February 10, 2005 / in Exploration, drilling and production / by Tanzania Petroleum

Natural Gas: The foundation Stone for Tanzania's Energy Security & Export Ambitions

Natural gas is an abundant, clean and reliable resource that will – in every sense – fuel Tanzania's growth and prosperity

TANZANIA NEEDS 'RELIABLE' POWER, NOT JUST 'MORE' POWER. NATURAL GAS IS THE KEY

In a world rightly obsessed with climate change, governments and the media are understandably keen to publicise plans for increased use of renewables such as wind, solar and hydropower. Power generation targets also make for eye-catching headlines. For example, Tanzania's plans to drastically increase energy production for domestic use and export to neighbouring countries - according to **Tanzania's Power System Master Plan 2020**, total **power generation capacity will rise to just over 20,200 MW by 2040**.

The United Nations issued a landmark report which names South Sudan and Tanzania as the nations with the largest percentage of land transitioning to drylands and so the fastest becoming drier

Renewables are important as part of our energy generation mix, **but they are reliant upon the weather**. For example, hydropower is a key part of Tanzania's plans. However, it should be noted that **the United Nations** Convention to Combat Desertification (UNCCD) recently issued a landmark report "The Global Threat of Drying Lands: Regional and global aridity trends and future projections", which **names South Sudan and Tanzania as the nations** with the largest percentage of land transitioning to drylands and so the **fastest becoming drier**. Such challenges are no doubt part of the reason that, at the recent Africa 300 Summit, **the Managing Director of Kenya Power and Lighting Company**, Eng. Joseph Siror, **emphasised the need for African countries to reduce over dependence on hydroelectric power**.

As such, natural gas is crucial as it underpins our energy production, ensuring reliable supply and, as we shall explore later, it is a resource that Tanzania has in great abundance, and it is comparatively clean and cost effective.

Natural gas emits 50% to 60% less carbon dioxide (CO_2) than regular oil or coal-fired power plants

NATURAL GAS PROVIDES ENERGY SECURITY, BUT IS ITS USE JUSTIFIABLE?

At this point, it is worth tackling the concerns of those who say that, due to environmental concerns, Tanzania should not develop our natural gas resources to ensure our future prosperity. At Tanzania Petroleum, **we recognize the need for the world to transition to greener sources of energy**. However, **in addition to weather dependence, the following should be considered**:

COST – the cost of renewable technologies in general has come down in recent years. However, for a country blessed with abundant natural gas – **particularly large onshore assets such as Tanzania's Ntorya gas field** – natural gas provides a **very cost-effective energy source**.

Whilst controversial, it is noteworthy that the United States of America has withdrawn from the Paris climate agreement and has vowed to promote oil and gas exploration in the U.S. to reduce energy costs and to bring in export revenues. Other countries are also re-considering their plans to transition to renewables, considering inflationary challenges in many territories. Taking just one example of potential inflationary risks, it has been suggested that food production costs in South-East Asia may increase by between 30.8 and 58.9 per cent by 2050 if current policy measures to achieve net-zero carbon emissions are successfully implemented.

FAIRNESS – Many countries around the world have built strong economies based on their use of fossil fuels over recent decades. By contrast, **Africa accounts for nearly 20% of the world's population**, but according to The President of the African Development Bank (AfDB) Akinwumi Adesina, "**if Africa were to triple the use of natural gas for energy generation, it will contribute 0.67 per cent to global emissions**".

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RELATIVE GREEN CREDENTIALS - "Natural gas is the most environmentally friendly fossil fuel because it burns cleaner. In power plants, **natural gas emits 50 to 60 percent less carbon dioxide (CO2)** than regular oil or coal-fired power plants. It also emits greenhouse gases with a lower life cycle into the atmosphere". In addition, various sources including the Tanzania Petroleum Development Corporation (TPDC) state that **Tanzanian natural has exceptionally low CO2 content**, making it cleaner than most natural gas.

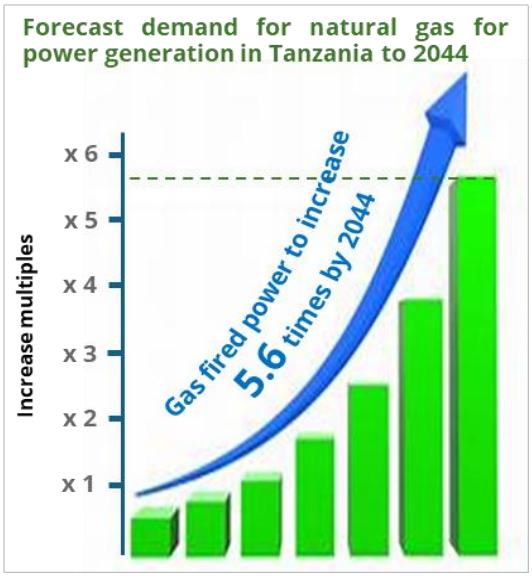
DEEP DIVE: FORECAST DEMAND FOR TANZANIAN NATURAL GAS

ELECTRICITY ACCESS

Tanzania is committed to **connecting 1.6 million people annually to electricity** to achieve the national target of **connecting 8.3 million people by 2030**. This national goal aligns with **Africa's broader target** of providing **energy access to 300 million people by 2030**, as declared during the Africa Energy Summit held recently in Dar es Salaam.

