

## ENERGY REVIEW



### MINISTRY OF FINANCE

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*The "Energy Review" is published by the Economic Policy and Planning Division of the Ministry of Finance. The analysis provides an overview of Samoa's Energy Sector and is intended to provide the Government of Samoa, business community and the general public with a better understanding of the energy sector.*

*This is the second review and covers the period from January to December 2008. The next review for the period January to December 2009 is envisaged to be released in June 2010.*

## 1. Executive Summary

### Key Features for 2008 Performance

#### Renewable Energy

- Total renewable energy consumption in 2008 is estimated at 36.6 kilo tonnes of oil equivalent (kTOE).
- Biomass consumption recorded a decrease in consumption from the commercial and manufacturing sector. The residential sector on the other hand recorded an increase in consumption.
- Solar Energy technology contributes to a minute portion of the national consumption. Based on accumulated system in the country, it is estimated that energy generated from solar grew by 2% when compared to 2007.
- Energy consumption from hydro power in 2008 stood at 3.8 kTOE.

#### Petroleum

- Prices of unleaded petrol and diesel increased in the first 8 months of 2008 then dropped significantly in the last quarter.
- The price of unleaded petrol and diesel in the peak month of August is 30% and 43% higher than the January prices respectively whilst in December compared to January they dropped by less than 12% and 7% respectively.
- The price of domestic kerosene showed a drop at an average monthly percentage of 1%.
- The price of domestic kerosene showed a 5% decrease between January and December 2008.
- Total petroleum consumption declined by 7.1 % from 2007 and is reflected across all the sectors in Samoa.
- The transport sector recorded a decrease in consumption from 2007 by 4.5% but still accounted for a significant portion of total consumption at 66%.
- Commercial sector consumption declined by 23.6% between 2007 and 2008.
- Electricity sector consumption declined by 1.4% between 2007 and 2008.
- Residential sector consumption decreased by 39% between 2007 and 2008.

#### Transport

- Petroleum consumption in the transport sector decreased by 4.5% between 2007 and 2008.
- Land and marine transport demand for petroleum decreased by 7% and 16.9% respectively between 2007 and 2008.
- Air transport demand for petroleum on the other hand increased by 6.3% between 2007 and 2008.
- Composition of petroleum usage in the transport sector for 2008 was 65.0% to land transport, 28.0% to air transport and 7.0% to Marine transport.

#### Electricity

- Electricity Generation fell by 8.1% between 2007 and 2008 with diesel generation supplying about 59%.
- Total Electricity Consumption dropped by 12.9% from 2007 and 2008
- Commercial and Manufacturing sector demand decreased by 15.1% between 2007 and 2008



## 2. Renewable Energy

**These are sustainable sources of energy that are obtained from locally available natural resources. Those that are currently utilised in Samoa include biomass, solar and hydro-power. Biomass use in Samoa consists of firewood, coconut shells and husks which are mainly utilised in domestic cooking. Solar technology use mainly consists of Solar Photovoltaics and Solar Hot Water Systems. Hydro-power over the past 2 decades has been used extensively in Samoa and currently supplies around 40% of electricity to the main grid in Upolu. Other high potentials for renewable energy in Samoa include harnessing energy from the wind, biogas, biofuels (coconut oil), waste and geothermal sources.**

### Summary:

Total energy consumption from the New and Renewable Energy sources in Samoa for 2008 is estimated at 36.6 kilo tonnes of oil equivalent (kTOE). Of this consumption, most is due to biomass utilisation. Solar energy consumption when compared as a whole is miniscule, with an estimated consumption of 2.7 tonnes of oil equivalent.

Not much significant changes were estimated for 2008 consumption when compared to 2007. Hydro power due to its major association with supplying electricity to Samoa is categorized under the electricity sector (energy consumption from hydro power in 2008 stands at 3.8 kTOE for Samoa.).

### Types of renewable energy available in Samoa:

#### **Solar Energy: Solar Photovoltaic and Solar Water Heaters:**

Developments on solar energy technologies in Samoa represented a very small part of the total energy generated or consumed per year. For 2008, total imports of solar type products recorded 25 systems giving an estimated energy capacity of 114.5 GJ or 2.69 TOE.



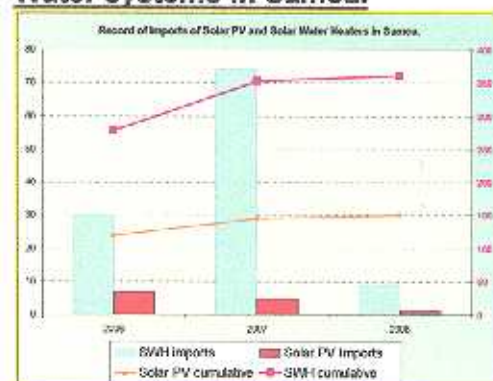
Figure 1: Apolima Island is successfully being electrified by solar power for over 2 years.

Of the systems imported in 2008, Solar hot water heaters accounted for 23 of the 25 solar energy technologies. Accounting for all the systems imported into the country since 2002,<sup>1</sup> it is estimated that the generation capacity of Solar PV in Samoa for 2008 stands at around 108.2 GJ or 2.5 TOE. Likewise, Solar hot water systems based on

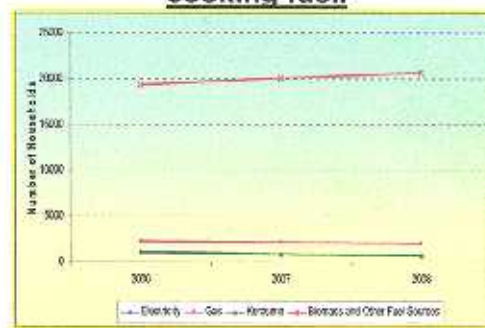
accumulated figures since 2002 is estimated at around 1,779.3 GJ (41.8 TOE).

