Fueling Samoa’s Growing Transport Sector:
The Impact of Rising Oil Prices and Imports on a Pacific Island Economy
Abstract

The developed nations of the world are more concerned than ever with reducing their dependence on imported oil, lowering greenhouse gas emissions and developing alternative energy technologies. These issues are among the highest priorities for developing economies in the Pacific region as well. Samoa is a part of several regional initiatives that address petroleum and energy issues and is due to launch its own national energy policy in the coming months.

Petroleum prices in Samoa are low in comparison to other parts of the region because of the unique government/oil company partnership that administers its oil imports and pricing; however this structure can only keep prices as low as world market fluctuations in crude prices allow. Higher levels of consumption coupled with rising prices have pushed the value of oil imports to an all time high. Strong growth in Samoa’s transportation sector is a major reason that petroleum consumption has been increasing and will continue to do so. Efficiency and conservation strategies will help to ease the burden of rising oil prices in the short term and the development of alternative fuels such as coconut oil are expected to reduce petroleum dependence and its negative economic consequences in the long run.

Contacts:

Silia Kilepoa Ualesi: Energy Coordinator, Economic Policy & Planning Division, Ministry of Finance:
Ph. 685 3434. silia.kilepoa@mof.gov.ws.

Sefo Samau Etuale: Managing Director, Petroleum Products Supplies:
Ph. 685 28999. etuales@ppssamo.com

Siloma Tago: Mechanical Engineer, Electric Power Corporation.
Ph. 685 2226. tagos@epc.com

Tusa Misi Tupuola: ACEO Road Transport/Secretary of the Transport Control Board:
Ph. 685 26740. mtupuola@mot.gov.ws

Karras.lui@cbs.gov.ws
Dedication

To my parents, for allowing me to pack up and trek thousands of miles away to a small island in the middle of the Pacific Ocean for several months … for the second time this year.
Acknowledgements

First, I would like to thank the country of Samoa for letting a winter-weary palagi find a hideout in the sun for the semester.

Deepest thanks to Silia Kilepoa for acting as my advisor for this paper, meeting with me several times over the course of the semester and looking over my draft; without her help the topic of the paper would not be what it is and I would still understand nothing about the tender system in Samoa.

I would like to extend my sincere gratitude to Misa Andriamihaja, Joseph Chan-Ting, Sefo Samau Etuale, Frank Griffin, Lu Ieremia, Misi Tupuola, Karras Lui, Siloma Tago, and Heremoni Suapaia who generously took time out of their hectic days to help me. This paper would not have been possible without their patience, knowledge and assistance. Thanks also to their organizations – the UNDP, Ministry of Foreign Affairs and Trade, Petroleum Products Supplies, SPREP, Asco Motors, Transport Control Board, CBS Statistics Department, EPC and Ministry of Finance.

Faafetai tele lava to Jackie Faasisila for the incredible semester, for pushing us to the furthest limits of our comfort zones (mostly in the plantation), introducing us to amazing people in Upolu, Savaii, American Samoa and Fiji and for sharing her country with us.

Lastly, thank you to my group for the friendship, stories and companionship throughout the trip. This has been an amazing experience and I am so glad to have been through it all with you.

