



Guyana Energy Agency

Annual Report 2014

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EXECUTIVE SUMMARY

A total of 4,934,807 barrels of petroleum-based products was imported in 2014 representing an average of 13,520 barrels per day. This represents a 4.05% increase when compared to 2013. Petroleum imports for the year were acquired at a cost, insurance and freight (CIF) value of US\$561,633,697, representing a decrease of 2.7% from that of the previous year. Fifty-one percent (51%) or 1,749,883 barrels (4,794 bpd) of total imports were obtained under the PetroCaribe Agreement during 2014.

There were increases in the consumption of Mogas, Gasoil, Kerosene and LPG with reductions in the consumption of Avjet, Fuel oil and Avgas. Notably, consumption of gasoil (diesel), mogas (gasoline) and domestic kerosene increased by 7.22%, 5.62% and 13.79%, respectively.

The average cost per barrel of petroleum-based imports decreased from US\$121.71 in 2013 to US\$113.72 in 2014, a decrease of 6.57%. This downward trend also continued for the average unit CIF value for each petroleum product. There were decreases of 6.94%, 6.03% and 10.11% in the average unit CIF value (US\$/bbl) for Mogas (gasoline), Gasoil (diesel) and Jet fuel/Kerosene, respectively. In addition, the average unit CIF value for Fuel oil, Aviation Gasoline (avgas) and LPG (cooking gas) also decreased by 9.67%, 3.26% and 1.28%, respectively.

Engineers of the GEA conducted research in a number of areas: hydropower, low sulphur diesel, compressed natural gas, energy potential from rice husk, gasification systems, energy efficient wood stoves, cool roof, sun pipe, demand side management, refrigerant replacement, solar powered and energy efficient street lights.

GEA assisted Office of the Prime Minister (OPM) in the monitoring and follow-up of various energy projects, helping to identify and repair non-functioning solar photovoltaic installations across Guyana. GEA's Engineers provided technical support to a number of organizations including NAREI, Hydromet, National Ozone Unit, GTI, GWI, Region 1 Administration, National Parks Commission, etc.

1,105.88 kW of solar photovoltaic capacity was documented as being the total installed capacity in Guyana producing an estimated 2,009.1 MWh of energy annually. Building on the experiences of GEA's solar PV grid-tied system, GEA provided technical support to the National Parks Commission towards the installation of a 15.84 kWp grid tie photovoltaic system at a cost of G\$11.7 million. The system will produce about 20.89 MWh of energy annually, saving the Commission approximately G\$1.3 million and avoiding 15,876.4 kg of CO₂ emissions annually.

The Amaila Falls Hydroelectric Project remains a priority and the flagship of the Low Carbon Development Strategy (LCDS). The Project is currently being reconfigured since the withdrawal of Sithe Global in 2013. His Excellency President Donald Ramotar announced on December 31, 2014 that Norway had transferred US\$80 million to the Inter-American Development Bank to fund part of Guyana's equity share in the project. Within months it is expected to achieve financial closure and commence construction.

Ten (10) visits were conducted at eight (8) sites in four different Regions during the year 2014. GEA finalised a prioritised list of Hydropower sites which were entered, along with all Hydromet stations, into a GIS data base (QGIS) for graphical representation and to guide future decision making processes. The prioritised list was used to help identify and select six priority sites for hydrological monitoring. Kumu Falls, Region 9, with an estimated potential of 0.1MW has been outfitted with water level logger as part of GEA's efforts to prepare a feasibility study for the site.

GEA's Engineers continued to evaluate and assess the wind energy potential in Guyana through the rehabilitation and relocation of existing wind measuring stations. More than 40 kW wind power installed capacity has been recorded.

After the commissioning of the bio-ethanol demonstration plant at the Albion Sugar Estate in 2013, the Bio-Ethanol E-10 fuel produced at GuySuCo's Albion Estate was formally launched for trial run in a number of vehicles, with the expectation that before the end of 2014, approximately 25 vehicles would be routinely utilizing the fuel, but moreover, the pilot plan developing in the future, towards the production of commercially available blended fuel.

With support from the Work Services Group, a total of 1,950 defective photosensors on street lights were replaced as part of GEA's efforts to conserve energy, translating into annual energy savings of about G\$118.8 million.

In 2014, GEA replaced 41 inefficient street lights with energy efficient LED replacements to conserve energy, reduce energy costs, improve the quality of street lighting and provide an opportunity to assess the LED street lights. The replacements would accrue annual energy savings of about G\$1.9 million

GEA completed Energy Consumption Assessments of 63 buildings in the last three years along with the change-out of inefficient lighting at 15 buildings. While conducting the energy assessments, an under-sized transformer was identified and GPL effected a suitable replacement. Support was also offered to a pensioner in reducing energy consumption in her home.

The annual Energy Week was celebrated by CARICOM member states under the theme “Achieving Climate, Environmental and Economic Resilience through Sustainable Energy”. Guyana Energy Agency planned and executed several activities including an in-house quizz, school presentations, poster board activity, energy seminar, essay competition, art competition, a series of radio quizzes, energy forum for students and distribution of children’s Energy Activity Booklet. The activities served to fulfill part of GEA’s mandate by disseminating information essential to improving public awareness on sustainable energy, conservation and overall efficiency.

The Agency issued a total of 1,459 licences to importers, wholesalers, retailers, consumer installations and bulk transportation carriers of petroleum and petroleum products during 2014.

GEA, in 2012, began the drafting of two Standards for the transportation of petroleum and petroleum products by bulk transportation carriers and road tanker wagons. A technical Committee was convened early in 2014 and met periodically to review the standards. Guyana National Bureau of Standard (GNBS), in collaboration with the GEA, held national consultations at Anna Regina, Bartica, New Amsterdam, Linden and Georgetown. The standards are expected to be finalized in 2015.

The Petroleum and Petroleum Products Regulations, initially published in 2004, was revised and re-published in the Gazette on December 23, 2014. The purpose of the amendment was to incorporate specific provisions relating to Bulk Transportation Carriers. The period of licence is now aligned with the business need and may be suspended or cancelled at any time, for cause. The period granted will be relative to the combined storage capacity of the site, taken as an indicator of the level of investment.

Under the Fuel Marking Programme, a total of 12,970 sites were visited during the year. 2,200 sites were sampled at least once. 51 (2%) of the sites sampled at least once were found with *significant dilution (defined as more than 50%)* in at least one tank. From 2006 to 2014, the percentage of sites found with significant dilution in at least one tank has progressively decreased from 34% in 2006 to 2% in 2013.

With support from the Task Force on Fuel Smuggling and Contraband, chaired by the Minister of Home Affairs, the Fuel Marking Programme recorded eight (8) convictions in 2014. Seventeen new charges were filed, an increase from nine in 2013. Three matters were also dismissed in 2014 of which one was appealed. At the end of 2014, there were fifteen matters continuing before the Magistrates’ Courts throughout Guyana. Compensation was accepted in four matters in 2014 under *Section 33A Guyana Energy Agency Act 1997 as amended by Section 8*

Guyana Energy Agency (Amendment) Act 2011, a reduction from seven matters in 2013.

GEA participated and facilitated many information dissemination and awareness activities which enabled interaction with members of the public, students and various organizations to provide lectures, seminars, information brochures, press releases, newspaper pull-outs, radio and TV infomercials with energy conservation tips.

The staff of the Agency benefited from training and workshops in several areas, through the conduct of 35 training programmes benefitting 205 Officers: aviation fuel handling and quality control, licensing Regulations, fire safety, bio-energy, hydropower, renewable energy, energy management for socio-economic development, energy assessments/audits, renewable energy, energy efficiency, sexual harassment, human resource development, communications, laboratory standards, swimming, accounting, supervisory management, occupational safety and health, defensive driving, auditing, first aid, personnel practices, investigation and intelligence gathering.

1.0 Review of Activities: Energy & Energy Statistics Division

1.1 Petroleum-Based Imports

For the year 2014, the Division facilitated the importation of one hundred and eighteen (118) shipments of petroleum-based products on Guyana's behalf, an increase from one hundred and one (101) shipments in the previous year. Fifty-three (53) shipments were lifted under the Petrocaribe Agreement while sixty-five (65) shipments were lifted from Petrotrin, Trinidad¹. It was observed that the distribution of volumes of similar products (Mogas, Gasoil, Avjet/Kero and Fuel oil) from PDVSA and Petrotrin remained unchanged in 2014 when compared to the previous year.

Year	PDVSA		Petrotrin	
	bpd	%	bpd	%
2012	6,915	76%	2,212	24%
2013	4,376	51%	4,192	49%
2014	4,794	51%	4,563	49%

Comparison of the quantity of fuel shipments (measured in barrels per day) imported from PDVSA and Petrotrin for the years 2012, 2013 and 2014

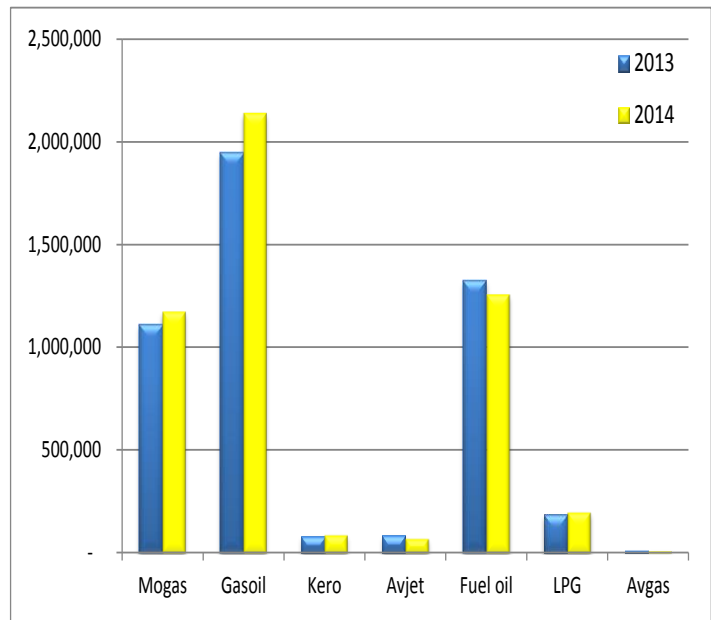
Under the Petrocaribe Agreement, 1,749,883 barrels were imported during 2014, representing a 9.55% increase when compared to volumes in 2013. However, this increase in volume in 2014 was not accompanied by increases in total shipment free on board (FOB) value and long-term financing portion which decreased by 0.86% and 4.38%, respectively. The decline is primarily due to falling oil prices on the international market.

Year	No. of Shipments	PetroCaribe Imports (BBLs)	Total Shipment FOB Value US\$	Financed Portion US\$
2007	23	640,895	61,280,208.48	27,261,993.84
2008	39	1,419,868	157,368,354.55	80,096,309.65
2009	25	1,079,252	76,352,580.73	32,853,436.32
2010	25	1,022,907	89,233,164.90	44,836,346.06
2011	35	1,451,843	175,776,131.35	105,140,994.29
2012	67	2,378,982	298,812,764.74	178,830,961.05
2012 (Spot)	4	151,925	18,720,660.61	-
2013	44	1,597,341	193,100,300.02	115,206,051.20
2014	53	1,749,883	191,446,541.18	110,155,890.54
Total	315	11,492,896	1,262,090,706.56	694,381,982.96

¹ Shipments relate solely to Mogas, Gasoil, Avjet/Kerosene and Fuel oil.

Guyana, for the year 2014, imported approximately 4,794 barrels per day (bpd) from Venezuela. While Importation from Venezuela accelerated significantly during the latter half of 2014, weaker demand during the first six months, logistical challenges and PDVSA's strict interpretation of the Petrocaribe Agreement prevented roll-over of unused volumes into subsequent months. This inability to have the unused volumes transferred, created some new challenges since fluctuations in demand are more pronounced on a monthly basis. Generally, efforts to make use of the unutilised volumes were not overwhelmingly successful but GEA was able to negotiate to have the unused Gasoil for December transferred to nominations in January 2015. Additionally, there have been concerns about the reliability of supplies from PDVSA. During a visit to PDVSA in February 2014, a Guyanese delegation was informed that the state entity currently has a deficit situation with their clients where the supply of products is insufficient to meet all their commitments. It should be noted, however, that PDVSA has often made considerable efforts to maintain the monthly supply quota of 5,200 bpd and the volumes lifted have been within the 10% margin of tolerance stipulated in the Sales Contract.

TOTAL IMPORTS (BBLs)				
January-December		2013	2014	% change
	Mogas	1,110,801	1,174,006	5.69%
	Gasoil	1,950,196	2,139,198	9.69%
	Kero	79,798	86,930	8.94%
	Avjet	82,770	70,196	-15.19%
	Fuel oil	1,325,315	1,257,255	-5.14%
	LPG	183,786	197,449	7.43%
	Avgas	9,926	9,774	-1.53%
	Total	4,742,592	4,934,807	4.05%



The total petroleum imports recorded an overall increase of 4.05% with a total of 4,934,807 barrels of petroleum-based products imported and an average of 13,520 barrels per day. There were increases in the importation of Mogas (gasoline), Gasoil (diesel), Kerosene and LPG (cooking gas) during the year while imports for Avjet (jet fuel), Fuel oil and Avgas (aviation gasoline) decreased. This trend was also observed at the market level with the oil companies.

1.2 Consumption of Petroleum Products

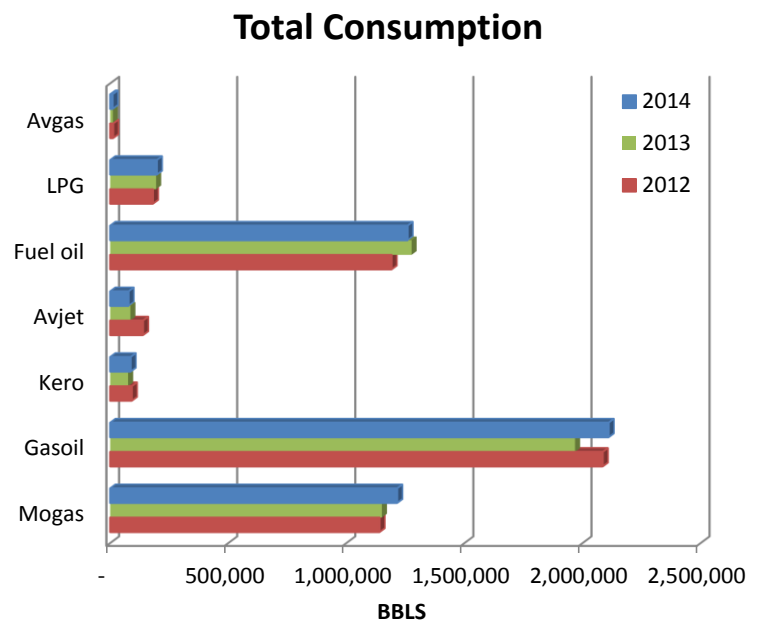
Consumption of petroleum products was calculated based on opening stock, closing stock and import volumes for the year.

$$\text{Consumption} = \text{Opening stock} + \text{Import volumes} - \text{Closing Stock}$$

Sales data received from Guyoil and consumption data from the Guyana Power and Light Inc. (GPL) and Bosai Minerals Group (Guyana) Inc. (BOSAI) was also incorporated in the calculation of total consumption.

A total of 4,953,944 barrels of petroleum-based products was consumed in 2014 with an average of 13,572 barrels per day. This represents a 4.07% increase when compared to 2013². There were increases in the consumption of Mogas, Gasoil, Kerosene and LPG while consumption of Avjet, Fuel oil and Avgas declined for the year.

TOTAL CONSUMPTION (BBLs)					
January - December		2012	2013	2014	% change
	Mogas	1,140,119	1,150,201	1,214,868	5.62%
	Gasoil	2,085,172	1,968,022	2,110,143	7.22%
	Kero	91,122	75,601	86,023	13.79%
	Avjet	138,787	85,302	77,309	-9.37%
	Fuel oil	1,190,973	1,275,935	1,258,669	-1.35%
	LPG	180,565	194,298	197,121	1.45%
	Avgas	12,333	11,005	9,813	-10.83%
	Total	4,839,071	4,760,364	4,953,944	4.07%
	Bpd	13,222	13,042	13,572	4.07%



The increase in gasoline consumption for 2014 can be attributed to an increase in motor vehicle registration while the increase in LPG consumption suggests more use of LPG as a cooking fuel. Notwithstanding a minor decrease in importation from Trawlers' Association and contraction in gold production, diesel consumption increased. The rise in diesel consumption correlates with increases in importation from the oil companies as well as diesel consumption from large duty-free consumers (specifically, GPL and BCGI). The growth in the agriculture

² Gasoil and Fuel oil purchased locally by GPL from the oil companies were discounted to avoid double counting.

sector, namely the production boom in the rice industry, is an important factor for this increase. It may also presumably result from decreased availability of smuggled fuel due to the success of the monitoring and enforcement activities of the Fuel Marking Programme.