As part of the rural electrification projects, solar home systems for household with no access to electricity has been an option EPC has been looking at for communities isolated from the main power grid. For SWH, in 2008, it is taken that the bulk of the imports went to the Hotel sector.

### **Records of Solar PV and Solar Hot Water systems in Samoa.**



### **Comparison on the number of households by main source of cooking fuel.**



<sup>1</sup> Records of Solar PV and SWH import go as far back as 2002. No record was shown for 2000 and 2001



**Bio-energy:** Biomass (Firewood, coconut shells, coconut husks, plant waste residues, wood charcoal etc), liquid biofuels (coconut oil biofuel, biodiesel, ethanol) and biogas.

Concrete studies on Biomass consumption for Samoa was last carried out in the late 80s. The following is an estimation based on calculation off the 2006 national census, commodity exports and estimation based on previous years' reports. For the year 2008, It was estimated that total biomass consumption was in the vicinity of 36.6 kilo tonnes of oil equivalent. Of this consumption, Residential Sector accounted for 94% with an estimated amount of 34 kTOE, an estimated increase of 0.5 kTOE from 2007.

For the commercial sector, Biomass consumption figures have been calculated and estimated off the commodity export figures. Based on this, it is estimated that maximum biomass consumption in the commercial sector stands at around 2.23 kTOE. An estimated increase of 0.2 kTOE from 2007.

#### Developments:

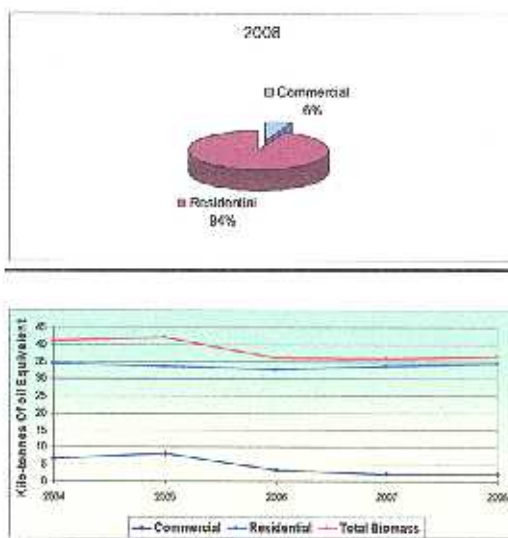
There is interest in Samoa to develop liquid biofuels from vegetable oils. In 2008 two new coconut oil companies were established whereby they will be looking at the possibility of developing coconut oil biofuel blends to substitute fuel for transportation and electricity. EPC is actively involved with the two companies as they also share interest in purchasing this fuel for their generation, envisaging some savings on their part as diesel fuel is one of the significant expenses for their operation. The transport sector is also targeted for selling bio-fuel to at a later stage.

Wind Monitoring Program is also taking place to monitor the possibility of developing wind for commercial and residential purposes in regard to power generation and masts have been installed at potential sites in Savaii and Upolu.

Photovoltaic had also been considered for Rural Electrification targeting the un-electrified households. EPC had completed a survey of the location of these households and are now seeking funds to further develop this initiative connecting some to the main grid with the remote ones having stand alone systems.

Further development of smaller hydro schemes will follow the Hydro data collection program that is currently undertaken by the EPC.

#### Comparison of Biomass consumption between commercial and residential Sector.



**Figure 3 : Piles of copra and desiccated coconuts in one of the coconut oil companies factory processing bio-fuel.**



**Figure 2: One of the wind masts on Upolu monitoring wind speed for further developments on wind energy**



### 3. Petroleum

**Samoa imports six petroleum products, namely Unleaded Petrol (ULP), Automotive Diesel Oil (ADO), Dual Purpose Kerosene (DPK), Aviation gasoline (Avgas), Lubricants & Greases and Liquid Petroleum Gas (LPG). Main Petroleum imports (ADO, DPK, ULP and Avgas) are solely supplied and distributed by Petroleum Products Supplies (PPS). In 1998 the Government of Samoa introduced and controlled effectively new supply and pricing arrangements by owning all the petroleum storage facilities and tendering out operation to a supplier every 5 years. This arrangement allows the control of domestic petroleum prices to be reflective of international market prices. The Ministry of Finance controls and manages this arrangement. LPG imports and sales are mainly operated by BOC Gas and ORIGIN Gas which are foreign owned firms with part local ownership. The Price Control Board which operates under the Ministry of Commerce, Industry and Labour (MCIL), sets LPG ceiling price range. Other products are brought in by different private companies.**

