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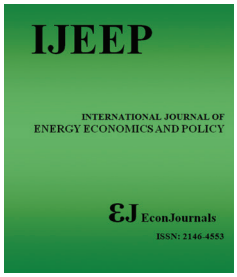

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Oil Tax, Subsidies and Extended Producer Responsibility in the Used Oil Market

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ABSTRACT

The Spanish used oil market has evolved largely in response to regulation and the application of economic incentives as subsidies or tax exemptions for the recovery and re-refining of used oils. Since 2006, extended producer responsibility (EPR) has been applied to the used oil market by an integrated management system (namely, SIGAUS). This study aims to examine the regulation from the 1960s to the present from the perspective of the funding regimen for used oil management. In addition, this study also analyzed the Spanish used oil market based on the evolution of the recovery rates of used oils and the re-refined lubricating oil regarding oil lubricant consumption. In turn, EPR assumes a stable financial system for used oil management. Currently, EPR serves for a new funding mechanism indexed to the international quotation of lubricants.

Keywords: Used Oils, Oil Tax, Subsidies, Extended Producer Responsibility, Funding
JEL Classifications: H21, Q35, Q48

1. INTRODUCTION

Used oil is hazardous waste that includes mineral or synthetic lubrication or industrial oils that have become unfit for their initially planned uses. The inadequate management of waste oils can cause significant negative impacts[1]. Used oil is reused by re-refining, a recycling operation in which base oils are produced by refining waste oils or by burning them to recover energy[2]. As a result, the market for used oils in Spain has largely evolved. In the oil monopoly, the regulation of used oils aimed to provide oil resources and excise oil equities. In this stage, the oil price shock in the early 1970s did not translate into oil derivatives prices until 1979[3]. Moreover, the oil tax was established in that year by Law 39/1979, of November 30. Since 1986, under EU waste regulation, the objective of waste regulation was to increase the recovery and re-refining rates of used oils using economic incentives as subsidies or oil tax exemptions. Furthermore, after the lubricating oil market was liberalized, budgetary constraints to guarantee the financing of interventions in the market for used oils emerged. Subsequently, waste policy aimed to provide a stable financial system for used oil management. The Spanish Used Oil Management Act (Royal Decree 679/2006, of June 2), which mandated extended producer responsibility (EPR) in the management of used oils, set the recovery and valorization rates of used oils to 95% and 100% for used oils affected by royal decree on July 1, 2006. Moreover, royal decree set the refining rates at 55% and 65% those of regenerable used oils, respectively, beginning in 2007 and 2008. As a result, manufacturers of lubricating oils in Spain constituted an integrated management system (IMS), namely, SIGAUS, to finance the management of used oils. This study aims to examine the regulation of the Spanish used oil market from the perspective of the funding regimen for used oil management. In addition, the Spanish used oil market is analyzed based on the evolution of

1 One liter of used oil can pollute up to 1 million liters of water; the uncontrolled burning of 5 liters of used oil can cause air pollution for as long as three years; and a spill of 1 liter of engine oil in a body of water can pollute an area as wide as 4,000 m2 (Torras, 1999).

2 The re-refining process involves the removal of pollutants, oxidation products, and additives from such oils (Angulo et al., 1996; Llobet Diaz, 1995; Gómez-Miñana, 1993; Ramsden, 1995). According to the Environmental Protection Agency (EPA), two liters of re-refined oil yields three liters of used oil, whereas 100 liters of oil is required to obtain the same amount of base oils (EPA, 1989). Moreover, it is estimated that every ton of re-refined oil prevents three tons of CO2 emissions from being released into the atmosphere (SIGAUS, 2016).

3 Santamaría (1988: 23).

the recovery rates of used oils and the re-refined lubricating oil regarding oil lubricant consumption.

Currently, policies to reduce the amount of waste generated and to increase recycling are differentiated by those that imply the definition of responsibilities—either of the producers or of all parties involved—and policies involving market intervention through regulation and economic instruments. Systems of payment based on the quantity of generated waste promote the internalization of these costs and the production of the optimal amount of waste, but this policy also generates a clear incentive for illegal dumping and incineration (Jenkins, 1993). Alternatively, to reduce the amount of waste to be disposed of, economic analysis considers policies that promote recycling, such as deposit-refund systems, which are defined as a combination of a product tax and a recycling subsidy, taxes on natural raw materials, recycling subsidies or recycled material standards (RMS). Several authors (Dinan, 1993; Fullerton and Kinnaman, 1995; Sigman, 1995; Palmer and Walls, 1997; 1999) have noted that the deposit-refund system is the most efficient policy to reduce the amount of waste to be eliminated because it combines the two effects that characterize a Pigouvian tax: The reduction of the product and the substitution of natural inputs by recycled inputs. In turn, an upstream deposit-refund system, in which the refund is paid to processors of recyclables and consumers who return materials to recovery centers, could be especially beneficial in this regard (Walls, 2011). In addition, the deposit-refund system is consistent with EPR and product liability, while the tax holds producers responsible for part of the elimination costs and encourages the reduction of waste and, if it is levied on intermediate products, the weights of the products, and the subsidy for recycling encourages the use of recycled materials (Palmer and Walls, 1999).

The RMS, or obligation that the products contain a percentage of recycled inputs in their composition, encourages the use of recycled materials. The RMS can be established individually for each company or for the industry through a system of negotiable permits, conferring greater flexibility and reducing costs (Dinan, 1992; Palmer et al., 1995). However, the cost of the RMS depends on the characteristics by which the permit system is defined. If the number of permits is set relative to the standard, the RMS will be efficient (Sigman, 1995). The study of the Spanish used oil market has shown that an RMS, applied through a marketable permit system, is more efficient than a subsidy because the marginal private cost is lower (Arner et al., 2005). In turn, Arner (2010) demonstrated that the application of EPR in the management of used oils in Spain constitutes an RMS applied through a marketable permit system, which is more efficient than a subsidy. Efficiency analysis applied to the IMS for used oils in Spain reported a producer contribution to the IMS of €60 per ton (Arner, 2017). In addition, it was shown that an RMS, applied through a marketable permit system, is consistent with EPR.

The present study is divided into four sections in addition to this introduction. The second section discusses the classification of the regulations on the used oil market. The third section shows the evolution of the recovery of used oils and re-refined lubricant consumption. The fourth section discusses the funding regimen for used oil management. The last section discusses the main conclusions. Finally, Annex 1 includes a compilation of legislative references.

2. THE REGULATION OF THE SPANISH USED OIL MARKET

The regulation of the Spanish used oil market, based on economic purpose and instruments that characterize interventions, may be differentiated among three stages: The oil monopoly, the transitional period of market liberalization and the market liberalization stage (Table 1).

2.1. Oil Monopoly Stage

Royal Decree-Law 1142/1927 of June 28, regulating the oil monopoly, attributed imports, industrial handling, storage, distribution and sales of liquid mineral fuels and derivatives to the monopoly, with jurisdiction over the peninsula and the Balearic Islands. The Arrendataria Company of Oil Monopoly (CAMPSA), formed by a consortium of domestic banks, was awarded the Monopoly Administration Service by Royal Decree 113/1928 of January 10. Subsequently, the Law of July 17, 1947, on the reorganization of the monopoly constituted it as a state agency under the decentralization of services and ownership of the shares transferred to the CAMPSA. Accordingly, issues that the state explicitly regulates were limited to part of the supply of crude oil, for strategic reasons of national security, and to the marketing and distribution of derivatives for reasons of tax recovery (Santamaria, 1988). In addition, the importation of oil was undertaken by the oil companies[4]. Consequently, the economic purposes for which interventions were planned ensured the supply of oil products. Moreover, the oil monopoly collected excise oil equities and oil monopoly equity (OME), or the net income of the monopoly, for the treasury.