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Table of Contents

Abstract............................................................................................................................... 3
Dedication........................................................................................................................... 4
Acknowledgements............................................................................................................. 5
Table of Contents................................................................................................................ 6
Acronyms............................................................................................................................ 7
Background......................................................................................................................... 8
Introduction: Petroleum Dependency and Development.................................................. 10
Oil in the Region............................................................................................................... 11
Samoa’s Tender System.................................................................................................... 12
The Growing Transport Sector ......................................................................................... 15
Reasons for Increasing Vehicle Demand.......................................................................... 16
The Transport Sector as a Source of Petroleum Demand................................................. 17
Consumer Trends.............................................................................................................. 18
Increasing Imports and Import Values.............................................................................. 20
Oil and the Trade Deficit................................................................................................... 22
For the Future.................................................................................................................... 23
A ‘Niu’ Kind of Oil........................................................................................................... 24
Conclusion ........................................................................................................................ 26
<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADO</td>
<td>Diesel</td>
</tr>
<tr>
<td>BOP</td>
<td>Balance of Payments</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development (UK)</td>
</tr>
<tr>
<td>DPK</td>
<td>Kerosene</td>
</tr>
<tr>
<td>FOB</td>
<td>Free on Board</td>
</tr>
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<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
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<td>MDG</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>OFID</td>
<td>OPEC Fund for International Development</td>
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<td>OPEC</td>
<td>Organization of Petroleum Exporting Countries</td>
</tr>
<tr>
<td>PICT</td>
<td>Pacific Island Countries and Territories</td>
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<td>PIFS</td>
<td>Pacific Islands Forum Secretariat</td>
</tr>
<tr>
<td>PPS</td>
<td>Petroleum Products Supplies</td>
</tr>
<tr>
<td>SIDS</td>
<td>Small Island Developing States</td>
</tr>
<tr>
<td>SNEP</td>
<td>Samoa National Energy Policy</td>
</tr>
<tr>
<td>SOPAC</td>
<td>South Pacific Applied Geoscience Commission</td>
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<td>SPREP</td>
<td>South Pacific Regional Environmental Programme</td>
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<td>United Nations Department of Economic and Social Affairs</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
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<td>ULP</td>
<td>Unleaded Petrol</td>
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<td>WST</td>
<td>Western Samoan Tala</td>
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Background

Samoa is a small island nation in the South Pacific. Like many other island nations in the Pacific, it is one of the 51 countries considered Small Island Developing States (SIDS) by the United Nations. The United Nations Department of Economic and Social Affairs (UNDESA) defines the SIDS as:

Small island and low-lying coastal countries that share similar sustainable development challenges, including small population, lack of resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and vulnerability to global developments. In addition, they suffer from lack of economies of scale, high transportation and communication costs, and costly public administration and infrastructure (UNDESA 2003).

Samoa is also classified as a least developed country (LDC) by the United Nations Development Programme. LDC status is based on the three factors of economic vulnerability, weak human resources and a low GDP per capita. Although urbanization and modernization have significantly changed the economic landscape in recent decades, many Samoans continue to lead a subsistent or semi-subsistent lifestyle – over 80% of the population is still dependent on agriculture (MOF 2006:9). During the 1990’s Samoa was battered by the Taro Leaf Blight (which halted taro exports) and two devastating cyclones that had a major impact on the economy. Since then the country has slowly rebuilt itself and is now enjoying strong economic growth. Over the last five years the real GDP growth of Samoa has averaged over four percent; consistently outperforming many of the other economies in the region (MOF 2006:10). Economic growth and development have brought with them an increasing demand for energy; especially petroleum.
Methodology

This paper initially intended to address the potential for economic trouble caused by a combination of the growing demand for oil imports in Samoa, especially from the transport sector, and what the researcher perceived as a complicated and overly regulated oil import and pricing system. The objective for the second part of the paper was to examine the efforts underway to develop coconut oil as a fuel to help combat the country’s growing dependence on oil. What the bias of the researcher did not allow her to see at first about the import and pricing mechanisms was the ingenuity of this system and that fact that it works well for Samoa, keeping prices lower in than most other countries in the region. The project continued as planned with an investigation into the transport sector, the impact of petroleum imports and the potential for coconut oil as an alternative fuel, but now also included a proposal to assess the tender system and what allows it to effectively meet the challenges of procuring affordable petroleum in the region.

Interviews were conducted during a three week period in April 2006 in the Apia area (with the exception of two interviews from early March) with representatives from government ministries, the private sector and international organizations. This range of interview sources was intended to cast light on the themes being explored from a variety of angles and perspectives. A number of primary documents acquired from the interviews provided a wealth of data that was used to verify growth trends and claims made by individuals from various ministries and organizations. Reports from regional organizations on energy, development, fuel prices and petroleum were consulted to give depth to the project.
This paper begins by examining the importance of oil in Samoa, the challenges it faces when importing oil and how it has structured its tender system to keep prices low. Growth trends in vehicle population, petroleum imports and the value of these imports are examined in the main body of the paper, followed by a brief discussion of alternative fuels and strategies for the future.

