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IN TONGA

# Contemporary Used Oil Audits

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Programme  
(SPREP)

RAPPORT



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### Executive Summary

This report presents the findings of a contemporary used oil audit in Tonga. In-country visits, interviews and data collection that support this report were conducted by Golder in May 2014.

The key findings of this report are:

The island of Tongatapu is the largest island and the main urban centre. The estimated resident population of the Kingdom of Tonga was 101,000 of whom 72% live on Tongatapu. Agriculture is dominant industry (30% of GDP).

- Total imports of lubricating and hydraulic oil equal approximately 450,000 L per year.
- 2 major companies (TOTAL, Pacific Energy) supply lubricating and hydraulic oil.
- The main consumer is the public power authority: Tonga Power Limited (TPL) and their Power Station located in Popua (Tongatapu).
- The main volume of waste oil is generated by the TPL power station. All the waste oil (50 to 60,000 L estimation) is currently sold to local customers.
- Local customers are using the waste oil as a poor quality lub oil for tractors, chainsaw, timber painting, sport field.
- Pacific Energy offers a take-back service.
- Considering the consistency of the national import figures, the total volume of waste oil to be potentially collected should be 225,000 L per year.
- Tonga has ratified Basel and Waigani Conventions.
- Waste Oil Management strategy could be a mix of the following options :
  - Obligation of take-back services for major oil companies
  - Building a waste Oil Storage Site to store the waste oil collected in the Islands
  - Shipping to Fiji or India and the costs have to be paid by final client.
  - With the volume of potential waste oil in Tonga, I would strongly recommend to study the feasibility of a treatment equipment in Tongatapu.
  - Recycling private companies exist in Tonga and should be in prior involved in the process.
- The common approach to fund a waste oil management programme is the introduction of a universal levy for all oil imports, which is the first principle of polluter-pays.



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## 1.0 INTRODUCTION

### 1.1 Purpose

The Secretariat of the Pacific Regional Environment Programme (SPREP) retained Golder Associates New Caledonia Sarl (Golder) to perform contemporary used oil audits in Cook Islands, Kiribati, Nauru, Solomon Islands, Tonga, and Tuvalu to establish volumes of lubricating, hydraulic and transmissions oils imported into each country and the volume of used oil produced, and stored or otherwise disposed of.

The major sources of used oil are power generation and motor vehicles. Used oil contains high levels of heavy metals and some amounts of more toxic chemicals.

Oil spilled on the ground contaminates the soil and leaches into the water system, polluting water courses, groundwater, lagoons and the ocean.

This report presents the findings of a contemporary used oil audit in Tonga.

In-country visits, interviews and data collection that support this report were conducted by Golder in May 2014.

### 1.2 Scope of Services

The scope of services for this consisted of the following tasks:

- Establish and document national oil import/generation volumes and rates for the last 3 years ideally 2011, 2012 and 2013;
- Establish national used oil production rates for the last 3 years ideally 2011, 2012 and 2013;
- Oil Audit Balance for the last 3 years ideally 2011, 2012 and 2013;
- Document and summarize existing national used oil management procedures; and
- Document and summarize existing national used oil management instruments.

### 1.3 Interviews/Consultation

The Ministry of Lands, Environment, Climate Change and Natural Resources was the primary point of contact and they suggested the most appropriate people to talk to. The Table 1 lists the people interviewed or consulted and visited, during the in-Country Visit (5 to 10 May).



## CONTEMPORARY USED OIL AUDIT IN TONGA

**Table 1: Stakeholders interviewed / consulted (April-May 2014)**

Organisation	Name
<u>Public institutions</u>	
Ministry of Lands, Environment, Climate Change and Natural	Lupe Matoto , Deputy CEO for Environment Mafile'o Masi (Senior Environmentalist)
National Bureau of Statistics	Telekaki Lataveo (Senior Statistician)
Ministry of Transport	Poasi Fonua (Land Transport Manager)
<u>Power Authority</u>	
Tonga Power Limited (TPL)	Michael Lani'Ahokava (Power Generation Manager)
<u>Oil company</u>	
TOTAL	Sales and Marketing Manager
Pacific Energy	Ifalemi Ma'u, (Terminal Manager)
<u>Main retailer</u>	
ASCO MOTORS Nuku'alofa	Fakatouola Matoto (Service Station Manager)
<u>Recycling</u>	
GIO RECYCLING	Ofa Tu'ikolovatu (Managing Director).



### 1.4 General facts about Tonga

Tonga consists of 176 islands with a total area of 748 km<sup>2</sup> in 4 groups of islands: Tongatapu, Vava'u, Haapai and Niua.

The estimated resident population of the Kingdom of Tonga was 101,000 of whom 72% live on Tongatapu (73,000). The capital Nuku'alofa, is located on the largest island, Tongatapu



Figure 1: Tonga Map

Tonga has an agriculture based economy. (30% of GDP) a small open economy with squash, coconuts and vanilla the main export crops that make up 2/3 of total.