The regulation of oil market is embodied in authorizations to install refineries and fixing prices. In 1929, the first refinery in Spain was established by the Spanish Company of Petroleum (namely, CEPSA) in Santa Cruz de Tenerife on the margins of the monopoly because of its geographic location. The refineries authorized to produce lubricating oil from 1947 to 1968 were REPESA in Cartagena (1949), ENCASO in Puertollano (1965) and ERT in Huelva (1967). The refined lubricants were manufactured by these refineries, CAMPSA and independent producers[5]. The substantial increase in the production of used oils in the Spanish economy justified the establishment of companies to manufacture base oils from used oils, and re-refining was also expanded by technological changes introduced into the re-refining process

4 Decree-law of April 5, 1957 allowed imports of oil derivatives by private and public entities that were so authorized, except for a forced share. In 1970, lubricants imported by the monopoly constituted approximately 3% of imports of petroleum products and corresponded to white oils and other specialty oils (CAMPSA, 1971).

5 These companies are independent producers comprising manufacturing companies that acquire base oils for the finishing of lubricating oils. The major companies are Agip, Bardhl, Castrol, Elf, Esso, Fina Iberian, Fuchs Lubricants, Kraft, Fl Iberia, Mobil oil, Iberian Motul, Pennzoil Products Mediterranean, Petrogal, Shell, Texaco, Total, and Verkol.

Table 1: The regulation of the Spanish market for used oils

Stage	Purpose	Instruments
1. The oil monopoly, 1927–1985		
	Ensure the supply of oil derivatives	Installation authorizations/setting of quantities
	Provide excise oil eqitities/OME	Pricing/equity/oil excises
2. The transitional period of market liberalization, 1986–1992		
	Liberalize oil market	Regulation leading to liberalized internal and external markets for oil
	Increase used oils recovery rate	Rules on the recovery, treatment and disposal of used oils
	Provide oil excises	Economic incentives (subsidies, oil tax exemption)
3. The liberalized lubricating oil market since 1993		
	Increase used oils recovery rate	Rules on the recovery, treatment and disposal of used oils
	Increase used oils re-refined rate	Economic incentives (subsidies, oil equities)
	Funding	ESR

Source: Own source. OME: Oil monopoly equity

(ULIBARRI in Madrid, OLIVOL in Sevilla, LUDESA, in Martorell and PETROLEV in Valencia)[6]. The acquisition by CAMPSA of re-refined oils, unlike the production of first-refined oils established each year by the government in the national oil plan, was subjected to the evolution of sales of this type of oil established in certain initial stocks[7].

2.2. The Transitional Period of Market Liberalization

Pursuant to the Treaty of Accession of Spain to the European Communities in 1985, by Royal Decree-Law 5/1985 of December 12, on the adaptation of the oil monopoly, the distribution of industrial lubricants was liberalized beginning January 1, 1986. In addition to a transitional regime for base oils and lubricants for automotive, refining and re-refining, oils were provided by Royal Decree 2644/1986 of December 30, which regulated the transitional period, liberalized prices and other conditions of sale beginning 1987 while maintaining authorization by the Delegation of the Government in CAMPSA of the quantity marketed by each manufacturer or distributor until January 1st, 1989. Pursuant to Art. 48 of the Accession Treaty, exclusive rights to the import of base oils were abrogated by the gradual opening of import quotas, increasing from January 1, 1986, until full liberalization of the foreign market on December 31, 1992. The oil monopoly was derogated by Law 34/1992 of December 22, thus organizing the oil sector.

Moreover, since the mid-1970s, directives on waste and waste oils in Europe were approved. Council Directive 75/439/EEC of June 16, 1975, on the disposal of waste oils, inaugurated the European Union policy on waste, establishing bans leading to preventing the dumping and uncontrolled deposit of waste oils while requiring their collection and treatment for reuse. In turn, the law provided for the granting of compensation for the collection or treatment of waste oils. Subsequently, it was modified by Council Directive 87/101/EEC of December 22, 1986, which ranked types of treatment of waste oils and prioritized re-refining, failing combustion with heat recovery and, finally, destruction or controlled storage. Additionally, Council Directive 78/319/EEC, of March 20, 1978, repealed by Directive 91/689, referred to management requirements for toxic and hazardous waste.

In Spain, the implementation of EU hazardous waste directive was affected by Law 20/1986 of May 14, Basic Law on Toxic and Hazardous Waste, and Royal Decree 833/1988 of July 20, which approved the regulations. Law 20/1986 required that the polluter pay a principal set out by Council Directive 75/442/EEC of July 15, 1975, on waste. In the Order of February 28, 1989, on the management of waste oils, the Ministry of the Ministry of Public Works and Urbanism, by Directive 75/439/EEC, transposed and regulated subsidies and authorized the burning of waste oil after it was declassified as hazardous waste. The Order of June 13, 1990, expanded subsidies to energy recovery from used oils. Consequently, under EU legislation on waste, the regulation aimed to correct for the external effects of dumping and inconvenient management of waste oils. In addition, interventions were extended to the authorization of the combustion of used oils and the use of economic incentives as grants.

2.3. The Liberalized Lubricating Oil Market Since 1993

Since 1993, the aim of used oil regulation was to increase the collection rate through using economic incentives as subsidies or tax exemptions. Arner et al. (2006) reported that the extension of the recovery sector and diversification of the reuse of used oils, using subsidies and taxes increased the recovery rate of used oils in the 1990s. The exemption from the oil tax of used oils used as fuel was approved in 1995 to ensure the economic viability of energy recovery plants with electricity production (Art. 51.4 of Law 38/1992, 28 December). The special regime of electricity production, regulated by Royal Decree 2366/1994, of December 9, from the Ministry of Industry, consists of the right to sell the final electricity production at the average market price plus a bonus or incentive. As a result, the collection rate increased to 87% in 2000. Finally, Law 10/1998 of April 21 on waste, transposed into national law Directive 91/156/EEC of March 18, 1991, prioritizing the reduction of other waste management options. In 2000, stricter limits on the activities of energy recovery from waste oil were set by Directive 2000/76 EC of December 4, on the incineration of waste. This regulation was transposed by Royal Decree 653/2003 of May. Moreover, the Council Decision of March 12, 2001, established the exemption of waste oils used as fuel and was applicable until 2007. Law 36/2006, of November 29, repealed

6 All the re-refining companies used the Meiken process, although ULIBARRI in 1977 modified its process to the TDA process.

7 Convention of 31 October 1962, entered between CAMPSA and OLIVOL, SL, and Convention of June 27, 1963, entered between CAMPSA and ULIBARRI, SA, for the recovery and regeneration of waste oils (not published).

this exemption. Accordingly, the rate of used oils intended for re-refining reached 65% in 2005.