Introduction: Petroleum Dependency and Development

Fossil fuels are an extremely important source of energy in Samoa, as in most other countries in the world. Samoa is by no means the only country that is heavily dependent on petroleum; even the wealthy nations of the world with the capacity and drive to invest millions in sustainable alternative energy projects have not severed their dependence on oil despite its destabilizing price fluctuations, environmentally degrading qualities and its high cost in the last few years. Petroleum dependence in Samoa, however, is more troublesome than in other places because of the crucial role it plays in the development of the country. The UK’s Department for International Development (DFID) published a report in August 2002 about the importance of energy in the achievement of the UNDP’s Millennium Development Goals (MDG). This report stated that:

Energy can play a crucial role in underpinning efforts to achieve the Millennium Development Goals (MDGs) and improving the lives of poor people across the world. Lack of access to adequate, affordable, reliable, safe and environmentally benign energy is a severe constraint on development (DFID 2002:5).

For Samoa and other developing countries, petroleum is the energy source that plays the crucial role that the DFID refers to. A Pacific Island Forum Secretariat (PIFS) report on
petroleum in the region discusses the importance of oil in the Pacific Island Countries and Territories (PICTs):

    The PICT’s energy use in these sectors [commercial and industrial] is dominated by fossil fuels. Indeed, the region can be regarded as among the world’s most dependent on fossil fuels for their economic development (PIFS 2006:9).

In an interview, the Energy and Environment Program Coordinator of the UNDP’s multi country office in Samoa, Misa Andriamihaja, confirmed that: “Fuel is an extremely important engine for economic growth” (2007). The importance of petroleum to the development of the region is evident; in fact that all countries except Papua New Guinea must import one hundred percent of their oil which is a serious concern because oil is neither cheap nor accessible in this area of the world.

**Oil in the Region**

Pacific Small Island Developing States (SIDS) like Samoa face a number of challenges related to oil that are created by common conditions such as small size, remote location and developing economies. The Pacific Island Forum Secretariat (PIFS), the administrative branch of a regional organization, describes some of the supply trends in the Pacific region: “There are logistical challenges, a spread of social issues, instances of poor credit performance, limited growth potential, and a high number of health and safety incidents” (PIFS 2006:9). The result of these supply trends is the relatively high cost of petroleum products in these countries in comparison to other parts of the world. Samoa, however, has managed to overcome these obstacles in order to keep prices fairly low. Figures from the 14th edition of the Pacific Fuel Price Monitor (Jan/Feb and Mar/Apr 2006 prices), which is published by the Pacific Islands Forum Secretariat (PIFS), show
that Samoa’s retail prices of petrol and diesel are among the lowest in the region (PIFS 2006:1-3). The way that Samoa’s oil importation, distribution and pricing system is structured is complicated, but it is the reason that prices have been lower than in neighboring countries.

**Samoa’s Tender System**

Before 1998 three oil companies – BP, Shell and Mobil – were operating in Samoa; each had their own infrastructure. Sefo Samau Etuale, the Managing Director of Petroleum Products Supplies, explained the findings of a consultant hired by the government to evaluate the old system:

He concluded that because of the volume of fuel that Samoa imports is such a small volume, it does not make sense for three separate infrastructures to handle that volume of fuel. Because the recovery cost is very high. So, it’d be better to have just one operator and one set of infrastructure tanks (Etuale 2007).

The government took the advice of the consultant and since 1998 a new system has governed the importation, distribution and pricing of petroleum products in Samoa. All of the country’s oil imports and distribution are handled exclusively by a single operator (or a team working in a joint venture) that is granted a contract for five years. The current operator is a joint venture team of Total and Petroleum Products Supplies (PPS). Though the contract was originally a joint venture with Shell handling supply and PPS handling distribution, Total took over Shell’s operations in the Pacific in 2007 and is now the one taking care of supply. Total has agreed to honor the arrangements made by Shell until the contract expires in 2008 (Kilepoa 2007). Mobil was the first operator under this system, holding the contract from 1998 until 2003.
The transition from one operator to another occurs every five years; this gives the government the freedom to choose operators based on their performance and not be stuck with one if it is not performing well. One year before the old contract expires a Request for Proposal is sent out for operators interested in bidding on the one for the next five years. All costs – transportation, administration, supply and distribution – are taken into consideration when an interested operator submits their proposal. The government reviews the offers, chooses the best one and negotiates with that company to come up with a final tender agreement (Kilepoa 2007). Once an operator begins their term of service the price template agreed on by the government becomes the formula for the prices of various kinds of petroleum products which change once a month.