#### Summary:

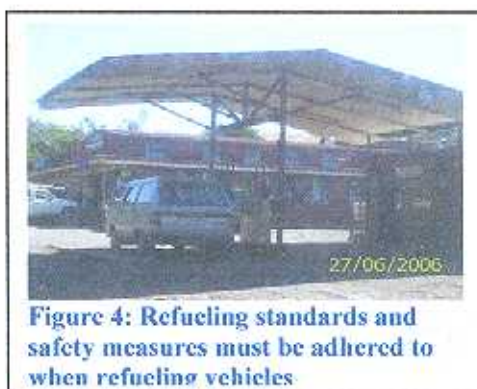
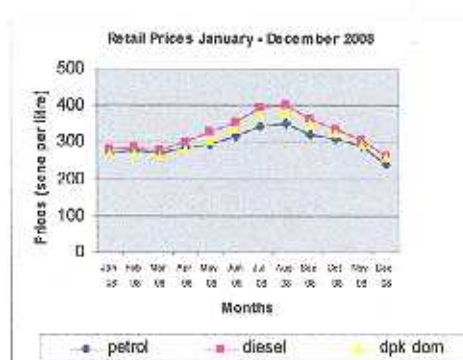
In 2008 petroleum consumption totaled 80,282 kl, seeing a decline of 7.1 % from 2007 (86,429kl). This overall decline in consumption is reflected across all the sectors in Samoa. The Transport sector which accounted for 66% of total petroleum consumption in 2008 recorded a total consumption of 53,480 kl, a decrease of 4.5% from 2007 (55,983 kl). The Electricity sector also recorded a decrease by 1.4% from 2007 (17,672 kl) with a total volume of 17,431 kl recorded in 2008. The Commercial and Manufacturing sector together with the Residential sector in 2008 consumed 9,371 kl. This decline is mainly attributed to the high fuel prices in the first eight months of the year. People tend to use less fuel when prices are high, becoming more energy efficient.

#### Petroleum Prices:

*Petroleum products sales considered in analysis are Unleaded Petrol, Automotive Diesel Oil and Dual Purpose Kerosene. Additional information on petroleum prices could be obtained from the Quarterly Economic Review also produced by the Economic Policy & Planning Division.*

Retail prices of unleaded petrol and diesel climbed in the first 8 months of the year under review by an average percentage of 4% and 5% respectively then it dropped significantly towards the last quarter by 11% and 10% respectively. The peak in August was 30% and 43% higher than the January prices respectively. December prices for unleaded petrol and diesel dropped by 12% and 7% respectively compared to January prices. In comparison to 2007 the two products increase at an average percentage of 2%. The unleaded petrol retail prices dropped by 11% from \$2.70 per litre in January to \$2.40 per litre in December and diesel by 7% from \$2.80 per litre to \$2.60 per litre. Over the same period last year the two products increased by 21% and 20% respectively.

The retail prices of domestic kerosene showed a drop at an average monthly percentage of 1% over the 12 months compared to 2% average monthly increase over the same period last year. The overall price of domestic kerosene





showed a 5% decrease between January and December from \$2.70 per litre to \$2.60 per litre in December. In 2007 the price of domestic kerosene showed 19% increase between January and December. August 2008 recorded a new record of fuel prices for all products.

Samoa has reviewed its initiative on rationalizing its fuel supply and distribution and separated the supply of fuel from its distribution. This has strengthened Samoa's position more as most oil companies do not want to be involved in country processes, leaving this to the local businesses that are believed to do better in this area. This rationalization exercise had further allowed for a reflection of the international market prices on the domestic prices. As a result of this arrangement since it started in 1998, it has put Samoa as one of the countries in the region with the lowest wholesale and retail fuel prices. The new contract for the fuel supplier has been executed on 1 August 2008 for the next 5 years and the new distribution contract commenced on August 1, 2009 until July 2014.



Comparing Samoa average retail prices for both unleaded petrol and diesel from January to December 2008 to New Zealand, Australia and Fiji, Samoa's average diesel price is similar to that of Fiji and its unleaded petrol retail price is the cheapest of the four countries in comparison. The diesel prices in New Zealand appears to be the cheapest of the four countries in comparison but the diesel engine vehicles pay for Distance Traveled License separately, which is not reflected in the retail prices shown above.

### Imports

Total fuel Imports for January to December 2008 fluctuated and stood at 84.5million litres in total compared to 79.4million litres in 2007. An increase of about 6.4%. Total imports dropped significantly in February and November. No fuel was discharged and recorded during the month of April. Fuel discharged in the month of March was sufficient to cover for the demand in April.

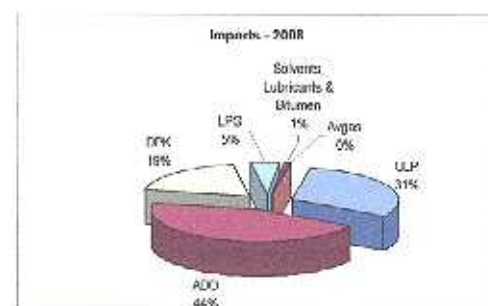
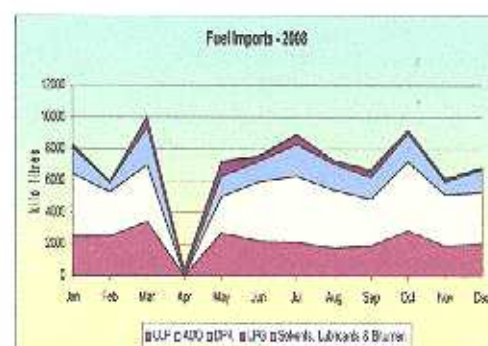
In the period under review, ADO recorded 44% of total oil imports with 37,816 kl, ULP 30% with 25,986 kl, DPK 20% with 16,214 kl, LPG 5% with 3,820 kl and the balance of 1% for Avgas, Solvents, lubricants and grease.

