering the entire life cycle of materials/products.

To integrate waste management, the National Confederation of Industries (CNI) in Brazil created and implemented the Integrated Waste Exchange System (SIBR) platform with the objective of integrating the information of the exchanges in a single database.

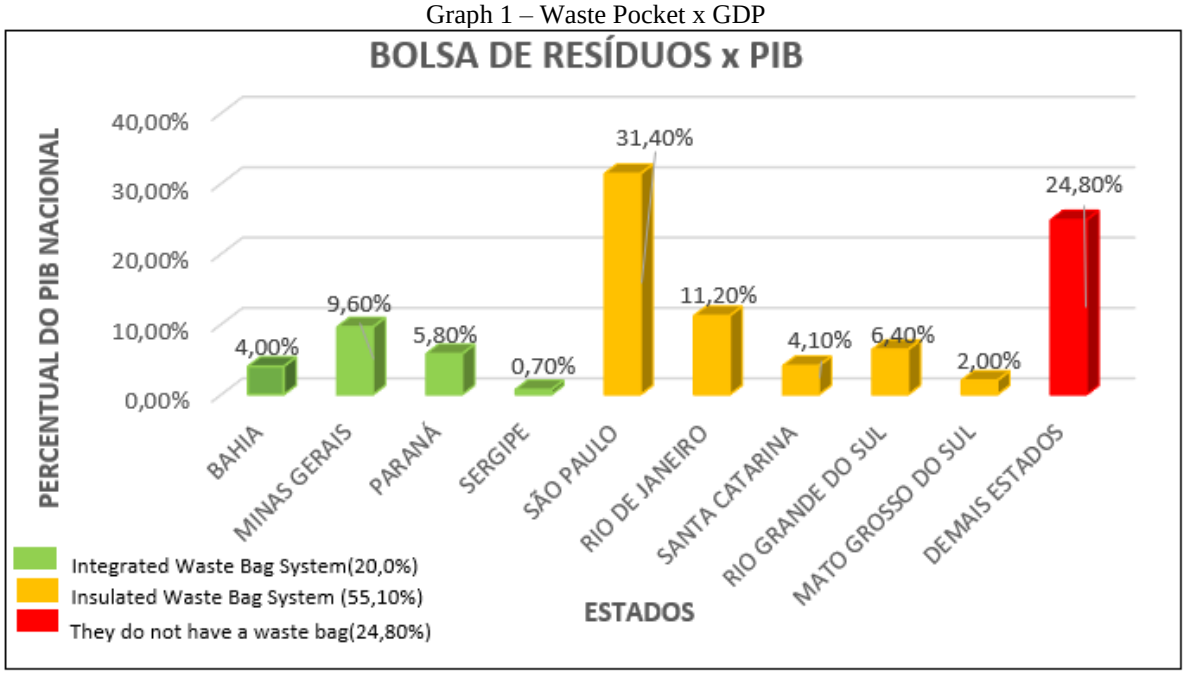
3 OVERVIEW OF WASTE POCKET SYSTEMS IN BRAZIL

Waste/recyclable exchanges are websites linked to the State Federations of Industries that allow the purchase, sale, exchange, or donation of industrial waste – plastic scraps, paper, wood, scrap metal, construction waste, among others that are generated during industrial activities [1].

The waste/recyclable bags aim to avoid waste, improper disposal, reducing environmental impact in addition to bringing economic benefits to the participants of the system.

In the current Brazilian scenario, of the twenty-seven federative units of Brazil, only the states of Paraná, Minas Gerais, Bahia and Sergipe (15% of the total federative units) corresponding to 20.10% of the Gross Domestic Product (GDP) participate in the Integrated System of Waste Exchange – SIBR. On the other hand, the states with isolated waste exchange systems are Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul and Mato Grosso do Sul (19% of the total federative units) corresponding to 55.10% of the GDP and in the rest of the Federations of the Brazilian States there is no type of Waste/Recyclable Exchange (66% of the total federative units) corresponding to 24.80% of the GDP. Graph 1 below presents a breakdown of the GDPs related to the participation or not of the State Federations in the Integrated Waste System.

Graph 1 – Waste Pocket x GDP



The following are the Insulated Bags and the Integrated System of Waste/Recyclable Bags existing in Brazil.