In 2006, the Spanish Used Oils Management Act established EPR in the management of used oil. As a result, EPR replaced the subsidies policy for the purpose of financing the used oils market by the payments that lubricant producers contributed to SIGAUS in the amount of 60€/ton of lubricants sold. Moreover, the obligation to prepare an enterprise prevention plan, to establish measures to prevent the environmental impact of industrial oil waste, to reduce its generation and to facilitate its recovery, preferably through regeneration or other forms of recycling, and to incorporate regenerated base oils in its composition was imposed. Currently, the second plan (2014–2017) is in force. The application of EPR to other wastes, such waste electrical and electronic equipment, by Royal Decree 110/2015 of February 20, has meant a new distribution of responsibilities regarding waste oils. In 2016, the market share of SIGAUS was modified from 87.13% to 87.15%[8]. Additionally, stock fraud voluntarily assumes SIGAUS was modified from 2.89% to 1.41%. Therefore, SIGAUS's financial responsibility of used oils subject to Royal Decree 679/2006 was 88.56%.

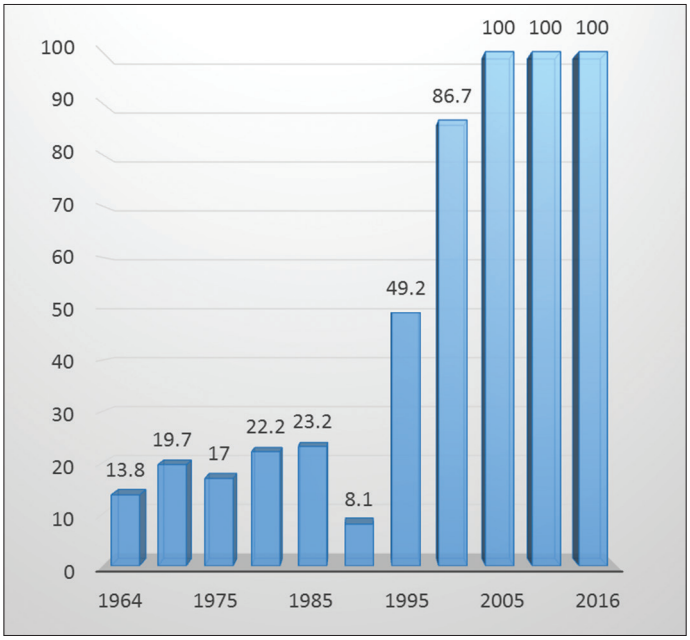
The Waste Framework Directive, or Directive 2008/98/EC, which incorporates EPR, repealed Directive 2006/12/EC of April 5 on waste (the codified version of Directive 75/442/EEC as amended), Directive 91/689/EEC, and Directive 75/439/EEC, providing for a general framework for waste management. Accordingly, EPR is one of the means to support the design and production of goods, and it considers and facilitates the efficient use of resources during their whole life cycles without compromising the free circulation of goods on the internal market. Moreover, the EU action plan for the Circular Economy recognized differences in the financial contributions paid by producers under ERP schemes on the basis of the end-of-life cost of their products to encourage better products design[9]. In Spain, Law 22/2011 of July 28, on waste and contaminated soils, transposed national law Directive 2008/98. Additionally, Law 5/2013, of June 11, transposed Directive 2010/75/EU on industrial emissions, repealing Directive 2000/76/EC. Currently, used oils are again regulated by the State Plan Waste Management Framework (2016–2022) includes among its objectives the establishment of a common legal framework for the implementation of EPR.

3. THE RECOVERY RATE OF USED OILS AND LUBRICANT CONSUMPTION

3.1. The Recovery Rate of Used Oils and Used Oils Intended for Different Uses

Figure 1 shows the evolution of the recovery ratio, or used oils collected of used oils produced, in the period 1964–2016. Although it is generally accepted that the amount of used oils generated reached 50% of lubricant consumption, in 1998, the Ministry of

Figure 1: The recovery rate of used oils in Spain, 1964–2016



Source: Government Delegation to CAMPSA (various years); CAMPSA Yearbooks; Ministry of Environment resolution of subsidies; Ministry of the Environment (2006); Ministry of the Environment personal communications; and SIGAUS

Environment accepted a recovery ratio between 40% and 44%. Since 2006, the recovery rate of lubricating oils has been subject to Royal Decree 679/2006 of June 2 and collected by SIGAUS. For the period 2007–2016, the amount of used oils generated ranged between 40.8% and 49.5% of lubricant consumption.

In 1985, the recovery rate was higher in European countries in which the EU directives on waste and waste oil, approved in the 1970s, were in force[10]. For the period 1985-1992, the recovery of used oils was mainly a result of the liberalization of the lubricant market. Therefore, the recovery rate in 1991 was less than the recovery rate in the mid-1960s (Figure 1). Consequently, all re-refining companies installed during the oil monopoly disappeared with the closure of LUDESA in 1989 and of ULIBARRI in 1992[11]. The new authorized public and private managers emerged for the collection of used oils act at the regional level, though some were at the supra-regional level (e.g., EMGRISA, RETRAOIL). Transfer centers to store the used oils were used to collect and analyze their basic characteristics and the extent of contamination and to carry out pretreatment to facilitate the reprocessing of used oils at the final destination. Since 2006, SIGAUS, through a management network exceeding 200 management companies specializing in the collection, analysis and treatment of this hazardous waste, valued 100% of used oil recovered throughout the national territory according to extant environmental law.

Recovery facilities initially were large heat capacity installations in which the heat energy from the energy recovery of used oils,

8 New market share according to the consulting firm PwC's independent market study (SIGAUS, 2016a).

9 Communication of the Commission "Closing the loop - An EU action plan for the Circular Economy" Brussels, 2.12.2015 COM (2015) 614 final.

10 The recovery rate was 36% in Italy, 55% in Germany, and 57% in France. In the UK and United States, the rate was 65% (Lohof, 1991).

11 OLIVOL ended production in 1983.

such as cement, brick or ceramic, was used. This activity occurred in almost all regional governments, except in Catalonia. In the Basque Country, Law 259/1998 of September 29, in force until 2013, repealing Decree 216/1994, regulated the management of the use of oil by burning. Since 1995, energy recovery with electricity production has been performed in five plants with a total capacity of 100,000 tons of used oils. This recovery can be differentiated from Process Aureca, as performed by Befesa Group, which accounted for 66,500 tons of used oils[12]. In addition, the Enviroil process was developed by Guascor Group[13]. Energy recovery with the use of heat energy increased the recovery rate to 49% in 1995 and increased energy recovery with electricity production to 86.7% in 2000 (Figure 2).

Subsequently, burning regulation become stricter, the recovery rate of used oils reached 100% in 2002, by the increasing of used oils intended for re-refining. In 2004, certain plants for energy recovery with electric production modified their activities of energy oil recovery to manufacture re-refining. In 2005, use oils intended for re-refining reached 65% of used oils (Figure 2). Today, these plants have generally converted their activities to other environmental services or have disappeared. Catalonia, by Law 6/1993 of July 15 regulating waste, declared the recovery of used oils to be a public service and re-refining to be the only destination for used oils. For this purpose, Catalana d'Olis Residuals, SA (CATOR, SA), in Alcover (Tarragona), was established in 1995[14]. In the 1990s, the companies applying for re-refining in Spain were CATOR S.A. and Aceites Ecológicos during the period 1996–1998. Today, the sector of oil regeneration has reached 197,500 tons as a result the companies applying for re-refining of SERTEGO in Madrid, Murcia, Huelva, and Rioja and PMA S.L. in A Coruña[15]. Additionally, for the period 2000-2007, SANTOIL in Murcia refined used oils[16]. As a result, the new re-refining plants assume that the performance of the Spanish re-refining process has been improved[17].

