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## **REVERSE LOGISTICS APPLIED TO WASTES OILY MANAGEMENT**

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## **Summary**

Reverse logistics seeks to manage logistics in reverse, dealing with products from point of consumption to point of origin. Its strategic objective is to restore the value of a returned product. This paper proposes an analysis of reverse logistics in lubricant sector, placing the wastes oily return in the productive chain and identifying some aspects which influence the efficiency in reverse management process. An analysis of wastes oily generation in Brazil was performed, as well as an investigation of the best practices for environmentally friendly final destinations. The investigation carried out made it possible to identify critical points interfering with the reverse chain and draw a parallel between Brazil and other countries. It contributed to understand the dimension of the problem and challenges in an attempt to minimize environmental impacts.

**Key-words:** Oily waste, Reverse Logistics, Environmental Impact.

## **1. Introduction**

In search of the customer's satisfaction, the logistics is challenging the effectiveness, in the physical movement and choosing manners, contractors and means of transports that contribute to appropriate fluidity of the product, considered the transportability, the origins and destinies.

Nowadays, more and more rigorous as for the discard of materials and useless products, the laws do with that the companies come to develop strategies not only for the direct logistics, but also for reverse ones, way which happens the appropriate destination of packing, inputs and even components of products, as batteries, cells and other.

The Reverse Logistics involves the process of planning, implementing and controlling the flow of products return with the conservation objective, recycling, substitution and disposition at a reasonable cost, seeking the need of the planning flow of residual items that returns along the chain after having consumed by the customers, it includes the return of wastes for recycling purposes.

Donato (2008, p.19) considers Reverse logistics as "the logistics area that treats from the aspects of products return, packing or materials to its productive center."

Wastes as the glass, plastic, aluminum and oily can be returned to the production line when segregated in the source. Such wastes, when return to the production line, generate employments to whom accomplishes the collecting, adds value to the materials before discarded and contributes to the environmental preservation, considering the input economy in the production of other assets.

Inside of this reverse chain is worth to point out the lubricating oil production, such product, with function of reducing the attrition in the thermodynamic activity of the vehicular motors, increasing its efficiency, helping out in the transports activities.

According to Cempre (2006), a liter of oil is able to drain the oxygen of 1 million liters of water, forming, in a few days, a thin layer on a surface of 1.000 m<sup>2</sup>, what blocks the passage of air and light, obstructing the breathing and the photosynthesis. The used oil also contains metals and composed highly toxicant, is classified as dangerous waste (class I), according to the norm 10.004 of ABNT, being prohibited the use as fuel, because its burning liberates for the atmosphere, heavy metals as cadmium, lead, nickel all potentially carcinogenics, besides residual and particulates gases.

Brazil consumes annually about 1.000.000 (m<sup>3</sup>) of lubricating oil and generates 350.000 m<sup>3</sup> of used oil. The data of collecting in 2007 reveal that the residue collecting was about 270 million liters, therefore, around 27% of the total of consumed volume. The volume of used oil collected in 2005, made possible the production of 183.5 million liters of oil basic re-refined. (CEMPRE, 2006)

Examining the data regarding the logistics of the lubricants provisioning, a variety of issues appears with the objective of improving the productive chain: (1) are there ways of improving the provisioning logistics in the generating establishments of residues for effectively to control the waste through the final consumer's system, with the objective of improving the reverse logistics?

(2) are there ways of improving the reverse logistics of the provisioning chain that jointly improves the managerial logistics preventing the environmental impact?

The article describes in the Brazilian ambit and in some countries, the main volumes of waste generation, contextualizing the reverse logistics in the lubrication section, besides showing the main aspects that interfere in the reverse chain management of the lubricating oil, as well as looks for identifying the generation of these residues and their environmental impacts, subsidizing decision making about the reverse channel perfection.

## **2. Reverse Logistics**

In terms macro economical the logistics is responsible for the physical flow of the materials in the industrial section and of this for the consumer, passing by the several distribution channels (BOWERSOX, CLOSS, 2001). In the managerial atmosphere the term is used to describe the related activities with the flows of materials

entrance and products exit and tends to win an integrated vision among the organizations as these start to plan their activities in joint way, to better serve the market and to win efficiency and effectiveness (BALLOU, 2001).

