Trans-Saharan Gas Pipeline Project and Energy Security: Prospects and Challenges

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Abstract- ***This paper examines the proposed 4,128 kilometers Trans-Saharan Pipeline gas project gas pipeline. The project is one of Africa's most ambitious cross-border infrastructural projects linking Nigeria's vast and natural gas reserve to European market via Niger and Algeria. The project is viewed to be of significance towards enhancing Nigeria's foreign exchange earnings, expand domestic energy infrastructure, create jobs and reduce gas flaring, stimulates industrialization, strengthen regional integration and bolster Nigeria's geopolitical influences. However, the project is fractioned by significant socio-economic, political and security challenges along the pipeline route. These may include but not limited to armed insurgencies, banditry and terrorism by Boko Haram and ISWAP. Others include foreign investors caution, corruption risks and environmental concerns. Drawing from Energy security theory and qualitative research design backed by secondary data, this study attempts to evaluate the policy proposals, the benefits and the challenges associated with the project. The study concluded that although Trans-Saharan Gas Pipeline holds the potential to transform the Nigerian energy sector and regional energy dynamics, unless the critical challenges are overcome, the project will forever be a dream. The paper recommends the need to strengthening regional partnerships, enhanced security measures and incentives for private sector participation.***

Index Terms- ***Trans-Saharan Gas Pipeline, security, energy security, natural gas***

I. INTRODUCTION

Energy is central to the socio economic and political development of any state in the global system. It is not an exaggeration to say that no nation can flourish economically or develop sustainably when its energy sector is weak and incapable of directing economic growth (Sovacool, 2016). Energy lies at the heart of modern development. It serves as both a driver and an enabler of productive activity, technological advancement, industrial expansion, urbanization, innovation, and social transformation (Smil, 2017). Indeed, energy is the invisible infrastructural power that determines a nation state's capacity to produce, compete, and prosper.

For these reasons, energy is seen not merely as a commodity but as a strategic tool shaping economic development, technological progress, and international politics. It influences the global balance of power, economic leverage, and diplomatic relations through supply control, pricing strategies, infrastructure, and investment patterns (Colgan, 2013).

For example, the 1973 oil embargo by the Organization of Arab Petroleum Exporting Countries (OAPEC) against states supporting Israel triggered a global oil shortage, inflation, and recession in industrialized Western countries (Yergin, 1991). Similarly, Russia has strategically leveraged natural gas exports to Europe, particularly during its conflict with Ukraine, compelling European states to diversify their supply sources by turning to Algeria and Nigeria (Henderson, 2022). Therefore, energy infrastructure is instrumental to geopolitical strategy.
It is in pursuit of such energy power and global influence that Nigeria and Algeria embarked on the ambitious Trans Saharan Gas Pipeline (TSGP) project. This initiative is significant not only for supplying energy to Europe but also for generating substantial revenue, creating employment, attracting foreign investment, and enhancing domestic and regional capacities (Nwoke, 2018; Umar & Adamu, 2021). Most importantly, it promises to bolster

Nigeria's energy security through reliable gas supply to its economic infrastructure.

Against this background, this paper examines the nature of the TSGP project, its significance for Nigeria and Algeria, and the short and long term challenges affecting its realization.

1.2 Statement of the Problem

Nigeria is richly endowed with diverse energy resources such as crude oil, natural gas, coal, and renewable energy. It holds Africa's largest proven natural gas reserves, estimated at about 200 trillion cubic feet, and is one of the continent's leading oil producers (Nigerian National Petroleum Corporation [NNPC], 2021). Despite this, the country faces chronic energy insecurity: shortages, high costs, erratic electricity supply, and industrial decline that stifle productivity and development (Ebohon & Ikeme, 2016).

A fundamental contradiction arises from the Nigerian government's effort to channel much of its clean energy resources, which are essential for domestic development, to external markets despite pressing local needs. Just as in the oil industry, this paradox perpetuates dependence and underdevelopment (Okonjo-Iweala, 2019). It is in this context that this study seeks to examine the nature, benefits, and challenges of the Trans-Saharan Gas Pipeline project.