As such, there will be increased demand for power domestically and for export.

GAS FOR ELECTRICITY GERNERATION IN TANZANIA



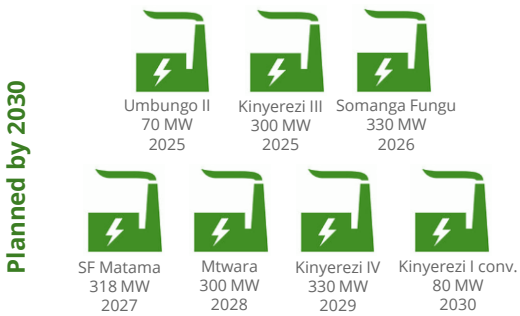
Demand for natural gas in Tanzania has grown steadily, averaging 8-10% per annum over the last 14 years. Whilst there are many know drivers of future demand, some observers of the market might have expected a temporary lull in demand as the Julius Neyere hydropower dam has been commissioned.

At Tanzania Petroleum, we note with interest that one of the two currently producing operators, Maurel et Prom (the other producer is in dispute with the government), reported on January 30 2025 that **demand for gas** at Mnazi Bay **was "up 19% compared to 2023"** and **"gas nominations** by TPDC **rose significantly during the fourth quarter,** with production of 58.2 mmcfd for the M&P share**. This highlights the trend increase in gas demand in Tanzania, despite the rise in hydropower generation in the country**".

By 2044, power produced from natural gas will be the largest source of energy by share

This trend is set to continue and gather pace. Tanzania plans to increase power generation capacity to 5,000 MW by the end of 2025 (from 3,160 MW currently). **Tanzania's Natural Gas Utilisation Master Plan** then forecasts that **by 2044, power produced from natural gas will be the largest source of energy by share, providing 6,700 MW** (**from** approximately **1,200 MW currently**) a **near 6-fold increase** in **less than 20 years**.

GAS FIRED POWER PLANTS



x 7

New gas fired power plants in the **next 5 years, capable** of generating an additional 1,938 MW. These are necessary to start building towards the 5,500 MW increase (from 1,200 MW to 6,700 MW) detailed above.

Even more gas fired power plants will then be needed to meet the 2044 targets for gas fired power generation.

EXPANSION OF DOMESTIC NATURAL GAS DISTRIBUTION NETWORK AND CONNECTIONS

Tanzania is rapidly extending its natural gas distribution network. This includes via physical pipelines and via 'virtual pipelines'; with new CNG stations forming the backbone of the latter (see later in this article for details of new CNG stations planned).

REGIONS - A TPDC report published in November 2024 confirms that only 4 regions in Tanzania are currently reached by the gas pipeline network. The Tanzanian Natural Gas Utilisation Master Plan outlines how **the natural gas pipeline network will be expanded in three 5-year phases**. This is re-iterated in a map in the 2024 report:

Phase 1: from Dar es Salaam to Mwanza, from Dar es Salaam to Arusha and from Mtwara to Njombe

Phase 2: from Morogoro to Iringa and Mbeya

Phase 3: Mbeya to Sumbawanga, Tabora to Kigoma, Mwanza to Kagera and Mwanza to Mara regions

INDUSTRIES – Currently, 56 industries are connected to natural gas. This will expand significantly in the coming years. **The direction and ambition is clear**; the 2016 – 2045 Tanzania Natural Gas Utilization Master Plan advised that **3.6 trillion cubic feet of gas has been ear-marked for use by industries** in that time period. Of particular note, is the **$1.2 billion fertilizer plant** – expected to be **commissioned from 2028** and **will consume 70 million cubic feet of gas per day**.