FLEISCHMANN (2001) points out the need to recover the assets, products or waste value, being this, the motivation for the commercialization of the same ones. He defines the reverse logistics as the planning process, implementation, and efficient and effective control of the entrances flow and storage of secondary materials and related information, opposed to the traditional sense of the supplies chain, with the purpose of recovering value or discarding materials correctly. With that vision, it enlarges the concepts for deeper understandings about the reverse channel, starting to perfect the reverse channels of recycled materials. For STOCK (1998) the reverse logistics is a term used to refer to the logistics in the recycling, discard and management of materials pollutants that, in a broader perspective, includes logistic activities of emission reduction, recycling, substitution, reutilization of materials and discard.

Roger and Tibben-Lembke (1999, p.2) define the reverse logistics as "the process of planning, implementation and efficient control, including the costs, the raw materials flow, the inventory in process (stocks), concluded assets, and relative information to them, of the consumption point to the origin point with the purpose of recapturing or creating value or still giving appropriate disposition."

The reverse logistics can, therefore, to be understood as the area of the managerial logistics that seeks to equal the logistic aspects of the assets return to the productive life cycle or of the businesses through the multiplicity of reverse distribution channels of after-sales and post-consumers, adding them economical, ecological, legal and location value (LEITE, 2003; FULLER, ALLEN, 1995; CLM, 1993).

They also describe the objective of the reverse logistics that is to make possible the return of the materials in the productive cycle, with emphasis about the issues that is to impact in the reverse process, for definition of the processes that should be submitted.

In this sense, Roger and Tibben-Lembke (1999), complement that the reverse logistics recovers the values through the channel reverse. According to Leite (2003), the strategic objective of the reverse logistics is to add value on an useless product or with little usefulness to the manufacturer. The reverse logistics should plan, operate and control the return flow of the consumed products or of their materials, packing, for example.

The strategic objective of the reverse logistics is to add value on a useless product or with little usefulness to the manufacturer. The reverse logistics should plan, operate and control the return flow of the consumed products or of their constituent materials (LEITE, 2003).

The product post-consumer can be classified in use conditions, end of useful life and industrial wastes. A product considered in use condition presents reutilization interest. It will enter in the reverse channel of the reuse and it will be negotiated by a reduced value in the market of second hand. That cycle will finish when the product reaches its end of useful life. (ROGERS AND TIBBEN-LEMBKE, 2001). The reverse logistics includes the totality of the processes of the assets movement, leaving of its initial destination and arriving to a point in which some value still inherent to the assets can be extracted, or, at least, an adapted final disposition can be made (ROSS 1998, apud DAUGHERTY et al., 2002).

The used lubricating oil adds value in the recycling chain, returning to the productive process of re-refine, through the logistics reverse post-consumer. The process

of lubricating oils recycling, known as re-refine, represents an interesting alternative and it has been adopted by several countries, including Brazil, with positive results. The importance of the reverse channel of the lubricating oil was studied by Tristão et al. (2005) that described the environmental management of the used lubricating oils residues and the risk of environmental degradation when discarded improperly or used as fuel in industrial establishments.

## **2.1 Reverse Chain of the Lubricating Oil**

Nowadays, as well as the machines, the lubricants suffered technological alterations to assist the extreme needs in industrial processes. Today there are several companies at the market that manufacture several types of lubricants, of mineral, synthetic and special origin. Besides having great using, the lubricant has forms of correct applications. For that, there are equipments for lubrication, available in Brazil since 1950 that are of fundamental use and also minimize the risks of the lubricants contamination.

All lubricating oil is a derived of petroleum to the base of basic oils (saturated hydrocarbons and aromatics) and an addictive package (UNILUBRI, 2006).

The Resolution CONAMA nº 362/05 presents the following concepts in relation to the lubricating oil (BRAZIL, 2007):

- a) Basic lubricating oil: main representative of the ended oil lubricating.
- b) Ended oil lubricating: formulated product from basic lubricating oils, could contain addictive.
- c) Used or polluted lubricating oil: ended oil lubricating that, due to its normal use or because of contamination, has become inadequate to its original

purpose.

Ramos (2001) considers lubricating oils, synthetic or not, as derived of petroleum, used in automotive or industrial purposes, that after the period of the recommended use by the manufacturers of the equipments, deteriorate partially, forming oxygenated composes (organic acids and ketones), polynuclear aromatic composed of high viscosity (and potentially carcinogenics), resins and lacquers. Besides the degradation products of the basic oil, they are present in the used oil, the additives that were added to the basic in the formulation process of lubricants and that they were not consumed yet, metals of the motors waste and of the lubricated machines and several pollutants, such as water, fuel, dust and other sludges.