Like other small Pacific islands Countries, Tonga faces a long supply chain from the refinery source. Products are shipped from Singapore to bulk storage in Fiji and shipped to Tongatapu and Vavau in Local Coastal Tankers (LCT).



Lubricants and other minor products are all supplied by drums. Drum distribution is more extensive..

Local ferries sail between all the island groups,

## 2.0 TONGA LUB OIL IMPORTS

### 2.1 National Statistics

Import data given by the National Statistics Bureau and customs imports.

**Table 2: Tonga Import of Lubricating oil – 2010 to 2013**

Year	Description	Quantity (Liters)
2010	Lubricating oils	418 196
2011	Lubricating oils	528 995
2012	Lubricating oils	418 995
2013	Lubricating oils	416 652

The annual average import of lubricating oils, based on the total imports over four years should be 446 000 liters. Over the last three years, the annual average import has been increased to 455 000 liters.

### 2.2 Main Import Stakeholders

As this information is commercially sensitive, the details provided by main importers have to be kept confidential, so we used the general figures.

There are one major consumer (Electricity Provider) and 2 main oil suppliers operating in Tonga: TOTAL and Pacific Petroleum Company acquired BP South West Pacific's (SWP) assets in the country in 2010. Since then BP South West Pacific is known as Pacific Energy.

TOTAL's key customers include the Government of Tonga, marine and tourism sectors.

#### 2.2.1 Tonga Power Limited (TPL)

Tonga Power Limited (TPL) is a state-owned entity which operates power supplies in the Islands of Tongatapu, 'Eua, Lifuka (Ha'apai) and Neiafu (Vava'u).

The outer islands have either solar power or community-managed diesel mini-grids.





## CONTEMPORARY USED OIL AUDIT IN TONGA

In Tongatapu, the generation capacity of Popua Power Plant is about 11,2 MW out of seven gen-sets and the solar wind farm generates 1 MW. A new 2.8 MW generator will be installed at the Popua Power station in 2014 reducing the diesel use and operating costs.

In Vavau the diesel plant generates 1.9 MW, Haapai, 0.4 MW and Eua : 0.4 MW.

No detailed figures about import of lube oil have been provided by TPL. But after discussion with the TPL manager of power generation, the annual lube oil consumption at the Popua power plant should be about 50 - 60,000 L/year. TPL is exempt of taxes when they buy Fuel and Lube oil from Oil companies.

In April 2013, the TPL board reaffirmed their strategy, which is to support the Government objective of 50% renewable generation by 2020.

### 2.2.2 Oil suppliers: Total and Pacific Energy

These two private-owned companies: TOTAL and Pacific Energy import lube oil using shipping containers, with the oil in drums and retail containers.

PE and Total have their main terminals on adjacent facilities just to the east of Nuku'alofa (Touliki area) close to the Queen Salote Wharf (Figure 2).



Figure 2: Oil Companies Terminal



## CONTEMPORARY USED OIL AUDIT IN TONGA

There is no obligation to collect or export any waste oil. But Pacific Energy (PE) offers a take back service to its retailer consumers.

The figure given by PE is the import of 20 drums of Lube Oil /month , so an average of 50,000 L per year.

PE sends 7 drums of 200L to outer islands by ferries every quarter.

Total did not want to give information as the business is competitive with PE., but Total says that Customs has all the figures.

### 2.2.3 Prices

The manager of Pacific Energy terminal put the emphasis on the difference of prices and quality of lube oil available in Tonga. One Liter of Shell Lube oil distributed by Pacific Energy has a price of US\$ 7.00, but one liter coming from a Chinese brand would be US \$4.00.

The Tonga Competent Authority regulates the retail price of petroleum products. Wholesale and retail fuel prices across Tonga vary, reflecting the higher transport costs to provinces distant from the main island.

However, in each province, a single price is set regardless of supplier. Retailers have a 7% mark-up on the wholesale price. The wholesale price incorporates a 15% return on investment for the oil companies. Retailers have expressed concern to the Competent Authority about the adequacy of the 7% retail margin.

Price of Diesel Fuel (1L) is US\$ 0.98 (retail) and US\$ 0.77 (wholesale).

## 3.0 TONGA WASTE OIL RECOVERY

It is generally recognised that only about 50% of the oil sold will end up as waste. Considering the consistency of the national import figures, the total volume of waste oil to be collected should be 225,000 L per year.

### 3.1 Power Station

The major source of used oil is the power generation.

TPL should generate 50 000 to 60 000 L of waste oil per year. But it is difficult to get a book with figures as all the waste oil is "given" to customers for their private re-using. After some enquiries, the cost of a drum of 200 L of waste oil has been evaluated to US \$50-100.