3.2. Refined and Re-refined Lubricating Oil Consumption

The evolution of the consumption and domestic demand, or consumption added to net imports, of refining lubricating oils allows the differentiation of two stages starting in 1985, when the liberalization of the lubricant market began (Figure 3). Since 2006, lubricating oil consumption has also included re-refined lubricating oil consumption.

During the period 1964–1975, growth in the consumption of refining lubricants reached almost 50%. Moreover, domestic demand mainly exceeded the consumption of lubricants because of lubricating oil imports (Figure 3). Instead, for the period 1975–1985, growth in the consumption of refining lubricants only reached 1.4%, while the expansion of the manufacturing capacity of refined oil lubricants was authorized in 1974 to allocate export production, and lubricant consumption exceeded domestic demand. Moreover, because the distribution of foreign brands was allowed in 1976, the consumption of foreign brand oils during the 1975–1985 period increased by 175%, from 8,679 tons to 23,699 tons, and as a percentage of lubricant consumption from 2.8% to 7.7%[18].

Since the lubricant market was liberalized, BP, CEPSA and REPSOL are the producers of refined base oils in Spain, and the companies that manufacture lubricants are also those that existed in the oil monopoly. Between 1985 and 1990, the consumption of lubricating oil increased to 250,000 tons and domestic demand was almost equivalent to the consumption of lubricants in 1990 (Figure 3). In the 1990s, the consumption of lubricants decreased by 7%. Moreover, at the end of the 1990s domestic demand became higher than lubricants consumption.

The consumption of re-refined lubricating oil increased by 5% during the period 1964–1975. In turn, during the period 1975–1985, the consumption of re-refined lubricating oil increased by 25% exceeded that of refinement. Thus, in 1985, the consumption of re-refined base oils reached 6.9% of the consumption of lubricants (Figure 4). Because burning of used oil is authorized in 1990, the consumption of re-refined oil and its share of lubricant consumption significantly decreased (Figure 4).

Instead, burning regulation become stricter, the consumption of re-refined oil increased to 16.3% of lubricants consumption in 2005. Subsequently, EPR was established the consumption of re-refined oil reached 21% of lubricants consumption in 2015. In turn, since 2006 the consumption of lubricants decreased by 41%. Moreover, the demand for other derivatives decreased (Figure 5). In fact, the consumption of lubricating oil exceeded the domestic demand, but the opposite occurred for base oils.

4. OME, OIL EXCISE EQUITIES AND FUNDING

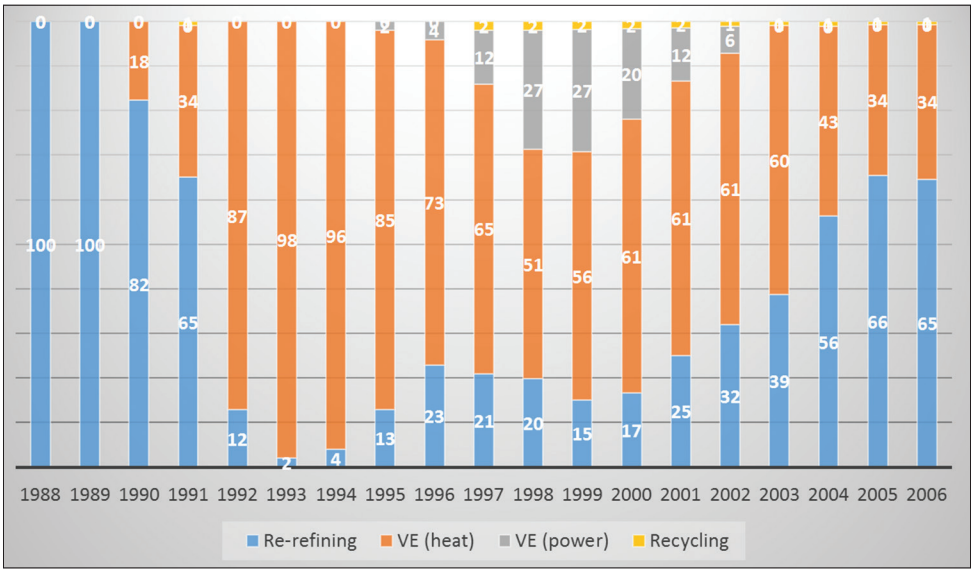
4.1. OME and Excise Oil Equities

The total amounts collected for the treasury by the oil monopoly were the OME and excise oil equities (Figure 6).

The pricing system for the sale of petroleum products is set at the state income to be obtained for each composite ton of products delivered to the monopoly by refineries, and it is distributed to

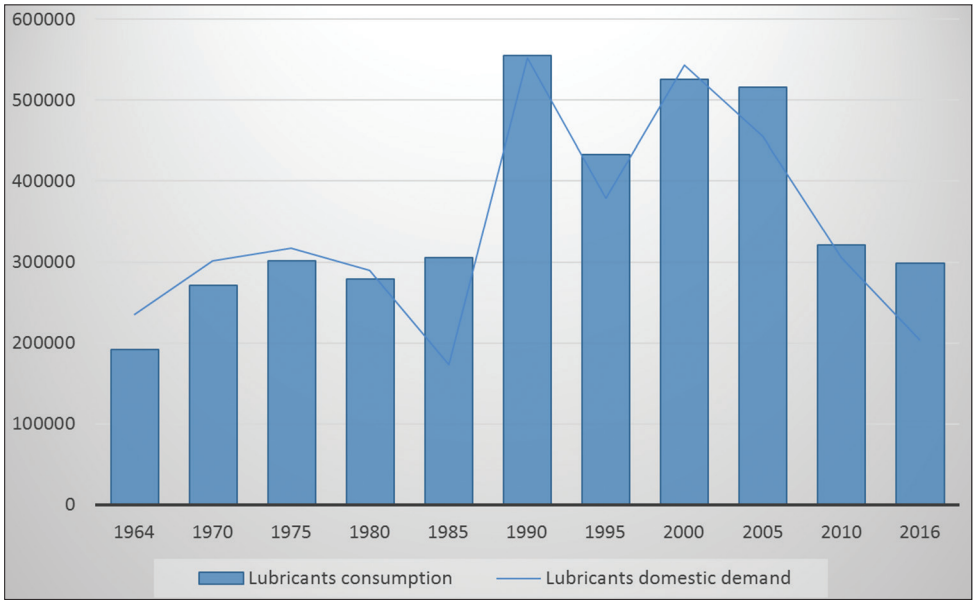
12 Suárez (2000).
13 Tinas (2000).
14 Until 2013, ownership of this service was exercised by CATOR, the capital of which included 90% to GBI services and 10% to the Generalitat de Catalunya through the Board of Waste of the Department of the Environment.
15 www.sigaus.es [Last accessed on 2017 October].
16 GEIR (2008).
17 The Vaxon regenerating process, used by CATOR, involves successive modules of vacuum distillation through a cyclone vacuum, obtaining a yield of 60%, with zero outside plant residue and a low average dimension. The re-refining process of Interline propane extraction, developed in Spain by Interline and SENER Engineering Group in the ECOLUBE – SERTEGO (Grupo Urbaser) plant, is characterized by its application in facilities with not very large average sizes and yields greater than 75%. The PMA company developed its own process involving the pretreatment and fractional distillation of waste to obtain three recoverable fractions (gasoline, fuel and re-refined base oils).
18 The data sources for foreign brands oils were from Pérez (1970), OILGAS, CAMPSA, and a Government Delegation to CAMPSA.

