

THE WASTE OIL MANAGEMENT PLAN OF CYPRUS REPUBLIC: TECHNICAL AND FINANCIAL ASPECTS OF THE PROPOSED STRATEGY

TH. LOLOS, C. RAPTIS, G. LOLOS, C. TSOMPANIDIS, P. FRAGKAKIS

Enviroplan S.A., 40, Ag. Konstantinou St., "Aethrio" Business Center 15124, Athens, Greece

Key words: Waste Oils, Lubricants, WLO management, producer responsibility, waste to energy

Waste oil is generated from a broad variety of sources within the transportation, construction and industrial sectors and consists of lubricating (motor and transmission oils) and industrial oils (hydraulic and cutting oils). The amount of oily wastes generated in EU – 27 is estimated at 7,4 Mt were 41% of these is recycled or energy recovered every year. Approximately half of waste lubricating oils (WLO) are lost through the internal combustion or through leakages. In Europe there are presently various types of treatment processes in use, the type of which depending on the composition of waste oil.

Waste lubricating oil is hazardous waste as it possesses certain hazardous properties. Oils found in rivers, lakes and streams can threaten aquatic life. Indeed, a litre of waste oil can contaminate a million litres of water. Furthermore, severe soil contamination can result from waste oils being left on the ground. Thus, it is crucial to collect as much as possible this very valuable resource, in order to avoid the contamination of the environment and to be able to profit from the very high recovery potential. The average collection rate in Europe is around 75% and it can be further improved. Industries, consumers, garages and do-it-yourselfers are not allowed to dump oils and are obliged by law to hand them to authorised collectors, ensuring their adequate recovery.

Following the corresponding European Directives waste lubricating oils was regulated in Cyprus as hazardous waste. A milestone in the Cypriot WLO legislative framework was the Law 215(I)/2002 together with subsequent Presidential Decrees. The Cypriot lubricants annual total market is approximately 6.000 tonnes and the main sources of WLO are a) cars and commercial vehicles, b) industrial lubricants and marine oils. The recent current mapping of Cypriot WLO production implemented by ENVIROPLAN S.A. has identified about 2.000 WLO producers including gas stations, garages, worksites, factories, harbours, etc. The bigger volume of WLO is produced in the wider Region of Nicosia (40%), followed by the Regions of Lemessos and Larnaca. In Cyprus, generation of waste oils has shown a slightly increasing tendency during the last years but is expected to decrease in the future for several reasons, such as use of more highly performance oils, use of synthetic and/or biogenic oils that will replace crude oils and the adoption of new technologies that enables lower oil consumption. Until now, the management of WLO is carried out by licensed collectors and two licensed treatment facilities.

This paper describes the proposed integrated management plan for WLO that includes all stakeholders, in order to optimise the proposed strategy as well as to minimize the environmental and health impacts associated with improper disposal of waste lubricating oil. More specifically all lubricants companies operating in Cyprus that produce, import and trade lubricants are compelled to subsidize WLO collection, which is henceforth the responsibility of a collective (national based)

Compliance Scheme for WLO management. The licensed collectors will collect and sell the WLO to the system organization. The National System purchases WLO to licensed treatment facilities, either for re-generation or for energy recovery.

The economic benefit of any project is a vital requirement for its viability. The major costs can be divided into three groups: (1) organization and control costs incurred by the compliance scheme; (2) collection cost and (3) the construction and operational costs of the regional storage facilities.

The annual scheme costs are estimated from 2012, which is expected to be the opening year. It is evaluated 5.600 tons of waste lubricating oils to be collected for treatment. A summary of costs and revenues as a function of the quantity of waste oil collected is presented in Table 2. Cost estimates are based on a detailed evaluation that reflects typical investment costs, interest rates, overhead costs, and transportation costs incurred in Cyprus.

Table 1: waste oils management scheme (Year 2012)

REVENUES		EXPENDITURES	
Fees from lubricating oil producers:	292.500€	Organization and control costs	161.000 €
Sales on Licensed Processors:	156.800€	Collection Costs:	168.000 €
TOTAL	449.300€	Depreciation:	73.000 €
		TOTAL	402.000 €
Fee: 45 € / tonne of selling lubricating oils			
Waste oil sale price from collectors to scheme: 30 € / tones			
Waste oil sale price from scheme to licensed processors: 28 € / tonnes			

The necessary fee on imported lube oil, which is necessary to ensure the financial equilibrium of the scheme, will result in an increase in the price of oil in the order of 3%. While such a relatively small price increase should not affect significantly the lube oil market in the country, the proposed strategy will minimize ecological impacts. The fees amount to about 3% of the total cost of imported lube oil, which should not have a significant effect on the existing market in the country.

The participation of all the stakeholders in the Scheme, it will offer a chance to the public to further realize its responsibility toward a sustainable environment. The strategy provides an opportunity to minimize adverse environmental and health impacts associated with improper disposal of waste oil, which can represent a resource with potential for economic growth. Positive social impacts are expected at many levels as a result of the implementation of the proposed strategy. However, the feasibility of the program depends heavily on implementation and enforcement of proper regulations.