LPG total imports for 2008 have increased by over 100% from 2007 with sharp increases in March and July with over 500 kl of LPG imports respectively. ADO and ULP continue to dominate total petroleum imports reflecting an increase of 4.2% and 0.4% respectively from 2007. This reflects the extensive use of these two products on transportation and electricity sectors. DPK imports recorded an increase of 14.6% from 2007 (14,152kl) to 2008 (16,214kl)

### Re-exports:

For 2008, Samoa recorded re-export sales to Tokelau totaling 908 kl (0.9 million litres). Of this amount ADO accounted for 634 kl, DPK for 35 kl, and ULP accounting for 235 kl.

### Petroleum Imports by products:





### Consumption

Total petroleum consumption declined by 7.1 % from 2007(86,429kl) to 2008 (80,282 kl) and is reflected across all the major sectors in Samoa. However by comparison on a monthly basis, trend in consumption grew at a monthly average rate of 1.7% from January to December.

The transport sector in 2008 (53,480 kl) recorded a decrease in consumption by 4.5% from 2007 (55,983 kl) and accounted for 66% of total petroleum consumption in 2008. The Commercial and Electricity sectors also recorded a drop in consumption by 23.6% and 1.4% respectively from 10,247kl (2007) to 7,830kl (2008) for Commercial and from 17,672kl in 2007 to 17,431kl for electricity sector. Their contribution to total petroleum consumption for 2008 is 10% and 22% respectively. The Residential sector recorded a decline in total consumption as well in 2008 (1,541kl) when compared to 2007 (2,527kl), a decline of about 39%. Its contribution to total consumption is 2% in 2008 compared to 3% in 2007. This drop in total consumption for all sectors under review corresponds to the high increases in fuel prices in the first eight (8) months of 2008 with the highest being recorded in August. It also reflects generally an economic slowdown following major constructions for the SPG in 2007.

A further outlook of the Residential sector shows a decreasing trend of consumption from January to December with an average monthly decrease of 1.72%. This is mainly attributed to the continual decline in domestic use of kerosene which records an average monthly decrease of 2.45% from January (101.70 kl) to December (72.20 kl). However the domestic use of LPG remained at a more unvarying level and recorded a monthly average increase 0.12% from January (58 kl) to December (54kl).

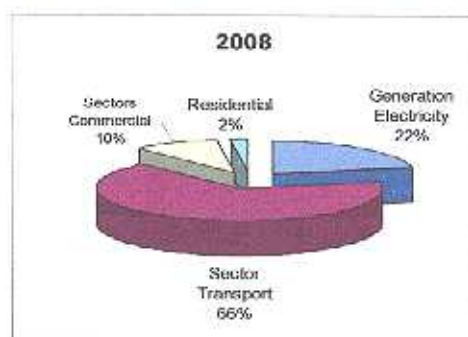
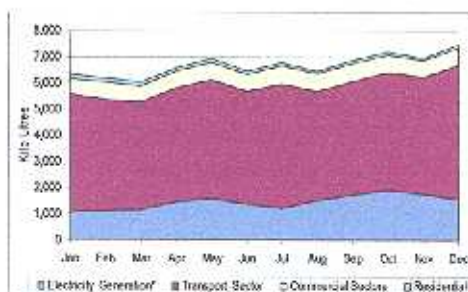
For the Commercial and Manufacturing sector, ADO consumption totaled 6260 kl in 2008 and with an average monthly consumption of 522 kl. Likewise LPG consumption totaled 1281 kl with an average monthly consumption of 107 kl. ULP and DPK the minor fuel consumed in the commercial and manufacturing sector totaled 162kl and 128 kl respectively.

### Developments:

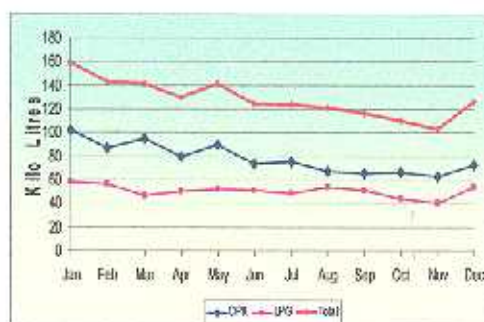
Samoa has reviewed its initiative on rationalizing its fuel supply and distribution and separated the supply of fuel from its distribution. Samoa has awarded the fuel supplier contract to Mobil for the next 5 years from 2008 to 2013 under its rationalization exercise for fuel supply and distribution. The new fuel distributor had recently been announced and was awarded to Petroleum Products Supplies Ltd for the second time commencing 1 August 2009 until end of July 2014.

The new land route pipeline to replace the old submarine pipeline was open for operation in July

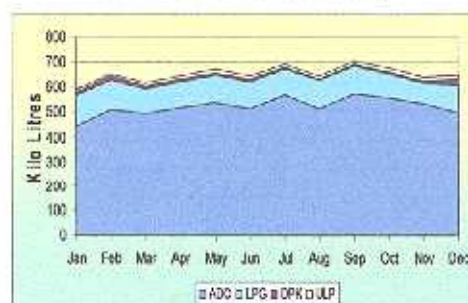
### Total Oil Consumption by Sector



### Petroleum Consumption in the residential Sector.



### Petroleum Consumption in the Commercial Sector.



2008. This has efficiently pumped the fuel from the tankers to shore in terms of timing and environmental risks and safety.

The insurance for petroleum facilities and equipments was awarded to Progressive Insurance Company in 2008 for a period of one year. This company has again won the tender for insurance put out this year for a period of three (3) years commencing from 1 August 2009 to end of July 2012.