Figure 2: Used oils intended for different uses under the subsidy policy in Spain



Source: Ministry of Environment resolution of subsidies and Ministry of Environment (2006)

Figure 3: Spanish consumption and domestic demand for lubricants, 1964–2016



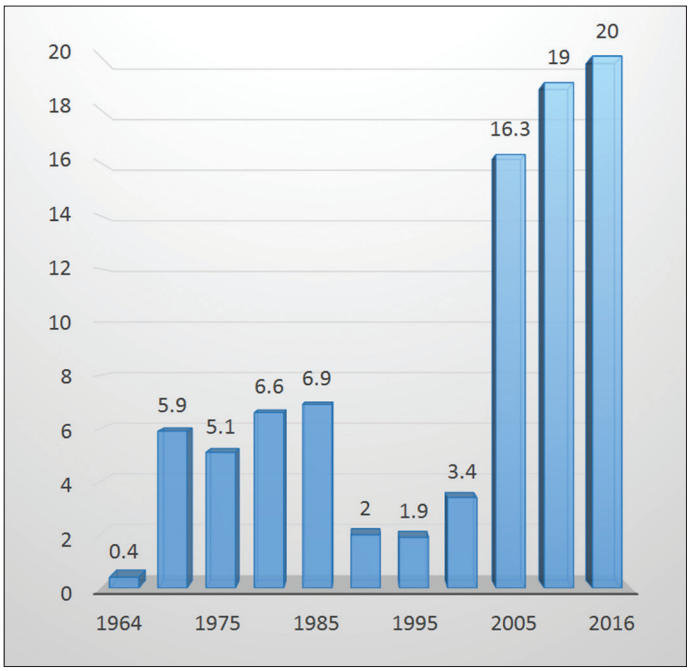
Source: Government Delegation to CAMPSA; CAMPSA Yearbooks; Directorate General of Customs; ASELUBE; ICEX; and the Ministry of Economics

the unit revenue among different products considering the impact of the resulting prices on consumer economic sectors (Sánchez Diezma, 1988). Therefore, the price of retail petroleum products in the oil monopoly was set by the Ministry of Finance based on the ex-refinery price or remuneration from the processor, the operating expenses of CAMPSA, excise oil equities and OME. Therefore, the OME was defined as the difference between the total sales of petroleum products and the costs of crude oil refining and distribution. The sale price of re-refined oils, in turn, was fixed by Order of the Ministry of Finance, June 26, 1964, as a percentage between 70% and 90%, similar to that of first-refined oils. In 1965, the sale price was set at 80% of first-refined oils. Between July 27, 1973, and July 25, 1977, it was fixed at 85%, and from that date, it was set at 80% of the oils for first refining and remained unchanged until 1986 (Order of the Ministry of Finance of 26 July 1973 and of 23 July 1977, respectively).

The ex-refinery prices or purchase prices of the products delivered to CAMPSA were set by the Board of Prices and approved by order of the Ministry of Finance[19]. Subsequently, Decree of the Industry Ministry 418/68, on authorization of scheme refineries, in February 1971 established a new formula by which the price of acquisition products was the average price per composed ton of delivered products, of the Monopoly by refineries, shared among different products according to their international prices (Borrell

19 The Board of Prices was created by Decree of the Prime Minister of October 24, 1952.

Figure 4: The Spanish ratio of re-refined and refined oil consumption, 1964–2016



Source: See Figure 1. A conversion factor of 0.6 is used to calculate the quantity of used oils in terms of re-refined oils until 2006

and Gafo, 1978). In turn, this decree assumed a substantial increase in refining margins. Consequently, the OME decreased with the new formula. Subsequently, the net income of the oil monopoly largely evolved with energy prices (Figure 7). Between 1975 and 1979, unit profit or the monopoly equity by product was positive for petrol, agricultural products, current kerosene, fuel oil A and lubricants and was negative for other fuel oils, being an aggregation of the overall positive benefits for the whole period (CAMPSA, various years).

Law 39/1979, of November 30, on excises, modified the methodology of calculating the OME by Royal Decree 1256/1980 of May 23 by considering, among other expenses, the acquisition of products, 95% of the refining margin and commissions and investments. In addition to the remuneration of CAMPSA, so far consisting of fixed percentages of the net monopoly income and taxes collected, changed to a distribution tariff applied to the quantities of products sold, a percentage of the amount of sales and a percentage of fees collected. In contrast, various expenses could be attributed, including 5% of the refining margin, 5% of sales commissions, total staff costs, supplies and repairs, and transport and freight costs (Delegation of the Government in CAMPSA, 1980). In consequence, the OME was negative in 1980 and 1981 (Figure 6).

Since 1982, Law 45/1981 of December 28, by which the National Institute of Hydrocarbons (INH) was created, including the investments of the oil monopoly, limited the maintenance and development of the network and distribution activities in expenditure items of the state budget and corrected the negative results of variable income in the previous year. Additionally, Law 39/1979 increased taxation by set a rate on lubricating oil of up to €78/ton from €6/ton for lubricating oil. In 1986, the VAT absorbed some of the oil tax reduction, following Law 45/1985, of December 23, on excises, derogating Law 39/1979, eliminating the OME, which constituted 45% of the revenue collected. Subsequently, the Law on the State Budget for 1987 and 1988 set rates of hydrocarbon taxes at €60/ton and €228.38/ton for re-refined and refined oils, respectively.

4.2. Subsidies and EPR

Since 1985, the price of lubricants has continued to decrease as a result of the gradual external liberalization of the market. This reduction is significantly greater for fuel, and since 1990, the price of fuel also decreased relative to the price of oil (Figure 8). In turn, the evolution of the price of lubricants is far different from that of the price of oil and other petroleum products. Undoubtedly, the differences in taxation carried by lubricants and other petroleum products since 1993 have been influential.

