Response to the Productivity Commission

Draft Report on

Waste Management Policy

by
Southern Oil Refining Ltd

Perspectives on Used Oil

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Including research, analysis, and commentary prepared by The Allen Consulting Group

Contents

Executive summary *iii*

Chapter 1 1
Introduction *1*
1.1 Southern Oil Refining Ltd 1
1.2 The Product Stewardship Oil scheme 2

Chapter 2 5
Economic analysis *5*
2.1 Potential applications 6
2.2 Market failures 6
2.3 Life cycle analysis 7
2.4 Summary 9

Chapter 3 10
Issues for consideration *10*
3.1 Preferential support for lube-to-lube re-refining of used oil 10
3.2 The PSO benefit rate for lube-to-lube re-refining 11
3.3 Burning used lubricating oil 11
3.4 Health hazards 12
3.5 Testing of re-refined lubricating oil 12
3.6 Advice of government on used oil 12

Chapter 4 13
Recommendations for the final report *13*

Executive summary

This response to the Productivity Commission's draft report on 'Waste Management and Resource Efficiency' by Southern Oil Refining Pty Ltd has been prepared with significant research, analysis, and commentary provided by The Allen Consulting Group.

Southern Oil Refineries is an Australian-owned company that operates Australia's only used oil refinery facility at Wagga Wagga, NSW. This refinery produces quality base oil products from previously used lubricating oils. This process is referred to as lube-to-lube re-refining, recognising that lubricating oil does not wear out but becomes dirty and contaminated and can be completely restored to its original condition.

The Allen Consulting Group has significant policy experience in waste management issues and conducted an Independent Review of the *Product Stewardship (Oil) Act* in 2004.

Under the Product Stewardship Oil (PSO) scheme, importers and producers of base oils pay a 5.449 cents per litre levy which is used to provide benefits to oil recyclers in order to encourage recycling in a safe and environmentally acceptable manner. The levy encourages the collection of used oil by supporting recyclers. Currently about 40 per cent of Australian used oil is recovered.

The PSO scheme also seeks to ensure that recycling activities do not create harm to the environment or human health and maximise the economic value of the recycled oil. Used oil is classified as a hazardous substance — it is toxic, carcinogenic, poisonous and a potential fire hazard.

Encouraging the recycling of used oil avoids damage to the environment and to human health. Re-refining used oil ensures that best use is made of this valuable resource. Re-refined oils match (or can even exceed) the quality of virgin base oils.

Ideally market mechanisms would determine the end use of used oil by reflecting the different processing options and the value of this material in alternative uses. Used oil would be processed to the point where maximum value added is obtained. Producers would target markets willing to pay the highest price for the processed product. Unfortunately market distortions, information asymmetries and economic spillovers prevent the used oil market from operating in this way.

The options for used oil are burning, with various levels of processing, or re-refining. Re-refining is less environmentally damaging than burning. A recent life cycle analysis by a highly regarded German research institute (IFEU) has found that re-refining produces significantly better environmental and economic outcomes than burning, after considering a number of environmental and resource criteria.

It is therefore argued that:

- Lube-to-lube re-refining should be the preferred means of addressing the issue of used lubricating oils. This view is shared by a number of overseas governments and supported by the IFEU life cycle analysis.

- The $0.50 per litre benefit rate is appropriate and should retain continuing relevancy by being increased by the CPI index. This rate reflects the significant long term capital investment required for lube-to-lube refining. It also covers the greater testing costs required for this product.
- There are health hazards from burning used lubricating oil in anything other than cement kilns. Not only is burning a poor use of a valuable resource, but the release of harmful chemicals into the environment or into glasshouses is undesirable.
- There is an unjustifiable imbalance between the testing requirements imposed on re-refined lube oil and other applications of used oil. The level of testing of re-refined used oil is excessive while there is effectively no testing requirements for used oil destined for burning applications (which involves known harmful emissions).
- The Government's source of external advice on used oil (OSAC) needs to include a senior person with expertise and experience in re-refining. The Government's advisory mechanism on used oil needs to be balanced and to cover all the major elements of used oil recycling.