HOUSEHOLDS – Tanzania plans to ensure 80% of the population is using clean cooking methods by 2034. Much of this can be achieved by use of gas canisters. However, linked to this ambition, TPDC has launched an initiative to **connect 951 additional households to natural gas** pipelines this fiscal year, up from ~1,500 currently. **A more than 60% increase in one year.**

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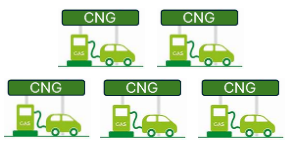
CNG FILLING STATIONS

Existing Compressed Natural Gas (CNG) filling stations – including the **new 'Mother Station'** recently completed.

x 5



13 New CNG filling stations are planned **by the end of 2025.** Bringing the total to 18.

x 18

An <u>increase of</u> 67.2m people using clean cooking solutions (primarily natural gas) in their homes in the next 9 years. This will help to prevent 33,000 deaths annually

CNG VEHICLES

The current number of CNG vehicles in Tanzania is believed to be at least 5,000:

x 5,000+

The government aims for '**the 'majority of' vehicles to be CNG fueled by 2050**. For reference, the total number of passenger cars (all fuel. types) is **currently ~650,000.**

x 520,000+

Considering the population and economic growth expected in Tanzania, a 15% increase in the number of cars by 2050 is probably very conservative, but we will base our estimates on that assumption. That would equate to 747,500. Assuming at least 70% are CNG fueled, that would mean approximately **523,250 CNG vehicles by 2050.**

In addition, **adoption of CNG for other vehicles** such as the Dar es Salaam Rapid Transit **(DART) buses,** which run on CNG.

Current CNG DART buses

x 210

Total planned CNG DART buses

x 755.

CLEAN COOKING STRATEGY

The current percentage adoption of clean cooking solutions by Tanzanian population is 7%. As the population of Tanzania is 69 million people. This equates to approximately:

4.8 m
People

The target percentage of the population to have adopted clean **cooking solutions by 2034 is 80%.** As the population of Tanzania is forecast to reach ~90.4 million people, this equates to approximately:

72 m
People

As such, we estimate an **increase of 67.2m people using** clean cooking solutions (**primarily natural gas**) in their homes in the **next 9 years**.

This will help to **prevent the 33,000 deaths caused annually** in Tanzania due to inhalation of smoke from combustion generated by inefficient cooking systems (wood and charcoal).

~~33,000~~
Deaths per annum

In addition, the transition away from wood will help to reduce deforestation in Tanzania. Currently **Tanzania is losing 1% of its forests each year** to deforestation, **equivalent to about 400,000 hectares (about 645,500 soccer pitches)**.

~~645,000~~
Soccer pitches Per annum

EXPORT DRIVEN DEMAND – TANZANIA AS A REGIONAL ENERGY HUB

GLOBAL AND REGIONAL CONTEXT

GLOBAL TREND FOR NATURAL GAS – A report by the Gas Exporting Countries Forum (GECEF) predicts that **global demand for natural gas will rise 34% by 2050**. Tanzania is strategically located to be able to provide natural gas to landlocked neighbouring countries. Also, to export natural gas by sea to countries including **India** (where **LNG import demand is forecast to more than double by 2030**) and **China** (who's **gas imports were up 9.9% (**at about 180 billion cubic metres) **in 2024** compared with 2023, and **forecast to increase to increase 350% to 400%** (to 650 to 700 billion cubic metres) **by 2050**. In fact, China, Taiwan and South Asia are forecast to account for 58% of all global LNG imports by 2050.

AFRICA DRIVE FOR ELECTRICITY ACCESS - 600 million Africans live without access to electricity. In an effort to address this, Mission 300 aims to accelerate the pace of electrification in Sub-Saharan Africa, with the target of providing reliable and affordable **power supply to 300 million people in Africa by 2030**. More than **$50 billion USD has been pledged** to ensure that goal is achieved.

AFRICA'S CLEAN COOKING PLANS - Nearly **one billion Africans do not have access to clean cooking solutions** – this results in the death of 600,000 African women and children each year. There is much to do but progress is being made. As one example, the African Development Bank (AfDB) has pledged **$2 billion USD** over ten years **towards clean cooking solutions in Africa**. In addition to demand for natural gas for power and industry, this will contribute to regional demand.

ELECTRICITY EXPORT

Tanzania and Kenya have recently energized a power transmission line between the two countries. The line has a transfer capacity of 2GW and will be connected to the existing Ethiopia-Kenya interconnector, making it part of the Eastern Africa Electricity Highway. As such, it will be the major link for power transfer between the Eastern Africa Power Pool (EAPP) and countries in North Africa, such as Sudan and Egypt.

East Africa Power Pool

- Burundi
- Djibouti
- Rwanda
- Egypt
- Ethiopia
- Kenya
- Libya
- Somalia
- South Sudan
- Sudan
- Uganda
- Democratic Republic of Congo
- Eritrea (pending)

In addition, the 500 MW Tanzania-Zambia power interconnector is currently 40% finished, and is due to complete in November 2025. This interconnector is of crucial strategic importance as it will link and allow power trade between the East Africa Power Pool and South African Power Pool.