The Ministry of Finance is currently reviewing the issuance of licenses to service stations in accordance with the Petroleum Act 1984, including safety and petroleum standards for terminals and service stations operators to comply with as stated in the Act.



**Figure 5: Upgrading and maintaining Petroleum Facilities and Terminals is part of works carried out under the OPEC Loan.**

Samoa is highly dependent on imported petroleum for transportation and electricity generation. Therefore, under the enacted Samoa National Energy Policy 2007 (SNEP2007) the targeted activities are aiming at improving efficiency in these two areas through its relevant agencies responsible for these sectors in collaboration with some development partners. Coconut oil is also being explored further as a substitute to diesel by the private sector and the Scientific Research Organisation to develop biodiesel and biofuel to be utilized by diesel vehicles and for power generation with the aim to reduce this dependency on imported diesel.



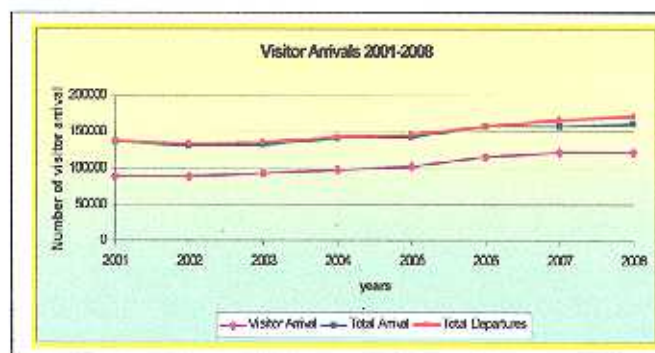
## 4. Transport

*Transportation has direct links to the advancements in other sectors of the economy. It is the medium that enables the movement of goods and services both domestically and abroad. The transport sector in Samoa consists mainly of land transport referring only to vehicles, Air transport mainly with reference to international flights and Sea transport as in fishing vessels and ferries.*

### Summary

Petroleum consumption in the transport sector decreased by 4.5% from 2007(55,983kl) to 2008 (53 480 kl). Likewise land transport and marine transport also recorded a decrease in consumption however, the air transport sector recorded an increase in consumption when compared to 2007. Land transport recorded a decrease of 7.0% from 2007 (37,219 kl) to 2008 (34,620), marine transport recorded a decrease of 16.9% from 2007 (4678 kl) to 2008 (3889 kl) whilst Air Transport accounted for an increase of 6.3% from 2007 (14086 kl) to 2008(14 970 kl). Attributed causes to decreases in petroleum consumption in the land and Marine transport are mainly due to high fuel price issues.

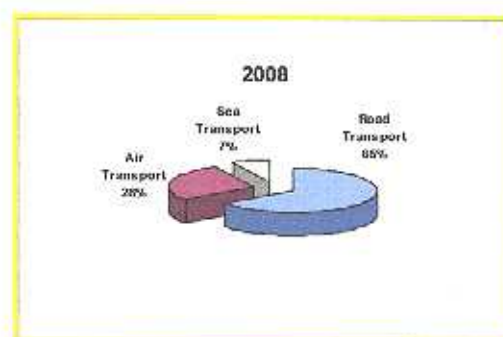
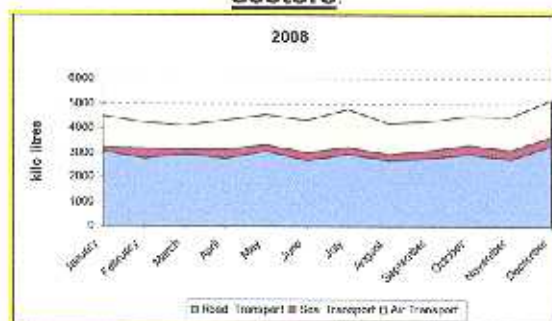
Petroleum consumption in **Air Transport sector** refers mainly to DPK jet fuel (*Avgas use account for 2 kilo litres in 2008*). Samoa in 2008 consumed 14,970 kl of petroleum. An increase of 6.3% from 2007 (14,086kl). Increasing petroleum consumption from the Air transport sector is the result of increased international flights and the introduction of new flight routes – a reflection of the growing tourism industry.



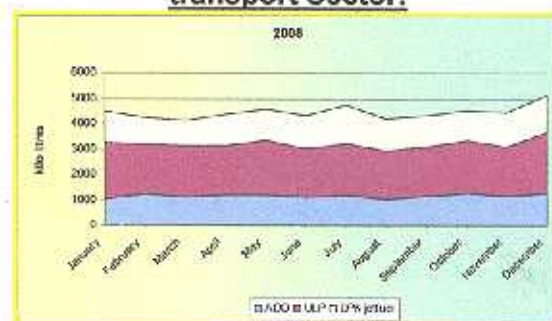
**Land Transport** fuel consumption decreased by 7.0% from 2007 (37,219 kl) to 2008 (34,620). ADO consumption in transport sector decreased by 2.3% from 2007 (10,202 kl) to 2008 (9971 kl). Likewise ULP Consumption in land Transport sector decreased by 8.8% from 2007 (27018 kl) to 2008 (24, 649 kl). Drop in petroleum consumption in the transport sector is attributed to high global fuel prices in the first 8 months of 2008. The private car owners (32% of total Vehicle distribution in Samoa) were among those who were directly affected by the high global fuel prices.