The Productivity Commission is urged to recommend that:

- CPI indexation should be reintroduced at the cumulative level that would have applied had it not been suspended.
- Future PSO benefits should be CPI indexed.
- All categories of recycled oils eligible for a benefit should have a mandatory quality specification at an appropriate level for their use that is regularly tested.
- OSAC membership be increased by the addition of an experienced lube-to-lube re-refiner and marketer.

Chapter 1

Introduction

This document provides comment and analysis in regard to policy settings for waste oil treatment in Australia as outlined in the Productivity Commission's Draft Report on Waste Management and Resource Efficiency, released on 23 May 2006. The Productivity Commission's terms of reference address waste generation and resource efficiency, having regard to economic, environmental and social benefits and costs.

The Allen Consulting Group (ACG) has been commissioned by Southern Oil Refining (SOR) to conduct background research and provide analysis on aspects of the draft report on Waste Management, issued by the Productivity Commission. SOR's interest in this report focuses on issues relating to re-refined, used, lubricating oil.

ACG has significant policy experience in waste management issues, and a strong understanding of issues related to the treatment of waste oil. ACG undertook an Independent Review (the ACG review) of the *Product Stewardship (Oil) Act* (the PSO Act) in 2004 for the Minister for the Environment and Heritage.[1] This review included a cost benefit analysis. ACG also understands the science and technology associated with re-refining waste oil, and has conducted attitude surveys of users of the re-refined waste oil product. ACG has also undertaken related work on other waste materials.

In developing its conclusions for the final report on waste management, the Productivity Commission should be aware of a range of important issues and implications associated with waste oil use, and the role of current policy settings in promoting efficient resource use and obviating potentially significant downstream social and environmental costs. Due consideration needs to be given to these factors in order to deliver high quality advice on issues and objectives specified in the terms of reference.

1.1 Southern Oil Refining Ltd

Australian-owned SOR is based in Wagga Wagga, and has two subsidiaries; Southern Oil Refineries Pty Ltd — which operates its used oil re-refinery and is situated at Bomen Business Park (5 kilometres north of the Wagga Wagga CBD) — and Klekies Pty Ltd — a substantial used oil collector operating throughout NSW. SOR is now a part of the group of environmental sustainability companies led by Babcock and Brown Environmental Investments Limited, a company listed on the Australian Stock Exchange.

[1] The Allen Consulting Group 20004, *Independent Review of the Product Stewardship (Oil) Act 2000*, report to the Minister for the Environment and Heritage.

SOR was established by a group of waste management investors in 1994 and after many years of technical development and the concurrent implementation of the *PSO Act*, built a multi-million dollar processing plant at Wagga Wagga to produce base oil to the standards required by the *PSO Act*. SOR is currently investing $9.0 million at its Wagga Wagga refinery to increase base oil output by more than 80 per cent, further reducing imports of virgin base oils.

The refinery produces a range of quality base oil products, which are all manufactured from previously used lube oils as opposed to being produced from crude oil as at the traditional oil refineries. The re-refinery also produces a range of fuel oils as by-products.

Manufacturing quality base oils by re-refining used lube oil has significant environmental benefits over refining from crude oils to the same specifications. The SOR process prevents the release into the environment (on land and in water courses) of waste oil and ensures that contaminants are properly removed and safely disposed.

In addition, tests have demonstrated that SOR base oils are at least as good as and in some specific ways better than base oils made directly from crude oil.

Southern Oil Refining's corporate vision for lube-to-lube re-refining is:

- that the inherent resource value of used lubricating oils is recovered and realised for future applications, which fully utilises the unique properties of the resource; and
- that the necessary collection and re-refining infrastructure will operate with minimal environmental impact, positive community benefit, and sustainable profitability, exceeding wherever possible our stakeholder expectations.

1.2 The Product Stewardship Oil scheme

Under the Product Stewardship Oil (PSO) scheme, importers and producers of base oils that are blended with additives to make lubrication, hydraulic and related oils pay a PSO levy (5.449 cents per litre), which is collected as excise by the Australian Tax Office (ATO) into a fully hypothecated fund. The PSO fund enables benefits to be paid to recyclers of used oils to carry out collection and recycling operations in a safe and effective manner. SOR applies some 80 per cent of the PSO benefit it receives to the cost of collecting used oil and associated quality control.