Fuel oil consumption can be linked to a decrease in imports of this product for this year. Limitations on fuel oil supply quota from PDVSA, Venezuela (under the Petrocaribe Agreement) and the level of opening stock for 2014 may have been underlying causes for the reduction. Furthermore, decline in Fuel oil consumption correlates with a contraction in the manufacturing sector (outside of rice and sugar production) and the bauxite mining sector³.

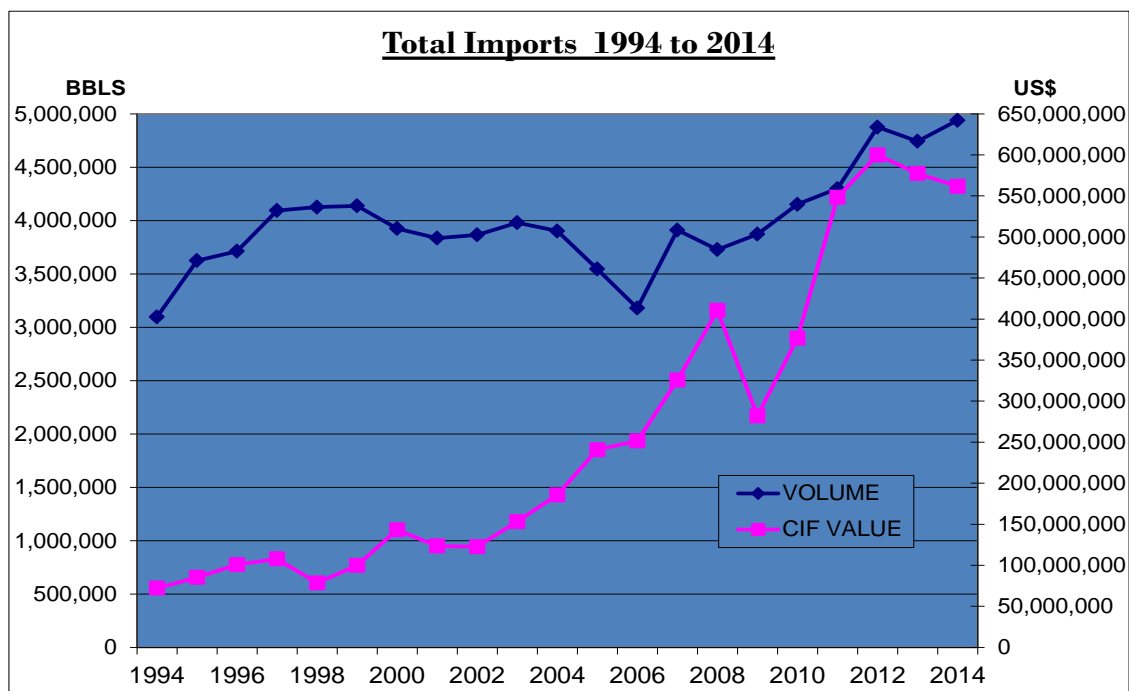
The reduction of Avjet is as a result of decline in sales which may, in part, be due to a fall in the number of international airline carriers and disruptions in flight travel. Conversely, the increase in Kerosene may be attributed to a transfer from the decline in use of Avjet. Avgas imports have also reduced, primarily due to moderate traffic at Ogle International Airport. Moreover, the prevalence of turbine engines in aircrafts has led to a decrease in imported Avgas volumes for CAMS.

1.3 Acquisition Cost and Retail Prices

Petroleum imports for 2014, which amounted to 4,934,807 barrels, were acquired at a cost, insurance and freight (CIF) value of US\$561,633,697, representing a decrease of 2.70% from acquisition cost in 2014.

	VOLUME		CIF VALUE
	BBLS	LTRS	US\$
1994	3,095,728	492,180,508	72,067,912
1995	3,624,053	576,177,314	85,161,130
1996	3,711,893	590,142,732	100,696,609
1997	4,093,677	650,841,425	107,727,233
1998	4,125,765	655,943,000	78,539,499
1999	4,137,266	657,771,510	99,704,391
2000	3,924,614	623,962,606	143,277,974
2001	3,834,651	609,659,659	123,373,521
2002	3,865,505	614,565,043	122,643,684
2003	3,980,199	632,799,898	153,193,966
2004	3,901,760	620,329,117	185,702,255
2005	3,546,069	563,778,872	240,663,147
2006	3,179,925	505,566,736	251,594,083
2007	3,910,234	621,676,373	325,461,550
2008	3,727,410	592,609,734	410,442,230
2009	3,872,679	615,705,616	282,073,925
2010	4,152,412	660,179,527	376,761,853
2011	4,298,336	683,379,591	548,264,213
2012	4,875,568	775,102,847	599,946,823
2013 (revised)	4,742,592	754,011,862	577,217,140
2014	4,938,855	760,520,985	561,633,697
TOTAL	78,600,336	12,496,383,970	4,884,513,138

³ Mid-year Report (2014), Ministry of Finance



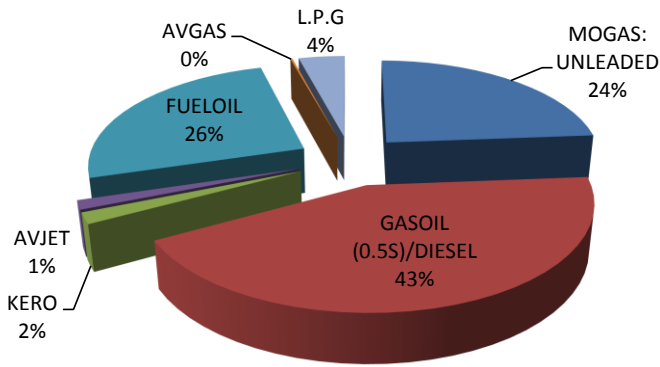
TOTAL IMPORTS BY PRODUCTS FOR THE YEAR

PRODUCTS	2014		C.I.F VALUE US\$
	VOLUME		
	LTRS	BBLs	
MOGAS: UNLEADED	186,652,103	1,174,006	143,806,446
GASOIL (0.5S)/DIESEL	340,105,266	2,139,198	260,334,967
KERO	13,820,698	86,930	10,819,182
AVJET	11,160,273	70,196	8,744,200
FUELOIL	199,887,562	1,257,255	116,133,335
AVGAS	32,035,419	9,774	2,011,612
L.P.G	1,553,942	201,497	19,783,956
TOTAL	785,215,261	4,938,855	561,633,697

For 2014, Gasoil was the most imported product representing 43% of total imports and a CIF value amounting to 46% of total acquisition expense⁴. Fuel oil and Mogas followed Gasoil, reflecting 26% and 24% of total imports, respectively, with corresponding CIF values amounting to 21% and 26% of total acquisition costs, respectively. The remaining products (Kerosene, Avjet, LPG and Avgas) constituted no more than 7% of total imports and total acquisition costs.

⁴ Gasoil CIF value was estimated for volumes used by the Trawler Association in 2014.

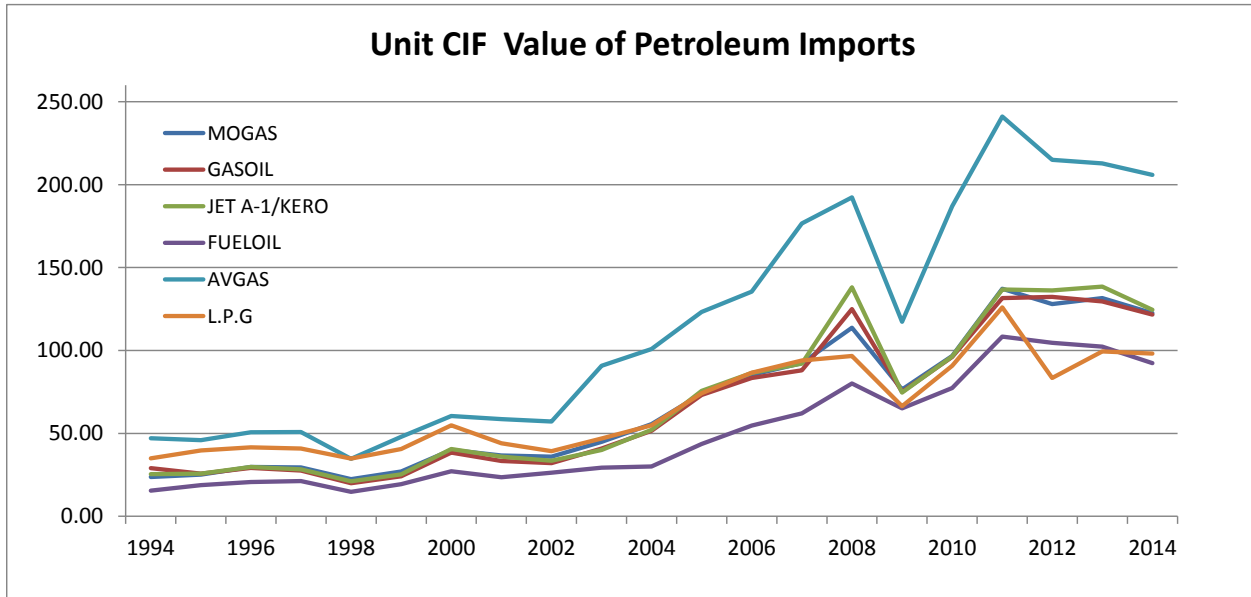
Percentage of Total Imports



The average cost per barrel of petroleum-based imports decreased from US\$121.71 in 2013⁵ to US\$113.72 in 2014, a decrease of 6.57%. This downward trend also continued for the average unit CIF value for each petroleum product. There were decreases of 6.94%, 6.03% and 10.11% in the average unit CIF value (US\$/bbl) for Mogas (gasoline), Gasoil (diesel) and Jet fuel/Kerosene respectively. In addition, the average

unit CIF value for Fuel oil, Aviation Gasoline (avgas) and LPG (cooking gas) also decreased by 9.67%, 3.26% and 1.28%, respectively.

Unit CIF Value of Petroleum Imports



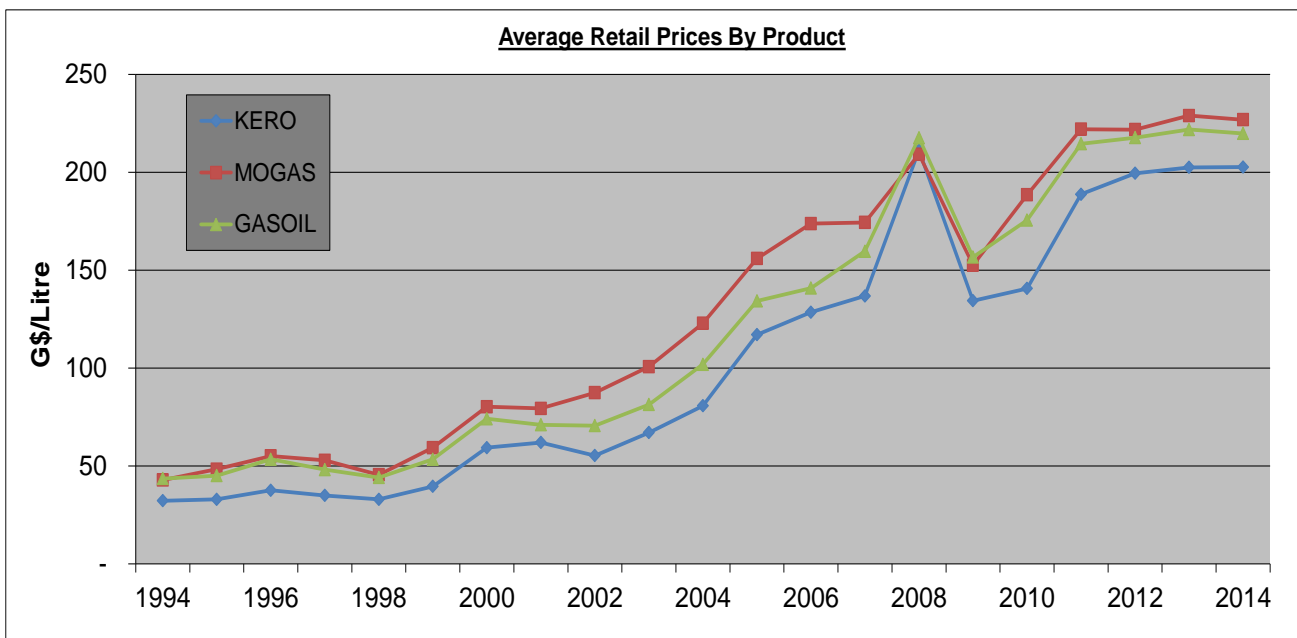
CIF prices peaked in May for Kero/Avjet and in June for Mogas, Gasoil and Fuel oil which corresponds with steadily rising crude oil prices during the first six months of the year. The average⁶ prices for refined products reached a high in mid-June 2014 but fell by approximately 49% at the end of December 2014. Notwithstanding minor fluctuations, prices were fairly stable from July to late September 2014. However, prices reduced rapidly approaching the beginning of the fourth quarter. In fact, there was a 41% decrease from US\$103.12 to about

⁵ Revision was subsequently made to Mogas CIF Value.

⁶ Average of Mogas (Unleaded 89), Gasoil (No. 2), Avjet/Kero (Jet 54 grade) and Residual Fuel oil (No. 6 3%).

US\$60.97 per barrel during the period September 30 to December 31, 2014. This decline mirrored a similar trend for crude oil prices as the West Texas Intermediate fell from US\$106.67 in mid-June 2014 and arrived at US\$54.61 on December 31, 2014.

According to the U.S. Energy Information Administration (EIA) (2014)⁷, crude oil prices fell as a result of increases in U.S. production and weaker-than-expected non-U.S. global demand, even in light of substantial disruptions to OPEC supply. Earlier in 2014, near-record Saudi production had helped offset high levels of OPEC supply disruptions. Moreover, the return of Libyan oil production to the market in late September, along with a weaker outlook for global oil demand, led to excess supply which placed downward pressure on prices.



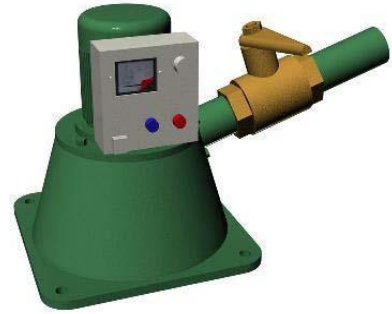
Retail prices for Mogas (gasoline), Gasoil (diesel) and Kerosene decreased during 2014 by an average of 0.59 percent. Specifically, average retail price for gasoline and diesel decreased by 0.91% and 0.88%, respectively. Also, the average retail price for domestic kerosene rose marginally by 0.08% while the average retail price for cooking gas (LPG) increased by 3.17%.

⁷ U.S. Energy Information Administration (EIA), 2014. This Week in Petroleum: Weak demand, plentiful supply drive recent decline in oil prices. [Online] Available at: http://www.eia.gov/petroleum/weekly/archive/2014/140924/includes/analysis_print.cfm [Accessed 24 October 2014].

1.4 Research

1.4.1 Hydropower: Micro Turbine Units

Hydropower Support Engineers conducted research on Micro Turbine units. Essential data requirements such as power, flow, head, frequency, voltage, phases, etc. were provided to suppliers. Quotations were received from four suppliers from China, and a Canadian Supplier and comparisons were made. Engineers are presently soliciting quotations from other manufactures with the objective of determining costs for micro and pico-sized hydropower systems.



1.4.2 Hydropower: Water Level Instrument



With the aim of collecting water level data at Kumu Falls, Region 9, Hydropower Support Engineers procured and subsequently installed the Junior LT M10 F30 water level recorder.

1.4.3 Low Sulphur Diesel

Currently, diesel fuel imported in Guyana from traditional suppliers (Trinidad and Tobago, Suriname and Venezuela) contains a sulphur content of a maximum of 5000 ppm (wt. of 0.5%). However, there are plans to produce low sulphur diesel and ultra low sulphur diesel (ULSD) in Trinidad and Tobago and Suriname by the end of 2014. A research paper was done to understand the general sulphur content limits in diesel, cost of reducing fuel sulphur, benefits and risks of low sulphur and ULSD, global trends, diesel importation in Guyana from 1994 to 2013 and recommendations on the way forward.

1.4.4 Compressed Natural Gas: An option for the transportation Sector

The Transportation sector consumes about 38% of total petroleum products and is the country's largest energy user, since it is driven mainly by the need for gasoline (mogas) and diesel (gasoil) due primarily to the growing vehicle fleet in the country.



As concerns over harmful emissions from vehicles increase, vehicles that run on alternate fuel sources will become increasingly important. For the aforementioned reasons, a research on Compressed Natural Gas (CNG) as an option has been completed.

CNG is used in traditional gasoline/internal combustion engine automobiles that have been modified or in vehicles which were manufactured for CNG use.