The new prices of petrol (ULP), diesel (ADO) and kerosene (DPK) become effective on the first of the month and are the same everywhere in the country with prices calculated on a period two months prior\(^1\) (Kilepoa 2007).

For example, June’s prices would reflect price fluctuations in world markets from April 16\(^{th}\) to May 15\(^{th}\). This has led to consumer confusion in the past in situations where world prices dropped at the end of one month but the new prices of petroleum products were even higher than those of the previous; what consumers do not understand is that there is a two week delay before price fluctuations are reflected in Samoa’s prices.

One of the reasons that this system is so effective is the government ownership of all the physical infrastructure of the country’s oil facilities which are then leased out to the current operator. The final acquisition of the physical infrastructure assets previously

\[^1\] To calculate them, the average of the spot prices on the Singapore market (since Samoa gets all of its oil from refineries in Singapore) from a specific period of time is applied to the formula and converted from US dollars to tala (WST) based on the average exchange rate of the same period of time. The period on which the new month’s prices are calculated begins on the 16\(^{th}\) of 2 months prior to the one being calculated and ends on the 15\(^{th}\) of the month before (Kilepoa 2007).
owned by Mobil took place in 2005. This acquisition, along with all of the other oil infrastructure projects in the country, was financed by loans from the OPEC (Organization of Petroleum Exporting Countries) Fund for International Development (OFID) (Kilepoa 2007). The government’s control of the infrastructure puts them in a strong position from which to deal with oil companies and gives them the flexibility to change operators every few years without having to worry about a potentially messy and costly transition process. The only loose end to tie up as far as the acquisition of the oil infrastructure is the matter of the land at Sogi, which is the main fuel storage depot located on Upolu. Though the government owns the tanks, pipelines and other infrastructure assets, the land that the assets are physically located on is privately owned and is leased out to the government. Negotiations are currently underway for government purchase of the land, which would complete their control of the infrastructure (Suapaia 2007).

Samoa’s system is one of the models being considered by the Pacific Islands Forum Secretariat (PIFS) for a regional ‘bulk buying’ plan that seeks to improve the petroleum importation and pricing systems for the Cook Islands, Federated States of Micronesia, Kiribati, Nauru, Niue, Palau, Republic of Marshall Islands and Tuvalu (PIFS 2006:1). Unlike Samoa, these nations pay some of the highest prices in the region because they are still grappling with issues such as the lack of economies of scale and multi-national oil company (MNOC) control of supply and prices. The project report reviews each type of system being considered to determine whether or not it will improve the situation in these countries with the goal of increasing efficiency and lowering costs – much like when Samoa reviewed its pre-1998 system. The current structure that Samoa
operates under is listed as: “Option C – Private Public Partnership #1: State Owned Terminals, Leased Back to a Supplier/Operator” (PIFS 2006:20). The report highlights the strengths of the system, reporting what it allows the government to do:

Maximize purchasing power of the nations petroleum energy requirements; maintain the economies of scale offered by monopoly supply… improve negotiation position by eliminating private sector control of key infrastructure… and test the market for suppliers to minimize the opportunity for monopoly margin creep (PIFS 2006:20-21).

This shows how effectively the system addresses the major challenges faced by PICT’s when importing oil. The ability of this system to allow both competition and the stability of a monopoly operator has allowed Samoa to keep its petroleum prices fairly low in comparison to the rest of the region. The system works effectively to keep prices down at the present time; however it cannot single handedly guarantee an ideal energy situation in the country. A few trends in Samoa such as increases in vehicle population, petroleum imports and the cost of oil in world markets have serious implications for the country and should be monitored carefully.