The PSO scheme benefits are GST inclusive and further, Category 1 base oil is also liable to the PSO levy – giving a net benefit of 40 cents per litre to the claimant of Category 1 base oils.

The PSO levy was introduced in 2000 at 5 cents per litre, with levy adjustments indexed to movements in the Consumer Price Index (CPI). The CPI compensation was suspended as improved recycling, especially lube-to-lube, was slow to be implemented and the non-allocated PSO fund became larger than expected.

The primary objective of the PSO scheme is to maximise the recovery of used oil from end of life activities (e.g., used engine oil), prevent its release into the environment, and make it available for recycling (mainly lube-to-lube recycling, and qualifying burning fuels). Currently about 40 per cent of virgin lubrication oil is recovered. The balance is applied to 'single use' applications or disappears into inappropriate disposal destinations.

The secondary objectives of the PSO scheme include:

- to ensure recycling activities do not create harm to the environment or human health;
- to maximise the economic value of the recycled oils; and
- the scheme is to be an Extended Producer Responsibility scheme, funded by industry. No direct government funding supports the benefits paid to recyclers.

The ACG review found that the PSO scheme had resulted in investment in lube-to-lube recycling that would not otherwise have been made.

The Department of the Environment and Heritage (DEH) has recorded that used oil is a hazardous substance[2] – it is toxic, carcinogenic and harmful to the environment when irresponsibly discarded. It is also poisonous if swallowed or inhaled and can present a fire hazard if not properly stored.

Category 1 re-refined oils have to meet extremely demanding quality criteria with a very rigorous compliance testing and PSO claim process. The regulations specify health, safety and environment standards for re-refined used oil that were comparable with similar virgin products manufactured in Australia at the time of the introduction of the PSO Act (2000). Since that time, Australia has become a significant importer of base oils manufactured in Russia, Korea, Thailand and Singapore.

It is notable that there is no specific testing or quality criteria for any other category of recycled used oil, other than general descriptions that are self-regulated. That is not to say that these uses are not appropriate at this time, but to record that the quality based PSO benefit criteria is not monitored

Burning fuels recovered from used oil (even so called 'high quality burning oils') may have high levels of carcinogens that are not destroyed in low temperature (e.g., glasshouse) burning or heating facilities. All recycled burning fuels should have a mandatory quality specification at an appropriate level for their use. The specification would include contaminant limits and should only be permitted for use in approved burning devices designed to prevent harmful emissions.

Lubrication oil does not wear out during use (unless lost to leaks, burning etc), but it does become dirty and contaminated with harmful by-products. Re-refining to remove the contaminants and restore the used oil to its original condition is a very complex process with a technical complexity similar to operating a lube oil manufacturing plant in a large crude oil refinery. In fact, PSO Category 1 quality standards are very difficult and complex to achieve, and are more rigorous than for virgin base oils. To date SOR is the only Australian company that has been able to meet these quality standards on a sustainable basis.

[2] The Australian Government Department of the Environment and Heritage 2006, *Used Oil Recycling Homepage,* http://www.oilrecycling.gov.au.

After similar development periods to SOR, at least one and perhaps two companies claim to have process proposals that will meet the quality standard within the next year or so. The benefits must match the rising operating costs of a small complex recycling process, which cannot achieve the economies of scale of a large crude oil refinery. Australia now has only one virgin base oil plant (Caltex, which has around 50 per cent of the base oil market), while the others having been closed due to size economics.

There is a real risk that the PSO levy income will not meet the growth in recycling schemes, nor rapidly rising energy costs, thereby placing a very high financial risk on investors. It is therefore important that CPI indexation of the levy, with a one-off adjustment to bring it to the level that would have applied, had it not been suspended. Future benefits from the PSO scheme should be CPI indexed. This will create the certainty, which the industry needs.