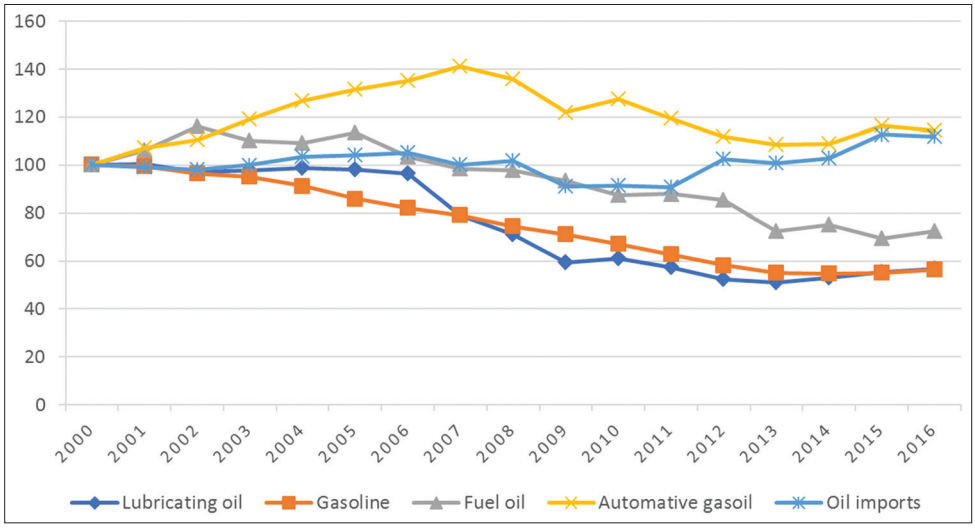
Previously, the automotive and base lubricating oil market was liberalized in 1989, by Order of the Ministry of Public Works and Urbanism of November 30, 1988, the law granted €0.77 million in subsidies to ensure the collection and reuse of used oils. Additionally, the Industrial Waste Plan (1989–1993) provided €10.75 million for the reuse of waste oils. However, in 1992, the Ministry of Environment emphasized the need to find a stable system of funding because of budgeted constraints emerged (MOPTMA, 1993). For that purpose, Law 38 of December 28, 1992, on excises, derogated Law 45/1985 and supported exclusion of the scope of excise duties on lubricating oils, which since 1989 had been set at €30/ton for both refining and re-refining oils. In this stage, the subsidy depended on the quantity of used oils being re-refined. Moreover, no subsidies were granted in 1993, when the price of fuel was fully liberalized.

In addition, subsidies were again regulated in 1994 by Order of the Ministry of Public Works and Urbanism on September 19, 1994. The subsidy for re-refining was fixed at €84.12/ton, from amount 27% (€24.05) was allocated to the operations of collection, storage and analysis and 73% (€66.12) to re-refining treatment and analysis. For the used oil not intended for re-refining, the grant was €42.08, with decontamination treatment prior to final use constituting 43% of the grant (€18.04). The National Industrial Waste Plan (1995–2000) accounted for €35.19 million in waste oil subsidies[20]. In 1996, the subsidy for re-refining was set at €90.16/ton (Order of October 30, 1996). In Royal Decree 2818/1998, of December 23, amended before a special regime, on the promulgation of the Law 54/1997, of November 27, on the electricity sector, by the Order of March 1, 1999, this activity is considered a recycling activity. Since 1998, subsidies to recycling operations have differed from energy recovery, amounting to €54.09 and, in 1999, to €60.12. Of this amount, 40% went to the operations of collection, storage and analysis and 60% to recycling operations[21]. The total amount granted between 2001

20 Incorporated Directive 91/689/EEC was fully transposed by Royal Decree 952/1997 of June 20, amending the Regulation of Law 20/1986 and establishing the classification of hazardous waste according to a list system.

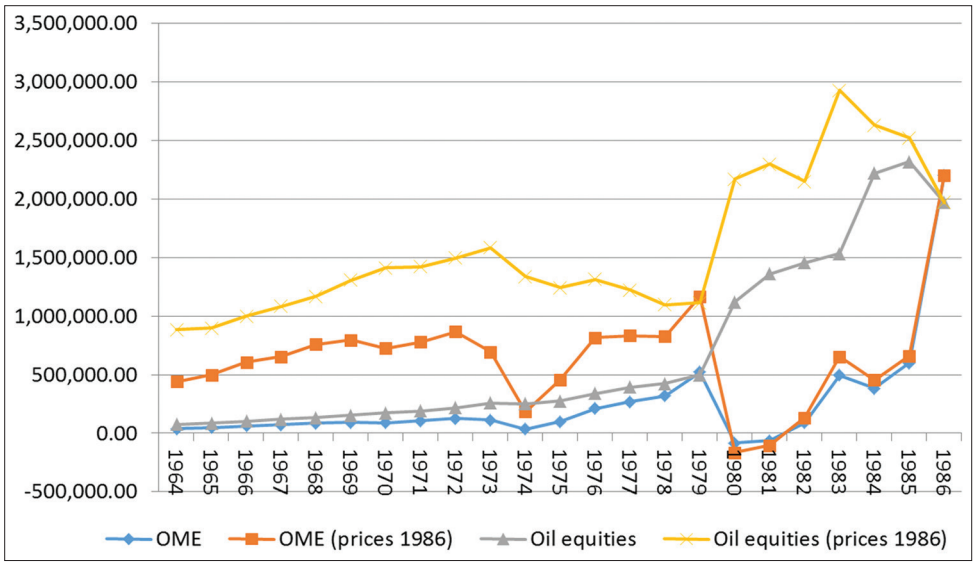
21 Currently, the special regime of electricity production is regulated by Royal Decree 413/2014, of June 6, establishing contributions to investments.

Figure 5: Spanish consumption of oil imports and derivatives (index 2000 = 100)



Source: CORES

Figure 6: OME and excise oil equities collected by the oil monopoly, 1964–1986 (thousand €)*



Source: Government Delegation to CAMPSA. *Prices constant in 1986 are obtained by applying the Consumer Price Index (base 1992)

and the establishment of the Spanish Used Oils Management Act was €56.81 million.

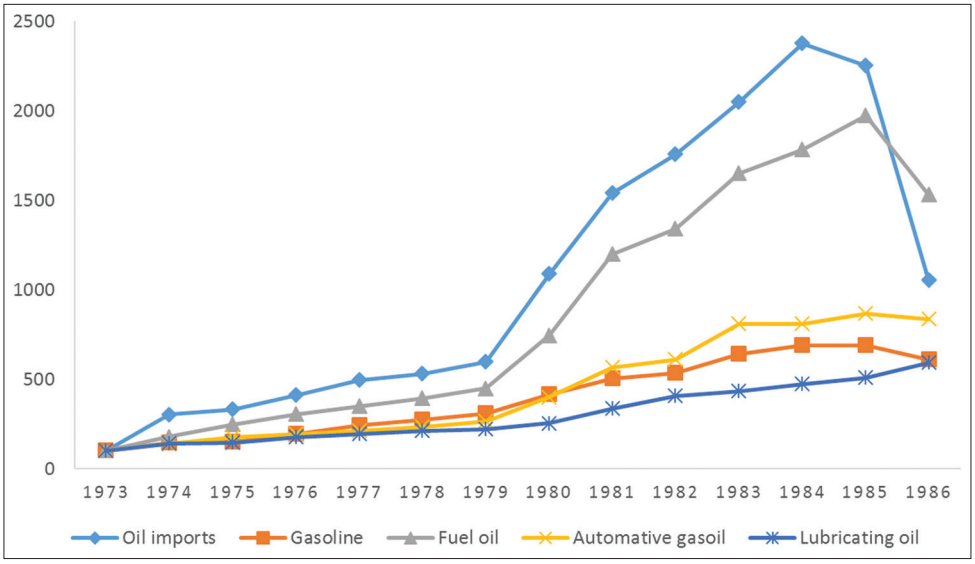
In 2006, SIGAUS assumes a stable financial system for used oil management. The payment that lubricant producers contributed to SIGAUS was established at €60/ton of lubricating oil sold. The IMS for used oils corrected for differences in the prices of lubricants and other derivatives that emerged in the 1990s. However, IMS highlighted the divergence between the prices of oil imports and derivatives. In turn, Spain's oil import and derivatives prices decreased beginning in 2013; therefore, the IMS also corrected for differences between them. In 2016, to protect the recovery and treatment of used oil from the instability of oil prices, SIGAUS established a financing mechanism indexed to the international quotation of lubricants (ICIS, PLATSS)[22].