It appears that the waste oil is re-used for agricultural machines and timber industry to lubricate chain, tractors. We have advised the manager that it is not a viable solution (without treatment) and it could be a source of breakdown or engine failure.



## CONTEMPORARY USED OIL AUDIT IN TONGA

Used oil is also commonly used for painting and preserving the wood from termites, or for marking the lines on sport fields and avoiding rust underneath the car.

On site the waste oil is well stored in a few 1,000 L containers prior to being transferred to drums and “given” /sold to customers “(Figure 2).

This solution satisfies TPL as they don’t have to manage an important stockpile on site.



*Figure 3: Waste Oil containers – TPL Popua Power Station*



## CONTEMPORARY USED OIL AUDIT IN TONGA



*Figure 4: Point of Waste Oil Fillings– TPL Popua Power Station*

The renewable energy strategy in place in Tonga would allow to reduce y the need in fuel and Lube oils.



*Figure 5: Solar Power at Popua Power Station*



### 3.2 Motor Vehicle

A visit to Asco Motors (Toyota) has been done. As they buy the waste oil from Pacific Energy, they can drop their waste oil on PE storage site, but they usually give to their customers as TPL.



*Figure 6: Asco Motors station service*

### 3.3 Tonga options for using waste oil

The supplier companies and retailer companies have to be responsible of what they sell (polluter-pays). Given the cost of goods in Tonga and the poverty of the main part of the population, a direct tax seems to be not applicable.

Some studies should be done with private companies to evaluate the feasibility of a small scale treatment equipment. At least a treatment to filter the rough waste oil should allow to avoid the re-using of waste oil directly in engines.

A company like GIO Recycling is involved in recycling of scrap metal, batteries, tyres, etc . Currently, GIO Recycling has the only license to handle hazardous waste within the Kingdom of Tonga.



GIO has already sent containers of waste oil to India and now to Japan (US \$2,200 for a 20ft). The cost is covered by the company downstream. In India and Japan, they use waste oil as a combustible.



Figure 7: Company involved in recycling

At least, a well managed storage site should be built on the main island to avoid the dispersion and pollution.

### 3.4 Waste Landfill

The Tonga government is active in promoting recycling and waste minimization and measures to keep “the Kingdom clean, green and healthy”.

The landfill at the Tapuuhia quarry is well managed but it does not accept hazardous waste such as waste oil.

Only the solid waste is accepted on site. So there is no available public site to store waste oil in Tonga.

### 3.5 Transport services

The shipping costs to Fiji, is approximately US \$2,500 for a 20 Feet Container. Many shipping containers return to Fiji empty.



### 4.0 REGULATION DRIVERS

There is no specific legislation on waste oil management but a real need for coordination in implementing or reinforcing a waste oil management programme.

Competencies exist but need to be managed in a focal point that will be accountable for the responsibilities.

- **The Ministry of Environment and Climate Change** is responsible of the movement or disposal of hazardous waste (Environment Management Act 2010).
- The Waste management Act (2005) has established the responsibilities of the **Tonga Waste Authority Ltd (WAL)**, a Government Public Enterprise mandated to manage waste in Tongatapu. They provide commercial, industrial and residential waste collection services and waste management facilities.
- Because the Energy and especially the generation of electricity through TPL are the most important sources of generation of waste oil, the Competent Authority is well located to reinforce the regulation or the taxes The **Tonga Competent Authority** regulates the retail price of petroleum products. Currently, there are duty exemptions on petrol products for use in power generation.
- The **Tonga Energy Road Map 2010-2020** has been developed to reduce Tonga's vulnerability to oil price and achieve an increase in quality access to modern energy services in an environmentally sustainable manner. The programme is motivated by the 50% renewable Energy Policy.

Tonga has also ratified **two International hazardous waste conventions**: Basel and Waigani.

- There are some obligations for the countries, members of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal :
  - Minimise generation of hazardous waste;
  - Ensure adequate disposal facilities are available;
  - Control and reduce international movements of hazardous waste;
  - Ensure environmentally sound management of wastes; and
  - Prevent and punish illegal traffic.
- The Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region.



### 5.0 DISCUSSION

There should be 225,000 L per year of potentially recoverable Oil in Tonga.

Cultural aspects need to be changed as the waste oil is mainly used by local customers. The governmental company has to be exemplar, and the main producer of waste oil (Power station) has to store and well manage its production before sending it to a recycling business. Selling to local customers is not a viable solution.

A governmental services campaign and a community campaign should begin to raise awareness.

In Tonga, the cost of goods and fuel products has been a politic issue. The way to use 50% of renewable energy in 2020 will allow to reduce the consumption of fuel products. A adding tax for managing waste oil seems not to be possible.

All stakeholders should be consulted and should actively participate in the discussion. Some potential solutions could be an in-country treatment plant or a storage facility before exporting to Fiji or India.





## Page signatures

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