

Utilization of Petroleum Products in Liberia – A Review

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Abstract

The present paper furnishes a comprehensive literature review on the utilization of petroleum products in Liberia. The paper captures the available petroleum products in Liberia. The Liberia Petroleum Refining Company (LPRC) is a State owned entity, completely owned by the Government of Liberia (GOL), with the authorization to produce and supply quality petroleum and petroleum related products to the Liberian market. Petroleum has been known throughout historical time. It was used in mortar, for coating walls and boat hulls, and as a fire weapon in defensive warfare. Native Americans used it in magic and medicine and in making paints. The essential petroleum products utilized by industries and home in Liberia are premium motor spirit (PMS), Automotive gas oil (AGO), and Jet A -1(kerosene).

Keywords: Liberia; Petroleum products; utilization; premium motor spirit (PMS); Automotive gas oil (AGO); jet A -1

1. Introduction

Liberia is located in the continent of Africa. The main location of Liberia is West Africa. Liberia covers 96,320 square kilometers of land and 15,049 square kilometers of water, making it the 104th largest nation in the world with a total area of 111,369 square kilometers. Liberia was founded as a distinct and original nation in 1847. The population of Liberia is 3,887,886 (2012) and the nation has a density of forty people per square kilometer. Liberia shares land borders with three countries: Cote d' Voire, Guinea, and Sierra Leone (Nyemah *et al.*, 2014).



Figure 1A: Map of Liberia showing the land borders with three countries

Petroleum products (oil and gas) are natural resources of substantial economic importance (S. W. Longworth, 2007). Petroleum provides about 60% of all the energy used by Liberian society today (Knight ,2013). Oil and gas provide fuel for transportation and are active for heating, lighting, and cooking(Knudsen *et al.*, 2004). Petroleum is used in the manufacture of synthetic fabrics, plastics, fertilizers, and detergent (Dougherty ,2007).

2. Premium Motor Spirit (PMS) is the primary transportation fuel used in Liberia

PMS (Gasoline) is one of the major petroleum products consumed in the Liberian transportation system and is the main product that Liberia Petroleum Refining Company (LPRC) produced. About 20.6% of gasoline is used as transportation ([Www.energyandsecurity.com/liberia.html](http://www.energyandsecurity.com/liberia.html), 2016). Gasoline is used in cars, sport utility vehicles, motorcycles, equipment and tools used in construction, farming, forestry, and landscaping, electricity generators for portable and emergency power supply ([Www.eia.gov/energyexplained/index.cfm](http://www.eia.gov/energyexplained/index.cfm), 2016).

3. Automotive Gas Oil (AGO)

Automotive gas oil (diesel) fuel is essential to the Liberia economy. Diesel fuel contains between 45% and 53% more energy per gallon than regular

PMS ([Www.energyandsecurity.com/liberia.html](http://www.energyandsecurity.com/liberia.html), 2016). AGO is a greater power density than other fuels in Liberia. For instance, AGO is utilized in diesel engine generators to produce electricity. Many industrial facilities in Liberia, large buildings, institutional facilities, and hospitals facilities used diesel fuel ([Http://www.dieselserviceandsupply.com/why_use_diesel.aspx](http://www.dieselserviceandsupply.com/why_use_diesel.aspx), 2015).

4. Jet A-1 (Kerosene)

Kerosene (Jet A – 1) is mainly utilized by airplanes and helicopters in Liberia. Some remote villages in Liberia used kerosene lamp as electric power ([Www.energyandsecurity.com/liberia.html](http://www.energyandsecurity.com/liberia.html), 2016).

5. Agriculture

One of the most essential uses of petroleum is in the production of ammonia to be used as the nitrogen source in agricultural fertilizers (Olsen, 2011). Agriculture also depends on the use of pesticides to ensure consistent, healthy crop yields (Gioia et al., 2013). In addition, running farm machinery to fertilizing plants, agriculture is one of the largest users of petroleum based products (Vasquez *et al.*, 2008).

6. Plastics

Plastic is an essential staple of modern life. Nylon is in everything from stockings to mechanical gears and even in car engines. All of these plastics are successful petroleum-based plastic which come from olefins which include ethylene and propylene (Lahiliah, 2007). **Petroleum** is also a significant part of the chemical makeup of more plastics and synthetics (Webb and Kuhn, 2007). Perhaps the most astonishing usage of petroleum for many people is its presence in foodstuffs such as beer and in medications such as aspirin ([Https://en.wikipedia.org/wiki/Petroleum](https://en.wikipedia.org/wiki/Petroleum), 2016).

7. Pharmaceuticals

Mineral oil and petrolatum are petroleum byproducts used in many creams and topical pharmaceuticals (Brundtland, 1997). Most pharmaceuticals are complex organic molecules, which have their basis in smaller, simpler organic molecules (Obaje *et al.* 2013). Most of these precursors are petroleum byproducts.

8. Dyes and Detergents

Petroleum distillates such as benzene, toluene, xylene, and others provide the raw material for products that include dyes, synthetic detergents, and fabrics (Arene, 1998). Benzene and toluene are the starting materials used to make polyurethanes, which are used in surfactants, oils, and even to varnish wood. Even sulfuric acid has its origins in the sulfur that is removed from petroleum (Gioia *et al.*, 2013).

9. Conclusion

The provision for petroleum products in Liberia will plausibly increase at a proportion of **one** or two percent a year. Abroad, the annual growth ratio will be perhaps three times as great as the rate in Liberia. It is implausible that oil provision will be increased appreciably in Liberia through project in utilization of petroleum products. Research on rehabilitated exploratory and productive techniques will plausibly have a greater influence on domestic oil demand than will research on petroleum utilization. Research on new utilization of petroleum products is likely to have a much stronger influence on Liberia utilization of petroleum products. Some project in petroleum products utilization is being conducted today on the supposition that crude oil is in limited supply and hence that refined product prices are likely to rise in the near future approximate to prices of competing petroleum products.

PMS is one of the major petroleum products consumed in the Liberian transportation system and is the main product that Liberia Petroleum Refining Company (LPRC) produced. AGO is a greater power density than other fuels in Liberia. AGO is utilized in diesel engine generators to produce electricity. Many industrial facilities in Liberia, large buildings, institutional facilities, and hospitals facilities used diesel fuel.

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