1.3 Research Questions

1. What is the nature of the proposed Trans-Saharan Gas Pipeline Project
2. What are the prospect Trans-Saharan Gas Pipeline Project
3. What are the possible challenges associated with the Trans-Saharan Gas Pipeline Project

1.4 Objective of the Study

1. To examine the nature of the proposed Trans-Saharan Gas Pipeline Project
2. To identify the prospect Trans-Saharan Gas Pipeline Project
3. To discuss the possible challenges associated with the Trans-Saharan Gas Pipeline Project

1.5 Significance of the Study

This study is significant to scholarly discourses, policy making and implementation. In the areas of scholarly contribution to scholarly discourse, the study provides an in-depth analysis of the nexus between large-scale transnational energy projects and energy security, thereby enriching existing literature on African energy geopolitics. By exploring its strategic, economic, and security dimensions, this study fills a critical research gap and offers a nuanced understanding of how African energy infrastructure intersects with global supply chains and geopolitical interests. In areas of policy making, the findings of this study have direct relevance for policymakers in Nigeria, Niger, and Algeria, as well as in regional bodies such as the African Union and the Economic Community of West African States (ECOWAS). Insights into the opportunities and challenges associated with the TSGP can inform policy formulation on infrastructure investment, cross-border cooperation, and energy sector reforms. Finally, the study sheds light on how large-scale energy infrastructure can stimulate industrial growth, job creation, and fiscal revenue for participating states. It also examines how these benefits can be balanced with social and environmental considerations, offering practical recommendations for inclusive and sustainable development.

1.7 Methodology

The study is basically a qualitative study based on secondary data collected from different online sources (like journals, media articles, official documents, etc.) on Trans-Saharan Gas Pipeline Project. To analyse the data collected, the study employ the qualitative content analysis by identifying the recurring patterns, perspectives and arguments. It further employ comparative analysis to assess different points of view while and critical interpretive approach to evaluate the socio-economic, political and security implications of the TSGP. The use of qualitative secondary data is suitable because it allows for in-depth analysis of the project's geographical, economic and security dimensions without exposing the researcher to logistical and security challenges associated with the field.

II. LITERATURE REVIEW

Cambridge Research (2025) views the Trans-Saharan Gas Pipeline (TSGP) as a geopolitical instrument for deepening interdependence between Nigeria, Niger, Algeria, and European importers. The study emphasizes the political dimensions of security such as diplomatic ties, institutional arrangements, and compensation agreements rather than strictly technical or economic feasibility. This perspective is valuable for energy security studies that situate infrastructure within the broader context of foreign policy. However, while the paper acknowledges security risks such as insurgency and sabotage, it addresses them at a high level and does not analyze route-specific security statistics or model risk-adjusted costs. Its empirical grounding relies heavily on secondary sources and policy documents with limited field data (Cambridge Research, 2025).

The Payne Institute (2022) situates the TSGP among competing energy corridor proposals and argues that unless project planning incorporates trans-Saharan security, governance, and shifting market dynamics, the project risks failure or becoming a stranded investment. This study is particularly relevant to understanding the geopolitical, governance, and security risks associated with transnational energy assets, although it has been criticized for lacking empirical depth (Payne Institute, 2022).

The French Institute of International Relations (IFRI, 2010) in its report The Trans-Saharan Gas Pipeline: An Illusion or a Real Prospect? concluded that while the project has clear economic logic by linking Nigerian reserves to European Union markets via Algeria, it also faces practical obstacles including weak internal gas markets in transit states, financing challenges, and security concerns in the Sahel. IFRI argued that the TSGP has always been as much about strategic diversification for Europe as about supplying West African domestic demand. The report is particularly useful for situating contemporary debates in a multi-decade historical context (IFRI, 2010).

2.1 Theoretical Framework

This paper adopts the energy security theory as the main theoretical framework guiding the study. The theory is a multidisciplinary approach that analyses the intersection and interaction between energy resources, national security, and economic stability of a given nation or region (Yergin, 2006). It explains how access to reliable, affordable, and sustainable energy sources is critical to national stability, economic growth, and overall human development (Sovacool, 2011). At its core, the theory emphasizes that states and societies require secure energy supplies to function effectively, and disruption in energy availability can threaten national security, political stability, and social welfare of a state or region (Cherp & Jewell, 2014).