The lubricating oil is made through the introduction of the appropriate additive for lubricating oil manufactured from paraffin cuts or mixed base of unrefined oils of petroleum (Nelson, 1964; Forbes and Neustadter, 1972). The main functions of the lubricating oil include the friction reduction: protecting against the rust and the waste; the removal of the motor pollutants.

The lubricating oils can be classified in industrial and automotives, difference that happens due the formulation process, in other words, additive, RAMOS (2001):

- a) Industrial: although it possesses a low additive level, when compared with used oils in motor-vehicles, there is more variety of pollutants, that difficult the collecting for the re-refine in mixture with automotive oils.
- b) Automotive: represents 70% of the national consumption of lubricating oil and, therefore, consists on the largest amount of destined oil for the re-refine activities, pointing out the passenger and fleet vehicles. The used oils with this purpose present additive levels and higher pollutants, besides

deeper degradation of the basic oil when compared with those of industrial use.

Due to the differentiated process of formulation the industrial and automotive lubricating oils also have forms of differentiated recycling (RAMOS, 2001).

### **2.1.1 Classification of the Lubricating Oil and Important Legislations**

The resolution CONAMA (National Council of the environment) n.362/05, in substitution to the resolution CONAMA n.09/1993, establishes new parameters for withdrawal activities, collecting and destination of the lubricating oil. Together with CONAMA, ANP (National Agency of the Petroleum), in the use of their legal attributions, and also environmental for the activities related to the theme lubricant oils establishes control on such residues.

The table 1 presents a relationship of the entrances (Legislation) with the activities described in the resolution CONAMA 362/05.

**Table 1:** Legislations and Relative Technical Norms to the Lubricating Oil

Resolution CONAMA 362/02, replacing 09/93	Entrance	Contribution of the Entrances
<b>Art. 7°</b> - To the producers and importers, should establish, at least annually, the minimum percentile of collecting of used or polluted lubricating oils, non inferior to 30% (thirty percent), in relation to the ended lubricating oil.	Entrance Interministerial MME/MMA n° 01/99 Requirements: It establishes the collecting percentile	It assists the demand of the resolution in relation to the collecting percentile
<b>Art. 1°</b> - Every used or polluted lubricating oil should be picked up, collected and to have final destination, so that it doesn't affect the environment negatively and propitiate the representatives' maximum recovery contained in it, in the foreseen way in this Resolution	Entrance ANP n° 125/99 Requirement: It establishes the control of the oily waste	It regulates the withdrawal activity, collecting, final destination of the used or polluted lubricating oil
<b>Art. 10 – Item X</b> - Every basic lubricating oil or marketed ended among the producing companies, among the importers companies, or between producers and importers, properly authorized by the National Agency of the Petroleum - ANP.	Entrance ANP n° 126/99 Requirement: It establishes the production and commercialization of the lubricating oil.	It regulates the production or import activity
<b>Art. 7°- Only Paragraph</b> - The producers and importers are forced to collect every available oil or to guarantee the costing of the whole collecting of used or contaminated lubricating oil indeed accomplished, in the proportion of the oil that place at the market in accordance with intermediate and final progressive goals to be established by the Environment Ministries of Mines and Energy in united normative act, even overcome the minimum fixed percentile.	Entrance ANP n° 127/99 Requirement: It establishes the requirement of the collection of the oily waste.	It regulates the activity of used lubricating oil collecting
<b>Art. 3°</b> - The whole used or polluted lubricating oil collected should be destined to the recycling through the re-refine process.	Entrance ANP n° 128/99 Requirements: It establishes the re-refine process for the reuse of the oily waste.	It regulates the industrial activity of re-refine of used or polluted lubricating oil

**Source:** National Council of the environment - CONAMA, 2010

The Brazilian Association of Technical Norms - ABNT, in its NBR-10004, classifies the oily waste as dangerous, by presenting toxicity.

It's important to point out the performance of the resolution in the oily residues control, in order to perfect the reverse chain, as well as to minimize the environmental impacts, through the collecting control, storage, and distribution.