3.1 INSULATED WASTE POUCH SYSTEMS

With the same objective of buying, selling, exchanging, and donating waste and recyclables but limited to a certain state. The states that have their own system are: São Paulo, Rio de Janeiro, Santa Catarina, Rio Grande do Sul and Mato Grosso do Sul.

3.1.1 São Paulo

In 1990 it started informally, being the Brazilian state with the highest production of waste. To participate in the Waste/Recyclable Exchange of the Federation of Industries of the State of São Paulo (FIESP), it is necessary for the interested company to submit its registration for consideration by the management committee and, only after approval, can it participate in the scholarship. The portal also has a list of service providers related or not to waste generation or collection [9].

As the State of São Paulo represents 31.4% of the Brazilian GDP, it is evident that it has the largest number of registered companies and visitors, as well as advertisements and online users, although this data is not available to those not registered in the system.

3.1.2 Rio de Janeiro

The Waste/Recyclables Exchange of the Federation of Industries of the State of Rio de Janeiro (FIRJAN), created in 2000 in partnership with the State Foundation for Environmental Engineering (FEEMA), is an online space, free and open, for companies to search for and disseminate information about their waste in order to achieve economic gains and reduce environmental impacts. Waste is made available by sector of activity with their respective offers and demands. The website receives about

700 queries monthly. To participate in the Scholarship, it is necessary to register in advance so that the residue can be disclosed. It is probable that its indicators are higher than those of the state of Minas Gerais [5].

3.1.3 Rio Grande do Sul

The main objective of the Waste Bank of the Federation of Industries of Rio Grande do Sul (FIERGS) is to reduce, reuse and recycle industrial waste, seeking to preserve the environment, generate jobs and implement technologically viable projects in the various research departments of the partner universities. In the composition of the Waste Bank there is the Recyclables Exchange in which previously registered companies can buy, exchange, sell and donate waste free of charge, seeking to strengthen and create new opportunities for the recycling sector. On the portal there are more than 10 thousand registered companies and 200 active ads. FIERGS is a very active federation in this area and promotes several lectures, workshops and international forums on solid waste to disseminate its programs and actions and, in 2016, it will have its 7th edition with the participation of several international experts [7].

3.1.4 Santa Catarina

The Waste Exchange of the Federation of Industries of the State of Santa Catarina (FIESC) was founded in 2004 and has the same objective as the other exchanges. It has an electronic portal that aims to identify business opportunities for waste. To participate, it is necessary to register in advance and free of charge, for restricted access (login and password) and currently has 1705 registered companies and 592 active ads [4]. FIESC understands that its scholarship "is an important instrument for the management of waste resulting from productive activities, based on the promotion of a process of free negotiation between waste claimants and suppliers, focusing on reuse or recycling" [8].

3.1.5 Mato Grosso do Sul

With the same objective as the other exchanges, to participate in the Waste Exchange of the Federation of Industries of the State of Mato Grosso do Sul, it is necessary to register in advance with *login* and password to access the exclusive restricted area for companies that are making their waste available. According to SINDVEST-MS, this is a proposal that contributes to the preservation of the environment, through the reduction of waste in nature. Participation is open to Legal Entities, including micro, small, medium, and large enterprises, for all available services of the Program. To register, the company must have waste to participate in the exchange. Companies only interested in acquiring waste should look directly for the companies registered on the exchange's website [6].

3.2 INTEGRATED WASTE BAG SYSTEM (SIBR)

In 2008, the National Confederation of Industries (CNI), which represents and defends the interests of Brazilian industry in the 27 State Federations and in 1250 employers' unions with almost 700 thousand industries before the Executive, Legislative and Judiciary powers, as well as in various entities and organizations in Brazil and abroad, proposed a project to interconnect the Waste/Recyclable Exchanges of all States in a single portal [3]. In 2009, CNI launched a new "on-line" internet system (http://www.sibr.com.br/sibr/index_bolsa.jsp*) with login and* password, which at the time intended to serve 10,000 companies throughout the country, with the objective of standardizing the operations of purchase, sale, exchange and donation of industrial waste among companies throughout the Brazilian territory. The SIBR system, in addition to interconnecting all state units, also avoids waste, reduces environmental impact and brings economic benefits to all users of the system.