The Core Assumptions of the theory include:

1. Energy is strategic to economic growth, increasing military might and political stability (Yergin, 2006; Goldthau & Witte, 2010).
2. Energy dependence on external sources, unstable suppliers and insecure transit routes expose states to strategic risks (Cherp & Jewell, 2014).
3. Energy security is multidimensional involving infrastructural protection and environmental sustainability (Winzer, 2012; Sovacool & Mukherjee, 2011).
4. Mutual interdependence between states can encourage cooperation but may also provide leverage for coercion (Keohane & Nye, 2011).

Coercion refers to the use of power and influence to shape the behaviour of states and actors in the international system (Keohane & Nye, 2011). The theory identifies five dimensions: availability, accessibility, affordability, acceptability, and awareness. Availability of energy resources is necessary for the survival of present and future demands of households, industries, and state survival (Cherp & Jewell, 2014). It therefore emphasizes resource adequacy and reliability over both short-term and long-term horizons. However, availability without accessibility is an exercise in futility, as there must be guaranteed physical access to energy sources, infrastructure, and markets without undue geopolitical or technical barriers (Sovacool & Mukherjee, 2011).

Energy must also be affordable in order to maintain stable and reasonable prices that support households and industries (Vivoda, 2010). Accessibility is often undermined in the face of political instability, trade restrictions, inadequate infrastructure, or territorial disputes (Winzer, 2012). Furthermore, energy must be acceptable, meaning it must have social, environmental, and political legitimacy in production and consumption practices (Sovacool & Brown, 2010). This includes integrating concerns about climate change, pollution, and public safety. Energy that is detrimental to human health and survival should be opposed even if it is abundant and cheap. Hence, there is the need to engage both the public and industries on sustainable energy practices (Ang et al., 2015).

Finally, awareness is critical, as the overall objective of energy security requires adequate knowledge, preparedness, and adaptive capacity of governments, industries, and the public to manage energy challenges. This involves strategic planning, risk assessment, early warning systems, and public education about energy conservation and diversification (Cherp & Jewell, 2011). Achieving these goals requires synergy among policymakers, implementers, and the public. This theory therefore provides a framework to discuss issues of availability, accessibility, affordability, acceptability, and awareness as they relate to the TSGP.

III. FINDING AND DISCUSSION

3.1 The Nature of the Trans-Saharan Gas Pipeline Project

The idea of the Trans-Saharan Gas Pipeline (TSGP) emerged in the 1970s between Nigeria and Algeria, both major oil and gas producers in Africa and members of OPEC, eager to monetize their natural gas resources. Algeria, with the third largest gas reserve in Africa (about 160 trillion cubic feet), was already exporting gas to Europe via the Trans-Med pipeline. The interest of Algeria was to generate fee revenue by transporting Nigerian gas across its territory, re-export gas at a profit by blending it with domestic supply, and position itself as a strategic energy security hub for Africa and Europe. Nigeria, on the other hand, holds Africa's largest gas reserve (over 200 trillion cubic feet), depends heavily on LNG exports which are costlier and require specialized terminals. Thus the project stands to save billions and boost revenue by exporting through TSGP (Wikipedia, n.d.).

Although the concept was proposed in the 1970s, no concrete steps were taken until 2002, when NNPC and Sonatrach signed a Memorandum of Understanding to study feasibility and define a pipeline route. Between 2005 and 2006 they concluded that the project was technically and economically viable, subject to confirmation of reserves, cost, and security considerations. In 2009, Niger joined as a transit partner and co-sponsor. The intergovernmental agreement specified a route from Nigeria (Warri/Ajaokuta) through Niger to Algeria's Hassi R'Mel gas hub, with an estimated length of approximately 4 128 km and capacity of 30 billion cubic metres per year at an estimated cost of USD 10 billion to USD 13 billion (Wikipedia, n.d.).

In July 2022, energy ministers from Nigeria, Algeria and Niger signed an updated MoU reaffirming their commitment to the TSGP in line with newly defined roadmap specifications. European urgency for alternative gas sources following the Russian invasion of Ukraine further spurred the revival of interest in the pipeline (Wikipedia, n.d.; Reddit summary, 2022).