1.4.5 Rice Husk Research

Guyana's heavy reliance on imported fossil-based fuels requires, among other initiatives, research, study, analysis, demonstration and implementation of sustainable energy sources to ensure the country's energy security. As such, a study was initiated and completed by the Guyana Energy Agency (GEA) to investigate the energy potential of rice husk biomass in Guyana. A summary of the key findings are tabulated below:

Total existing mills (No.)	80
Total mills in working condition (No.)	72
Total milling Facilities (No.)	67
Capacity range (MT/hr)	0.5 - 15
Total paddy processed annually (MT)	611,348.60
Total Estimated Rice husk generated (MT)	122,311.90
Total rice husk utilized (%)	47
Uses of rice husk	Parboiling, drying and electricity generation
Total rice husk discarded (%)	53
Methods of rice husk disposal	Dumping and burning
Estimated energy value of discarded rice husk (kWh)	31,756,364.03
Total CO₂ contribution from discarded rice husk (kg)	24,199,495.41

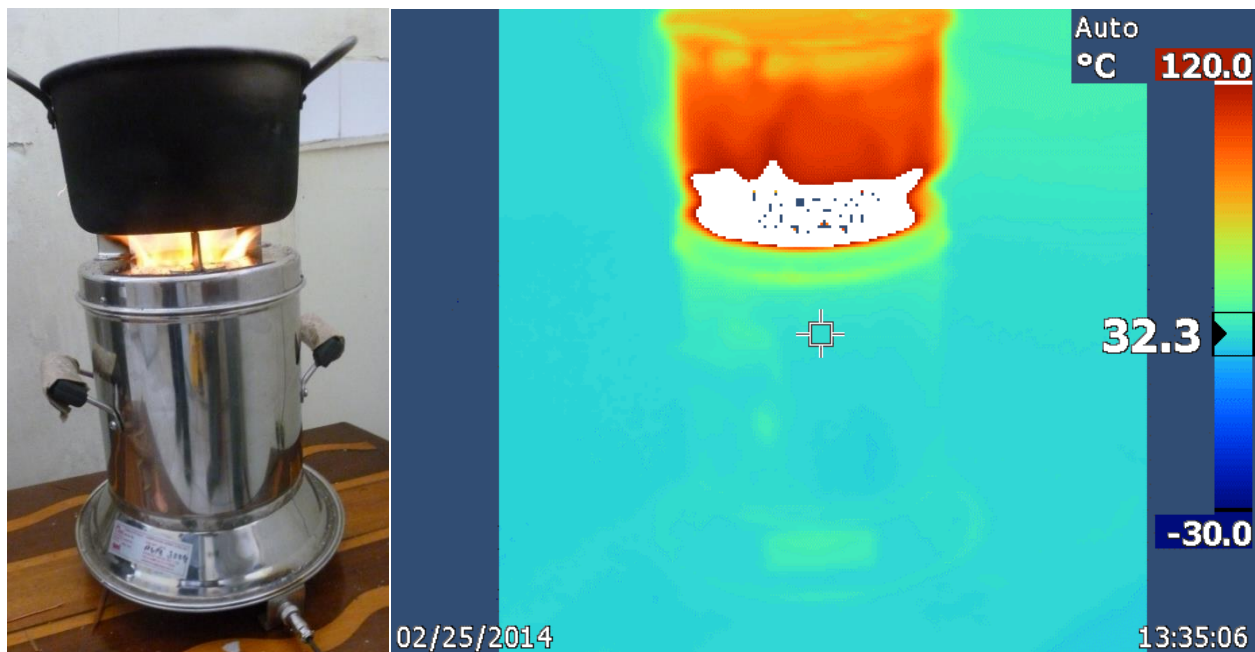
1.4.6 Gasification System

GEA's Engineers conducted research on a 20kW Gasification System with the view of proposing a demonstration biomass project using wood waste. Essential data requirement such as moisture content, feed stock consumption, frequency, voltage, etc. were provided to suppliers. Quotations were received from four suppliers from USA, India and Germany and a spread sheet was developed in order to make effective comparisons. This venture will afford the wood processing community, the GEA and other stakeholders the opportunity to gain a deeper understanding of the implications of biomass gasifier technology. A pilot demonstration unit will exemplify the opportunities for biomass power generation and will help to reduce barriers associated with the use of renewable energy.

1.4.7 Energy Efficient Wood Stove Testing

The two (2) Energy Efficient wood stoves provided by TERI utilize forced draft by means of a fan to inject air into the combustion chamber. The stove consists of a single metal chamber that can cater to the cooking requirements of a family of up to 7 members.

Fuel wood, agriculture residue and cattle dung cake can be used as fuel for this stove. The power charger has dual charging mode (both AC/ grid power supply and solar power supply) to cater for households in rural un-electrified areas. Quality components have been used to make the stove's performance long lasting. Stainless steel has been used to fabricate the stove's body and 12 V, 2.2 Ah lithium ion batteries have been used to power the fan.



The Energy Efficient wood stove is capable of reducing firewood consumption by about 50% and reduce smoke by about 70%.

In an effort to further understand and test the stoves, GEA has procured 100 of the stoves to be deployed in 10 villages in 2015.

1.4.8 **Cool Roof**

A cool roof is one that has been designed to reflect more sunlight and absorb less heat than a standard roof. Cool roofs can be achieved by a coating of a highly reflective type of paint (usually bright white in color) that protects the roof surface from ultra-violet (UV) light, chemical damage and corrosion. Cool roofs reduce the roof surface temperature by up to 37 degrees Celsius, thereby reducing the heat transferred into the building below. This helps



to reduce energy costs (by keeping interior cooler), improve occupant comfort, cut maintenance costs and air conditioning replacement costs and increase the lifetime of the roof. Beyond the building itself, cool roofs can also benefit the environment, especially when many buildings in a community have them, thereby reducing local air temperature (sometimes referred to as the urban heat island effect).

With the aim of understanding the impact of cool roof, part of GEA's roof was painted white.

1.4.9 **Updated Manuals for Energy Efficient Wood Stoves and Biodigesters**

Manuals for the Energy Efficient Wood Stoves and Biodigesters were updated based on experiences garnered from additional installations. In some cases more local visuals/illustrations were added to the manuals to make them easier to understand.

1.4.10 Demand Side Management Program

GEA compiled a draft Demand Side Management (DSM) programme for Guyana which targeted five specific components; Public Awareness and Training, Residential, Commercial, Industrial and Monitoring and Evaluation.

The DSM programme can promote the viability of selected energy savings and efficiency in the commercial sector, the technical and financial feasibility of installing alternative and renewable energy sources in the commercial building sector, a residential programme to develop information on potential for energy savings, assess potential energy savings in the industrial sector and develop a strategy for implementation, and develop a monitoring and evaluation system to strengthen the implementation, performance and assess the results of the various DSM actions. The draft was sent to Guyana Power and Light Inc.

1.4.11 Measurement of Induction lamps

Engineers from the Guyana Energy Agency conducted measurements on induction lamps installed at the GUYSUOCO Estate Road, East Coast Demerara. Light output measurements were done using the agency's digital illuminance/light meter. The induction lamps were a donation from The Energy Research Institute (TERI).



Measured luminance levels under the induction luminaire revealed that sufficient illumination was attained to meet the standard for street lighting requirements in the city of Georgetown. The spread of the luminaire was found to be over 85 feet where acceptable levels of lighting were achieved.

1.4.12 Assistance to Hydromet

GEA's Energy Engineer assisted the Guyana Meteorological Service at its Doppler radar station to test, identify and rectify an electrical problem the station was experiencing. The earthing issue was identified as the cause for the damage to telecommunication equipment. Tests were carried out with an Amp-probe power

logger that was acquired by the GEA for conducting energy assessments and is capable of earth fault detection. It was first suspected by engineers of the Meteorological Service that the main chemical grounding was the cause of the fault. However, after the GEA Engineer conducted initial inspections and tested the main grounding, this was ruled out. Further inspections and testing at different parts of the facility were conducted and it was found that the main telecommunication cable grounding system indicated a fault. Upon inspection it was found to be disconnected in an area that was hard to diagnose. The cable was reconnected and based on follow-up reports, the electrical problem has been rectified.

1.4.13 Assistance to NAREI to setup Weather Stations

National Agriculture Research Extension and Institute (NAREI) acquired seven solar-powered Davis weather stations with capability of measuring solar radiation, wind speed and direction, rainfall, dew point, heat index, barometric pressure and humidity. The GEA engineers provided support to NAREI's staff to help configure and install the stations. The stations are to be installed at different locations on the coast and the information would be collected wirelessly.

1.4.14 Refrigerant Replacement Pilot

Guyana Energy Agency, in collaboration with the National Ozone Unit, commenced a pilot project to compare energy efficiency of R-290 with R-22 in air-conditioner systems. The objectives are to assess the:

- economic benefits or non-benefits
- environmental benefits
- effect of the R-290 on energy consumption
- safety factors
- need for building capacity
- challenges to adopting the technology.



The measurements of pressure, temperature, current and voltage readings were completed in 2014. The next step of the exercise is to change out the R22 refrigerant with the R290 refrigerant and conduct measurements.

1.5 Energy Access Project

The *Energy Access at community level for Millennium Development Goals (MDG) achievement in Hinterland area Project*, a United Nations Development Programme (UNDP) Project, implemented by Office of the Prime Minister (OPM), aims to provide energy services, electricity or cleaner fuels in rural areas to all Hinterland villages at the community level by 2015. Some objectives of this project were to:

- Promote and demonstrate the use of Solar Cookers
- Promote the use of Energy Efficient Cook Stoves identified and tested
- Install Bio-digesters for cooking purposes
- Implement a pilot project in two selected communities based on the results of an energy needs survey.

The Guyana Energy Agency (GEA), in 2103, had assisted OPM in the promotion and distribution of 507 solar cooking stoves, the construction and demonstration of five (5) energy efficient wood stoves and the installation of two (2) bio-digesters in five (5) communities, namely Shulinab and Rupertee (Region 9), Powaikoru (Region 1), Kangaruma (Region 7) and Tuseneng (Region 8). Pilot projects were implemented at Kanuballi, Region 1 and Kako, Region 7.

Follow-up visit to Kako Village, Region 7

A follow-up visit to Kako, Region 7, was conducted in 2014 to inspect the solar PV installation at the Kako Health Center. This system comprised a 1,680Wp solar PV array with a 1000Ah battery bank. Checks were made on the operation of the system and to identify the frequency of maintenance activities. The maintenance on the system was found to be conducted as planned by the persons previously trained. Checks were also done on the wiring installations to ensure that none of the connections were loose or faulty.

GEA's Engineers also checked on the energy efficient wood stoves previously constructed. At the time of the visit, the condition of the stove suggested that it was being used regularly (which was confirmed by the school's headmistress), however, the stove showed signs of severe



cracking due to poor or no maintenance. The visiting team made attempts to repair the stove, however the team was faced with the same problem as with the construction of the stove, that is, no one was willing or made time, to fetch the mud, even though the stove was being used on a daily basis and very helpful (according to the kitchen's staff and headmistress).

The stoves built at the volunteer's homes were completely dry and showed very little signs of cracking. All the stoves were already being used, the visiting team even observed a few of the stoves being used by the volunteers for meal preparation. The end users of the stoves found them to be very beneficial and were satisfied with their performance, one of the volunteers even got rid of their old fireside completely.



Rupertee:

The digester that was previously built was rendered non-operational after the plastic tube was punctured. The damaged biodigester was removed, pit cleared and a new assembly was placed in the pit for filling. The team constructed and replaced one biodigester at Rupertee.



Assembling the biodigester plastic

Shulinab:

The team carried a routine visit to check on the status of the biodigester installed at the school's kitchen. From a visual inspection, the digester seems to be filled with biogas which suggests that it was being recharged and the surroundings were relatively clear of vegetation. The team also spoke with one of the kitchen staff who reported that the digester and stoves were fully functional. The



visiting team was satisfied with the current status of the digester and applauded the efforts of the kitchen staff in keeping the biodigester functioning. The staff were encouraged to continue their good work.

UNDP Assessment

GEA accompanied a consultant contracted by UNDP to conduct an assessment on the stove project implemented in 2012. Visits were made to two villages in Region 9 (Rupertee and Shulinab). Meetings were held in both villages where residents were interviewed on the usage, performance, usefulness, general ideas and comments residents may have on the solar cookers, wood stoves and biodigesters that were distributed and constructed in these two villages. Feedback on the solar cookers in both villages was generally not encouraging

since most residents were not putting the cookers into use. However, there was good feedback on the two bio-digesters constructed.



Biodigester Constructed at Rupertee

1.6 The Energy Resource Institute (TERI)

The Government of Guyana (GoG), through the Office of Climate Change (OCC), has been collaborating with The Energy Resource Institute (TERI).

TERI assisted the Guyana Energy Agency (GEA) with a number of key projects:

- Energy efficient street lamps - Local Suppliers were invited to tender for forty (40) energy efficient induction lamps with timer control but all bids submitted were non-responsive. TERI assisted the GEA in obtaining quotations from international suppliers and also acted as a conduit for the procurement of forty (40) 120 watts energy efficient induction lamps with a timer control from a successful bidder.
- Energy efficient wood stove pilot – TERI introduced to the GEA an energy efficient wood stove that uses both solar and biomass to achieve high efficiency when cooking. Investigations were conducted and the stoves were found to be appropriate for Guyana's conditions. A pilot has since commenced and the purchase of 100 stoves were facilitated by the GEA.

These stoves are to be distributed in 10 hinterland communities to access their functionality.

- Energy Assessment – TERI, after reviewing energy assessment reports created by the GEA, identified areas where improvement can be made to add clarity to the reports.

GEA's Engineers assisted the TERI experts to conduct a follow-up energy assessment at the Georgetown Public Hospital. A meeting was organized with the Facilities Manager where implementation of the first energy assessment which was conducted by Tetra Tech and funded by USAID were discussed. According to the manager, most of the energy conservation opportunities identified were not implemented because of financial constraints. Other areas discussed were the hospital's procurement of a 60 cycle generator and the voltage problems experienced with the internal wiring. TERI experts conducted voltage measurements and were able to confirm that there was a problem and made recommendations on how to solve the issue. TERI also informed the manager of a 60 cycle generation that is used on a 50 cycle water pump at a Guyana Water Incorporated (GWI). Recommendations were made for an exchange if the hospital wants to replace a 50 cycle generator that is used primarily for the air-conditioner system, since there are plans to change the 50 cycle AC units to 60 cycle, the manger agreed to dialogue with GWI.

1.7 Solar Energy

1.7.1 Installation of Photovoltaic Equipment

Throughout 2014, GEA's Engineers actively identified and repaired non-functioning solar photovoltaic installations across Guyana. Below is a summary of the various systems repaired:

Location	Facility	Installed Capacity (W)	Energy Use	GEA's Support
47 Miles Village, Mabura Road, Region 10	Health Post	165	Lighting	Supply and installation of wiring, lights and batteries.
Caria Caria, Region 3	Health Outpost and Primary School	1,350	Lighting, AC loads, Audio visual teaching aids	Supply and installation of inverter, wiring, batteries and electrical outlets.
District 10, Region 5	Primary School	280	Computer and radio	Supply and installation of batteries and inverter.

				for interactive learning and lighting.	
47 Miles Village, Mabura Road, Region 10	Primary School and Teacher's quarters	200		Lighting and audio and visual teaching aids	Installation of complete systems.
TOTAL		1,995			

1.7.2 Documentation of Solar PV Installations

In an effort to track solar photovoltaic installations across Guyana, GEA has been monitoring and recording the various installations. The total documented photovoltaic systems in Guyana is 1,105.88 kW producing an estimated 2,009.1 MWh of energy annually.

1.7.3 Follow-up visit to Aishalton and Karasabai, Region 9

A follow-up visit was done to Aishalton and Karasabai, Region 9, to inspect the stand-alone solar PV installations which were installed at the Karasabai Health Centre and Aishalton Cottage Hospital under the USAID's IHFI (Improving Health facility Infrastructure) project. These systems comprised a 1200Wp solar PV array with a 350Ah battery bank. The Aishalton Hospital was fitted with three separate stand-alone PV installations. Checks were made on the operation of the system and to identify the frequency of maintenance activities done by inspecting the log sheets which were provided.



1.7.4 Sun pipe Installation

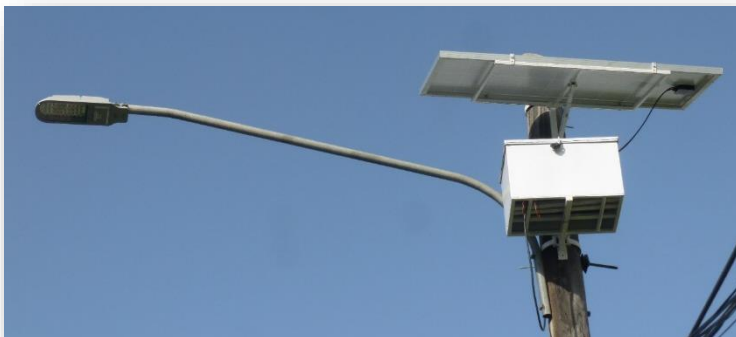


In an effort to promote the use of renewable energy and learn about the application of passive solar lighting, a sun pipe was installed on the roof over the Energy and Statistics Division (EESD) of the GEA. Prior to the installation, temperature and light measurements were

recorded. The occupants of the office, though appreciative of natural lighting, experienced some discomfort, hence, the sun pipe was re-positioned to provide lighting in the hallway.

