

## The Development of West African Gas Pipeline

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**Abstract:** The major focus of this study is on the recent development of gas pipelines along the coastal areas of the West African Sub-region which is composed of Nigeria, Ghana, Benin and Togo. The study also, examined the pipeline routes/networks, capacity, diameters and issues that are related to safety as well as the Environmental Impact Assessment (EIA) were also discussed.

**Key words:** Pipeline, development, gas, environment, transportation

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### INTRODUCTION

The popularity in the use of pipelines however is now gaining ground in many countries of the world with rapid increase in oil production, consumption and distribution (Lawal, 1989, 2001, 2005, 2006a, b). The increasing use of pipelines in recent years according to Manners (1962) represents one of the most notable revolutions in the history of transport and especially in the transport of energy.

Since, the research of Manners (1962), there has been revolution in oil and gas movement from the point of production to the refineries which is known as primary transportation. Movements of refined products from the refineries to the terminals or depots known as secondary transportation and movement involving direct delivery from refinery to consumers which forms a small but increasing proportion of all movements. This is known as tertiary transportation. Ward (1963), Odell (1965) Standen (1968) and Baker (1975).

It is not only oil that is being moved by pipeline as domestic waste, water, natural gas, milk and stabilized slurry are being moved by pipeline. Stabilized slurry is when the percentage composition of coal to water are in the proportion of 65% coal and 35% water. This technique has been found to allow the coal to remain in suspension, easy for transportation and storage pipelines are known to carry 30% more coal than the existing method of transmissions. The concerns in this study is the recent development of gas pipelines along the coastal areas of West African Sub-region which is composed of Nigeria, Ghana, Benin and Togo. The West African gas pipeline has a total length of 678 km which links into the existing Escravos-Lagos pipeline at the Nigeria Gas Company's Itoki, Natural Gas Export Terminal in Nigeria and proceeds to a beachhead in Lagos. From there, it moves offshore to Takoradi in Ghana with gas delivery laterals from the main

line extending to Cotonou (Benin), Lome (Togo) and Tema (Ghana). The Escravos-Lagos Pipeline system has a capacity of 800 MMscfd and the West African Pipeline Company WAPCO system will initially carry a volume of 170 MMscfd and a peak over time at a capacity of 460 MMscfd. The route network for the pipeline within the four West African countries is as shown in Fig. 1.

While the Trans-Saharan gas pipelines originates from Warri in Southern Nigeria, it passes through Niger Republic to Benisaf Algeria before finally gets to Europe. On the other hand, the West African gas pipelines originated from Escravos in Warri Southern Nigeria and laid along the coastal areas of West Africa. The main offshore pipeline runs East to West at an average water depth of 35 m though some sections such as the South East of Ghana, South of Lome and the Benin-Nigerian frontier ranges between 50-70 m. It ranges from the coast is as varied as the depth, South of Cape, St. Paul in Ghana, it is as close as 3.5 nautical miles (6.5 km) while at it widest section South of Winneba also in Ghana it is 17.5 nautical miles (32.5 km). The ranges of the Tees from the coast are approximately as shown:

- Cotonou = 7 nautical miles (13 km)
- Lome = 10.3 nautical miles (19 km)
- Tema = 7.8 nautical miles (14 km)

The pipeline has a diameter of 20 inches. The Cotonou and Lome laterals has 8 inches, respectively while the Tema laterals is 18 inches. The pipeline will terminate at Takoradi (Aboadzi). This forms part of the main pipeline. The West African gas pipeline will transport purified natural gas that is free of hydrocarbons, liquids and water which is ideally suited as fuel for power plants and industrial applications. About 85% of the gas is for power generation and the remaining 15% for industrial applications. The Volta river authority's