Dias and Teodósio (2006), characterize four logistic reverse processes involving the recycling: the collecting, the combined process of inspection, selection and screening; the reprocessing and the redistribution. The characterization of the logistic reverse processes by the authors makes possible the need of being controlled with support of the effective legislations, because the reverse process incorporates all the actors involved in the chain of supplies.

### **2.1.2 Management of the Oily Waste**

Until the few years ago the companies had the environment being source of resources and deposit of waste. They had the idea that the natural resources would be inexhaustible, not awakening the interest for the preservation of the environment. The idea of environmental preservation was seen as barrier for development, being just restricted to small environmentalist groups. Donaire (1999, p.34), points out that:

[...] the referring demands to the environmental protection were considered a brake to the growth of the production, a legal juridical obstacle and great investments plaintiff of difficult recovery and, therefore, factor of production increase.

In this sense, an organization that possesses activities facing to the preservation of the environment possesses a differential front of their competitors and consumers.

Andreoli (2006, p.62) considers that:

Exactly the businessmen's ethical responsibility and headier politicians, was able to prove in practice that advantages in goes beyond that unilateral vision of the environment as a cost and to consider it an opportunity. The initiative of adopting the beginnings of the environmental administration, in an economy that is characterized by the high waste of resources, determines an important competitive differential.

Mananhan (1997) makes an important placement when he says that to minimize the amounts of wastes is a good business, means to save. Even so, if there are still residues, it should remember that wastes are materials, they have value and they should be used for improvement and not to discharge as residue, usually with high disposition cost.

According to IEEP (European Institute of Environmental Politics) 2009, the most common reason for the reprocessing of oil waste is not in the small amounts of produced and collected petroleum, it is in the lack of processing capacity. Under an economical point of view, the investment in infrastructure of the petroleum wastes reprocessing is considered high in some countries. Country as Lithuania mentions the "mediocre" quality of the used picked up oils, difficult the recycling. According to the legislation of Slovenia, it treats the regeneration and the co-incineration of used oils as good reuse options, however, there is little amount of used oils by regeneration. Countries as Romania and Spain, consider the lack of capacity of the oily waste

regeneration, as technical impediment. In the United Kingdom, in the regeneration issue said there to be a disparity between the criterion wastes concept and its extinction.

Brazil according to SINDIRERREFINO (2009) falls to the re-refiner the promotion and popularization of the re-refine. For ANP (National Agency of the Petroleum), for IBAMA (Brazilian Institute of the environment) and for CONAMA, the social participation is distant among the members of the reverse chain, in other words, the sections involuntarily belong to the merchants and to the consumers.

The oily waste is a material that globally has similar physical-chemistry properties, however with different forms of management. When dealing of control, each country defines its legislation, besides the interaction of responsibility about the return of this waste.

## **2.2 Panorama of the Oily Wastes Geration in Brazil, the United States and Europe.**

The production of lubricating oil in Brazil is approximately 1 billion liters a year (ADVICE IN MAGAZINE, 2005). This volume, about 650 million liters a year are consumed in motors burning or in other uses, in other words, they are not susceptible to recovery. Of 350 million liters/year that are used, but not consumed in the thermo mechanical processes of the motors activity, 69.2% are recycled through re-refine, in other words, 240 million liters/year. Data of 2004 reveal that in that year 240 million liters of used oil were collected, about 24% of the lubricating oil marketed in the country. The volume of used oil collected in 2004 made possible the processing of 170 million liters of basic oil re-refine (CEMPRE, 2005; ESCOREL OF AZEVEDO, 2002).

In Europe, 50% of the marketed oil comes back for the reuse (ADVICE IN MAGAZINE, 2005), while in Brazil, which proportion just arrives to 24% (CEMPRE, 2005).

In the United States, every year are generated 5 million m<sup>3</sup> of used oil approximately for 9 million m<sup>3</sup> of new lubricating oil, only 57% of this used oil are directed for the reuse. It is considered that 2.1 million m<sup>3</sup> of used oil come back to the environment every year in an inappropriate way in this country (FUCHS, 2003).

### **3. Management of the Oily Wastes in 08 Countries**

The table 2 demonstrates the administration characteristics of the oily wastes in 08 countries, pointing the legal, environmental and operational issues, besides highlighting variables that favors in the administration activity development.