**The Growing Transport Sector**

The growing number of vehicles on the road is a visible sign of development and the increasing importance of Apia as the urban center of the country. Years ago there were few private family vehicles; much of the population consisted of subsistence farmers who could not afford them. In the past few years, however, circumstances have begun to change and the demand for vehicles has grown significantly. In 2006 the total number of vehicles registered in Samoa was 194% of what it had been just five years before in 2001 – up to 15,012 vehicles from 7,731 (TCB 2007). The total number of vehicles registered includes private cars and pick-up trucks, buses, trucks, taxis,
motorcycles, tractors and other. The combined number of private cars, pick-ups and taxis – which are privately owned and usually serve as the driver’s personal family vehicle as well as a taxi – accounted for nearly 70% of the total number of vehicles on Samoan roads in 2006 (TCB 2007). These three types of vehicles are what this paper will refer to as ‘private vehicles’; this is an important category because much of the growth in the vehicle population has occurred in it. The number of vehicles in Samoa has grown consistently for the past several years and seems to be showing no sign of letting up yet.

Figure I. (based on registration data from the Transport Control Board) illustrates the steady growth of both the total number of vehicles and of private vehicles. According to the ACEO of Transport, Misi Tupuola, the vehicle population has grown by almost 500 vehicles annually and is likely to increase by an even greater amount each year (Tupuola 2007)

**Reasons for Increasing Vehicle Demand**

A number of forces are driving the growth in the vehicle population. Lu Ieremia, a car dealer at the Asco Motors Toyota dealership in Apia, has noticed an increase in sales from about eighteen to twenty vehicles per month two to three years ago to about thirty per month currently (Ieremia 2007). He says that Samoans are beginning to feel that cars a necessity, which was never the case before. “Many times relatives from overseas come back and see that it is very important now for their family to have a car to bring their goods to sell in Apia or get treatment at the hospital, so they help them buy cars” (Ieremia
Misi Tupuola has also noticed the trend of Samoans overseas helping their family here obtain vehicles: “Samoa is developing. The people are growing; they have money; they have aiga [family] in the United States. Some of them are very good to give vehicles to their family here” (Tupuola 2007).

As the country continues to develop economically and the influence of a cash economy on a system that was based mostly on subsistence for so long increases; mobility becomes more important. The final draft of Samoa’s National Energy Policy (SNEP) recognizes the role transportation plays in development:

Development in the transportation sector has direct links to the advancements in other sectors of the economy. It enables the movement of goods and services both domestically and abroad and increases access for non-urban dwellers to markets, employment opportunities and services such as education and health (MOF 2006:28).

For these and other reasons the demand for private vehicles has been growing quickly and will likely continue to do so. Though they are still out of the budget for many Samoans; money from remittances and the greater availability of loans have made vehicles accessible to families who would never have been able to afford them on their own (Ieremia 2007).

**The Transport Sector as a Source of Petroleum Demand**

All of the vehicles on the road in Samoa – with the exception of one experimental EPC truck which will be discussed in greater detail later – run on either petrol or diesel fuel. The transport sector is by far the greatest source of demand for unleaded petrol (ULP), accounting for 95% of all of the petrol consumed (Etuale 2007). Diesel fuel is consumed in significant quantities by the transport sector as well, but only accounts for 24.5% of country’s total consumption due to the heavy demand for diesel from the power
generation sector, especially in the dry season when hydropower output decreases significantly (Etuale 2007). The dependence of the expanding transport sector on oil has naturally led it to play a part in the growth of petroleum imports. According to the SNEP final draft, 80% of the total fossil fuel consumption in 2005 was accounted for by the transportation sector (MOF 2006:28). Mr. Etuale, Managing Director of PPS Samoa, remarked:

And for petrol [demand increasing] – we’ve seen a hell of a lot more cars. In the past few years there has been a huge increase in vehicles for a small place. And as a result, of course, we’ve seen the consumption of petrol increase. And that’s despite the fact that, in the same period of time, the price of petrol has gone up quite a bit. But we haven’t seen any reduction in the actual volume of petroleum sales (Etuale 2007).

This trend of a growing vehicle population even as fuel prices rise is not unique to Samoa; it is visible in many other parts of the region as well. The 14th edition of the Pacific Fuel Price Monitor notes that: “Despite the current high fuel costs there is an increasing trend of vehicle ownership and is attributed to improved earning capacity of the working class (middle and upper) and affordability of vehicles…” (PIFS 2006:1). The large number of vehicles is not the only reason that petroleum imports for the transport sector have been increasing; consumer preferences for big engine vehicles and a lack of interest in the fuel efficiency of cars has amplified the increases in demand caused by a growing vehicle population.