Chapter 2

Economic analysis

The need for a coordinated approach to the collection of used oil collection is not in dispute. Used oil is a storage hazard, since used oil that is stored in sheds and garages can leak into the environment, or catch fire. Oil that has been used in engines or transmissions picks up harmful contaminants, such as dioxins, benzene and polycyclic aromatics. As a result, used oil is hazardous to the environment and poisonous to aquatic plants and animals. Used oil that is poured onto the ground can contaminate soil, or seep into the ground and contaminate drinking water and other waterways. In addition, used oil that is poured down the drain can also cause serious damage to sewerage treatment plants. Considering that one litre of used oil can contaminate a million litres of water (i.e., at one part per million), it is important that appropriate measures are in place to collect used oil.

An additional benefit of collecting used oil is that the oil can then be 'recycled', by cleaning it to remove the contaminants and reusing it as industrial burner fuel, incorporating it into other products, or re-refining it back into lubricating oil or hydraulic oil. While it is generally preferable to directly discourage the inappropriate disposal of used oil (through penalties, etc), there are costs associated with monitoring and enforcing this direct discouragement. As a result, it is preferable to point to the potential benefits of collecting and reusing oil and to provide incentives for people to do so, rather than punishing the inappropriate disposal of used oil.

Higher values on used oil improve the economics of collection effort, and improve the take up rate of oil that might otherwise find its way into soil, waterways or landfills. However, while collection of waste oil has obvious environmental benefits it is also appropriate for policymakers to look at the efficiency implications of subsequent processing and disposal. In order to promote the recycling of used oil, the cost of cleaning used oil needs to be compared to:

- the cost of producing 'new' oil; and
- the cost of safely disposing of used oil.

In a well functioning market, the end use of used oil will be determined by the relative cost of different processing options and the value of the collected and processed oil in alternative uses. In the absence of significant market distortions or economic spillovers (e.g., impacts on third parties) this comparison of costs and prices can be expected to result in an efficient allocation of resources — that is, the oil will be processed to the point where maximum 'value-added' is obtained. This implies that costs will be minimised, while producers target markets and users willing to pay the highest price for the product. In this way, markets guard against excessive resource consumption and direct resources to those who value them most.

Importantly, this paradigm does not hold for waste oil. There is a common, but incorrect, perception that re-refined used oil is of inferior quality to virgin oil.

2.1 Potential applications

In addition to the perception problem, there are a number of aspects of this market failure that need to be addressed in order to improve the rate of the collection and recycling of used oil. Used oil can be re-used as:

- fuel in small-scale space heaters;
- fuel in industrial-scale processes such as power stations and cement kilns;
- re-processing to be used as distillate or residual fuels;
- re-processing to produce various hydrocarbon products such as drilling fluids, or explosive binders; and
- re-refining or regeneration to produce new lubricants.

Regeneration is less environmentally damaging than the incineration of used oil. This suggests that it is important not only to promote the collection and cleaning of used oil, but also the appropriate application of used oil.

The market for reprocessed oil suffers from a classic information asymmetry problem — despite widespread perceptions of it being an inferior product, it can be at least as good as virgin oil. SOR markets a product which is fully competitive on cost and quality with the best equivalent base oils available (and this is repeatedly recognised by SOR's wholesale customers), but which suffers a price disadvantage because of a community misconception that 'recycled is not as good as new'.

Further, significant adverse spillovers can be associated with the application of used oil in the wrong application. The Productivity Commission's draft report notes the potential for disposal of waste oil in burning applications. However, 'oils ain't oils' in this regard. The frequent use of waste oil as a fuel source in agricultural and light industrial applications — such as heating for greenhouses — carries with it significant health risks, both to those in the immediate area and to those consuming the resulting food products. While high temperature burning in cement kilns is a fully acceptable and safe means of disposing of used oil (carcinogenic combustion compounds are minimised in cement kiln conditions), lube-to-lube re-refining presents a very much smaller health risk than any of the other burning options.

Lube-to-lube re-refining not only represents the highest value use for waste oil, but also obviates the adverse health and environmental spillovers that can be associated with low value applications. Targeted regulation and awareness raising programs are to be encouraged as 'first best' responses to these problems but, in the absence of these options, current incentives for oil recycling should be viewed in the context of these market failures.