**Table 2: Characteristics of the Administration Programs of the Used Oil**

Countries	References	Characteristics of the Administration Programs of the Used Oil
France	Study of Used Motor Oil Recycling in Eleven Selected Countries” by the Used Oil Working Group November 1997, API.	78% of picking up of used oils; programs financed by the government and the rates are imposed to producing of unrefined lubricants, 42% of the used oil are re-refined by the government, being the rerefine destined to the associations.
Germany	Ibid	94% of the oil are recovered, there is a high level of the consumers' interest in the recycling, all the used oils are treated as dangerous wastes; all the merchants of petroleum should provide easiness of collecting near establishment of the retail; retailers pay to catch the used oil; 41% of motor used oils are re-refined; 35% burned in cement ovens and 24%, processed and burned in other applications, recovering 48% of the total lubricants oils sold.
Japan	Ibid	In the program of national level recycling; there are subsidies / financing; essentially in the market no Japan DIY; a high percentage of used oil motor is recovered, treated and burned for the heating value; the re-refine is very limited.
Italy	Improving Market for Waste Oils” by David Fitzsimons, Oakdene Hollins LTD, page 57.	The obligatory use of re-refined oils in motor oils; six re-operation of refining facilities; financed by the taxes on the oil lubricants sales; gatherers and re-refiners both subsidized; only 10% of used oil can be taken for cement ovens, 18% of used oil are re-refined; the Government decided that the used oil products with tenor of re-refined oil for the government's use; besides picking up 33% of the total of lubricants sold.
Australia	Ibid	Elevated subsidies for the re-refine, subsidies for low burning oils of the low degree; no degree; none for recovered industrial oils; picking up 81% of the available petroleum, US\$ 10 million financed by the Brazilian government to subsidize the recycling; revision of the incentive re-refine down; picking up 38% of the total of lubricants sales.
Alberta Canada	Ibid	Little emphasis in the prevention of contamination; little emphasis re-refine; financed for imposed on the sales, recovering 51% of the total lubricant oil sold.
United States of America	U.S. Department of Energy	States-members implemented a wide range of recycling programs, some States-members impose sales rate to subsidize the recycling, some states classify used oil as dangerous residues, preventing any illegal discharge, in some municipal districts places exist activities of fundraising, signs of fast growth of the facilities lubricant that it has been producing positive results, reducing the oil discarded inadequately for oil exchangers; the small refining industry; disposition of used oils as fuel are motivated; the United States don't have any central coordination organ that concentrates on the administration of used oils statistics of the similar industry to Europe, therefore, they are not easily available. The USA don't have an obligatory federal politics that demands the preferential acquisition of refined re-oil and not to promote the reduction in the source and the recycling of the materials about its treatment (including burning as fuel) and elimination, under the Conservation of Resources and the Law of Recovery and Pollution Prevention Act
Brazil	CEMPRE	The current Entrance 127/99 of ANP determines that 30.0% of the volume of marketed oil are collected and destined to the re-refine, industrial process that transforms the used oil in basic oil, main raw of the ended lubricant production The differential of the used oil not collected yet, is usually burned in substitution to the fuel oil or used for countless illegal applications or still spilled in the nature. In Brazil, from October 2001 became obligatory the collecting of 30% of oil of the marketed volume. The Resolution CONAMA 09/93, was revised recently by a Group of Work and suffered deep alterations, becoming effective the Resolution Conama 362/2005, that still has become more severe the punishment for the noncompliance of the relative norms to the administration, collecting, transport and re-refine of the used oils.

**Source:** Adapted by U.S Energy Department Energy. Fossil Energy Office, 2006.

The table 2 shows, countries as Germany, France, Italy, besides having the incentive programs to the reuse of the residues, demonstrate the most expressive use for other purposes that it is not the re-refine. The Resolution CONAMA 362/05 considers the re-refine as process of the smaller environmental impact, in other words, even these countries not addressing the residues for re-refine, they can be impacting the environment in other ways.

Australia has politics similar with the one in Brazil, the government through legislation imposes the return of the waste for the re-refine, it is worth to point out the subsidy of the Brazilian government to this country, characteristic that can be shared with the United States, when it is spoken about the government participation in these issues, on a side the subsidies, of the other, legislation imposing the collecting.