**Consumer Trends**

Of the new cars pouring onto Samoan roads, many are unapologetic gas guzzlers. Older vehicles tend to be less fuel efficient and usually produce more emissions that are harmful to the environment, so steps have been taken to limit the number of these aging cars in the country. The Transport Control Board has set regulations that ban the import
of cars over eight years old to keep out vehicles that are dirty and inefficient because of their age (Tupuola 2007). Unfortunately, many of the new cars are not very efficient either because of the types of vehicles that are popular. Given the high cost of oil in recent years it seems strange that the most highly coveted vehicles are those with huge and wasteful engines, but that seems to be the case. The preference for large gas guzzlers is the product of both a lack of consumer awareness and social and cultural reasons. Large vehicles are status symbols in a society experiencing the transition from a subsistence economy to a cash one. Frank Griffin from the South Pacific Regional Environmental Programme (SPREP) explained:

The people of Samoa have a tendency to buy big vehicles. You know, it’s amazing because this is not a big place, and usually you buy a big engine vehicle to go long distances or speed down the main street. But the main street over here is very narrow and has lots of speed bumps and traffic lights strategically placed around the town. So, I think it’s just a personal choice for people wanting to show that they’ve got a little bit more money; they’re more prosperous than some of the others around the place (Griffin 2007).

At Asco Motors, Lu Ieremia has seen the same consumer preferences, adding that engine size is one of the most important factors in the average customer’s decision (Ieremia 2007). This consumer trend of buying big is interesting because of the simultaneous public dissatisfaction with the high cost of fuel. Misi Tupuola of the Transport Control Board remarked: “I know consumers are very afraid with the high cost of fuel. And, as I said, we don’t know where to go because we have to buy the fuel; we have to buy the diesel and the petrol from the gas station” (Tupuola 2007). This fear of high prices is surprising to note, as Samoa’s prices are so low compared to those in other countries in the region, however it can be explained by the widespread lack of understanding about the tender system. With such concern about fuel prices, it would seem natural for car
buyers to care about fuel efficiency when making a purchase. This is usually not the case, however. Lu Ieremia estimated that: “Out of every one hundred people that buy a car, maybe only two would ask about fuel efficiency” (Ieremia 2007). What is more surprising than the consumer disregard of fuel economy considerations in the face of rising crude oil prices is that even if they bothered to ask, the dealerships would not be able to provide the information. When asked whether there is a problem with awareness about the benefits of owning a more fuel efficient vehicle – such as saving money on petrol – Frank Griffin of SPREP explained:

First of all, like some of the dealers have said, that information is not supplied to them when they buy their vehicles off island. And there are no information mechanisms properly put into place in the Pacific where you put all that information for public consumption. On top of that, you have to break all that technical information down into something a layman can understand (Griffin 2007).

Since 70% of Samoa’s registered vehicles are private cars, pick-ups and taxis (TCB 2007), informational programs that aim to encourage the purchase of more efficient vehicles have the potential to lower imports noticeably, or at least slow the growth of these imports.

**Increasing Imports and Import Values**

Increasing demand for petroleum from both the transport sector and an expanding Samoan economy has led to consistent growth in imports over the past few years. Mr. Etuale, the Managing Director of PPS, said: “Since we took over here in 2003, we have seen a steady increase of about three and a half to four percent total, each year. And that has been quite consistent over the last three or four years since we’ve been here” (Etuale 2007). Even in the last year the total sales volume increased significantly. From the period between March 2006 to February 2007 it was recorded as 79,029,631 litres; up
from 2,772,949 litres from the levels recorded in the same time period from 2005 to 2006 (EEA 2007:1). According to Mr. Etuale, import volumes have been increasing even though prices across the board for ULP, ADO and DPK have been rising as well (Etuale:2007). Over the past few years, these increases have translated into alarming increases in the cost of imports. Figure II. (based on data from the Ministry of Foreign Affairs and Trade) shows that from 2002 to 2006 the CIF value (customs, insurance and freight added value) of total petroleum imports increased from $56,307,014 WST in 2002 to $117,523,209 WST in 2006 (MFAT 2007:). For a country whose total exports garnered $28,746,000 WST in 2006 (CBS 2007:8), oil expenditure increases like these can be extremely difficult for the economy to handle. This issue will be discussed in greater depth in the next section.