In addition as based from the Transport Control

### Transport petroleum consumption by sub sectors



### Petroleum consumption by fuel types in transport Sector:









## 5. Electricity

*Electricity is classified as secondary energy sources that are generated from primary sources such as petroleum, hydro and solar. Currently around 40% of total electricity production in Samoa is generated from hydro and the rest from diesel. This percentage varies during the wet and dry seasons. Electricity generation, transmission and distribution are exclusively under the authority of the Electric Power Corporation which is a government owned monopoly. The 2006 Population Census identified that 96% of the whole population in Samoa is electrified.*

### Summary

Gross electricity generation in 2008 amounted to 109.9 GWh, which is a drop in generation by 8.1% from 2007 (119.6 GWh). The composition of electricity generation in 2008 recorded 41% to hydro and 59% to diesel. Electricity consumption accounted for 85.5 GWh in 2008 recording a decrease of 12.9% from 2007 (98.2 GWh). Commercial and manufacturing sector demand accounted for 55% of total consumption in 2008. Other sub-sectors which make up the 45% of total consumption in 2008 include government departments (10%), schools (3%), religious organisations (6%) and the residential users (26%).

### Generation

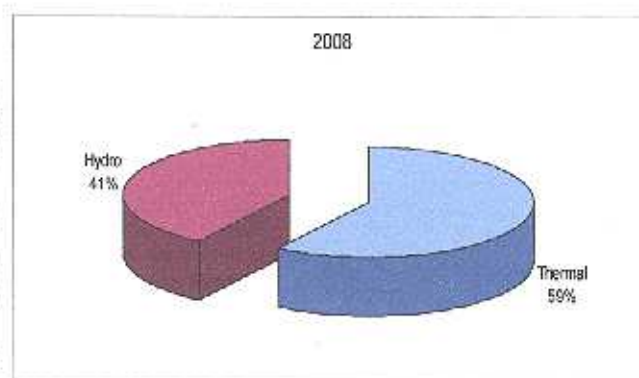
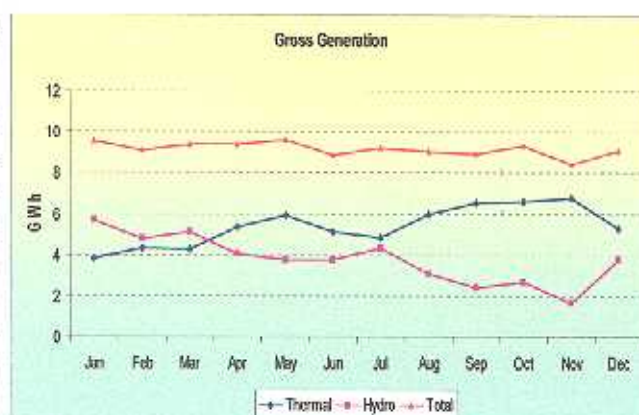
Gross generation fell by 8.1% from 2007 (119.6 GWh) to 2008 (109.6 GWh). Of notable interest, Diesel generation dominated the power supply through out Samoa for most of the year (from April to December) and accounting for 59% of total power generated in 2008. The power generation from Hydro fluctuated throughout the year, with high generation in the beginning of the year and low generation towards the end of the year. The low generation is the result of the dry season affecting the water dam levels which in turn has caused a drop in power generation from Hydro. Due to the low generation from Hydro, this has increased the use of diesel generation, which as a result increases the petroleum consumption. Due to the rising of fuel prices, a surcharge was added to the base tariff to assist the EPC with providing their services to the country.



Figure 7: EPC is considering coconut oil for electricity generation to supplement for diesel and are assessing the viability of this product

Surcharge was reviewed on a yearly and then on a 6 monthly basis but due to the rising of diesel prices, this has now been charged on a monthly basis in accordance with the change in diesel prices. The graph shows the effect of the price of diesel on the electricity tariff. The monthly surcharge rate is based on the diesel price for the previous month.

### Gross generation





### TARIFF SURCHARGE

Effective Date	Tariff	Cost per unit, 1 - 50 units	50 upwards
1-Feb-07	15%	67 sene	79 sene
1-Feb-08	22.3%	71 sene	84 sene
1 Jun -08	25.76%	73 sene	87 sene
15-Aug-08	45.92%	85 sene	1.01 sene
1-Sep-08	47.94%	86 sene	1.02 sene
1-Oct-08	39.35%	81 sene	96 sene
1-Nov-08	32.73%	77 sene	92 sene
1-Dec-08	26.24%	73 sene	87 sene

### Consumption

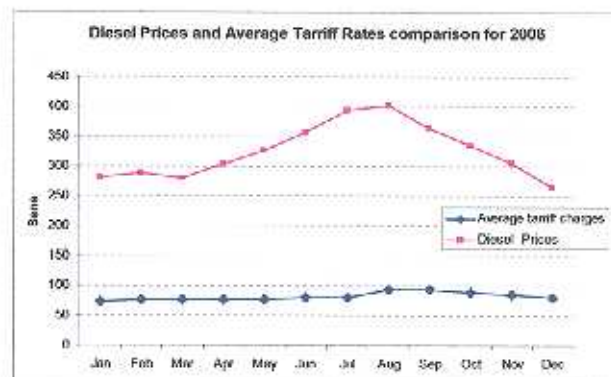
Electricity consumption from 2007 (98.2 GWh) to 2008 (85.5 GWh) decreased by 12.9%. The drop in consumption in 2008 was majorly affected by the decline in the economic situation.