2.2 Market failures

In spite of the benefits stated above, there are a number of market failures that impede the occurrence of an efficient outcome. In the market for re-fined oil, these market failures include:

- information failures relating to recovered oil quality;
- risk aversion to using re-refined base oils;
- switching costs and barriers to entry; and

- technological externalities.

Organisations that collect used oil can never be certain what sorts of contaminants are in the oil that they recover. The cost of detecting these contaminants can be considerable, since most of the used oil that is collected 'is immediately mixed with other oil in a road tanker, and the risk of those responsible for contamination being identified is small'.[3] This can occur even when separate compartments are used for oils of different quality. The testing protocols for used oils are more costly for oil re-refining than for oil incineration. Given that these costs are ultimately borne by the buyers of used oil, rather than by the collectors, the disparity in cost is a disincentive for the supply of re-refined oil.

Buyers of re-refined oils are sensitive to the risk of using materials that may cause their own products — such as additive packages — to fail. As re-refiners are almost always independent of oil refiners and lubricant manufacturers, their products are sold for a lower value. In Australia, re-refined oil products are some 10 to 12 cents a litre lower than for a virgin base oil product of comparable specifications.[4] This is another disincentive for the supply of re-refined oil.

Another consideration is the existence of barriers to entry in the market for lubricant. Existing producers have an incentive to protect their market share. As there are economies of scale in the supply of re-refined oil, a re-refiner will need to quickly achieve a share of the market in order to be sustainable, and to operate at a volume that maximises production efficiency. Existing producers are typically large, integrated oil companies that can respond to the entry of a competitor, and adjust their pricing in the short-term to prevent the new entrant from establishing the necessary market presence.

Finally, there are technological externalities associated with the types of additives that are combined with base oils to produce lubricants. The economic efficiency of re-refining oils is diminished if the improvement in engine performance of particular additives is lower than the cost of removing the additives in the recycling process. This arises because designers of lubricant products have no incentive to take the downstream costs of re-refining into account.

2.3 Life cycle analysis

Assessing relative costs and benefits on a holistic basis is best done through life cycle analysis. Life cycle analysis (LCA) is a widely accepted framework that is used to assess the environmental impact of different products and functions. It is described as:

> a process of evaluating the effects that a product has on the environment over the entire period of its life thereby increasing resource-use efficiency and decreasing liabilities. It can be used to study the environmental impact of either a product or the function the product is designed to perform. LCA is commonly referred to as a 'cradle-to-grave' analysis.[5]

[3] Organisation for Economic Co-operation and Development 2005, *Improving Recycling Markets*, Paris, p. 55.

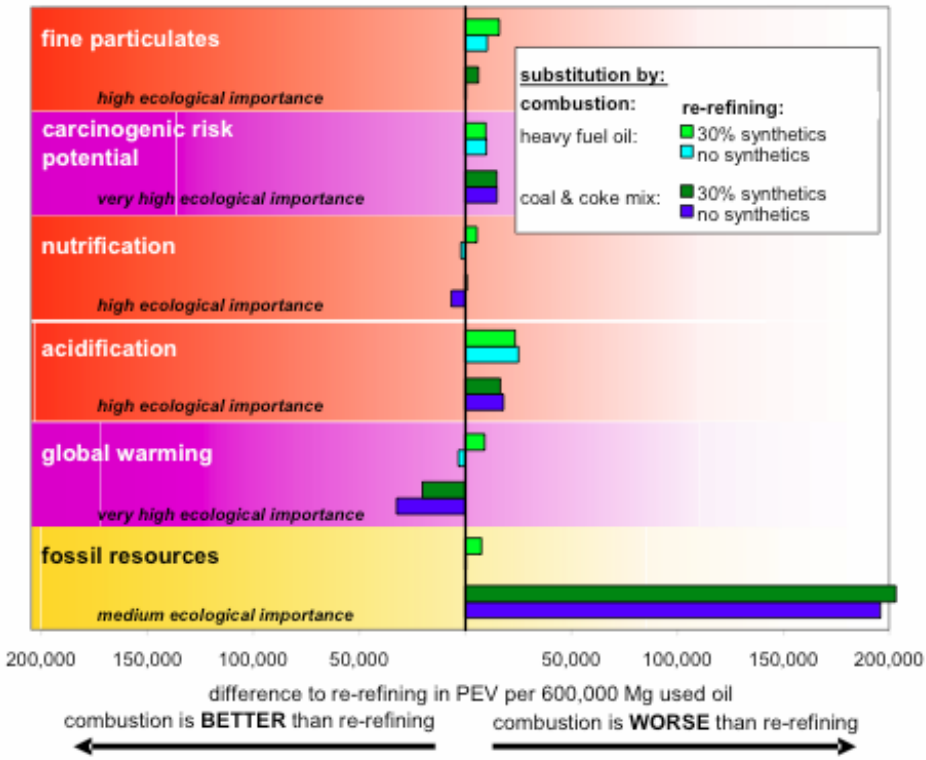
[4] Australian Academy of Technological Sciences and Engineering 2004, *Independent Review of the Transitional Assistance Element of the Product Stewardship for Oil (PSO) Program*, Canberra, p. 16.