Looking to the future, Mr. Etuale sees the import levels of petroleum continuing to increase as Samoa develops. He does expect, however, that the vehicular demand for imports will begin to level off at some point in the future because there are only so many cars that a small country can handle (Etuale 2007). At the current time, however, there is no indication that the growth of imports will slow. The hope is that world oil prices will stabilize and ease a bit in the next few years so that import levels can continue to increase without the country’s oil expenditures becoming a danger to the development and economy of the country. During a visit to Samoa in February, IMF representatives
forecasted lower and more stable oil prices in the next two years, so there seems to be hope for the immediate future that oil import levels and prices will remain manageable (Lui 2007).

**Oil and the Trade Deficit**

Samoa’s oil imports have a significant impact in terms of the trade deficit. The price of crude oil is determined in world markets and, no matter how efficient the tender system is or how much the government regulates the price, it is impossible to shield Samoan consumers from the price fluctuations that oil is prone to. As Samoa’s petroleum imports continue to grow, so too will the vulnerability of the economy to price increases.

The country’s main exports are fresh fish, coconut cream, beer, nonu products, copra and taro (CBS 2007:8). The total value of these and other exports combined is extremely small compared to the cost of imports. In 2006, for example, the free on board (FOB) value of exports was $28,746,000 tala; the FOB value of total imports was $607,809,000 tala (CBS 2007:8). The export sector has been declining for the last seven years and shows no immediate potential for growth, according to Mr. Lui of the Central Bank of Samoa. (Lui 2007). Oil imports accounted for one fifth of total imports in 2006 and as demand increases and prices go up they will continue to contribute to the massive trade deficit. Though earnings from tourism and remittances are currently able to offset the high level of imports to keep the BOP current account deficit at under 5% of the GDP (Government of Samoa: Appendix 1), the vulnerability of the tourism industry should be kept in mind. Though the economy is able to handle the high cost of oil imports at this point, proactive steps should be taken to ensure that it remains able to absorb rising costs and volumes.
For the Future

The current trends of increasing vehicle population, demand for imported oil and the cost of crude in world markets in recent years have created the need to plan for the future in order to avoid major problems for the economy and Samoa’s development. The Economic Policy and Planning Division of the Ministry of Finance has spent years drafting a national energy policy which seeks to do just that. The final draft of the policy is now completed and scheduled to be submitted to the cabinet for approval later this month (Suapaia 2007). The release of this policy will hopefully stimulate more interest in energy issues, encourage energy efficiency and promote research of alternative energy technologies. Raising awareness about the economic benefits of fuel efficiency and the potential economic viability of alternative fuels is one of the best ways to address the growth of expensive oil imports. Recommendations from the 14th edition of the Pacific Fuel Price Monitor stress the importance of the former: “In simple terms, energy efficiency and conservation measures are the most logical direction the region can immediately consider to cushion the adverse impacts of rising oil prices” (PIFS 2006:7). Strategies aimed at efficiency and conservation measures have the potential to make a difference in the oil consumption at the household level. This is good because the promotion of energy efficiency will help prepare consumers, who need oil but will be hard hit by increasing prices, to make adjustments that will enable them bear the rising costs.

Developing alternative energy sources is much more complicated than the promotion of fuel efficiency, especially when it comes to fuel for the transportation sector. Alternative energies require new infrastructure components, extensive research
and development projects and the interest and cooperation of the public in order to be economically viable and practical on a scale large enough to make a difference in the country’s energy situation. While hydropower and solar technologies have proven feasible for power generation, the transportation sector’s fossil fuel consumption is more difficult to tackle because consumers have neither interest nor confidence in alternatives to diesel and petrol yet. The only significant progress that has been made as of now for the transportation sector has been the result of a project to use coconut oil as the basis for a motor fuel.