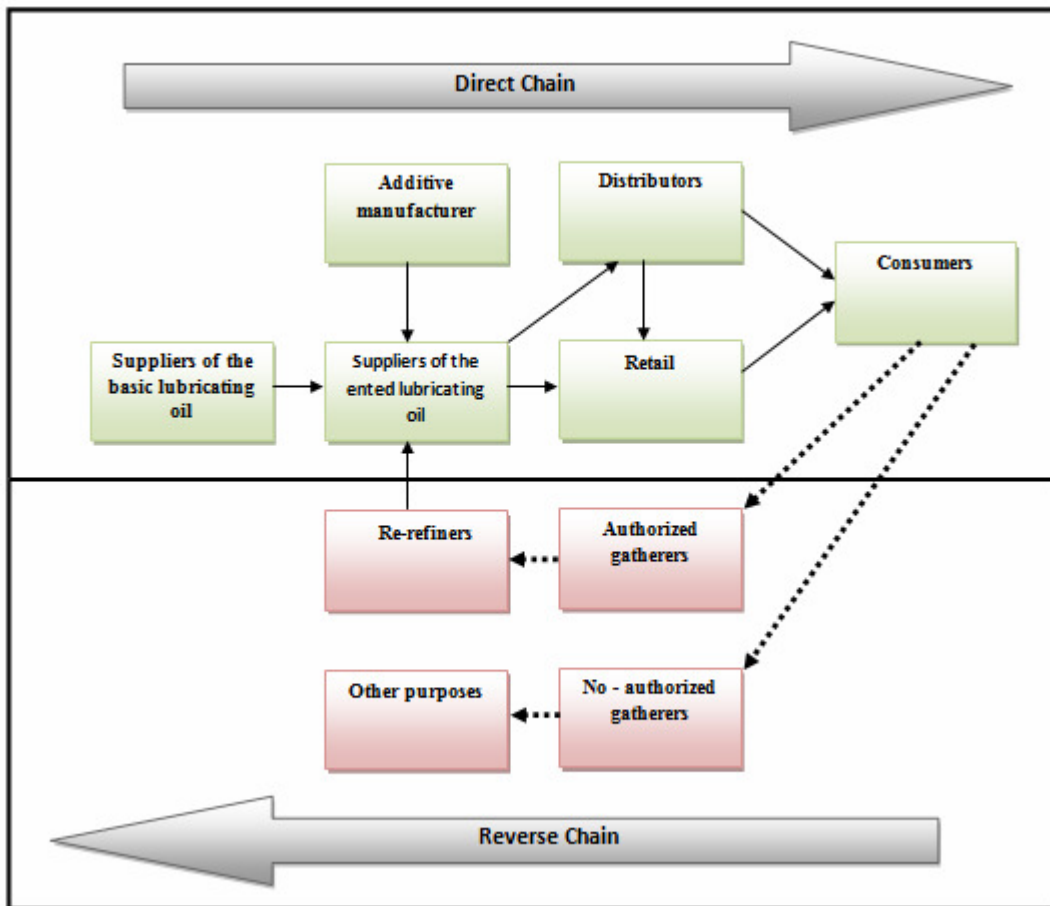
Countries as Germany and Italy, interact themselves strongly with the reverse chain management of the oily waste, compared with Brazil, where there is little interaction of the chain yet. Brazil stands out in laws that punish the incorrect destiny of this residue severely. This reality doesn't impel an efficient return, could be evidenced in the return percentile, factor that is directly linked to the little review about the generating establishments.

The reverse logistics is looked for understanding how works in practice, pointing out the actors and the processes involved in the recovery of the product value. The actors can be differentiated on whom returns, receives collecting and processes the material. Any part of the chain can be responsible for the devolution, including consumers. The receivers can be found along the chain of supplies (suppliers, manufacturers, wholesalers or retailers). Then there is the group that collects, and that can be intermediate independent, such as: specific companies of recovery, suppliers of

services of reverse logistics, collecting companies of municipal wastes, public and private foundations created to help in the recovery. Finally, the processors, that are responsible for the transformation in a new product that will come back to the market. In the general, different structures appear for the several recovery options, because each actor has different objectives. The re-refine can, for instance, to be done by private companies responsible for the process. In this case the companies are responsible in the first stage of the collecting, being addressed by ethical, economical and legal aspects. It can, thus, characterize four logistics reverse processes involving the recycling: the collecting, the combined process of inspection, selection and screen; the reprocessing; and the redistribution.

Several measures adopted in the defense lubrication activity (motors) demand responsible management on the oily waste, due the risks to the environment that it presents. Regulated by specific legislation, the transport and storage of that waste are carefully supervised by the federal and state government.