[5] Sustainable Agri-Food Production and Consumption Forum 2006, *Possible Solutions: Life Cycle Analysis*, http://www.agrifood-forum.net/practices/lca.asp, accessed on 10 July 2006.

A new life cycle analysis by the highly regarded Institut für Energie und Umweltforschung in Heidelberg (IFEU) has recently become available. This life cycle analysis has been thoroughly reviewed. The IFEU's life cycle analysis has been critically reviewed to ensure it meets the ISO 14040 standard, and demonstrates the merits of lube-to-lube re-refining of used oil over other uses — particularly combustion. Re-refined oil replaces virgin base oil in the production of lubricants. For combustion, used oil would replace either heavy fuel oil, or a mix of coal and coke. It is therefore necessary to consider the impacts of both of these substitutes when analysing the impact of used oil in combustion.

Figure 2.1

OVERVIEW OF IMPACT-RELATED AND NORMALISED DIFFERENCES BETWEEN AVERAGE RE_REFINING AND COMBUSTION



Note: 1 PEV equals the general per-capita-load on average.
Source: Institut für Energie und Umweltforschung 2005, *Ecological and energetic assessment for re-refining used oils to base oils,* Heidelberg, p. 8.

The IFEU study found that the application of used oil in re-refining is better for the environment than in combustion, considered against a number of criteria (see Figure 2.1). The study found that not only are there clear environmental benefits to re-refining when compared with producing base oils in standard oil refineries, but that, due to the increase of synthetic compounds in oil, the advantages of re-refining oil also increase, while the advantages of burning used oil are significantly reduced.

2.4 Summary

There is general acknowledgement that the quality of re-refined oils matches (or can exceed) that of virgin base oils. SOR's re-refined oils have been tested to demonstrate this, and SOR's wholesale customers require such technical data. However, despite the quality assurance standards and safeguards that apply to the supply of re-refined oil, there is still a perception in the retail marketplace that re-refined oils are not of comparable quality to virgin product. As a result, re-refined oils are unable to command the same price as virgin base oils, thereby reducing the incentive for cleaning and selling re-refined oils.

Perhaps in relation to this, present arrangements in Australia are leading to a recovery of only about forty per cent of sales of virgin lubricating oils. This suggests that the encouragement to recycle used oil may not yet have achieved its full potential, or that in the present investment risk environment, benefits may be insufficient to generate significant new investment. Certainly the lube-to-lube re-refining industry is very small (just SOR at this time), although it has potential to grow if investors are sent appropriate signals about the future levels of benefits. In order to do so, it is necessary to address the perception that re-refined oil is of inferior quality to virgin base oils.

Currently, this market imperfection persists due to consumers having less information about the quality of the product than the suppliers of re-refined oil and virgin base oil. This is a market failure that is observed in other markets, such as markets for credit, insurance, labour and used cars. In Akerlof's description of a market for 'lemons',[6] the seller of a second hand car has much more information about the quality of the car than the potential buyer — the buyer's best guess for how much the car is worth will reflect the value of an average car in the market. Sellers who have used cars that are of higher quality than the average car in the market will not be prepared to enter the market as the only price they can obtain is the average price — which does not accurately reflect the value of their car.