1.7.5 Solar-powered LED street light

Engineers from the Guyana Energy Agency installed two (2) stand-alone solar powered 40W LED street lights to demonstrate energy efficient street lighting utilizing solar energy. The 40W LED lights were fitted to the pole at a height of about 25 feet from the base. The structures to mount the battery backup and solar PV panel were fitted slightly higher than the LED light.



Measured luminance levels under the LED luminaire revealed that sufficient illumination was attained to meet the standard for street lighting requirements in the city of Georgetown.

The first solar powered street light cost G\$278,300 while the second unit was installed at a cost of G\$209,800. The second unit benefitted from reduced prices and improved design and construction.

1.7.6 Donation to Government Technical Institute

The Guyana Energy Agency (GEA) in the exercise of part of its mandate to promote energy efficiency, energy conservation and the development and utilisation of renewable sources of energy, donated 3 sets of solar PV equipment to the Government Technical Institute (GTI) for training purposes:

- a) 3 x 15 WP solar panels
- b) 3 X 7 Amp Hour Battery
- c) 3 X 3 Solar control kits
- d) 3X 11 Watts 12 VDC CFL bulbs.



The aim of the donation is to foster learning and create interest in renewable energy technology by providing the students of GTI with the opportunity to interface with the said technology, thereby creating the opportunity to engage in practical demonstrations. The equipment will also allow for the exploration of the sun's energy and facilitate learning in the areas of photovoltaic cells and electrical circuits.

1.7.7 Assistance to GWI

GWI requested the assistance of GEA to identify problems with 3 solar water pumps located at Toka, Aranapunta and Masarah. GEA's Engineers were in Region 9 and assisted GWI with this request. Initially, it was assumed that the photovoltaic (PV) systems that provided energy to operate the submersible pumps were non-functional. The three systems were tested and the problems were identified. All PV systems were found to be functional, but the submersible water pumps were all found to be damaged.



GWI was informed of the findings and agreed to replace the damaged pumps.

1.7.8 **Assessment at Solar Photovoltaic (PV) installations in Region 1**

At the request of the Administration of Region 1, technical assessments were conducted by GEA's Energy Engineer at several sites having solar photovoltaic (PV) installations across the Region. The objective of the assessments was to inspect the installations, provide a technical review of each system and highlight the corrective actions required to have the systems returned to operation. A report was prepared which highlighted the findings.

The assessments were conducted at the following sites: The Learning and Resource Center, Mabaruma, Sebai Health Center, St Anslem's Primary School, Port Kaituma Hospital, Port Kaituma Secondary School, Port Kaituma Regional Office, Arakaka Nursery School, Arakaka Health Center, Matthew's Ridge District Hospital, Matthew's Ridge Primary School, Baramita Health Outpost.

Technical assessments were also conducted in the Moruca district at:

- Kumaka District Hospital
- Waramuri Health Center
- Haimaracabra Health outpost
- Kwebanna Health Center

1.7.9 **National Parks 15.84kW Grid Tie Photovoltaic System Commissioned**

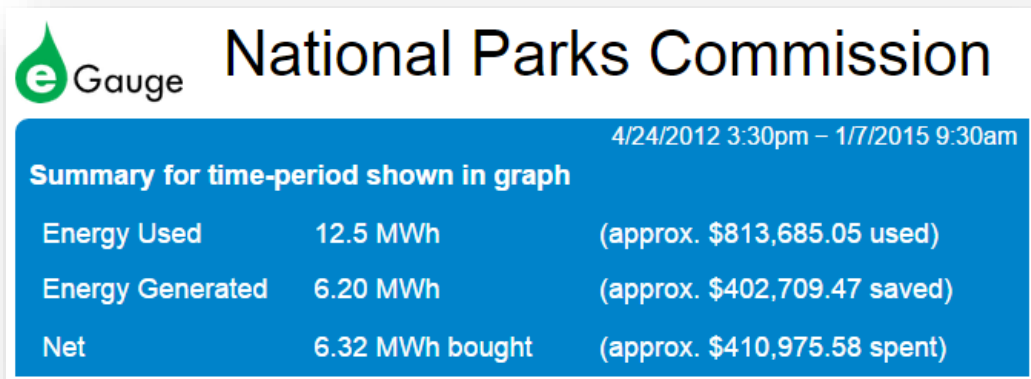
The National Parks Commission installed a 15.84 kWp grid tie photovoltaic system which was commissioned in March, 2014 at a cost of G\$11,716,843. The system, installed at their head office building, is estimated to produce 20.89 MWh of energy annually, saving the Commission approximately

G\$1,374,770 and avoiding 15,876.4 kg of CO₂ emissions. The Guyana Power & Light Incorporated (GPL) modified the existing electrical circuit to facilitate a net metering



configuration. The Government Electrical Inspectorate (GEI) was also consulted to certify that all equipment were installed in accordance with the relevant standards.

A web-based electric energy and power meter was also installed to measure the energy used by the building, energy generated by the solar system and the net energy that is supplied by the utility grid.



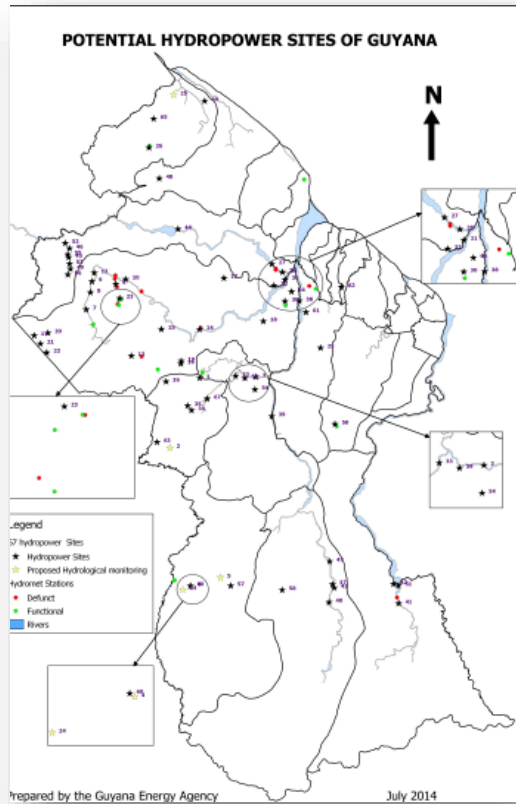
1.8 Hydropower

1.8.1 Amaila Falls

The Government of Guyana continued to pursue the development of the Amaila Falls Hydroelectric Project (AFHP) which comprises three main components: the Hydropower Facility to be located approximately 200km from Georgetown, the Electrical Interconnection which consists of the 230 kV transmission line. The project involves the construction of a hydropower plant where the Amaila and Kuribrong rivers meet. Electricity produced at the plant will be delivered to Guyana's capital, Georgetown, and its second largest town, Linden. Once operational, approximately G\$9 billion will be saved annually from fuel import.

AFHP, the flagship of the Low Carbon Development Strategy (LCDS), is currently being reconfigured since the withdrawal of Sithe Global in 2013. His Excellency President Donald Ramotar announced on December 31, 2014 that Norway had transferred US\$80 million to the Inter-American Development Bank to fund part of Guyana's equity share in the project. Within months it is expected to achieve financial closure and commence construction.

1.8.2 Potential Hydropower Sites

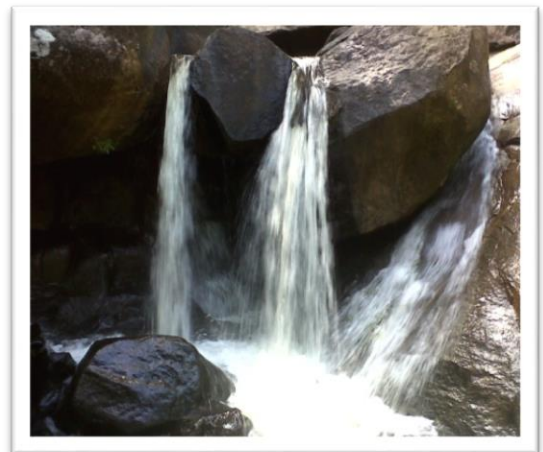


The Guyana Energy Agency finalised a prioritised list of Hydropower sites which was entered, along with all Hydromet stations, into a GIS data base (QGIS) for graphical representation and to guide future decision making processes. The prioritised list was used to help identify and select six priority sites for hydrological monitoring.

1.8.3 Kumu Falls

According to a study done in 1977 by M. Singh, Specialist Engineer (Designs), attached to the Hydropower Division of Guyana Natural Resources Agency (GNRA), Kumu may be suited for a small scale hydropower generation with a potential of 0.1MW, since the creek channel may accommodate a small amount of storage, with a head of approximately 9 metres (30 feet) and discharge of $0.17\text{m}^3/\text{s}$ at the foot of the mountain.

GEA's Hydropower Support Engineers are currently collecting hydrological and other data to prepare a feasibility study for the Kumu Falls.



1.8.4 Hydropower Site Visits

Ten (10) visits were conducted at eight (8) sites in four different Regions during the year 2014. All the sites were visited once, with the exception of Kumu, Region 9 to facilitate the feasibility study currently being undertaken by the GEA. The Table below depicts the sites visited, their location and the number of visits conducted at each site.

Name of Sight	Location	Number of Site Visits
Kumu	Region 9	3
Kato	Region 8	1
Boro Boro	Region 9	1
Toka	Region 9	1
Ikuribisi	Region 7	1
Loo Creek	Region 4	1
Yarakabra	Region 4	1
Wamakaru	Region 9	1

1.9 Wind Energy

1.9.1 UAEP Wind Measuring Towers

Under the Unserved Areas Electrification Programme (UAEP), wind speeds were monitored in the following areas: Orealla, Region 6, Jawalla, Region 7, Campbelltown, Region 8, Yupukari, Region 9. However, the wind speeds were not very attractive. The measuring towers and equipment were subsequently handed over to GEA.

GEA's Energy Engineer subsequently restarted wind measurements and compiled a wind data analysis for Yupukari, Orealla and Jawalla. The data for these locations were collected over a 1 year period using the NRG Monitoring Systems for wind speed and direction. From the data analysed, it can be concluded that the wind regime was not favourable for energy production using wind turbines at those sites since the average wind speed was between 2 and 4 m/s. Alternative sites for wind measurement were subsequently identified.

Relocation of Wind Measuring Towers

In order to understand the wind regime around Guyana, various entities have been involved in monitoring and recording wind speed and direction at various locations around Guyana. The Ministry of Agriculture, Hydrometeorological Office also has 14 automatic weather station that have also been recording wind speeds in various regions across Guyana. Taking into consideration these existing sites with known data and data obtained from Solar and Wind Energy Resource

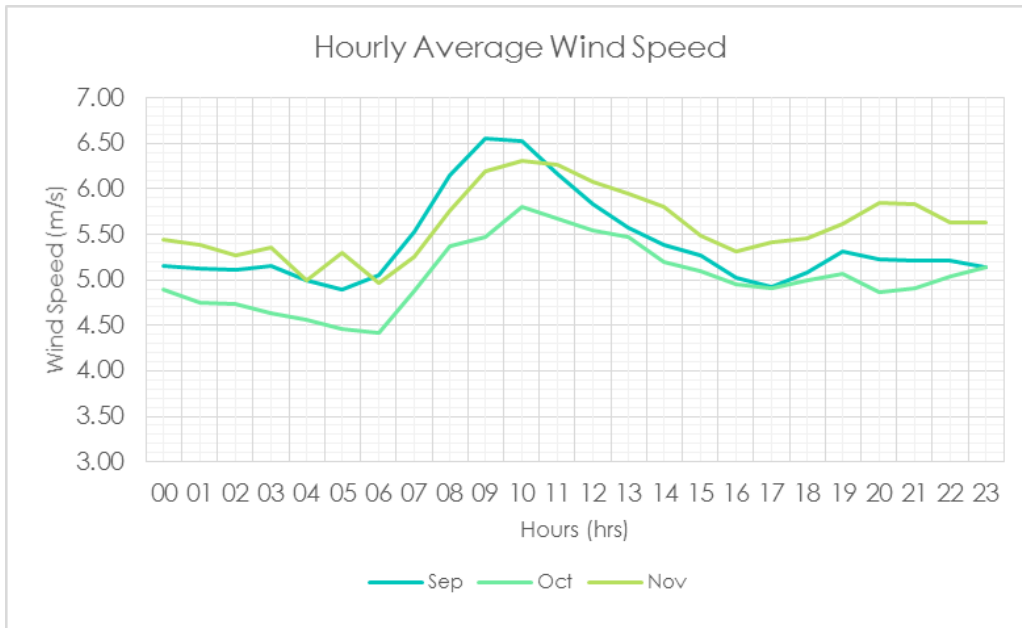
Assessment (SWERA) and NASA Low Resolution Wind Data for Guyana, GEA has identified possible locations for the relocation of the existing wind monitoring stations for continued measurement.



The mast and supporting instruments previously installed at Yupukari in October 18, 2008 were relocated to Kumu (Region 9) and commenced logging on November 5, 2014.

1.9.2 Anemometer and Data Logger at GWI Port Mourant

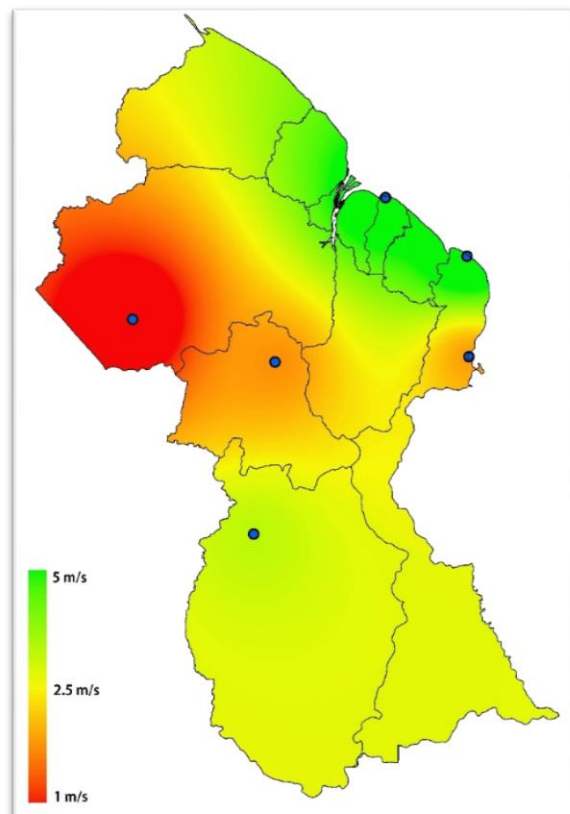
Upon a request from the Guyana Water Incorporated (GWI), the Guyana Energy Agency mounted a wind monitoring system (anemometer, wind vane and data logger) in Region 6 on the Corentyne Coast, Port Mourant. The anemometer and wind vane was mounted on a water tank structure approximately 40 meters above ground level. GWI is one of the largest electricity consumers in Guyana and is interested in monitoring winds speeds at several plant locations to assess the wind energy potential.



1.9.3 Wind Map for Guyana based on GEA's Measuring Stations

A wind map is a representation of the magnitude and sometimes direction of the winds of a region or country in graphic form, using cartography with a scale and determined symbolism. The objective of the data represented on the wind map is always to reveal or identify the wind potential in an area.

A wind map was created by GEA's Energy Engineer using GIS software (ESRI Arcmap) and the average wind speed measurements obtained from six (6) 34 meter wind stations installed at 6 different location (Georgetown -Region 4, Port Mourant -Region 6, Orealla - Region 6, Jawalla - Region 7, Mahdia - Region 8 and Yupukari - Region 9) around Guyana for a period of at least one year.



The wind speeds for the entire country was estimated using these 6 location by

means of an algorithm called Inverse Distance Weighted Interpolation (IDW) inherent in the GIS software. Data from new measuring stations will be incorporated to further improve the wind map.

GEA has been monitoring and recording wind generators across Guyana. To date, more than 40kW wind power installed capacity has been recorded.

1.10 Bio-Energy

1.10.1 GuySuCo launches E-10 fuel



Through a technical cooperation; “Expanding bio-energy opportunities in Guyana” and with funding from the Inter-American Development Bank (IDB), in August 2013, the Government of Guyana formally commissioned a Bio-ethanol demonstration plant at GuySuCo’s Albion Estate with the objectives of demonstrating production of fuel grade ethanol from the estates’ available feed stock, increasing the mass of trained personnel in the area of bio-

fuel through training and research, and demonstrating the utilisation of bio-ethanol fuel.

The Bio-Ethanol E-10 fuel produced at GuySuCo’s Albion Estate was formally launched for trial run in a number of vehicles, with the expectation that before the end of 2014, approximately 25 vehicles would be routinely utilizing the fuel, but moreover, towards the production of commercially available blended fuel.