Despite these developments, no substantive domestic project activity followed until the AKK pipeline was included in Nigeria's national planning. The Ajaokuta–Kaduna–Kano (AKK) pipeline is a 614 km northbound project intended to supply power plants and urban areas in central and northern Nigeria. Construction began in July 2020 and is divided into three phases. Phase one (Ajaokuta to Abuja, ~200 km) is budgeted at USD 855 million. Phase two (Abuja to Kaduna, ~193 km) is at USD 835 million. Phase three (Kaduna to Kano, ~221 km) is estimated at USD 1.2 billion (Wikipedia, n.d.).

NNPCL has largely financed the project internally without third-party funding. As of April 2023, over USD 1.1 billion had been released, with total project cost now estimated at USD 2.5 billion after renegotiation from an initial USD 2.8 billion

approved in 2018 (Vanguard, 2023; BusinessDay, 2023; The Nation, 2023)[3][4][6]. By Q1 2025, the project was approximately 72 per cent complete (Arise News, 2025)[5]. A significant technical milestone is the crossing of the River Niger which was achieved in July 2025 (Channels TV, 2025)[6].

The AKK pipeline is expected to supply up to 2 billion standard cubic feet per day to power plants in Abuja (1 350 MW), Kaduna (900 MW), and Kano (1 350 MW), and foster industrial development along the route (The Nation, 2023; Wikipedia, n.d.; NS Energy, n.d.).

3.2 Significance of TSGP

The Trans-Saharan Gas Pipeline (TSGP) is significant to the socio-economic and political security of the participating states. First, it provides opportunities for revenue generation and economic diversification in African states while ensuring a reliable source of natural gas for industrial development in Europe. For Nigeria, which derives about 80% of its national revenue from crude oil exports, the pipeline represents an important alternative source of income. With an estimated annual export capacity of 30 billion cubic meters of gas, the project could generate billions of dollars while reducing vulnerability to fluctuations in global oil markets. Similarly, Algeria and Niger are expected to benefit from substantial transit fees.

Furthermore, the construction and operation of the pipeline will create and sustain both direct and indirect jobs for citizens in Africa and Europe. These include opportunities in engineering, welding, safety inspection, and other technical fields. Local businesses are also likely to benefit through the supply of materials and services. More broadly, the project is expected to attract Foreign Direct Investment (FDI) from energy companies, engineering firms, and financial institutions. Infrastructure such as compressor plants, gas processing facilities, and storage depots are likely to spread across the region, providing additional employment opportunities and reducing supply costs in both African and European markets (Henderson, 2022). The development of settlements, local trade, and economic activities along the pipeline route is another expected outcome.

Beyond economic gains, the TSGP also offers important security benefits at national, regional, and global levels. It encourages security cooperation between Sahel states and European partners. This includes intelligence sharing and the development of regional security frameworks to safeguard the infrastructure. Such cooperation is particularly crucial given the prevalence of terrorism and smuggling in the Sahel (International Crisis Group, 2021). A useful comparison can be drawn from the Chad–Cameroon Pipeline Project, where the two states collaborated to secure the infrastructure against vandalism and insurgent attacks (World Bank, 2009). Economic interdependence through projects of this nature reduces incentives for conflict and fosters cooperation. Ultimately, this may lead to the creation of multilateral mechanisms that ensure route security, information sharing, and coordinated response systems.

In terms of infrastructure, the TSGP is expected to strengthen gas networks in Nigeria and across the region. The establishment of the pipeline will inevitably lead to the development of high-pressure transmission lines, compressor stations, metering stations, and storage facilities. Once in place, these facilities can stimulate the expansion of power plants, industrial plants, and city gas networks, thereby improving electricity reliability and industrial productivity (NNPC, 2021). The pipeline will also necessitate the development of access roads, fuelling stations, bridges, airstrips for maintenance, logistics yards, and fibre optic networks, all of which will further boost regional infrastructure and connectivity.

3.3 Challenges of Trans-Saharan Gas Pipeline

The Trans-Saharan Gas Pipeline (TSGP) promises economic growth, regional integration, and stronger cooperation between Africa and Europe. However, the project faces significant challenges that could undermine its viability if not properly addressed.