Given current knowledge and policy settings, a very strong case can be made for the potential of used oil re-refining subsidies to promote economic efficiency objectives, any reduction of the subsidy favouring lube-to-lube processing over other categories of reuse would operate against efficiency objectives. The subsidy helps overcome competitive disadvantage from market imperfections.

[6] G. A. Akerlof 1970, 'The Market for "Lemons": Quality Uncertainty and the Market Mechanism', *Quarterly Journal of Economics*, vol. 84, no. 3, pp. 488-500.

Chapter 3

Issues for consideration

The issues addressed in this submission are:

- Lube-to-lube re-refining should remain the preferred means of addressing the issue of used lubricating oils.
- The $0.50 per litre gross benefit rate ($0.40 per litre net) is appropriate and to retain continuing relevancy should be indexed to the CPI on an ongoing basis.
- There are health and environmental risks from burning used lubricating oil in anything other than cement kilns.
- There is an unjustifiable imbalance between the testing requirements imposed on re-refined lube oil and other applications of used oil.
- The government's source of external advice on used oil needs to include a senior person with expertise and experience in re-refining.

3.1 Preferential support for lube-to-lube re-refining of used oil

The 2004 Independent Review of the *PSO Act* supported the preference for the lube-to-lube re-refining of used oil, which was based on resource efficiency grounds. Re-refining requires only about one third of the energy required to produce lubricating oil from crude.[7] The anticipated entry of a second lube-to-lube refiner in Australia will remove the ACG review's concerns about having 'too many eggs in one basket' (i.e., in one re-refining facility).

There is also international recognition of the merits of lube-to-lube re-refining in comparison with other options for used oil. As noted in the Independent Review of the Transitional Assistance Element of the *PSO Act* (the ATSE Report),[8] a number of governments have introduced policies to promote re-refining in preference to the direct burning of used oil. The EU Council Directive 75/469 (as amended by Directive 87/101/EEC) gives priority to the re-refining of used oil. This preference remains in place in spite of some debate based on earlier life cycle analyses.

As noted above, since the 2004 ACG review, a life cycle analysis of re-refining used oil by the Institut für Energie und Umweltforschung in Heidelberg (IFEU) has become available. This life cycle analysis clearly demonstrates the merits of lube-to-lube re-refining of used oil over other uses. The IFEU analysis is currently having a significant impact on thinking in Europe about the relative merits of lube-to-lube versus burning used oil by finding that re-refining produces significantly better environmental and economic outcomes than burning.

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7 US Environment Protection Authority 2004, *Wastes: Managing Used Oil*.

8 Academy of Technological Sciences and Engineering (ATSE) 2004, *Independent Review of the Transitional Assistance Element of the Product Stewardship for Oil (PSO) Program*, report for the Minister for the Environment and Heritage.

3.2 The PSO benefit rate for lube-to-lube re-refining

The ACG review of the PSO Act considered that the $0.50 benefit rate should be maintained. This rate reflects the long-term capital investment required and the public benefits arising from lube-to-lube re-refining. In contrast, the processing of used oil for burning in many low-grade applications requires very little capital investment.

The collection of used oil involves handling transport and storage costs that are quite different and significantly greater than the costs incurred by oil companies when they distribute virgin lubricating oil. For example, the collection of used oil usually requires special purpose tanker trucks that have to travel considerable distances, making multiple stops for individually low volume collections, while virgin oil is a bulk oil refinery product. Lube-to-lube re-refining also involves greater testing costs (see below).

The government originally indexed the levy for lube-to-lube re-refining, however this was suspended in 2000. In the meantime, the costs of collection and re-refining have risen faster than the CPI, influenced by collection transport and fuel costs. It is therefore imperative that the Government adjusts the current levy to reflect past inflation and increase it every six months in line with the appropriate CPI index. The Government also needs to ensure that the levy continues to collect sufficient funds to be able to meet benefit payments under such a regime.