1.10.2 Site visit to Saj Rice Milling Complex

The Guyana Energy Agency (GEA), after consulting with the Guyana Rice Development Board (GRDB), identified the Saj Rice Milling Complex as a possible site for piloting a rice husk gasifier. GEA met with the management of the rice mill and discussed the possibility of a collaboration. GEA subsequently submitted a technical questionnaire to the management and is awaiting their response.

1.10.3 Energy Efficient Wood Stoves: Region 8 Schools

GEA's Energy Engineer visited three (3) schools; Paramakatoi Secondary, Paramakatoi Primary and Kato Primary schools located in Region 8 to investigate the use of firewood for meal preparation. The visit was prompted following concerns raised by members of the community on the large quantity of firewood being used on a daily basis.

All three of the schools were assessed and a recommendation was made to use Energy Efficient Institutional Wood Stoves at each school. The findings a recommendations were documented and compiled in a report. GEA has commenced the procurement of Energy Efficient Institutional Wood Stoves for the schools.



1.11 Replacement of Photosensors

Since the commencement of the photosensor replacement programme, a total of 1,950 defective photosensors on street lights were replaced as part of GEA's efforts to conserve energy.

The photosensor should automatically switch on the street lamp in the evening as night approaches, and switch it off in the morning as daylight breaks.



A defective photosensor, however, can keep the street light lit during daylight hours resulting in wasted energy, costing G\$60,958 per lamp per year based on current electricity tariffs. The 1,950 new photocells replaced to date were procured at a unit cost of G\$904 and would translate into annual energy savings of about G\$118.8 million.

1.12 Energy Efficient Street Lights

Over the last three years, GEA has been testing and reviewing Light Emitting Diode (LED) and Induction street lights. In 2014, GEA replaced 40 of the 250Watt high pressure sodium (HPS) lamps with 60 Watt LED lamps to conserve energy, reduce energy costs, improve the quality of street lighting and provide an opportunity to assess the LED street lights.

Qty	Power (W)	Capital Cost (G\$)	Operating Hours	Days Of Operation	Energy per Year (kWh/yr)	Energy Cost per year (G\$)	CO ₂ (kg)
40	250	1,880,000.00	12	365	43,800	2,438,346.00	30,660
40	60	2,720,000.00	12	365	10,512	585,203.04	7,358
SAVINGS					33,288	1,853,143	23,302

Installation of a 30W LED Street Light

GEA with assistance from the Ministry of Public Works, Works Services Group, replaced a 175W Mercury Vapour (MV) street light which was located to the east of the Agency's head office with a 30W LED street light. With a capital cost of G\$52,500, this unit is expected to last over 10 years with savings of approximately \$28,000/year in operational costs as compared to the MV light. The payback

period on this investment is approximately 1 year 2 months at the current cost of electricity (\$55.67/kWh). An analysis computed at the real cost of energy (estimated to be \$80/kWh), results in an immediate payback on the investment. An in-depth analysis of LED street lights will be prepared by the Agency that covers the benefits (environmental and economic) and operational characteristics.

1.13 Energy Assessments/Audits

GEA commenced Energy Consumption Assessments of 20 Government buildings in 2012, expanded this to private sector and schools in 2013, and continued assessments in 2014, resulting in a total of 63 buildings being assessed at the end of 2014.

The energy conservation assessments were conducted and ratings for all installed equipment and lighting loads were recorded to understand the daily power demand and to make recommendations on energy conservation opportunities. A written report identifying energy conservation opportunities, estimated costs and pay back calculations for the various recommendations would be prepared and submitted to the respective entities. Below is a summary of the progress with the energy assessments:

	Organization	Assessment Completed	Energy Report Completed	Lighting Change-Out Completed
1	Guyana Forestry Commission	X	X	X
2	Guyana Lands & Surveys Commission	X	X	X
3	Guyana Office for Investment	X	X	X
4	Office of the Prime Minister	X	X	X
5	Guyana Energy Agency	X	X	X
6	Hydromet Doppler Radar Station, Timehri	X	X	X
7	Hydromet Head Office, Brickdam	X	X	X
8	Public Utilities Commission	X	X	X
9	Guyana National Bureau of Standards	X	X	
10	Environmental Protection Agency	X	X	X
11	Guyana Post Office	X	X	X
12	National Centre for Educational Resource Development (NCERD)	X	X	X
13	Regional Democratic Council Building, Region 4	X	X	
14	National Agricultural Research and Extension Institute, NAREI	X	X	X
15	Guyana Livestock & Development (Head Office)	X	X	X

16	Government Electrical Inspectorate	X	X	
17	Ministry of Amerindian Affairs (Scholarship Hostel)	X	X	X
18	Public/Police Services Commission	X	X	
19	Guyana Livestock & Development (Hatchery)	X	X	
20	Ministry of Culture, Youth and Sport (Head Office)	X	X	
21	Caribbean Container Limited	X	X	
22	Demerara Mutual Life/ Scotia	X	X	
23	Office of the President	X	X	
24	State House	X	X	
25	Red House	X	X	
26	Cara Lodge	X	X	
27	Farfan	X	X	
28	Guyana Livestock & Development (Farm)	X	X	
29	Guyana Civil Aviation Authority	X	X	
30	Presidents College	X	X	
31	Bishops High School	X	X	
32	Mercy Hospital	X	X	
33	National Park Commission	X	X	
34	Caricom Bottling Plant	X	X	
35	St Joseph Secondary School	X	X	
36	East Ruimveldt Secondary School	X	X	
37	North Georgetown Secondary School	X	X	
38	Guyana Rice Development Board	X	X	
39	Ministry of Natural Research and Environment	X	X	X
40	Aracari's Hotel	X	X	
41	Dr. Balwant Singh's Hospital	X		
42	Guyana Rice Producers Association	X		
43	Richard Ishmael Secondary	X		
44	Christ Church Secondary	X	X	
45	North Ruimveldt Secondary	X	X	
46	Ogle International Airport	X		
47	MOW Work Service Building	X		
48	GWI Front Building (B1)	X		
49	GWI Back Building (B2)	X		
50	Ministry of Amerindian Affairs (Head-office)	X		
51	International Conference Center	X		
52	Cummings Lodge Secondary School	X		
53	Uitvlugt Secondary School	X		
54	Annandale Secondary School	X		
55	Bladen Hall Secondary School	X		
56	Houston Secondary School	X		
57	Central High School	X		
58	Leonora Secondary School	X		
59	West Demerara Secondary	X		

60	Soesdyke Secondary School	X		
61	Patentia Secondary School	X		
62	St John's Secondary School	X		
63	Director of Public Prosecutor Office	X		

Energy Assessment Results Intervention

Based on the results of an energy assessment report that was presented to Regional Democratic Council, Region 4, a 25kVA transformer was found to be 9.5 % under sized. An under-sized transformer can lead to an overloaded fuse which would cause power outages and is also a fire hazard. GEA recommended that the transformer be changed and GPL requested that GEA justify the reasons for the change. After presenting data, GPL agreed to the change. A 50 kVA transformer is now installed at the RDC Region 4 office making that Office's operation more efficient and safe.

Technical assessment at the Guyana International Conference Center

An intervention was done by engineers from the GEA at the International Conference Center located at Liliendaal. An assessment of this system revealed that a fault in the changeover switch resulted in the failure of the system's operation. It was also found that the batteries were discharged beyond their operational set point, and as a consequence, were at the end of their useful life. A follow-up visit was then planned so as to allow sufficient time to obtain a manual online to review the entire system. Further, after gaining additional understanding of the system, recommendations will be made so as to have this system operational again.

Energy Efficient Implementation at Pensioner's Home

The Guyana Energy Agency (GEA) supported the change out of old and inefficient lighting technology at the home of a pensioner and widower at Eccles. The matter was brought to GEA's attention by GPL who indicated that the pensioner was concerned about high electricity bills, a monthly cost of approximately G\$13,500.

Upon inspection by the GEA engineer and engineering technician, it was found that most of the lights installed were incandescent lamps ranging from 60 watts to 100 watts. A four feet fluorescent lamp with inductive ballast and T12 tube was

also found at the location. When measured with all loads on, the demand was 1,050 watts. It was also noticed by the team that a sparsely packed refrigerator had its thermostat set for maximum cooling for both the freezing and refrigerator compartments.

Thirteen-watt compact fluorescent lamps (CFL's) were used to replace 2 x 60 watts and 5 X 100 watts incandescent lamps. The 40-watt inductive ballast was replaced with a 32-watt electronic ballasts and the T12 tube was replaced with a T8 tube. The refrigerator thermostat was adjusted to medium cooling.

These change out and adjustments reduced the energy demand of the home to 471 watts, a 55% reduction of the initial demand. The pensioner was also advised on energy conservation and other energy efficiency tips.

1.14 Caricom Energy Week

CARICOM Energy Week 2014 (CEW 2014) was celebrated by CARICOM member states under the theme "Achieving Climate, Environmental and Economic Resilience through Sustainable Energy". The Guyana Energy Agency (GEA), in keeping with the main thrust of CEW- to build awareness among various segments of the society across the Community about critical energy issues with a key focus on sustainable energy development at the national level, planned a week of activities to commemorate CEW 2014. These included an in-house quiz, the launch of an Essay and Art Competition, a series of radios quizzes, a Poster Board Activity, School Presentation, and a National Energy Forum.

In House quiz

GEA kick started their energy week activities 'at home' with an in-house quiz on Friday November 14th, 2014 at the Cara Lodge. Two Presentations were delivered to staff members titled 'Sustainable Energy' and 'Energy Conservation and Efficiency Tips', followed by the viewing of a Documentary on Sustainable Energy.



The quiz segment saw questions being posed to staff that were based on the presentations that were made and some of the content of the Documentary. In the end, the Accounts Division was the overall winner carting off five of the ten prizes that were up for grabs. The presentations were delivered by GEA's Energy Engineers and Public Communications Officer.

The aim of the activity was mainly to involve employees in the Energy Week celebrations as well as disseminate energy related information.

School Presentations

The in-house quiz paved the way for a school presentation on Monday November 17, 2014. Held in Bartica Region 7, the fourth and fifth formers of 'Three Mile Secondary School' were the recipients of the presentation. Delivered in the form of viewing a ten minute Documentary followed by a power point on Sustainable Energy Initiatives, students were engaged in discussions on energy and energy related issues while being encouraged to practice energy efficiency and conservation. Key definitions were highlighted for example 'Sustainable Energy', 'Energy Conservation' and 'Energy Efficiency' among others.

After the delivery of the presentation, students were encouraged to answer questions and tokens (CFLS and T-Shirts) were distributed to those who answered correctly. This activity was executed by GEA's Public Communications Officer, Economist and Hydropower Support Engineer. School Presentations are an ongoing component of GEA's strategic plan and is aimed towards providing students with a practical



understanding of energy and energy related issues, encourage interest, and behavioral changes, in relation to energy efficiency and conservation.

During Energy Week the Agency seeks to have outlying schools be recipients of the presentation. Hence, Three Mile Secondary was chosen.

Poster Board Activity

On the heels of the school presentation, the Burrowes School of Arts came alive with much excitement on Tuesday November 17th, 2014, as fifty six (56) Primary School students of grades 4-6 expressed their energy during the Poster Board Activity. Aptly titled 'Express your Energy', this activity had in attendance fifty six (56) students between the ages of nine to eleven (9-11) whose enthusiasm could not be contained. Representing St. Margaret's Primary, Marian Academy, St. Angela's Primary and Winfer Gardens, the students were encouraged to convey

their interpretation of energy efficiency and sustainability through artwork and pictorial illustrations. Ardently encouraged by their fellow team members, students expressed their interpretation of 'The Power of Sustainable Energy', 'Think Act Save', 'Protect the Environment' and 'How to be an Energy Champion'.

The activity was non-competitive; therefore, students were not judged or ranked based on their illustrations. Rather, each school was awarded a 'Certificate of Participation' while each student (and teacher) was awarded a token of appreciation as an honorary 'Energy Champion'.



The Posters created during the activity will be displayed at the upcoming National Energy Forum which will be held in January 2015. The goal of the Poster Board activity was to tap into the creativity of children by allowing them to express their views and perspectives (through art) on energy-related matters in a non-competitive environment.

Seminar

Held on Thursday November 20th, in the Essequibo Room of the Cara Lodge, a Seminar titled 'Taking Account of Energy Efficiency in Procurement' was the next activity which was facilitated by the Chief Executive Officer of the GEA. The objective of the seminar was to stimulate dialogue, discuss and bring awareness to benefits of Energy Efficient Procurement and what it entails while highlighting the Procurement Policy statement which states that 'All public procurement of electrical appliances shall include, as part of the decision-making process, an evaluation of the annual operating energy costs of the various electrical appliances'. Participants were made aware of certain aspects of the Energy policy and encouraged to ensure that the annual operating energy costs of

electrical appliances must be included as part of the evaluation in the procurement process.

Though specifically targeting Government Ministries and Agencies the Seminar was also open to the private Sector. Present at the Seminar were representatives from the following Ministries: Tourism, Youth Sports and Culture, Human Services, Agriculture, Foreign Affairs, Amerindian Affairs and Home affairs. Other participants included The Guyana Police Force, the Bank of Guyana, the Cyril Potter College of Education, the Guyana Revenue Authority and GUYSUCO among others.



Launch of Essay and Art Competition

The Agency also launched an Essay and Art competition during Energy Week. Secondary Schools across Guyana were invited to participate in this activity. The 1st, 2nd and 3rd place winners of both activities will be announced in January 2015 and awarded their prizes.

Media Interaction and Radio Quiz

Leading up to Energy Week the Public Communications Officer of GEA attended a radio morning show to publicize Energy Week 2014. The show was the 'Early Mayhem Show' on 98.1 (Friday November 14, 2014). In addition to radio, the Agency also utilized the television and print medium to broadcast advertisements in the form of energy conservation and efficiency messages.

National Energy Forum

The National Energy Forum which was scheduled for Friday November 21, 2014 was postponed due to inclement weather. For CEW 2014 the Forum targetted Secondary School students. To this end, 17 schools were invited to participate. However, heavy rainfalls caused severe flooding which in turn caused the closure of all schools within Georgetown and those that were affected in other areas. A new date in 2015 will be finalized in January.

Distribution of Children's Energy Activity Booklet

In 2014 GEA designed an Energy Activity Booklet titled 'What is Energy?'. Through funding from ECLAC and RUBIS (they both printed and donated the booklets to GEA), GEA was able to acquire 1,697 copies (in addition to what was previously printed with support from ECLAC) of 'What is Energy?' These contributions assisted GEA to embark upon their vision to have the Booklet distributed to Primary Schools, with the aim of eventually having all Primary Schools across Guyana to eventually have access to the 'What is Energy?' booklet.

Schools within Georgetown, owing to easy access, were contacted to determine the number of students on roll in their grade 6 classes. The Agency therefore commenced the distribution exercise in September 2014 and distributed the booklets to four Primary Schools: St Margaret's, St Angela's, North Georgetown Primary and Winfer Gardens.

The exercise continued in November and the following schools benefitted: West Ruimveldt Primary, St Agnes, St Ambrose, South Ruimveldt Primary, Redeemer Primary, School of the Nations, Marian Academy, Maes Primary, Ketley, JE Burnham, Green Acres, Graham's Hall Primary and East Lapenitence Primary. A total of eighteen (18) schools has thus far benefitted from this exercise and a total of one thousand and thirty eight (1,038) copies distributed.



1.15 Information Dissemination and Awareness Activities

Presentation at Guyana National Bureau of Standards (GNBS)

On Monday the 5th of January, 2014 the Guyana Energy Agency conducted a presentation at the Guyana National Bureau of Standards (GNBS). Titled 'Tips for Energy Conservation', the presentation which was facilitated by GEA's Energy Engineer was delivered to 50 employees of the GNBS at their Head Office in Sophia.



Presentation at Demerara Mutual

The GEA's Energy Engineers along with the Public Communications Officer presented the main findings of an energy assessment to Demerara Mutual (DM). This was done at the request of DM. The findings, savings and payback costs were provided to DM and they have since committed to implement all of the proposed recommendations and expressed interest in conducting assessments at their other locations across the Caribbean.



Attending the meeting on DM' behalf were the Corporate Services Manager and Deputy Corporate Services Manager.

University of Guyana Annual Career Day



On Friday February 14th, 2014 a team consisting of the Public Communications Officer, Economist and three Engineers represented the Guyana Energy Agency at the University of Guyana's annual Career Day, which was celebrated under the theme 'Honouring the past, moulding the present, transforming the future'.

Over three hundred students and teachers (combined) visited the GEA's booth. The main purpose of the Agency's participation was one of awareness and information dissemination. The team focused on energy efficiency, energy conservation methods, the various departments of the GEA and what they do, and the career opportunities that exist within the Agency. There

were displays of brochures and booklets which were distributed to those who visited the booth.

Ministry of Education National Science, Mathematics and Technology Fair



The Guyana Energy Agency participated in the Ministry of Education's National Science, Mathematics and Technology Fair which was held in Anna Regina from Tuesday 22nd to Friday 25th of April 2014. Representing the Agency at this biennial event, which was held under the theme '**Science, Mathematics and Technology: Providing Solutions for the 21st Century**', were a five-member team consisting of the Public Communications Officer, Economist and three Engineers.