One of the greatest threats to the TSGP is insecurity along its planned route. In the Niger Delta, where Nigeria's major gas fields are located, militant groups

such as the Niger Delta Avengers have a long record of sabotaging oil pipelines and disrupting production (Asuni, 2009). In northern Nigeria, Boko Haram and rural bandit groups are known for mass killings, kidnappings, cattle rustling, and even assaults on military installations (Adebajo, 2021). Across the Sahara, terrorist groups such as the Islamic State in the Greater Sahara (ISGS) in Niger and al-Qaeda in the Islamic Maghreb (AQIM) in Algeria present additional risks. The 2013 attack on the In Amenas gas plant in Algeria, which resulted in dozens of deaths, heightened fears that similar groups could target the TSGP to disrupt supply or use it as leverage for political and financial gains (Lacher, 2013).

Political instability further complicates the project. Niger's recent withdrawal from the Economic Community of West African States (ECOWAS) and its strained relations with Nigeria and neighbouring countries may undermine cooperation on revenue-sharing, security coordination, and contractual agreements (International Crisis Group, 2023).

The enormous cost of securing and maintaining more than 4,000 kilometres of pipeline represents another obstacle. Effective protection would require patrol units, drones, rapid response teams, and satellite monitoring systems. Algeria already deploys thousands of soldiers to protect its Trans-Mediterranean pipeline infrastructure (Keenan, 2009). Without comparable safeguards in Nigeria and Niger, the TSGP could suffer repeated disruptions.

Technical and environmental risks are also considerable. The harsh Saharan climate, with daytime temperatures exceeding 50°C and night-time temperatures near 0°C, can cause irregular expansion and contraction of pipes, which may result in material fatigue, micro cracks, and gas leaks (International Energy Agency [IEA], 2019). Pipeline sabotage and theft by vandals remain additional threats. Furthermore, construction activities such as land clearing, the building of access roads, and the installation of compressor stations could harm fragile ecosystems and displace wildlife. In the Niger Delta, oil spills have destroyed habitats, polluted drinking water, and endangered human health (United Nations Environment Programme [UNEP], 2011). Similar challenges could occur along the TSGP route, including erosion, desertification, and forced migration of communities due to socio-economic pressures.

Market dynamics present yet another challenge. The global gas market is highly volatile and influenced by seasonal demand, geopolitical tensions, and competition from alternative suppliers. Price fluctuations could undermine the project's profitability and complicate debt servicing. For example, Spain, once heavily dependent on Algerian gas, now imports much of its supply from Qatar and the United States through liquefied natural gas (LNG) (Tagliapietra, 2017). As Europe diversifies its energy sources and invests in renewable energy, there is no certainty that Nigerian gas will secure a reliable long-term market. Moreover, geopolitical realignments could reopen European gas markets to Russia or impose sanctions that restrict Nigerian exports.

CONCLUSION

The Trans-Saharan Gas Pipeline (TSGP) project represents a strategic intersection between Africa's abundant natural gas resources and Europe's urgent quest for diversified, secure, and sustainable energy supplies. Conceptually, it embodies both an energy export corridor for Nigeria, Niger, and Algeria, and a geopolitical linkage between sub-Saharan Africa, North Africa, and Europe. In theory, the project has the potential to enhance energy security for both producing and consuming states: for African producers, by creating reliable market access and stimulating economic growth through gas revenues and infrastructure development; for European consumers, by reducing overdependence on Russian gas and expanding access to alternative supply routes.

However, the pathway to realizing these benefits is fraught with structural, political, and security challenges. Persistent instability in parts of the Sahel and North Africa marked by terrorism, armed insurgencies, and weak border governance. These poses significant risks to the physical integrity of the pipeline. Equally, political mistrust among participating states, fluctuating global energy prices, and the rising competitiveness of liquefied natural

gas (LNG) markets complicate the project's viability. Moreover, the global shift toward renewable energy, while not immediately displacing natural gas, introduces long-term uncertainty regarding demand.
From an energy security perspective, the TSGP could contribute to the diversification of energy sources, routes, and suppliers especially if complemented by robust political agreements, security guarantees, and transparent commercial frameworks. Yet, without coordinated regional governance, sustained investment, and credible conflict mitigation measures, the project risks becoming another unrealized mega-infrastructure ambition.