According to SIBR/CNI [11], "The main objective of the Integrated system is to strengthen the state stock exchanges, provide standardization in the way they operate and incorporate the best existing experiences in a friendly, modern and safe environment. With the national database, it is intended to give greater scale and visibility to the operations of the exchanges, adding value to the negotiations for reasons of scale and providing greater publicity to the registered advertisements".

Companies legally established in the country, or from other countries, can participate in the Waste Exchanges, as long as they have a legal representative duly authorized to sell waste. Individuals and companies with pending regularization with the Federal Revenue Service [11] cannot participate in the Integrated System.

To enable registration, it is necessary for the participant to provide their National Registry of Legal Entities (CNPJ) and National Registry of Economic Activities (CNAE). After approval, the registration, the participant will be able to participate in the transactions of the exchange that involve registration of the advertisements for sale, purchase, exchange or donation of waste.

Currently, the Integrated Waste Exchange System (SIBR) is composed of four states: Bahia, Minas Gerais, Paraná and Sergipe, and it was found that there was no expected adhesion. Another important issue is that the Waste/Recyclable Bags of the Federations of the States of Espírito Santo, Goiás, Pernambuco and Pará, which were once active in the SIBR system, are now inactive.

In an online consultation on 05/11/2015, the global indicators were 7082 registered companies, with 46 ads, 17 online users and 675258 visitors.

The integration of waste exchanges in a single system allows interested companies to find waste that is closer to their location, even if they are in another state of the Federation. In the case of isolated systems, when accessing the system of its federative unit, a company would only be able to observe offers from companies registered in this isolated system, while if it were in an integrated system, it

could find all the offers of waste, throughout the federation, even making it possible to acquire waste from a company in another state, but geographically closer. Figure 1 below exemplifies this idea: Accessing an isolated system, company "A" would only see waste offers from its state and, therefore, would only see company "B's" offer, however, if it were in an integrated waste exchange system, it could see company "C's" offer, which, although it is in another federation unit, is geographically closer, allowing a more economical and environmentally correct acquisition, by reducing the costs and emissions arising from the transportation of the waste to be acquired, due to the shorter transport distance. Now, if there were an integrated system, in addition to the possibility of increasing the supply of waste, consequently increasing competitiveness, the important aspect of physical location that impacts the possibility of reducing costs and emissions in the transportation of acquired waste is also highlighted.

Figure 1 – Isolated x Integrated System – Physical Location of Waste Exchange Participants

A – Company registered in the FIERGS Waste Exchange
B – Company registered in the FIERGS Waste Exchange
C – Company registered in the FIESC Waste Exchange

4 ADVANTAGES OF INTEGRATED WASTE BAG SYSTEM

The greatest advantage is the creation of a common environment for all Federations, highlighting the standardization, the concentration of data and information in a single national database, allowing the generation of statistics of the transactions carried out and the expectations of demands, allowing the participants to program their actions in a more effective and efficient way.

Another aspect of great importance is the agility in the search for buyers/sellers due to the concentration of data in a single database, which would not be possible if you had to search between several sites individually.

Access is also simplified since the user would have a standardized (unique) interface, avoiding understanding and becoming familiar with other portals.

The registration of waste in a single portal reduces time, speeds up visualization and facilitates the comparison between offers of the same type of waste available.

It is important to highlight the aspects of shortening time, resources and emissions, when it becomes possible to select waste suppliers closer to buyers, due to the integrated system.

5 CONCLUSION

It is evident the need for actions that bring the development of new waste management tools in accordance with the National Waste Policy of August 2010 based on the hierarchy of "avoid, reduce, reuse, recycle and adequate treatment".

The Integrated Waste Exchange System brings greater efficiency in waste management, expanding the universe of interconnections between suppliers/buyers, reducing waste and operating costs, greater environmental responsibility and at the same time bringing better decision-making, resulting in greater competitiveness and the improvement of society's principles and values.

In view of the above, it would be of great importance for the National Confederation of Industry (CNI) to encourage the State Federations to adopt the Integrated Waste Exchange System (SIBR) through events such as meetings, seminars, workshops, etc., presenting all its advantages and benefits.

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