The Agency displayed an energy efficient wood stove, a hydro model and an energy efficient house. The use of solar energy was also practically demonstrated as it was used to power

the energy efficient wood stove as well as provide power to the projector which was used to show a sustainable energy documentary.



Visitors to GEA's booth were given practical demonstrations as Officers not only displayed the energy efficient wood stove but also demonstrated its efficiency by preparing simple meals. Brochures and booklets were also on display and available to patrons of the booth. Key points in each of the five brochures were explained to those who visited. The younger visitors (Primary school and younger) were introduced to the kids' Activity Booklet 'What is Energy' and the definition of 'energy' was discussed.

Meeting with Officials from the Ministry of Education

A meeting was held with Chief Education Officer and other officials from the Ministry of Education, at the Ministry's Head Office on Brickdam. The CEO of the GEA presented the findings from an energy assessment conducted at a senior secondary school in Georgetown and explained the importance energy conservation and energy efficiency plays in securing lower utility costs at schools. A proposal which was done by the GEA was also submitted to the Ministry. This proposal explored the opportunities of implementing energy efficient change outs which would result in lower electricity costs at schools.

Towards the provision of electricity at schools in remote areas, the Ministry made a request to the GEA for its assistance in the installation of stand-alone solar photovoltaic systems at these locations. The GEA, in support of this effort, pledged technical support towards this activity.

Hydropower Seminar



The Guyana Energy Agency, with support from Renewable Energy and Energy Efficiency Technical Assistance (REETA), conducted a Hydropower Seminar entitled "Elements of a Hydropower Feasibility Study".

Thirty-five (35) persons were in attendance.

Distribution of Brochures

The Guyana Energy Agency (GEA) designed and printed two new brochures in May titled 'Solar Water Heaters' and 'Easy Tips for Energy Efficient Air Conditioning'. As a communication strategy, the Agency distributed one of each brochure to 40 Government Agencies and Organisations.



World Accreditation day 2014



World Accreditation Day was observed on June 9th 2014 under the theme 'Delivering Confidence in the Provision of Energy'. The Guyana National Bureau of Standards (GNBS), under whose purview the coordination of activities to observe this annual event falls, invited the Guyana Energy Agency (GEA) to conduct a presentation at a seminar that was planned to commemorate the Day.

Chief Executive Officer of the GEA conducted the presentation which was titled '*Benefits of Conducting Energy Assessments in the Manufacturing Sector*'. The presentation which was well received, sought to highlight key components of an Energy Assessment such as (among others): What it is, its benefits, energy efficient lighting equipment that are currently available and common practices, that are not energy efficient that have been observed in previously conducted energy assessments.

At the seminar which was held in the Savannah Suite of the Pegasus Hotel, GEA, with GNBS' permission, displayed brochures, booklets and a lighting board. The lighting board allowed for attendees to be given a hands on demonstration of energy efficient lighting choices and the cost saving benefits that can be derived from their installation and use.

In-house Distribution of Energy Booklet



On October 10th, 2014 GEA conducted an in house distribution of the booklet titled 'Guidelines to an Energy Efficient Home'. Each member of staff received one copy of the booklet. The goal of this exercise was to disseminate information on energy efficiency and conservation and to bring further awareness to members of staff.

Bath Settlement Village Day Agro Expo and Fair

On Saturday October 11th, 2014 the Guyana Energy Agency participated in the Bath Settlement Village Day Agri Expo and Fair. GEA's participation involved showcasing and disseminating energy related information. Patrons to the booth, which was also shared with a team from the Hinterland Electrification Unit (HEU), were given information about the hydropower potential of Guyana and the Upper and Middle Mazaruni Hydroelectric Project. Government's commitment to developing hydropower and how such developments would benefit Guyanese as a whole was also highlighted. In addition to brochures and booklets, patrons were also able to view a pictorial display of various hydropower sites in Guyana.



Presentation at GEI Seminar

The Government Electrical Inspectorate (GEI) and the Hinterland Electrification Unit (HEU) hosted a seminar targeting electrical contractors. GEA's Energy Engineers presented on "Energy Efficiency and Conservation – Useful tips for Electrical Contractors". Topics presented were based on key findings from fifty energy assessments conducted by the Guyana Energy Agency (GEA) and included recommendations on how to improve energy efficiency and conservation efforts. The seminar was attended by approximately two hundred persons.

Solar Workshops

In keeping with the organization's Five-Year Strategic Plan, GEA conducted two workshops in the month of December. Titled 'Introduction to Solar Photovoltaic Theory', workshops were conducted by GEA's Energy Engineer at the Guyana Technical Institute (GTI) on Dec 5th 2014 and at Kuru Kuru Co-operative College on Wednesday Dec. 11th, 2014.

The workshop included a two part power point presentation- (1) Fundamentals of Solar Energy and 2) Solar Energy Principles and an Overview of Solar Electric Technology- followed by demonstrations of how Solar PV technology works.

The goal of the workshops was to foster learning and create interest in renewable energy technology and that the beneficiaries would acquire knowledge, and the requisite skills, needed for them to positively contribute to 'A Secure and Sustainable Energy Future'.



Seminar

On Thursday December 18th, in the Ballet Room of the Cara Lodge, GEA once again held the Seminar titled 'Taking Account of Energy Efficiency in Procurement'. The Seminar, which was once again facilitated by Chief Executive Officer of the GEA, was re-held as inclement weather in November prevented several Organizations who had shown interest from attending.



The objective of the seminar was to stimulate dialogue, discuss and bring awareness to benefits of Energy Efficient Procurement and what it entails while highlighting the Procurement Policy statement which states that 'All public procurement of electrical appliances shall include, as part of the decision-making process, an evaluation of the annual operating energy costs of the various electrical appliances'. Participants were made aware of certain aspects of the

Energy policy and encouraged to ensure that the annual operating energy costs of electrical appliances must be included as part of the evaluation in the procurement process.



Though specifically targeting Government Ministries and Agencies the Seminar was also open to the private Sector. Present at the Seminar were representatives from the following Ministries and

Agencies: Education, Local Government, Home Affairs, Housing and Water, Central Housing and Planning Authority, Guyana Lands and Surveys Commission, Guyana Geology and Mines Commission, Teaching Service Commission, Georgetown Public Hospital Corporation, Environmental Protection Agency, National Library, Guyana Oil Company and Guyana Energy Agency. Other participants included Guyana Business Coalition on HIV and Aids, Farfan and Mendes and Parliament Office among others.

School Presentations

GEA's Public Communications Officer, with support from the Engineers, conducted school presentations reaching about 2,900 students at thirty-five (35) Secondary Schools in Guyana.



School Presentations are part of GEA's goal to disseminate information by providing students with a practical understanding of energy and energy related issues, encourage interest, and behavioural changes, in relation to energy efficiency and conservation.



The presentations were done in the form of viewing a ten minute documentary followed by a power point on Sustainable Energy Initiatives and Conservation Practices. Students were engaged in discussions on energy and

energy related issues while being encouraged to practice energy efficiency and conservation. Key definitions were highlighted for example 'Sustainable Energy', 'Energy Conservation' and 'Energy Efficiency' among others.

After the delivery of the presentation students were encouraged to answer questions and tokens (CFLS and T-Shirts) were distributed to those who answered correctly. Students also received a set of five brochures.

Summary of Advertisements and Brochures

Description	Year to Date	2014 Target
Number of Fuel Smuggling Ads in the Newspapers	60	60
Number of Fuel Smuggling Ads on the radio	512	500
Number of Fuel Smuggling Ads on TV	61	10
Number of Energy/Conservation ads in the Newspapers	40	40
Number of Energy Conservation ads on TV	52 ⁸	45
Number of Energy Conservation ads on the radio	582 ⁹	500
Number of brochures printed	6,000	5,000
Number of booklets printed	2,097 ¹⁰	2,000
Number of posters printed	2000 ¹¹	100
Number of brochures distributed	12,097	5,000
Number of booklets distributed	1,536	1,000
Number of posters distributed	1,187	100
Number of infomercials	2,378 ¹²	45
Number of documentaries	709 ¹³	30
Number of Energy Awareness Seminars	3	3
Number of Energy Awareness Workshops	2	2
Number of Presentations to Ministries and Agencies	4	4
Number of Presentations to Private Sector	1	4
Number of Visits to GEA's Website	15,269	30,000

⁸ Through funding from CARICOM for Energy Week 2014 (Nov 16th- 22nd) the energy efficiency and conservation ads were aired 21 times

(once per day for seven days on three television stations-NCN, RCA and LRTV).

⁹ Through funding from CARICOM for Energy Week 2014 (Nov 16th- 22nd) an additional 70 energy efficiency and conservation tips were aired

(3 Tips per day 17th-20th and 2 on the 21st: 5 times per day across 5 radio stations-89.1, 93.1, 94.1, 98.1 & 100.1).

¹⁰ ECLAC printed and donated a total of 875 of the Children Energy Activity Booklet 'What is Energy?'; while RUBIS donated 822.

¹¹ Donation from Pavnik Press

¹² CNS Channel 6 airs the animated Infomercials six (6) times per day free of cost; while the Learning Channel airs them twice per day.

¹³ CNS Channel 6 airs the 10 minutes 'Sustainable Energy' documentary once per day free of cost; while the Learning Channel airs it once a day on weekdays and twice per day on weekends (free of cost). For the month of November, during energy week (16th-22nd) the documentary was aired 21 times (once per day for seven days on three stations-NCN, RCA and LRTV) through funding from the CARICOM Secretariat.

2.0 Legal & Licensing Division

The Division enjoyed a successful year in 2014 as the targets were accomplished. The total number of licences issued was 1,459 compared to 1,332 in 2013, representing an overall growth of 10%.

	2014													2013 YTD	Total Growth %	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD			
Importing Wholesale	2	0	1	4	1	2	0	4	2	3	5	0	24	15	60%	
Wholesale	0	0	7	2	0	0	0	1	2	0	10	0	22	6	267%	
Retail	Petrol Filling Stations	3	2	38	30	27	7	5	10	8	6	39	15	190	85	124%
	Others	12	11	18	35	29	23	23	36	31	22	28	34	302	291	4%
Consumer Installation	43	8	20	94	9	30	3	6	60	4	9	7	293	197	49%	
Road Tanker Wagons	7	8	9	15	22	12	11	7	12	5	6	10	124	152	-18%	
Bulk Transportation Carrier	Trucks	25	66	36	36	36	42	24	34	36	27	31	34	427	528	-19%
	Fuel Barges	0	0	0	0	1	0	0	0	0	0	0	0	1	2	-50%
	Boats	2	2	4	4	8	12	8	3	12	4	5	12	76	56	36%
Total	94	97	133	220	133	128	74	101	163	71	133	112	1459	1332	10%	

Table illustrating Licences issued from January to December 2014

Bulk Transportation Standards



GEA, in 2012, began the drafting of two Standards for the transportation of petroleum and petroleum products by bulk transportation carriers and road tanker wagons.

The purpose of the standards is to ensure that operators transport fuel in a safe manner while at the same time protecting the lives of citizens and the environment. A technical Committee was convened early in 2014 and met periodically to review the standards. There

were no major changes to the draft under review.

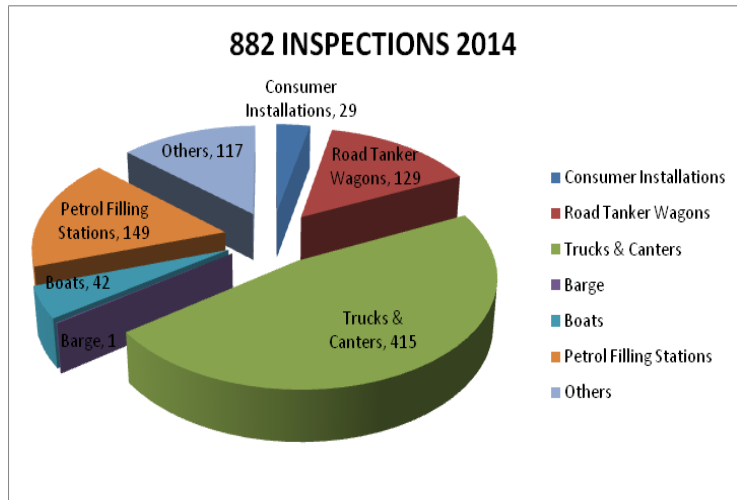
Guyana National Bureau of Standard (GNBS) in collaboration with the Guyana Energy Agency (GEA) held national consultations at Anna Regina, Bartica, New Amsterdam, Linden and Georgetown for the following two draft standards:

1. Requirements for the transportation of petroleum and petroleum products by bulk transportation carriers; and
2. Requirements for the transportation of petroleum and petroleum products by road tanker wagons.

The standards are expected to be finalized in 2015.

2.1 Petrol Filling Station Inspections

The Division conducted a total of **882** inspections during the course of the year in an effort to ensure continued conformity with the '**GNBS Guidance For The Design, Construction, Modification And Maintenance Of Petrol Filling Stations**' and in pursuance of its mandate to ensure continued compliance with the relevant standards and Regulations.



During the period September 27-28, 2014 a team comprising representatives from the Protected Areas Commission, Environmental Protection Agency, Guyana Lands & Survey Commission, Guyana Forestry Commission, Guyana Police Force and the Guyana Energy Agency visited Moruca, Region 1, to examine fuel depot sites, both current and potential, for regulatory compliance. Four sites were visited and the operators were advised to on the need for compliance with the respective Agencies' Regulations.

A team comprising representatives from the Guyana Energy Agency, Environmental Protection Agency and Guyana National Bureau of Standards visited Port Kaituma during the period September 30 to October 1, 2014. The purpose of the visit was to evaluate the sites that store, handle and dispense petroleum and petroleum products and to engage these stakeholders in becoming compliant with the respective Agencies' Regulations and recommend best practice for the storage and handling of petroleum and petroleum products.



2.2 Petroleum and Petroleum Products Regulations 2014

The Petroleum and Petroleum Products Regulations 2004, enacted under the Guyana Energy Agency Act 1997 cap 56:05, was revised to incorporate specific provisions relating to Bulk Transportation Carriers as well as other licensing related matters that have arisen over the years:

- New provisions have been included to deal specifically with bulk transportation carrier, import, importing wholesale and storage licences.
- The period of licence is now aligned with the business need – it may be suspended or cancelled at any time for cause. The period granted will be relative to the combined storage capacity of the site, taken as an indicator of the level of investment.
- Under the proposed regulations, licence holders, for periods of and greater than 10 years, must be incorporated or statutory bodies. This requirement is not set for licences of less than 10 years duration, with the aim of not burdening the small to medium scale licence holders with the financial and legislative responsibility that accompany the incorporation of a body.
- An Annual Fee, the same as the previous annual licensing fee has been proposed in the draft Regulations. Holders of multi-year licences have the discretion to make a lump sum payment of the licence's annual fees.
- The category of export licence has been included to accommodate servicing ships at sea.
- The GEA may now grant conditional licences whilst other permits, licensing and business arrangements are pursued.
- Provision is now made for the sending of Warning Notices in cases where, for example, a licence has expired and there has been non-compliance with Renewal Notices.
- Penalties have been introduced for the non-payment of the annual fee and non-submission of required documents which may expire during the validity of a licence.
- All documents requested in practice, but not stated in the original regulations, have been included.
- All licence holders, except storage licence holders, are now required to submit reports on a quarterly rather than monthly basis.
- Provision has been made for the submission of electronic applications.
- The proposed regulations have been reorganized to make the document more easily readable by licence holders and other relevant stakeholders.

The new Petroleum and Petroleum Products Regulation 2014 was gazetted on December 23, 2014.

3.0 Review of Activities: Fuel Marking Division

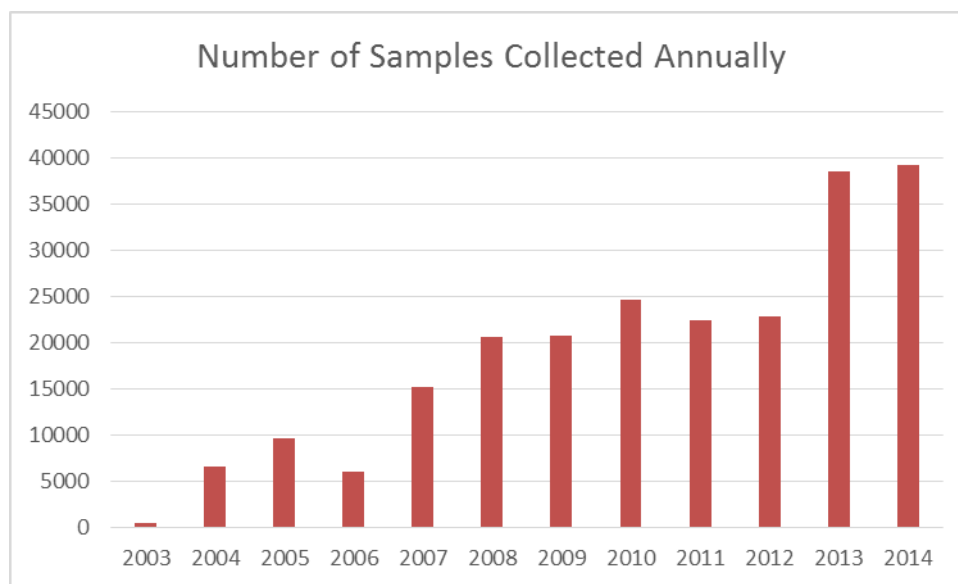
Since implementation of the Fuel Marking Programme in 2003, the Division has, in keeping with the legislative mandate, utilised a marking system to add markers to petroleum products imported by every person under an import licence or import wholesale licence for the purpose of identifying such petroleum and petroleum products as having been legitimately imported. Legally imported fuel was bulk marked, a total of 205 bulk markings: 140 at the Georgetown terminals, 50 at the Berbice terminals and 15 at the Linden terminal.