In essence, the TSGP's success depends not merely on engineering capability, but on the political will of its stakeholders, the stability of its transit zones, and its adaptability to evolving global energy dynamics. If these conditions are met, the pipeline could serve as a transformative energy corridor, advancing regional integration, economic development, and shared security. If \they are not, it may remain emblematic of Africa's untapped potential in global energy geopolitics.

REFERENCES

[1] Adebajo, A. (2021). Nigeria's insecurity crisis: Causes and consequences. Centre for Democracy and Development.

[2] Akinyemi, T., & Oke, M. (2022). Infrastructure development and energy security in West Africa: Opportunities and challenges. African Journal of Development Studies, 17(2), 45–63.

[3] Ang, B. W., Choong, W. L., & Ng, T. S. (2015). Energy security: Definitions, dimensions and indexes. Renewable and Sustainable Energy Reviews, 42, 1077–1093. https://doi.org/10.1016/j.rser.2014.10.064

[4] Arise News. (2025, March 15). NNPC announces 72% completion of $2.8bn Ajaokuta–Kaduna–Kano Gas Pipeline Project. Arise News. https://www.arise.tv

[5] Asuni, J. B. (2009). Blood oil in the Niger Delta. United States Institute of Peace.

[6] BusinessDay. (2023, April 25). $2.5bn AKK gas pipeline project on course to deliver by Q3 '23 – NNPCL. BusinessDay NG. https://businessday.ng

[7] Cambridge Research Institute. (2025). The Trans-Saharan Gas Pipeline and geopolitical interdependence. Cambridge Research Institute.

[8] Channels Television. (2025, July 1). NNPCL announces successful River Niger crossing on AKK gas pipeline. Channels TV. https://www.channelstv.com

[9] Cherp, A., & Jewell, J. (2014). The concept of energy security: Beyond the four As. Energy Policy, 75, 415–421. https://doi.org/10.1016/j.enpol.2014.09.005

[10] Colgan, J. D. (2013). Fueling the fire: Pathways from oil to war. International Security, 38(2), 147–180. https://doi.org/10.1162/ISEC_a_00135

[11] Ebohon, O. J., & Ikeme, J. (2005). Dealing with energy issues in Africa: Energy transition and sustainable development. Energy Policy, 34(18), 1–9. https://doi.org/10.1016/j.enpol.2005.01.010

[12] Energy Capital & Power. (2022, July 28). Nigeria, Algeria, Niger sign agreements to advance Trans-Saharan Gas Pipeline project. https://energycapitalpower.com/nigeria-algeria-niger-sign-agreements-to-advance-trans-saharan-gas-pipeline-project

[13] French Institute of International Relations (IFRI). (2010). The Trans-Saharan Gas Pipeline: An illusion or a real prospect? IFRI.

[14] Goldthau, A., & Witte, J. M. (2010). Global energy governance: The new rules of the game. Brookings Institution Press.

[15] Henderson, J. (2022). Russian gas to Europe: The impact of war and sanctions. Oxford Institute for Energy Studies. https://doi.org/10.26889/9781784671960

[16] Henderson, J. (2022). Russia's gas pivot and Europe's energy security. Oxford Institute for Energy Studies. https://www.oxfordenergy.org

[17] Henderson, J. (2022). The future of African gas: Prospects for trans-Saharan energy trade. Oxford Institute for Energy Studies.

[18] International Crisis Group. (2021). Violence and insecurity in the Sahel: Regional responses and

prospects. International Crisis Group. https://www.crisisgroup.org

[19] International Crisis Group. (2023). Niger: Transition at risk. International Crisis Group. https://www.crisisgroup.orga

[20] International Energy Agency (IEA). (2019). The future of hydrogen and natural gas. OECD/IEA.

[21] Keenan, J. (2009). The In Amenas gas facility attack: Security lessons for Algeria's energy sector. The Journal of North African Studies, 14(3), 423–440. https://doi.org/10.1080/13629380902948175

[22] Keohane, R. O., & Nye, J. S. (2011). Power and interdependence (4th ed.). Longman.

[23] Lacher, W. (2013). Challenging the myth of AQIM in the Sahara-Sahel. Stiftung Wissenschaft und Politik.