3.3 Burning used lubricating oil

The arguments against the burning of used lubricating oil are that:

- burning used lubricating oil is a poor use of a valuable resource;
- burning such oil releases harmful chemicals into the environment and, in particular, using this oil to heat greenhouses may be particularly hazardous; and
- the IFEU life cycle analysis shows that the only burning application of used oil which can have any merit is in cement kilns where the physical and chemical conditions ensure that there are minimal dangerous emissions — however in Australia the cement industry is showing a preference for using gas.

The ACG review recognised that it would not be realistic to try to re-refine all of Australia's used lubricating oil, primarily because of transport costs,[9] and therefore recommended an adjustment to the high grade burning oils as an option. This assessment was strongly influenced by the life cycle analyses available at that time (referenced in the ACG review report).

Prior to the IFEU analysis, there had been a number of previous life cycle analysis studies,[10] which influenced the ACG review to propose an increase in the burning oil benefit rate.

[9] ACG, 2004, op cit, page 44.

[10] See European Commission, 2001, *Critical review of existing studies of life cycle analysis of the regeneration and incineration of waste oils*, final report.

3.4 Health hazards

Emissions from the combustion of used lubricating oil include polyaromatic hydrocarbons, sulphur and metals such as zinc chromium. The ATSE report raises specific concerns about the burning used oil to heat greenhouses and in hydroponics. There is evidence to suggest that the small unregistered furnaces involved are releasing toxic emissions, including carcinogenic polychlorodioxins.[11]

3.5 Testing of re-refined lubricating oil

At present the lube-to-lube re-refining of used lubricating oil in Australia is subject to excessive testing requirements, while other uses of this oil do not require any such testing at all and are subject to little regulatory control. Re-refining removes the hazardous materials in used oil that are of potential concern. There is no justification for the level of testing currently required of re-refined oil. There are also doubts about the appropriateness of one of the required tests.

It is therefore remarkable that other treatment of used oil is not subject to testing, when the processes involved do not remove the potentially hazardous components. As a result, when used oil is used in burning applications, there are potential health hazards as noted above.

In SOR's view, all categories of recycled oils eligible for a benefit should have a specific quality threshold for each parameter (e.g., maximum per cent water, maximum micron size for filtered, metals content for demineralised, poly-aromatic hydrocarbons (PAHs) for fuels, etc.) that is appropriate to the usage and the environmental or health risks.

3.6 Advice of government on used oil

While the government's Oil Stewardship Advisory Council (OSAC) includes members with experience in collection and other processing of used oil, it lacks a member with re-refining expertise and experience and even more importantly the marketing of high quality re-refined products. Given the relative importance of lube-to-lube re-refining, this means that OSAC lacks balance. As the only experienced and successful lube-to-lube re-refiner and marketer, SOR should be represented on OSAC as an additional member.

[11] ATSE, op cit, page iv

Chapter 4

Recommendations for the final report

It is suggested that, in its final report, the Productivity Commission should:

- Note that unless indexation is re-established, the PSO levy income will not meet growth in recycling, nor rapidly rising energy costs, thereby placing a very high financial risk on both current and prospective investors.
- Recommend that CPI indexation should be reintroduced at the cumulative level that would have applied had it not been suspended.
- Recommend that future PSO benefits should be CPI indexed.
- Note that, apart from Category 1 re-refined oils which have extremely demanding quality criteria with a very rigorous compliance testing and PSO claim process, there are no specific quality criteria for any other category of recycled used oil Including high quality burning fuels yet these fuels may have high levels of carcinogens that are not destroyed in low temperature (eg glasshouse) burning / heating facilities.
- Recommend that all categories of recycled oils eligible for a benefit should have a mandatory quality specification at an appropriate level for their use. There should be a specific quality threshold for each parameter (eg maximum per cent water, maximum micron size for filtered, metals content for demineralised, poly-aromatic hydrocarbons (poly aromatic hydrocarbons) for fuels etc). The specification would include contaminant limits and should only be permitted for use in approved burning devices designed to prevent harmful emissions.
- Note that there is inadequate lube-to-lube oil technology experience/expertise on the PSO Advisory Committee — The Oil Stewardship Advisory Council (OSAC).
- Recommend that OSAC membership be increased by the addition of a lube-to-lube re-refiner and marketer.