Samples of petroleum and petroleum products were collected from a number of sites throughout Guyana and tests were conducted to determine the presence or proportion of the markers in the respective samples of petroleum products.

The Task Force on Fuel Smuggling and Contraband, under the chairmanship of the Minister of Home Affairs, provided a framework to foster cooperation and coordination among the following key enforcement entities: Guyana Police Force, Guyana Revenue Authority, Guyana Defence Force and Customs Anti-Narcotics Unit. GRA rendered assistance to the GEA in relation to the disposal of illegal fuel. The coordination efforts of the Task Force has positively influenced the efforts to combat fuel smuggling.

3.1 Sample Analysis

The number of fuel samples collected/logged each year:



Since 2007 there has been a persistent year to year increase in samples collected. Between 2007 and 2014 this change has been more pronounced by going up more than 157%. However, between the last two years it has been just around 2%.



The table below shows the breakdown of analyses by Region. 42,403 analyses were done in 2014 compared to 39,199 analyses in 2013.

Number of Quantitative Analyses by Region											
Region	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	10	79	40	1,134	157	20	55	59	273	0	20
2	777	4,130	1,557	870	613	1,173	1,920	1,408	1,673	2,250	1,894
3	496	1,188	908	1,473	3,386	3,927	3,741	2,419	3,479	4,167	2,727
4	823	1,183	1,111	809	2,212	1,848	4,420	3,289	4,595	5,291	5,189
5	111	403	225	151	354	420	1160	827	1479	1,274	710
6	599	1,596	165	476	618	376	627	829	931	1,167	919
7	140	338	195	290	561	170	286	140	295	354	377
8	33	11	61	227	95	76	130	12	135	25	62
9	25					5	93	1	64	0	53
10	42	168	744	9,457	12,457	12,236	15,839	15,858	12,770	24,671	30,452
Total	3,056	9,096	5,006	14,887	20,453	20,251	28,271	24,842	25,694	39,199	42,403

Number of Quantitative Analyses by Region

Notes:

1. Database to track analyses was installed in July, 2004. Figures were not representative of ALL samples analysed for that year.
2. Sampling for 2006 and 2007 was focused on smuggling "hot spots"
3. Sampling on a 24-hr basis commenced in 2007 at the McKenzie, Linden Bridge

3.2 Analysis by Site

12,970 site visits were recorded during 2014 compared to 15,022 for 2013.

	2014	2013	2012	2011	2010	2009
Other Regions	6,987	8,917	4,922	4,276	3,975	3,242
McKenzie Bridge	5,983	6,105	3,401	4,239	3,994	2,849
Total	12,970	15,022	8,323	8,515	7,969	6,091

Note: Each truck, boat, retail outlet etc. is counted as a site in this table.

There has been a generally upward trend in site visits being recorded since 2009.



Despite the near 14% drop recorded in site visits in 2014, when compared to 2009, 2014 has seen more than a doubling of such visits. The decline in sites visited is in part due to the extensive trainings afforded to inspectors by the Agency, as well as time spent conducting more surveillance type activities with support from members of the Task Force on Fuel Smuggling and Contraband.

51 incidents of illegal fuel were recorded in the year 2014 compared to 35 in 2013.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	1	3	3	1	6	4	7	6	6	4	3	2	46
2010	6	2	3	3	5	3	6	3	2	2	3	10	48
2011	7	0	2	3	1	1	2	1	1	2	1	0	21
2012	1	0	0	0	0	3	0	3	1	1	2	2	13
2013	1	2	3	3	7	2	3	2	6	0	2	4	35
2014	2	2	1	3	2	1	0	3	2	3	11	21	51

Joint Operations

In 2014 the GEA has been able to conduct 29 joint operations with members of the Task Force on Fuel Smuggling and Contraband: Guyana Defence Force (5), Guyana Police Force (13) and Guyana Revenue Authority (11). These operations were both scheduled and unscheduled.

Of the 12,970 total sites visited during the year, 2,200 sites were sampled at least once.

51 (2%) of the sites sampled at least once were found with *significant dilution (defined as more than 50%)* in at least one tank. From 2006 to 2014, the percentage of sites found with significant dilution in at least one tank has progressively decreased from 34% in 2006 to 2% in 2014. With more sites visited, the data suggests that more sites are dealing in legal fuel.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
No. of Sites sampled at least once	573	763	656	566	592	1202	1313	1,179	1,648	2,146	2,200
No. of Sites found with significant dilution in at least 1 tank	72	240	220	128	57	73	45	21	13	35	51
% of Sites found with significant dilution in at least 1 tank	13%	31%	34%	23%	10%	6%	3%	2%	1%	2%	2%

Analysis of Site Results

Note: The "No. of Sites sampled at least once" does not capture trucks sampled at the McKenzie bridge.

3.3 Analysis of Test Results

The "Test Results" (*Quantitative Analyses*) refer to the percentage of marker concentrate detected when the sample was analysed. A "correctly marked" sample should be at 100%.

The results of samples analyses over the years are categorized in the following four ranges:

0 to 50% : *Significant dilution*

51 to 70% : *Some dilution*

71 to 90% : *Suspected dilution*

91% and more : *Legal*

The table below shows that during the assessment phase (2003), 12% of the samples analysed were found to be significantly diluted. This decreased to 6% in the post-assessment phase and throughout 2004. From 2005 to 2007, the testing strategy was focused on areas with a high incidence of illegal activity. For this three-year period, the percentage of significantly diluted samples fluctuated from 9% to 15% and then to 8%. It is believed that this fluctuation was a direct result of

the strategy used for sampling and would have a direct relationship with the number of samples analysed and the focus on areas with a high incidence of smuggling. The year 2008 can be characterized as a mixture of focused, planned and random sampling. The percentage of samples found with significant dilution was maintained at 3% in 2009. The year 2010 set another record with significant dilution reported as 2%, indicative of sustained reduction in the percentage of significantly diluted samples analysed. In 2011 and again in 2012, *significant levels of adulteration (defined as more than 50%)* were detected in only 1% of the samples analysed. With the analysis of 64% more samples in 2013, 1% of the samples analysed were found to be significantly diluted. While an increased number of samples were analysed in 2014, levels, of adulteration remained below 2%.

TEST RESULTS (Quantitative analyses)	2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014	
	0-50 %	196	6%	855	9%	764	15%	1,169	8%	593	3%	701	3%	511	2%	167	1%	259	1%	303	1%	186
51-70 %	275	9%	1,234	14%	223	4%	343	2%	254	1%	767	4%	372	2%	164	1%	128	1%	137	1%	46	1%
71-90 %	475	16%	2,576	28%	928	19%	8,204	55%	8,593	42%	12,654	62%	10,834	45%	10,990	49%	10,491	49%	29,734	49%	30,440	49%
91 % -	2,110	69%	4,431	49%	3,091	62%	5,171	35%	11,013	54%	6,129	30%	12,612	52%	11,171	49%	11,867	49%	7,252	49%	9,270	49%
Total	3,056	100%	9,096	100%	5,006	100%	14,887	100%	20,453	100%	20,251	100%	24,329	100%	22,492	100%	22,745	100%	37,426	100%	39,942	100%
Qualitative Analyses	36		375		1,825		1,180		307		887		1,259		113		452		710		961	

Test Results of Samples Analysed

Note: Duplicate quantitative analyses removed

3.4 Quantity of Illegal Fuel Seized

The table below compares the volume (UK gallons) of illegal fuel seized from 2005 to 2014:

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
3,011	8,001	21,793	33,560	33,443	21,242	10,272.6	6,004	2,931	3,785

3.5 Volume Analysis

An additional metric to evaluate the performance of the Fuel Marking programme is a measure of gasoline, diesel and kerosene consumption (excluding large duty-free consumers). For the oil companies, it is estimated that 3,385,595 barrels of petroleum-based products were sold in 2014 with an average of 9,276 barrels per day. This represents a 5.82% increase when compared to

TOTAL CONSUMPTION - OIL COMPANIES (BBLs)					
January - December		2012	2013	2014	% change
	Mogas	1,140,119	1,150,201	1,214,868	5.62%
	Gasoil	1,696,895	1,621,640	1,734,780	6.98%
	Kero	91,122	75,601	86,023	13.79%
	Avjet	132,924	81,584	77,166	-5.42%
	Fuel oil	77,095	73,596	80,997	10.06%
	LPG	177,133	190,806	187,526	-1.72%
	Avgas	6,041	6,000	4,236	-29.40%
	Total	3,321,329	3,199,428	3,385,595	5.82%
	Bpd	9,075	8,766	9,276	5.82%

2013¹⁴. There were increases in the consumption of Mogas, Gasoil, Kerosene and Fuel oil while consumption of Avjet, LPG and Avgas declined for the year.

The increase in gasoline consumption for 2014 can be attributed to an increase in motor vehicle registration.

The rise in diesel consumption correlates with a growth in the agriculture sector, namely the production boom in the rice industry. It may also presumably result from decreased availability of smuggled fuel due to the success of the monitoring and enforcement activities of the Fuel Marking Programme.

3.6 Prosecutions

For the year 2014, the Fuel Marking Programme recorded eight convictions in comparison with two in 2013. Seventeen new charges were filed, an increase from nine in 2013. Three matters were also dismissed in 2014 of which one was appealed. At the end of 2014, there were fifteen matters continuing before the Magistrates' Courts throughout Guyana as compared to thirteen last year. Compensation was accepted in four matters in 2014 under *Section 33A Guyana Energy Agency Act 1997* as amended by *Section 8 Guyana Energy Agency (Amendment) Act 2011*, a reduction from seven matters in 2013.



¹⁴ Gasoil and Fuel oil purchased locally by GPL from the oil companies were discounted to avoid double counting.

In January and February 2014, three training sessions were conducted with all field officers of the GEA- Inspectors and Marking Officers- informing them of the features of all licences issued by the GEA and certain pertinent requirements of licence-holders.

In September 2014, an introductory training session was conducted with recently appointed Inspectors of the Agency. The training examined the Standard Operating Procedures, the importance of maintaining the chain of custody, statement writing and testifying in court.

4.0 Review of Activities: Administration and Human Resource Division

At the beginning of 2014, the GEA had a staff complement of ninety (90) employees and ended the year with ninety-two (92) employees.

The following existing positions were filled during the year:

- 5 Inspectors
- 3 Marking Officers
- 1 Investigator
- 2 Driver/Office Assistants

Resignations from the following 7 positions were received:

- 4 Marking Officers
- 2 Inspectors
- 1 Head, Energy and Energy Statistics Division

The services of persons who filled the following positions were terminated:

- 2 Inspectors
- 1 Driver/Office Assistant

4.1 Professional Development

Seminar on Energy Efficiency and Conservation

GEA's Energy Engineer attended a seminar on energy efficiency and conservation in Nicaragua for potential projects development under CORE scheme which was sponsored by the Japan International Cooperation Agency and the Inter-American Development Bank.

		Training for the period Jan 1 to November 30, 2014	Target to be achieved for 2014
Organize and install suitable capacity building and professional development programmes to provide employees with requisite knowledge and skills.	Number of training programmes	35	20
	Number of Officers trained	205	100

Other training

Dates	Facilitator	Aim	Participants
January 31, 2014	T. Benn, Legal Officer – GEA	Understanding the functions of the Licensing Division.	R. Deochan, P. Fraser, N. Bacchus, D. Brummell, D. Edwards, M. Cumberbatch, E. Richards, F. Kissoon, J. Croker, M. Welch, and K. Barron.
February 26, 2014	Mr. Wickham, Station Officer – Guyana Fire Service	Fire Safety	Deochand Boodhoo, Dale London, Shankar Ram, Jonquil Croker, Ronell Gonsalves and Ramesh Amyan
February 17 to March 12, 2014	Dr. Devon Gardner	Planning and Strategy for the Development of Bio- fuels	Brian Constantine and Kenny Samaroo
March 4 to 7, 2014	Mr. Maurice Veacock	Hydropower Development	2 Hydropower Support Engineers and 3 Energy Engineers
March 21, 2014	Dr. Beverly Braithwaite- Chan, Professional Social Work Practitioner	Raise staff awareness on the topic of sexual harassment in the workplace.	66 Staff
April 1-4, 2014	PSM Training Division	Principles of Human Resource Development – Module 1	Terance Ram
April 8 – 11, 2014	PSM Training Division	Communication in the Office.	Nominee Ram, Shankar Ram. Randy Deochan and Abigail Bijader
April 9-11, 2014	GNBS	General Requirements for the operation of a laboratory – GYS 170:2009	Yota Burgess
April 14-16, 2014	Guyana School of Agriculture	Biogas Technology Workshop	Dolwin Khan and Kenny Samaroo

May 7-9, 2014	PSM Training Division	Improving Services of the Customer Care Professional	Merisha Welch, Abigail Bijader and Dhanomattie Shyamraj
May 12-30, 2014	Carlos Roberio- Professional Swimming Instructor - Hotel Tower	Swimming Classes (First Batch)	Jonquil Croker, Koreen Barron, Kissina Fitzallen, Earicka Richards, Ramish Amyan, Randy Deochan, Mowshani Lekhraj, Simeon Butcher, Merisha Welch, Floyd Kissoon, Devon Brummell, Dwayne Edwards, and Sherry Jagnarine
June 3-5, 2014	PSM	Government Accounting	Devica Sukhandan and Maurice Cave
June 20, 2014	IPED / IMC	International Business Communications	Nomiinee Ram and Geneva Cumbermack
June 24-25, 2014	PSM	Office Assistance	Abdul Alli
July 1-4, 2014	PSM	Principle of Supervisory Management – Module I	Nelta Dainty and Mowshani Lekhraj
July 15-16, 2014	PMS	Occupational Safety and Health	Mowshani Lekhraj
July 18, 2014	Junior Chamber International Guyana	Defensive Driving	Galburn Williams, Robert Nazir and Mervyn McGregor
July 24-25, 2014	Institute of Internal Auditors Guyana Chapter	Audit of Inventory and Stores Management & the Audit Process: From Planning to Reporting	Valmiki Ramtahal
July 22-25, 2014	PSM	Principles of Professional Secretarial Practice – Module I	Nominee Ram
July 29-31, 2014	Guyana Red Cross Society	First Aid Training	Arjune Deally, Kassina Fitzallen, Koreen Gittens, Jonquil Croker, Earicka Richards, Ramish Amyan, Randy Deochan, Mowshani Lekhraj, Simeon Butcher, Merisha Welch, Floyd Kissoon, Devon Brummell, Dwayne Edwards, Bernard Rodrigues, Cindy Williams, Ryan Dowden

August 19 - 22, 2014	PSM	Communication in the Office	Dhanomattie Shyamraj, Dale London, Koreen Barron and Steve Merai.
September 9 -12, 2014	PSM	Personnel Practices and Policies	Terance Ram
September 16-19, 2014	PSM	Principle of Supervisory Management – Module I I	Nelta Dainty & Mowshani Lekhraj
September 23-25, 2014	PSM	Improving Services of the Customer Care Professional	Shankar Ram, Dale London & Devon Brummell
September 24, 2014	Guyana Fire Service	Fire Safety	Winston Setal, Abigail Bijader, Deochand Boodhoo, Shanamay Daniels King, Chelcia Stephen, Paul Fraser, Merisha Welch, Mowshani Lekhraj, Simeon Butcher, Koreen Gittens, Kissina Fitzallen, Cindy Williams, Dwayne Edwards, Jonquil Croker, Nicholae Leacock, George Steffon, Adrian Webster & Rolin Wilson
September 26, 2014	T. Benn, Legal Officer - GEA	Introduction to Conducting Inspectorate Work	Mario Rodrigues, Ryan Dowden, Cindy Williams, Dwayne Edwards, Steffon George and Nicholae Leacock
October 7-9, 2014	PSM	Government Accounting Procedures	Joslyn Nesbitt
October 3, 2014 to Novemeber 7, 2014	Guyana Defense Force	Outboard Operation/Maintenance Course	Alec Yhan
October 1-31, 2014	Guyana Red Cross Society	First Aid Training	Rolin Wilson, Adrian Webster, Chelcia Stephen & Paul Fraser
October 29-30, 2014	GNBS	Measurement Uncertainty –ISO/IEC 17025	William Holder
October 21-22, 2014	Domenic Caccese, Consultant	Aviation Fueling Handling in Guyana	W. Setal, D. Shyamraj, D. London, D. Boodhoo , S. Ram and thirteen external Agencies with one participant each.