22 SIGAUS (2016b).

5. CONCLUSIONS

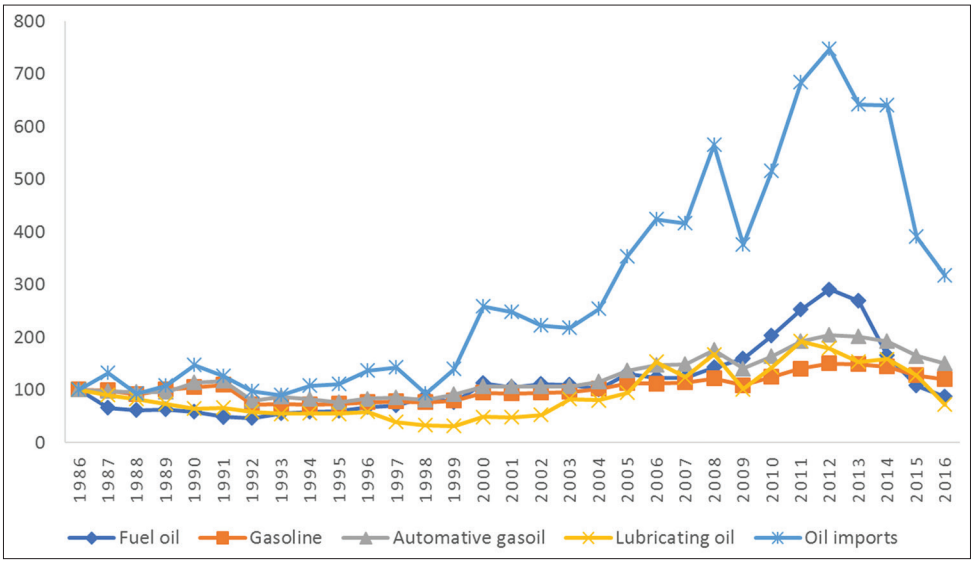
The aim of this study was to examine the regulation on the Spanish used oil market, from the 1960s to the present, from the perspective of the funding regimen for used oil management. This study also analyzed the Spanish used oil market based on the evolution of the recovery rates of used oils and the re-refined lubricating oil regarding oil lubricant consumption. The regulation on the Spanish used oil market may be differentiated among three stages. During the oil monopoly, regulation was intended to ensure the supply of petroleum products and collect excise oil equities. At this stage, the oil tax was also established in 1979. For the second stage, between 1985 and 1992, regulation aimed to liberalize lubricating oil market. In addition, a new oil tax law entered into force in 1985, and the net income of the oil monopoly disappeared. In this stage, lubricants consumption increased 250.000 tons and domestic demand was almost equivalent to the consumption of

Figure 7: The prices for imported oil and derivatives in Spain, 1973–1986 (index 1973 = 100)



Source: Santamaría (1988) and Government Delegation to CAMPSA

Figure 8: Prices for imported oil and derivatives in Spain, 1986–2016. Index 1986 = 100



Source: Government Delegation to CAMPSA (1991); price cap system of the Directorate of Energy for 1992–1993; Oil Bulletin; for lubricating oil, REPSOL (personal communication) and the Ministry of Economics; for oil imports, IEA (2016)

lubricants in first 1990s. Moreover, the regulation on used oil market corrected dumping and inconvenient management of waste oils. For this purpose, burning used oils was authorized and grants for the recovery and reuse of used oils were approved.

Since 1993, the objective of environmental regulation has mainly been to increase the recovery rate of used oils. For this purpose, diversification in the reuse of used oils for energy recovery with electricity production were facilitated by oil tax exemption on used oils using as a fuel in 1995. Moreover, regulation aimed to find a stable system of funding. In this regard, the exclusion of the scope of excise duties on lubricating oils in 1993. Subsequently, lubricants consumption decreased by 7% in the 1990s. Moreover, at the end of the 1990s domestic demand became higher than lubricants consumption. The Spanish Used Oil Management Act (Royal Decree 679/2006, of June 2), which mandated EPR in the management of used oils, set the recovery and valorization rates of used oils to 95% and 100% for used oils affected by royal decree on July 1, 2006. Moreover, royal decree set the refining rates at 55% and 65% those of regenerable used oils, respectively, beginning in 2007 and 2008. As a result, manufacturers of lubricating oils in Spain constituted an IMS, namely, SIGAUS, to finance the management of used oils.

In turn, EPR has been configured as a policy alternative to intervention through regulation and economic instruments for the recovery and re-refining of used oils. In this regard, SIGAUS constitutes an EMR, applied through a marketable permit system, and is more efficient than a subsidy. Moreover, SIGAUS assumes a stable financial system for used oil management. Subsequently, EPR significantly influenced the re-refined lubricating oil regarding oil lubricant consumption. In 2015, the consumption of re-refined oil reached 21% of lubricants consumption. In turn, EPR

corrected for differences in taxation and prices between lubricating oil and derivatives. However, EPR supposed the consumption of lubricants decreased by 41%. Currently, to protect the recovery and treatment of used oil from the instability of oil prices, SIGAUS established a financing mechanism indexed to the international quotation of lubricants (ICIS, PLATSS). Consequently, EPR allows for new mechanisms supporting the funding for used oil management in the context of low oil prices.