By comparison to consumption by Sectors, consumption in 2008 decrease compared to 2007. The commercial and manufacturing sector recorded a decrease of 15.1% from 2007(55.2 GWh) to 2008 (46.9 GWh) and accounts for 55% of total power consumption, a drop of 1% when compared to the 2007 percentage consumption.

The decrease in consumption from the Commercial & Manufacturing is due to decline in the total production in Manufacturing sector in terms of products produced and also the overall decline was strongly influenced by the completion of construction works relating to the South Pacific Games 2007. All of these affected the economy which has recorded a decrease in the GDP growth for 2008.

Consumption from the residential sector recorded a decrease of 12.5% from 2007 (25.2 GWh) to 2008 (22.1 GWh). The decrease in electricity demand was due to the continuous increase in the fuel surcharge which raised the price of the electricity tariff. Also, EPC had made a lot of awareness programmes through the media, educating people on how to save energy and electricity, as well as informing them to buy and use energy efficient and conservative appliances and also energy saving light bulbs to reduce electricity consumption.

Other sectors namely Schools, religious organisations and government departments recording percentage consumption of 3% (2.6 GWh), 6% (5.1 GWh) and



### Electricity Consumption by Sector

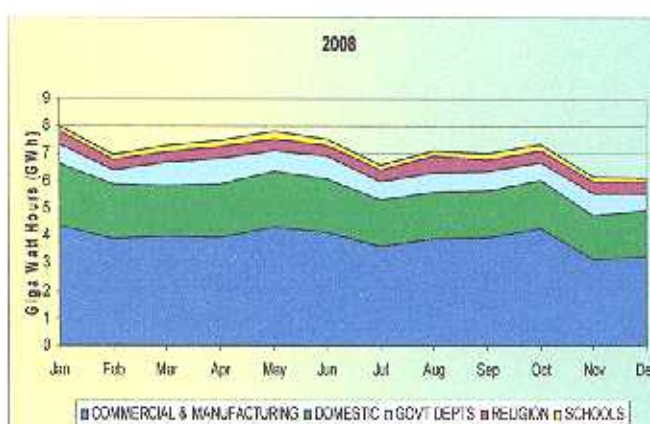
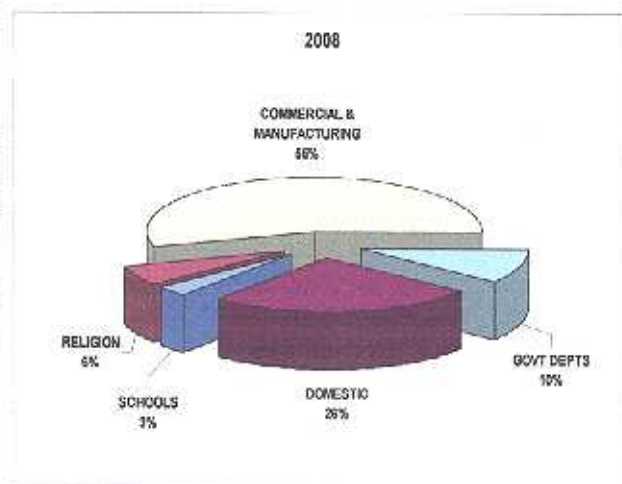


Figure 8: A lot of construction including the Aquatic Centre above was carried out for the Pacific Games in 2007 thus increase consumption for electricity and fuel.



10% (8.8 GWh) respectively. Electricity demands in these sectors are mainly for lighting, cooking (domestic), cooling and other mechanical processes.

The decrease in Electricity demand for some sectors such as schools and government corporations is due to them practicing a Black out day, such as the National University, they have chosen every Friday to be their Black out day in which no lights or anything that uses electricity is turned on, and this has become one of the main reductions in their electricity consumption.



### **Developments:**

The Power Sector Expansion project between government and the Asian Development Bank calls for a review of relevant legislation and regulations to allow private sector participation in the supply of electricity, with the aim of establishing a Regulator for electricity services as an outcome for component 3. This is progressing well and is managed by the EPC. Components 1 and 2 of this project are the Implementation of the SNEP2007 aiming at establishing the Designated National Authority for Clean Development Mechanisms (CDM) projects and the Clean Energy Fund aiming at financing Renewable Energy and Energy Efficiency projects at the national level.

The Project Management Unit at EPC continues to implement the Prepayment metering initiatives under the Power Sector Expansion project by subcontracting the installment of prepaid meters.<sup>2</sup>

The EPC continues to carry out refurbishment of some of their power stations in terms of generators, equipment, power plants and related works to improve electricity systems and efficiency when providing power to the nation.

EPC also continues to explore opportunities on Renewable Energy Technologies such as coconut fuel and biodiesel, palm oil, wind, hydro, solar and other potentials to substitute for fuel (diesel) used for power generation in collaboration with the private sector who are currently experimenting with some of these technologies and their viability. Under EPC's current program on Rural Electrification, the Authority is looking at electrifying the un-electrified homes with photovoltaic.

Under the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP), wind monitoring has been expanded to Savaii island and PIGGAREP is financing the monitoring wind masts to be raised in potential sites in Savaii.

Hydro Data Collection project carried out by EPC is also partially financed by PIGGAREP and is currently progressing well, considering and testing the viability of mini hydro sites on Upolu for potential activities.