October 27, 2014 to November 14, 2014	Intelliguard Specialist Security Service Inc.	Investigation and Intelligence Gathering	C. Williams, R. Dowden, S. George, B. Rodrigues, N. Leacock & D. Edwards
October 14- November 13, 2014	OLADE	Energy and Society: Environmental Impacts of Biofuels and alternatives for prevention and mitigation	Winston Setal
November 12, 2014 to December 10, 2014	Technische Universitat Dresden	Energy Efficiency & Renewable Energy Sources	Mr. Brian Constantine
November 20, 2014	Dr. Sharma – CEO, GEA	Energy Efficient Procurement	Seema Greene and Terance Ram, Dolwin Khan, Leon DeSouza, Evarard Rampersaud, Kenny Samaroo
November 25-26	IDB	Workshop on Sustainable Energy Program for Guyana GY-G1004	Leon DeSouza, Kenny Samaroo and Dolwin Khan
December 18, 2014	Dr. Sharma – CEO, GEA	Energy Efficient Procurement	Dolwin Khan, Leon DeSouza, Evarard Rampersaud, Shevon Wood, Taiwo Wilson-Williams and Kenny Samaroo

4.2 Administration and Infrastructural Enhancement

During the year, the Division facilitated the procurement of goods and services based on the budget and workplan.

The following main infrastructural works commenced:

- Extension to the Northern Section of the GEA's building at Quamina Street.
- Extension to the Southern Section of the GEA's building at Quamina Street.

Maintenance works to the Agency's boats, outboard engines and vehicles were done. Buildings and compound at outlying locations were also maintained. A new boat is being built and two new engines are in the procurement process.

The Agency also enhanced the aesthetics of the compound by adding potted plants. Hedges were also planted within the compound.

5.0 Review of Activities: Finance Division

The activities of GEA are financed from Government subventions and from revenue generation. Revenue was generated by the Agency from administrative fees (Agency Fees) for the marking and handling of fuel and from the issuance of licences to import, sell, store and transport petroleum and petroleum products. Due to the project-based self-financing nature of the Fuel Marking Programme, separate accounts are kept for its income and expenditure.

The GEA facilitated payments for fuel purchased under the PetroCaribe Agreement by the oil companies. The payments for fuel purchased from Venezuela were facilitated by the GEA and were captured in the accounts to ensure that payments are made according to contractual obligations.

A number of internal audit exercises were performed for the year 2014. Monthly reviews of key areas within the Agency, mainly in the Accounts Division have continuously improved in the areas of efficiency and effectiveness.

Appendix: Legislation, Mandate and Overview of the Divisions

Legislation

The GEA, a body corporate, was established in 1997 by the **Guyana Energy Agency Act 1997 (Act No. 31 of 1997)**. The GEA Act has been amended over the years to foster harmonization, increased monitoring, better regulation and greater enforcement in the energy sector.

The GEA falls under the purview of the Prime Minister as the Minister responsible for energy and electricity. GEA's organization structure consists of a Board of Directors, Chief Executive Officer, Deputy Chief Executive Officer, Secretariat and the following five Divisions:

- i) Energy & Energy Statistics Division,
- ii) Legal & Licensing Division,
- iii) Fuel Marking Division,
- iv) Administration/Human Resource Division, and
- v) Finance Division.

The GEA's organization structure was revised during 2010 to accommodate the following new positions: Energy Economist, Energy Engineer, Hydropower Support Engineer, Licensing Administrator, Internal Auditor, Public Communications Officer, Human Resource Officer, [additional] Legal Officer, Field Operations Coordinator, Senior Investigator and Investigator.

The mandate and activities of the Guyana Energy Agency (GEA) are governed by the following legislation:

- Guyana Energy Agency Act 1997,
- Energy Sector (Harmonisation of Laws) Act 2002,
- Guyana Energy Agency (Amendment) Act 2004,
- Guyana Energy Agency (Amendment) Act 2005,
- Guyana Energy Agency (Amendment) Act 2011,
- Petroleum and Petroleum Products Regulations 2014,
- Hydroelectric Power Act and Regulations 1956,
- Hydroelectric Power (Amendment) Act 1988,
- Electricity Sector Reform Act 1999,
- Public Utilities Commission Act 1999,
- Electricity Sector Reform (Amendment) Act 2010, and
- Public Utilities Commission (Amendment) Act 2010.

The GEA Act of 1997 established the Guyana Energy Agency (GEA) as a body corporate. On March 31, 2004 the **GEA (Amendment) Act 2004** was assented to and published in an Extraordinary Issue of the *Official Gazette* which made provisions for the implementation of the fuel marking system, creation of offences

and also for the grant and issue of the various classes of licences, viz- Import Licence; Wholesale Licence; Importing Wholesale Licence; Retail Licence; Bulk Transportation Carrier Licence; Storage Licence; and Consumer Installation Licence.

The core functions listed in section 5 of the principal Act are:

- to advise and make recommendations to the Minister regarding any measures necessary to secure the efficient management of energy and the source of energy in the public interest and to develop and encourage the development and utilisation of sources of energy other than sources presently in use;
- to develop a national energy policy and secure its implementation;
- to carry out research into all sources of energy including those sources presently used in Guyana for the generation of energy, and securing more efficient utilization of energy and sources of energy;
- to monitor the performance of the energy sector in Guyana, including the production, importation, distribution and utilization of petroleum and petroleum products;
- to disseminate information relating to energy management, including energy conservation and the development and utilization of alternative sources of energy;
- to grant and issue licences relating to petroleum and petroleum products, including import licences, wholesale licences, importing wholesale licences, retail licences, bulk transportation carrier licences, storage licences and consumer installation licences;
- to utilise a marking system to add markers to petroleum and petroleum products imported by every person under an import licence or import wholesale licence for the purpose of identifying such petroleum and petroleum products as having been legitimately imported;
- to take samples of petroleum and petroleum products from any person at random throughout Guyana and carry out tests and examinations to determine the presence or level of the markers in the samples of the petroleum and petroleum products;
- to perform the necessary tests to determine whether the marker(s) is (are) in the required proportion and any further test necessary to determine whether the petroleum and petroleum products have been lawfully obtained, stored, possessed, offered for sale, blended or mixed with any substance that is not approved;
- to prosecute in the Magistrates' Courts persons who are in possession of petroleum and petroleum products bearing no markers or at a concentration contrary to that required;
- to prosecute in the Magistrates' Courts persons who import petroleum and petroleum products without an import licence or wholesale import licence;

- to prosecute in the Magistrates' Courts persons who purchase, obtain, store, possess, offer for sale, sell, distribute, transport or otherwise deal with illegal petroleum.

Section 6 of the Act further outlines several advisory functions of the Agency:

- to study and keep under review matters relating to the exploration for, production, recovery, processing, transmission, transportation, distribution, sale, purchase, exchange and disposal of energy and sources of energy;
- to report thereon to the Minister and recommend to the Minister such measures as the Agency considers necessary or in the public interest for the control, supervision, conservation, use and marketing and development of energy and sources of energy;
- to prepare studies and reports at the request of the Minister on any matter relating to energy or any source of energy, including research into alternative sources of energy, or the application of such research, and to recommend to the Minister the making of such arrangements as the Agency considers desirable for cooperation with governmental or other agencies in or outside Guyana in respect of matters relating to energy and sources of energy;
- to advise the Minister or assigned authority on matters relating to the administration and discharge of the functions of the *Electricity Sector Reform Act 1999*.

The Fuel Marking Programme was charged with the responsibility of ensuring that all gasoline, diesel and kerosene are properly marked at a known concentration at all legitimate import points and also collecting and testing samples of fuel from various parts of the country including wholesalers, retailers, distributors, transporters, commercial consumers and any person in possession of fuel for the relevant marker(s).

Energy & Energy Statistics Division

The Division's duties and responsibilities are:

- to ensure that petroleum products are readily available in the country;
- to manage the purchase and importation of petroleum and petroleum products;
- to facilitate payment arrangements between the Oil Companies, the Bank of Guyana and other petroleum importers;
- to collaborate with sector agencies on energy and related matters;
- to develop Guyana's Energy Policy and revise as necessary;

- to study and review matters relating to the exploration for, production, recovery, processing, transmission, transportation, distribution, sale, purchase, exchange and disposal of energy and sources of energy within and outside Guyana;
- to prepare studies and reports at the request of the Minister on any matter relating to energy;
- to develop and execute projects relating to alternative sources of energy;
- to update the country's energy data with respect to acquisition prices, wholesale prices and retail prices;
- to prepare and analyse energy demand and supply data;
- to supply petroleum information and analysis of the relevant energy data as required;
- to supply the **CEIS** and **OLADE** databases with energy information.

Legal & Licensing Division

The Division's duties and responsibilities are:

- to inspect all sites, motor vehicles, machinery and equipment for which a licence may be required under the Regulations;
- to grant/issue the relevant licences pertaining to-
 - o importation of petroleum or petroleum products;
 - o bulk transportation of petroleum or petroleum products;
 - o storage of petroleum or petroleum products;
 - o wholesale of petroleum or petroleum products;
 - o retail of petroleum or petroleum products;
 - o storage and own-use of petroleum or petroleum products.
- to suspend, cancel, cease licences in accordance with the regulations made under the **Guyana Energy Agency Act 1997** as amended by the **Guyana Energy Agency (Amendment) Acts 2004, 2005 and 2011**;
- to ensure that files for prosecution are completed promptly and dispatched to the Office of the Director of Public Prosecutions for advice;
- to oversee and coordinate the assignment of cases for prosecution;
- to prosecute in the Magistrates' Courts persons who are in possession of petroleum and petroleum products bearing no markers or at a concentration contrary to that required;

- to prosecute in the Magistrates' Courts persons who import petroleum and petroleum products without an import licence or wholesale import licence;
- to prosecute in the Magistrates' Courts persons who purchase, obtain, store, possess, offer for sale, sell, distribute, transport or otherwise deal with petroleum without the relevant licence (s);
- to coordinate the representation of the Agency in civil litigation;
- to prepare Amendments to the Legislation as required and work in collaboration with the Drafting Department of the Ministry of Legal Affairs regarding same;
- to provide management with the necessary legal guidance in execution of the Agency's overall mandate and in relation to other stakeholder agencies, where necessary.

Fuel Marking Division

The Division's duties and responsibilities are:

- to utilise the respective marking system to add markers to petroleum and petroleum products imported by every person under an import licence or import wholesale licence for the purpose of identifying such petroleum and petroleum products as having been legitimately imported, whether domestic or duty-free;
- to add the relevant covert proprietary chemical markers to petroleum and petroleum products at the concentration determined by the Minister by notice in the Gazette;
- to maintain the integrity of the marking system;
- to test the accuracy and monitor the effectiveness of the marking system;
- to take samples of petroleum and petroleum products from any site at random throughout Guyana and carry out tests and examinations to determine the presence or level of the markers in the samples of the petroleum and petroleum products;
- to perform the necessary laboratory tests to determine whether the marker(s) is (are) in the required proportion;
- to determine the composition and grade of petroleum and petroleum products and determine whether same have been blended or mixed with any substance that is not approved;
- to give testimonial evidence in the prosecution of offences under the Act;
- to provide, through the Analyst's Certificate, expert/scientific evidence as proof of the legality of petroleum and petroleum products.

Administration and Human Resource Division

The Division's duties and responsibilities are:

- to maintain and update the Agency's personnel files and other records;
- to aid in the recruitment, selection, replacement and continuous professional development of staff;
- to address staff concerns related to wages and salary administration, contract negotiation and separation procedures;
- to improve staff morale through cogent policies and remuneration;
- to manage and maintain the Group Pension, Group Life, Medical and National Insurance Schemes while ensuring that claims, benefits and queries are processed expeditiously and to the satisfaction of the staff;
- to handle all grievance procedures with the objective of reaching mutually acceptable solutions;
- to ensure that office supplies, equipment, and vehicles are adequately provided and maintained;
- to ensure that the Agency's edifices, facilities and compound are kept clean and properly utilized and maintained;
- to monitor the security services for reliability and adequacy in the execution of their duties;
- to develop and enforce the Agency's Policy Manual and Disciplinary Code;
- to provide general support services to the officers of the Agency in the execution of their duties;
- to ensure adherence to health and safety regulations in the work environment;
- to manage the procurement, receipt and issue of stationery, stocks, office equipment and assets of the Agency and monitor use of same to prevent abuse of the Agency's resources.

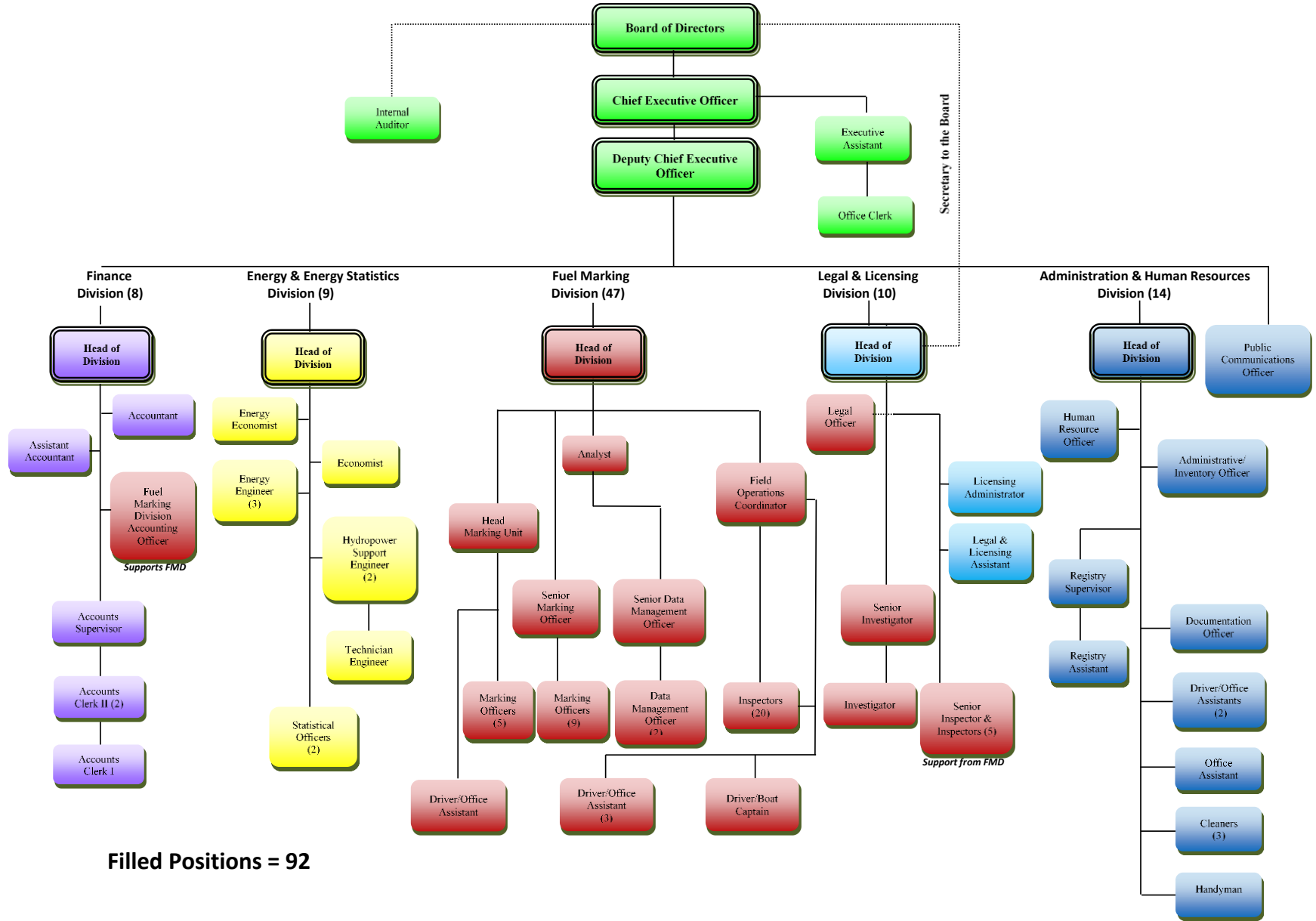
Finance Division

The Finance Division is tasked with the responsibilities of the day to day management of the Agency's financial resources. The Division's duties and responsibilities are:

- to advise management on the Agency's financial matters, and where necessary, other agencies;
- to manage and maintain the Agency's income and expense accounts and all other accounting records;
- to prepare the Agency's financial statements;
- to prepare the Agency's budget documents;
- to prepare monthly wages and salaries and other allowances;
- to process payments;

- to ensure that goods and services procured by the Agency are so procured in compliance with the **Procurement Act** and other relevant guidelines;
- to verify the accuracy of bills and receipts provided and investigate suspicious or fraudulent bills/receipts;
- to maintain and update the Agency's asset register.

ORGANISATIONAL STRUCTURE FOR THE GUYANA ENERGY AGENCY



Filled Positions = 92