A ‘Niu’ Kind of Oil

The Electric Power Corporation (EPC), UNDP and the South Pacific Applied Geoscience Commission (SOPAC) have been working on a coconut oil fuel project for the last few years. While the main focus for this project is to develop an alternative to the use of diesel for power generation, there has been research and testing on the potential of coconut oil for the transport sector as well. The EPC has run three separate pick-up trucks on coconut oil blend fuels in unmodified engines over the course of the vehicular part of the project. The most success has come with the most recent trial, which was launched in March 2006 and involves a brand new, unmodified Toyota Hilux pick-up truck and a blend of 85% coconut oil 15% kerosene for the fuel (Tago 2007). One of the team’s mechanical engineers, Siloma Tago, says that the kerosene/coconut oil blend minimizes the sludge buildup that can result from using pure coconut oil as fuel. The vehicle has driven about 80,000 km and seems to be running with no problems so far (Tago 2007). A project report prepared by Mr. Tago in March 2006 calculated a fuel efficiency of 11.8704 km/l, compared to the 11.7647 km/l stated in the manufacturer specifications of
the vehicle published by Toyota (Tago 2006:5). While this difference is marginal, it is a promising sign for the future that coconut oil in an unmodified engine was able to maintain (and even surpass) the fuel economy of the truck running on diesel. The report also contained a cost analysis of the fuel for the project which demonstrates the potential for the coconut oil/kerosene fuel as being economically viable. Based on the March 2006 prices, the cost of a 76 litre fuel tank of diesel was $167.05 WST. The cost of filling the same tank 85% with coconut oil and 15% with kerosene at their respective March 2006 prices was only $135.91 WST (Tago:2006:8). The cost savings increased as the cost analysis for greater volumes of each kind of fuel was calculated. For example, the report showed that it cost $405.20 WST more to fill a 1000 litre trailer with diesel at March 2006 prices than with the coconut oil and kerosene mix.

Though the vehicle proved the feasibility of coconut oil as a fuel source for a motor vehicle and demonstrated the economic viability of it as well, the project has been temporarily shelved. The halt in testing has nothing to do with the viability of coconut oil as a fuel; rather, it has to do with the lack of coconut oil itself. The only mill in Samoa that produces coconut oil was closed about a year ago due to bankruptcy and until the mill opens again there is no way to obtain coconut oil for the project (Tago 2007). The mill has since been taken over by another company that plans to reopen it; when it reopens work on the project will continue (Kilepoa 2007).

One major hurdle the project will have to overcome in the course of its development is the negativity that surrounds it. Though the coconut oil/kerosene blend was proven to be cheaper and better for the environment, most Samoans seem to have no interest or confidence in alternative fuels at this point. Siloma Tago has been
disappointed with the unenthusiastic public response to the vehicle; which he claims stems from a lack of a public awareness campaign or any kind of explanation to go along with the project. According to him, the truck was decorated with signs advertising that it runs on coconut oil but was never really publicized or explained; therefore people don’t understand the motivations behind the use of alternative fuels or the fact that this particular fuel is actually cheaper than diesel (Tago 2007). Hopefully the release of the Samoa National Energy Policy will spark more interest in the project, because at this point it shows great potential. When asked if there was hope for this project after the reopening of the mill, Misa Andriamihaja from the UNDP said: “Of course. Anything good has a future… It’s just not yet at a big scale” (Andriamihaja 2007). Though coconut oil is certainly not the only option as Samoa explores alternative energies for the transport sector, the EPC project has paved the way for others in the future by taking the first step and demonstrating that economically viable alternative fuels can, and do, exist.

**Conclusion**

Much of the progress and development in Samoa in recent years has been fueled by petroleum. Demand for oil comes from many sources in Samoa, but the transport sector’s petroleum consumption is especially important to take note of for a few reasons. Vehicles are becoming more accessible and naturally the growing number of them on the roads has led to increasing demand for petrol and diesel. The popularity of big engine vehicles and disregard for fuel efficiency has amplified this growth. The increasing cost of oil that coincides with Samoa’s growing demand has driven the value of petroleum imports to worrisome levels. Despite the efficiency of a government regulated, monopoly operated supply and distribution system that keeps prices among the lowest in the region,
prices of petrol and diesel have been climbing (and will continue to do so) as they reflect trends in world markets. Serious efforts to encourage efficiency and conservation and to develop alternative fuels for the future are needed to ease the vulnerability of Samoa’s economy and development to oil price increases. With the government’s commitment to handle energy issues proactively and the coming release of the Samoa National Energy policy, the country seems to be moving in exactly the direction it needs to be.
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