<sup>2</sup> [www.epc.ws](http://www.epc.ws)



## 6. OVERVIEW OF SAMOA'S ENERGY SECTOR:– 2007 to 2008

In 2008, Samoa was estimated to have consumed around 108.1 kilo-tonnes of oil equivalent, a drop of 3% when compared to 2007. Of the total energy consumed, it was estimated that 34% was met by biomass, 62% by petroleum products while the remaining 4% was met by hydropower. This total consumption when broken down by sectors shows that the transport (land, sea and air) and residential sectors were the major energy consumers, consuming 40% and 33% of total energy consumed in Samoa, respectively. Electricity generation accounts for around 19% of total energy consumption and around 23% of total petroleum imports to Samoa. The commercial and manufacturing sector accounted for 9% of total energy consumption.

In comparison, across most of the sectors in Samoa, 2008 recorded a decrease in consumption when compared to 2007. This decrease is due to a number of reasons based on events that transpired from 2007 to 2008. The completion of construction works and the hosting of the South Pacific Games in 2007 created a higher demand for energy, especially from the power sector. Developing from late 2007 to the first half of 2008, high global fuel prices impacted the consumption trend in Samoa, with a noticeable drop in consumption from the transport sector. The residential sector was the only sector estimated to have increased energy consumption in 2008. As per the 2006 census, it was noticed that households in Samoa are using more than two sources of fuel for domestic cooking with biomass being one of the major sources. The high fuel prices in the first half of 2008 would have caused a lot of families to rely heavily on biomass for their domestic cooking.

**Table of total energy Consumption in Samoa**

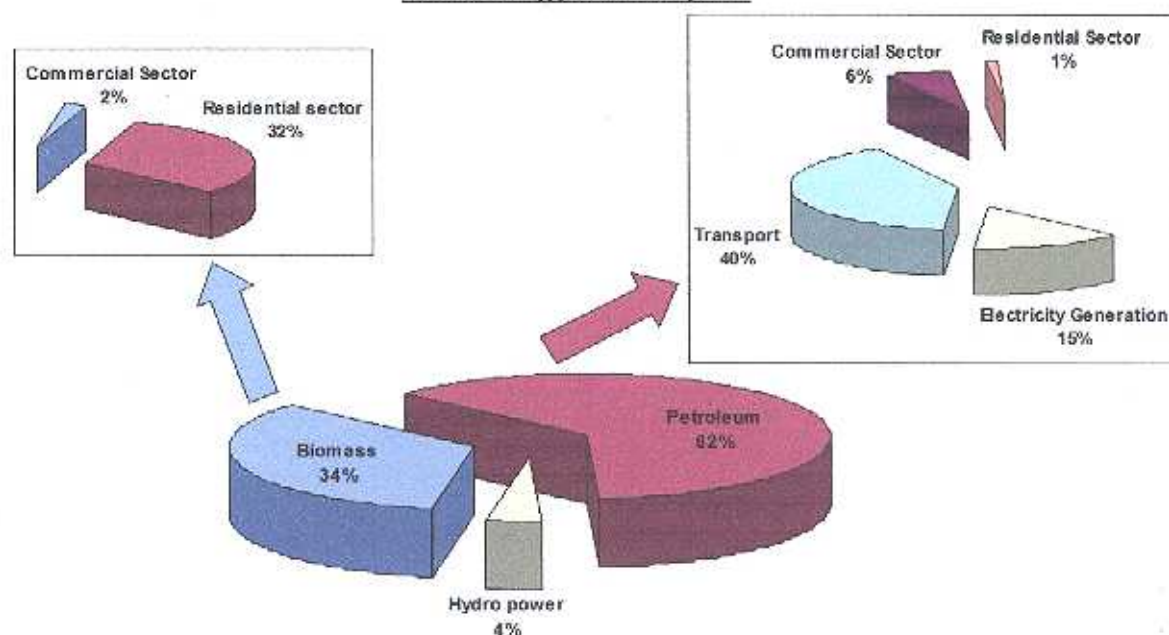
		<b>Total Energy Consumption. ( Kilo tonne of Oil Equivalent)</b>	
		<b>2007</b>	<b>2008</b>
Biomass	Commercial Sector	2.1	2.2
	residential sector	33.8	34.3
Petroleum	Electricity Generation	16.0	15.8
	Transport	44.9	44.0
	Commercial Sector	8.5	6.7
	Residential Sector	1.9	1.2
Electricity	Hydropower	4.4	3.8
Others		0.04	0.04

After July of 2008, global fuel prices began to decline, which became apparent in September in Samoa. This decline has come about for varying reasons in the global markets, with the recession in USA being identified as the major influential cause. An increase in petroleum consumption by the transport, commercial and manufacturing sectors is expected for the year 2009. Addressing the vulnerability that Samoa faces with fluctuating high fuel prices is an area of concern. EPPD together with EPC and MNRE through their strategic action plans will be undertaking activities and projects in a timely manner, which will constructively develop and ensure consistent cheap energy supply for meeting the demand in Samoa. The following are some of the activities earmarked to be undertaken in 2009:



1. Power sector expansion project including Energy Efficiency activities through the ADB assistance.
2. Energy Efficiency activities targeting appliance labelling and awareness under the REEEP assistance.
3. Wind Monitoring Program monitoring possibility of developing wind for commercial and residential purposes in regard to power generation.
4. Hydro Data Collection Program targeting at assessing small hydro schemes for development for power generation.
5. Continue the coordination of National Energy Awareness as an annual event.

### 2008 Energy Consumption




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108.1 kilo tonnes of Oil Equivalent