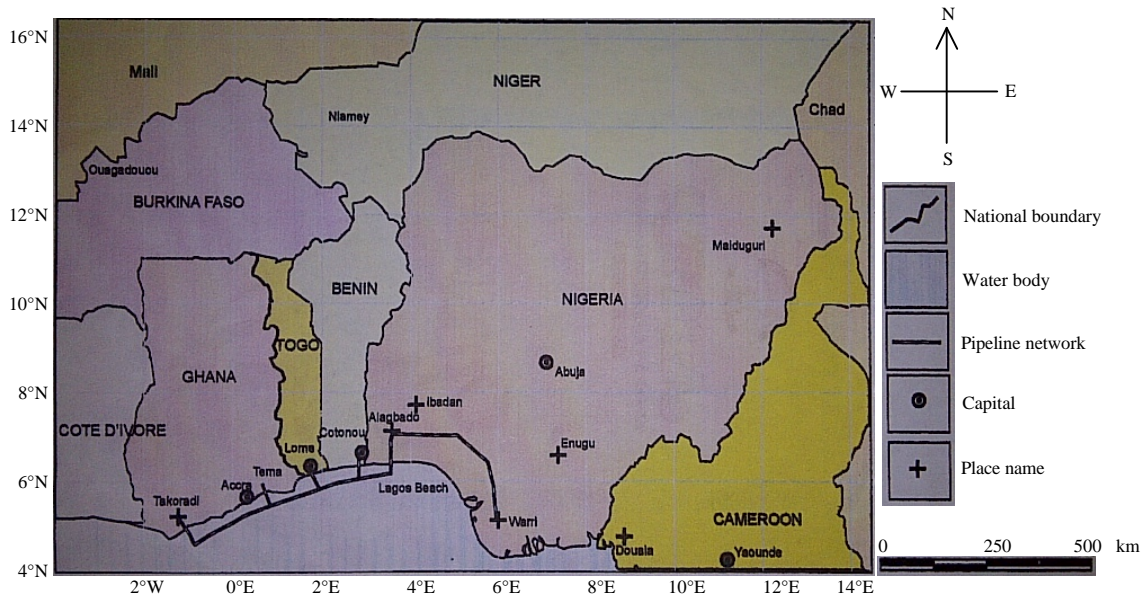


Fig. 1: Map showing the route network of pipelines within the west African countries

Takoradi Thermal Power Plant in Ghana, CEB of Benin and Togo are all West African Pipeline Company’s foundation customers.

Both the West African gas pipeline and the West African pipeline company have been able to put in place and in proper perspectives the issues on safety and the Environmental Impact Assessment (EIA) as it was done in April 2007 when the two organizations/companies have been conducting safety awareness publicity across the region to sensitize the maritime communities on the safety and security precautions for safety transmission. Similarly, the West African Gas Pipeline Authority has been able to regulate and as part of the risk mitigation measures a one nautical mile exclusion zone on either side of the pipeline. This is known and called pipeline Protection Zone (PPZ). This has been adopted across the four countries to minimize the chances of causing damages to the pipeline. The zone and pipeline are published and contained in the new editions of admiralty charts, especially 1383 and 1384 which all mariners are encouraged to consult when operating within the West Coast of Africa. Apart from the Safety and the Environmental Impact Assessment programme, the WAGP and WAPCO was able to put forward to prevent damages, WAPCO is able to partner with some communities through the community relations policy within its areas of operation is aimed at establishing proactive partnerships that will foster healthy, long term relationship with host communities. The underlisted are the highlights of WAPCO’s specific objectives for this partnership:

- To cultivate and sustain, trusting and harmonious relationships as well as mutually beneficial social partnership with local communities
- To foster good neighbourliness and ensure community goodwill and support for successful project implementation and operations
- To maintain open, honest and constructive dialogue with all stakeholder groups and facilitate actions to manage their legitimate concerns and issues
- To implement a sustainable community development programme that will have positive impact on the living standard of people in the project communities

In addition to the specific objectives, the WAPCO in partnership with host communities , through a participatory needs assessment study, also identified high impact programmes that would address the basic needs and economic development in these communities.

The West African Gas Pipeline Company (WAPCO) is a limited liability company which owns and operates the West African Gas Pipeline (WAGP) with its headquarters in Accra and an office in Badagry, Nigeria and field offices in Cotonou-Benin, Lome-Togo, Tema and Takoradi, both in Ghana. WAPCO is a joint venture between public and private sectors companies from Nigeria, Benin, Togo and Ghana. The company’s main concern is to transport natural gas from Nigeria to customers in Benin, Togo and Ghana in a safe, responsible and reliable manner at a competitive prices with other fuel alternatives.

### **CONCLUSION**

In terms of ownership, WAPCO is owned by Chevron West African Gas Pipeline Limited with 36.7% share. The Nigerian National Petroleum Company has 25% share. The Shell Overseas Holdings Limited has 18% and Takoradi Power Company Limited has 15.3% while both the Societe Togolaise de Gaz has 2% and Societe BenGaz of South Africa S.A. 2%, respectively. It should be noted and known that the West African Gas Pipeline Authority based in Abuja is the regulatory body for WAPCO.

### **REFERENCES**

- Baker, J.H., 1975. Transport by Road and Rail. In: Modern Petroleum Technology, Hobson, G.D. and W. Pohl (Eds.). 4th Edn., Applied Science Publishers Limited, USA.
- Lawal, M.O., 2001. Nigerian Pipeline Network and Environment: Challenges of the 21st Century. Tunwobi Services, Lagos, Nigeria.
- Lawal, M.O., 1989. Pipeline development in the Nigerian petroleum industry. *Geography*, 74: 60-62.
- Lawal, M.O., 2005. Oil Refineries and Oil Pipelines in Nigeria: Some Recent Development and Projects. In: African Perspectives on Globalization and Sustainable Development, Fadeyi, A.O. and R.O.C. Somoye (Eds.). Roscom Publishers, Lagos, Nigeria, pp: 30-38.
- Lawal, M.O., 2006a. Historical development of the pipeline as a mode of transportation. *Geograph. Bull.*, 43: 91-99.
- Lawal, M.O., 2006b. The trends and impacts of pipeline network distribution in Nigerian petroleum industry. *Indonesian J. Geogr.*, 38: 169-183.
- Manners, G., 1962. The pipeline revolution. *Geography*, 47: 154-163.
- Odell, P.R., 1965. An Economic Geography of Oil. G. Bell and Sons Limited, London.
- Standen, A., 1968. Petroleum Products Distribution. *Encyclopaedia Chem. Technol.*, 15: 88-92.
- Ward, M.W., 1963. The Distribution of Motor Spirit in New Zealand. *New Zeal. Geograph.*, 19: 126-141.