[24] Nigerian National Petroleum Corporation (NNPC). (2021). Annual report and financial statements. NNPC.

[25] Nigerian National Petroleum Corporation (NNPC). (2021). Annual statistical bulletin. NNPC.

[26] Nigerian National Petroleum Company Limited (NNPCL). (2022). AKK Gas Pipeline Project. https://www.nnpcgroup.com/

[27] NS Energy. (n.d.). Ajaokuta–Kaduna–Kano (AKK) gas pipeline. NS Energy Business. https://www.nsenergybusiness.com

[28] Nwoke, C. N. (2018). Nigeria and the political economy of the Trans Saharan Gas Pipeline. Nigerian Journal of International Studies, 44(1), 1–23.

[29] Nwoke, C. N. (2018). Nigeria, Algeria and the Trans-Saharan Gas Pipeline project: Issues and prospects. Journal of Energy Studies, 25(2), 45–62.

[30] Okonjo-Iweala, N. (2019). Fighting corruption is dangerous: The story behind the headlines. MIT Press.

[31] Oxford Business Group. (2022). Nigeria and Algeria's renewed push for the Trans-Saharan Gas Pipeline. Oxford Business Group. https://oxfordbusinessgroup.com/

[32] Payne Institute for Public Policy. (2022). The Trans-Saharan Gas Pipeline in context: Security, governance, and market challenges. Colorado School of Mines.

[33] S&P Global Commodity Insights. (2022, June 21). Algeria, Niger, Nigeria pledge acceleration of work on Trans-Saharan gas link. https://www.spglobal.com/commodity-insights

[34] Salisu, B. (2021). Nigeria's gas export strategy and the Trans-Saharan Gas Pipeline. Journal of African Energy Studies, 7(1), 44–59.

[35] Smil, V. (2017). Energy and civilization: A history. MIT Press.

[36] Sovacool, B. K. (2016). How long will it take? Conceptualizing the temporal dynamics of energy transitions. Energy Research & Social Science, 13, 202–215. https://doi.org/10.1016/j.erss.2015.12.020

[37] Sovacool, B. K., & Mukherjee, I. (2011). Conceptualizing and measuring energy security: A synthesized approach. Energy, 36(8), 5343–5355. https://doi.org/10.1016/j.energy.2011.06.043

[38] Tagliapietra, S. (2017). Energy relations in the Euro-Mediterranean: A political economy perspective. Palgrave Macmillan.

[39] The Nation. (2023, April 25). NNPCL expenditure on AKK pipeline hits $1.1bn. The Nation Nigeria. https://thenationonlineng.net

[40] Umar, A., & Adamu, S. (2021). The Trans Saharan Gas Pipeline and the geopolitics of energy in Africa. Journal of Energy Studies and Policy, 5(2), 33–48.

[41] United Nations Environment Programme (UNEP). (2011). Environmental assessment of Ogoniland. UNEP.

[42] Vanguard News. (2023, April 25). NNPCL pays $1.1bn to AKK contractors, targets Q3 completion date. Vanguard News. https://www.vanguardngr.com

[43] Wikipedia contributors. (n.d.). Ajaokuta–Kaduna–Kano Natural Gas Pipeline. In Wikipedia. Retrieved August 29, 2025, from https://en.wikipedia.org/wiki/Ajaokuta–Kaduna–Kano_Natural_Gas_Pipeline

[44] Wikipedia contributors. (n.d.). Trans-Saharan gas pipeline. In Wikipedia. Retrieved August 29, 2025, from

https://en.wikipedia.org/wiki/Trans-Saharan_gas_pipeline

[45] Winzer, C. (2012). Conceptualizing energy security. Energy Policy, 46, 36–48. https://doi.org/10.1016/j.enpol.2012.02.067

[46] World Bank. (2009). Chad–Cameroon pipeline project: Lessons in project security and governance. World Bank.

[47] Yergin, D. (1991). The prize: The epic quest for oil, money, and power. Free Press.

[48] Yun, Y. (2023). Energy security cooperation in Africa-Europe relations: The case of transnational pipelines. Journal of Energy Policy Studies, 15(1), 77–95.