Figure 1 shows the channel reverse the lubricating oil, for best to understand the management of the oily wastes.



**Picture 1:** Direct Channel and Reverse of the Lubricating Oil

**Source:** Adapted by Beamon, 1999.

The physical flow of the lubricating oil begins in the production generated by the refiners. Besides those generating sources, there is the import and re-refine through some companies.

Those chain beginners are supplying of the basic oils, reviewed for the suppliers of the ended oil lubricating that accomplish the additive of chemical substances, seeking to assist the use specifications, in agreement with its destination. Then, the ended oil is sent to the market to be sold by dealers or even in the retail.

In the reverse flow, it passes by the consumers, reviewed by the authorized or not authorized collectors, with final destiny for the re-refine and other ends.

Through analysis of the flow and reverse and the process of the oily wastes management of the 08 countries mentioned in the table 2, it can be understood the generated contribution by each country in relation to the residue return, and the development of this waste management:

In France, most of the residue return is addressed to the producing of raw lubricant, besides they be subsidized by the government of this country, in this case 42% of the used oil is re-refined by the government. Considering the reverse flow, the performance of the residue return, become solidarity responsibility, with the manufacturer, however the government has a larger share in the recovery of the oily residue.

In Germany, 94% of the oil are recovered, because there is interaction with all the chain actors of reverse distribution, being compared to flow of the illustration 1, it is noticed, in this case, besides the re-refine, this country addresses the waste for other purposes. The use for purposes (example: burning in boilers) that is not the re-refine can provoke environmental impacts, such as: effect stews, contributing with the global heating.

Japan considers the re-refine very limited, the recovery is limited to the retailers, in some cases, and they own promote the recovery of the residue.

Italy forces the consumer the use of the re-refined oil, the refining facilities are subsidized by the taxes on the sale of the lubricating oil, in this case the subsidy is valid for both the collector and the re-refiner the government collects 33% of the sold oil, besides using products with content of re-refined oil. Comparing with the reverse flow, the government has an expressive participation in the return of the oily residue.

In Australia there is a strong performance on the re-refine, it accomplishes partnerships with other countries, subsidizing the recycling, and in this case 38% of the total of oil lubricants sales is collected. As the flow of the illustration 1 demonstrates, the performance on the return is more concentrated in the used oil re-refiners and recyclers, besides being subsidized, there are investments coming of other countries.

Alberta / Canada concentrates most of the recovery on the retail, through financing of taxes on the sale.

The United States have a strong performance on the oily waste discard, besides promoting some subsidies, however it doesn't contain a federal politics for the use of the re-refined oil, it is noticed that a strong performance in every chain, besides the control of the government, promoting very little to reduce the consumption in the source of the lubricating oil generation.

In Brazil, the re-refiners participation is larger in the reverse chain, imposed by the resolution CONAMA 362/05, where finishes the 30% return of the oil volume marketed in the country, thus, the consumer, collector and the re-refiner, have legal responsibilities on the management of this waste. Different from other countries, there are not subsidies for such activities, and also demands of the re-refined oil consumption. When it comes to legislation, Brazil points out for involving the whole direct and reverse chain in the responsibilities of the oily waste management.

The analysis allows us to understand the participation of each country about the reverse management of the oily waste, visualizing the economical, legal and social interests.

#### **4. Final Considerations**

The importance of the reverse chain management, helps in the recovery of the assets and services value, cleanings in the distribution channels, it allows the return of the materials economically. In the case of the oily residue, it is noticed lowers effectiveness in the management actions, in order to reach the inserted benefits in the development of the reverse logistics.

Before the current environmental problems, it is pointed out the importance of developing tools that perfect the return of this waste in the production chain.

In the environmental issues, the reverse logistics supports the discard and management of polluting materials that, in a broader perspective, includes logistic activities of emission reduction, recycling, substitution, reuse of materials and discards. The priority is addressed in the environmental issues; however natural resources are running out, what demonstrates through analysis, an interest discrepancy of each country generator of this waste.

The countries know about the importance of the control on the oily waste, when it recognizes its environmental impacts and classifies the oily waste as highly dangerous, however, different forms of managing the waste are demonstrated in the context of the reverse logistic variables (legal, economical, social and operational).

It should enhance studies that make possible the reverse chain, prioritizing the environmental issues, to develop new interaction formats, with all the participants' of the direct and reverse chain distribution involvements and change management experience with other countries.

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