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ANNEX

Annex 1: Law index in chronological order

Date	Law
6/28/1927	Royal Decree-Law No. 1142 of June 28, 1927, by which the Oil Monopoly is established (Gaceta Bulletin, on June 30, 1927, no. 181)
1/10/1928	Royal Decree No. 113 of January 10, 1928, approving the agreement between the State and the Leasing Company Petroleum Monopoly, S.A. (Gaceta Bulletin on January 12, 1928, no. 12)
7/17/1947	Law of July 17, 1947, on reorganization of Monopoly (BOE of July 18, 1947, no. 199)
10/24/1952	Decree of Prime Minister of October 24, 1952, establishing a Board for the pricing of supplies to CAMPSA, is constituted (BOE of November 9, 1952, no. 314)
15/10/1964	Order of the Ministry of Finance, June 26, 1964, sent by CAMPSA No. Office. 3565 of the Government Delegation about the same, dated October 15, 1964
3/9/1968	Decree of Industry Ministry 418/68 of March 9, 1968, on authorization scheme refineries (BOE of March 11, 1968, no. 61)
7/27/1973	Order of the Ministry of Finance of 26 July 1973 (BOE of July 27, 1973)
6/16/1975	Council Directive 75/439/EEC of June 16, 1975, on the disposal of waste oils (OJ L 194 of July 25, 1975)
7/15/1975	Council Directive 75/442/EEC of July 15, 1975, on waste (OJ L 194 of July 25, 1975)
7/25/1977	Order of the Ministry of Finance of 23 July 1977. Prices of various petroleum products (BOE of July 25, 1977)
3/20/1978	Council Directive 78/319/EEC of March 20, 1978, on toxic and hazardous waste (OJ L 84, of March 31, 1978)
11/30/1979	Law 39/1979, of November 30, 1979, Excise (BOE of December 6, 1979, no. 292)
12/30/1981	Law 45/1981 of December 28, 1981, the National Institute of Hydrocarbons is created (BOE of December 30, 1981, no. 312)
12/23/1985	Law 45/1985, of December 23, 1985, Excise (BOE of December 24, 1985, no. 307)
12/12/1985	Royal Decree-Law 5/1985 of December 12, 1985, on adaptation Petroleum Monopoly (BOE of December 13, 1985, no. 298), in force until Law 38/1992 is passed
1/1/1986	Treaty of Accession of Spain to the European Communities of June 12, 1985 (BOE of January 1, 1986)
12/30/1986	Royal Decree 2644/1986, of December 30, 1986, addressing the manufacture, distribution and sale of base oils and automotive lubricants (BOE of December 31, 1986, no. 313)
5/14/1986	Law 20/1986, of May 14, 1986, Basic Law on Toxic and Hazardous Waste (BOE of May 20, 1986, no. 120)
12/28/1987	Council Directive 87/101/EEC of December 22, 1986, amending Directive 75/439/EEC on the disposal of waste oils (OJ L 42, February 12, 1987)
7/20/1988	Royal Decree 833/1988 of July 20, 1988, on Regulations for the implementation of the Basics Law on Toxic and Hazardous Waste (BOE of July 30, 1988, no. 182)
12/3/1988	Order of the Ministry of Public Works and Urbanism of November 30, 1988 (BOE of December 3, 1988, no. 290)
2/2/1989	Order of February 28, 1989, management of waste oils, of the Ministry of Public Works and Urbanism (BOE of March 8, 1989, no. 57)
6/13/1990	Order of June 13, 1990, of the Ministry of Public Works and Urbanism, establishing rules for the granting in 1990 of compensatory subsidies for activities of reusing used oils (BOE of June 21, 1990, no. 148)
3/18/1991	Council Directive 91/156/EEC of March 18, 1991, amending Directive 75/442/EEC on waste (OJ L 078 of March 26, 1991)
12/31/1991	Council Directive 91/689 of December 12, 1991, on hazardous waste, repealing Directive 78/319/EEC (OJ L 377/20, of
12/22/1992	December 31, 1991)
	Law 34/1992, of December 22, 1992, organizing oil sector (BOE of December 24, 1992, no. 308)
12/28/1992	Law 38/1992, of December 28, 1992, Excise (BOE of December 29, 1992, no. 312)
7/15/1993	Law 6/1993 of July 15, 1993, on the management of waste in Catalonia (DOGC of July 28, 1993, no. 1776), in force until Legislative Decree 1/2009 is passed
9/8/1994	Decree 216/1994, of June 21, 1994, on the management of the oil used in the Autonomous Community of the Basque Country (B.O.P.V. of August 9, 1994, no. 150)
12/9/1994	Royal Decree 2366/1994, of December 9, 1994, on production of electricity at hydroelectric facilities, from cogeneration, from other resources, and from renewable energy sources (BOE of December 31, 1994, no. 313)
9/19/1994	Order of September 19, 1994, establishing subsidies, envisaged into the National Plan of Industrial Waste, for activities of reusing used oils during 1994, is regulated (BOE of September 22, 1994, no. 227)
10/30/1996	Order of October 30, 1996, establishing subsidies for activities of reusing used oils during 1996, is regulated (BOE of
6/20/1997	November 8, 1996, no. 270)
	Royal Decree 952/1997 of June 20, 1997, amending the Regulations for the execution of law 20/1986, of May 14, 1986, Basic Law on Toxic and Hazardous Waste (BOE of July 5, 1997, no. 160)

(Contd...)

Annex 1: ***(Continued)***

Date	Law
11/27/1997	Law 54/1997 of November 27, 1997, addressing the electricity sector, is passed (BOE of November 28, 1997, no. 258)
4/21/1998	Law 10/1998 of April 21, 1998, on waste (BOE of April 22, 1998, no. 96). Repeals Law 20/1986, of May 14, 1986, and Articles 50, 51 and 56 of the Regulation for implementation of Law 20/1986
10/20/1998	Law 259/1998 of September 29, 1998, on the management of used oil in the Autonomous Community of País Vasco, repealing Decree 216/1994 (BOPV of October 20, 1998, No. 199). In force until 1/1/2013
12/23/1998	Royal Decree 2818/1998, of December 23, 1998, addressing the production of electricity by renewable energy sources, waste and cogeneration, amending Royal Decree 2366/1994 (BOE of December 30, 1998, no. 312)
3/1/1999	Order of March 1, 1999, establishing subsidies for activities of reusing used oils during 1998 is regulated (BOE of March 22, 1999, no. 69)
12/4/2000	Directive 2000/76/EC of the European Parliament and of the Council of December 4, 2000, on waste incineration (OJ L 332 of December 28, 2000)
3/12/2001	Council Decision of March 12, 2001 concerning reduced rates and exemptions from excise duty on certain mineral oils used for specific purposes (OJ L 84/23 of March 23, 2001)
5/30/2003	Royal Decree 653/2003, of May 30, 2003, on waste incineration, applies to new facilities in 2003 and to existing installations in 2005 (BOE of June 14, 2003, no. 142)
11/17/2003	Law 38/2003, of November 17, 20013, on general subsidies (BOE of November 18, 2003, no. 276)
7/8/2005	Order 2191/2005, of June 27, 2005, of the Ministry of Environment, establishing the regulatory bases for granting subsidies for recovery activities, and recovery of waste is set (BOE of July 8, 2005, No. oils. 162)
4/27/2006	Directive 2006/12/EC of the European Parliament and of the Council of April 5, 2006, on waste (DO L 114/15, of April 27, 2006)
6/3/2006	Royal Decree 679/2006 of June 2, 2006, on the management of industrial used oils, repealing the Order of February 28, 1989 (BOE of June 3, 2006, no. 132)
11/29/2006	Law 36/2006 of November 29, 2006, on measures to prevent tax fraud (BOE of November 30, 2006, no. 286)
11/22/2008	Directive 2008/98/EC of the European Parliament and of the Council of November 19, 2008, on waste and repealing certain Directives (2006/12/CE, 75/442/CEE, 75/439/CEE) (DO L 312/3, of November 22, 2008)
7/28/2009	Legislative Decree 1/2009, approves the revised text of the regulation on waste (DOGC, on July 28, 2009, no. 5430)
12/17/2010	Directive 2010/75/EU of the European Parliament and of the Council of November 24, 2010, on industrial emissions by repealing Directive 2000/76/EC (DO L 334, of December 17, 2010)
7/29/2011	Law 22/2011, of July 28, 2011, on waste and contaminated soil (BOE of July 29, 2011, no. 181)
6//2013	Law 5/2013 of June 11, 2013, amending Law 16/2002, of July 1, 2013 and Law 22/2011, of July 28, 2013, are
6/10/2014	modified (BOE of June 12, 2013, no. 140)
	Royal Decree 413/2014, of June 6, 2014, regulating the activity of production of electric energy from renewable energy sources, cogeneration and waste (BOE of June 10, 2014, no. 140)
21/2/2015	Royal Decree 110/2015, of February 20, on WEEE (B.O.E. of February 21, 2015, no. 45)

WEEE: Waste electrical and electronic equipment