This gives Tanzania the potential to export excess power to a market of up to

27 other countries

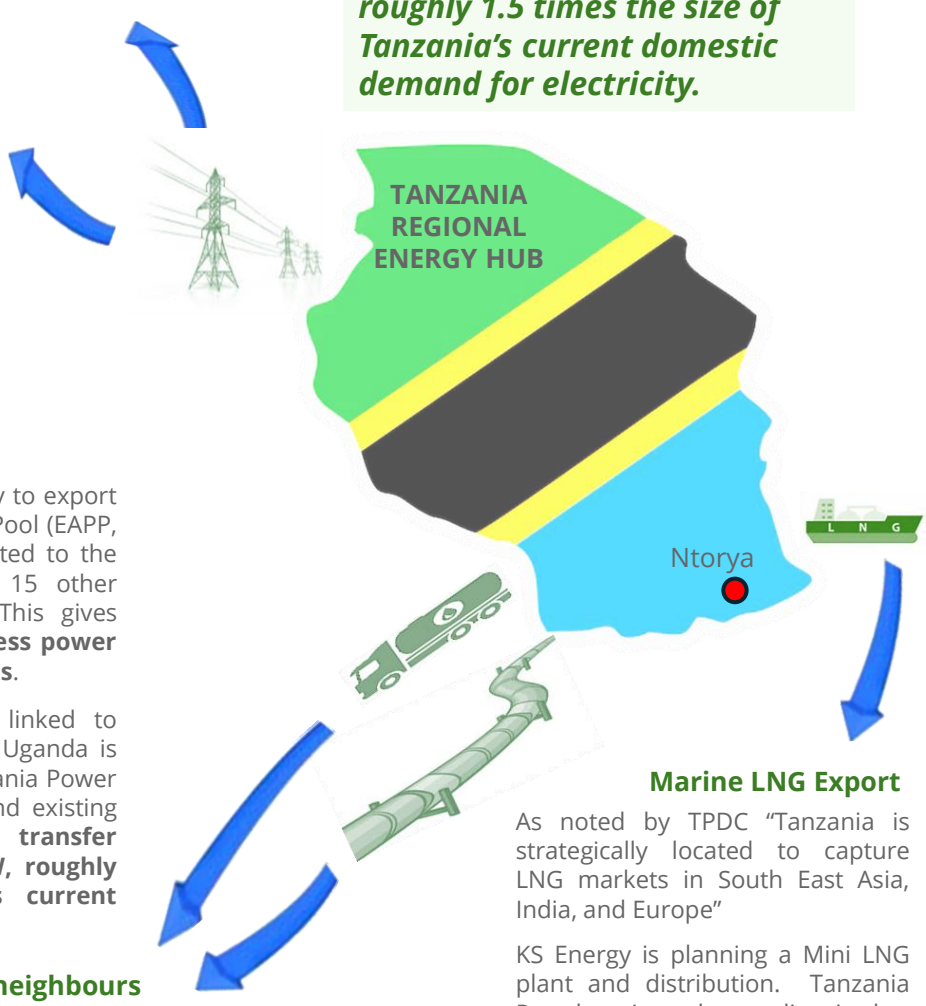
With a total transfer capacity of approximately 2,700 MW, roughly 1.5 times the size of Tanzania's current domestic demand for electricity.

Southern African Power Pool

- Angola
- Comoros
- Botswana
- Eswatini
- Lesotho
- Mauritius
- Mozambique
- Democratic Republic of Congo
- Madagascar
- Malawi
- Namibia
- Seychelles
- South Africa
- Zambia
- Zimbabwe

As such, Tanzania already has the ability to export excess energy to the East Africa Power Pool (EAPP, 12 other countries) and will be connected to the Southern African Power Pool (SAPP, 15 other countries) by November this year. This gives **Tanzania the potential to export excess power to a market of up to 27 other countries**.

The Tanzanian national grid is also linked to Burundi and Rwanda. A connector to Uganda is also in progress. According to the Tanzania Power System Master Plan (2020), planned and existing interconnectors will have **a total transfer capacity of approximately 2,700 MW, roughly 1.5 times the size of Tanzania's current domestic demand for electricity**.



Natural Gas export to landlocked neighbours

Tanzania has **already signed agreements to supply natural gas to the following countries** via a mixture of pipelines, Liquefied Natural Gas and Mini LNG systems:

- Uganda
- Kenya
- Democratic Republic of Congo (DRC)
- Zambia

Marine LNG Export

As noted by TPDC "Tanzania is strategically located to capture LNG markets in South East Asia, India, and Europe"

KS Energy is planning a Mini LNG plant and distribution. Tanzania Petroleum's understanding is that this will focus on gas from ARA and Aminex's Ntorya gas field, with offtake to commence in 2026. We note that KS Energy advised that "The aim is to use both marine and road transportation routes to deliver LNG to the offtakers"

TANZANIA'S ABILITY TO MEET THE NATURAL GAS DEMAND - A RECAP ON THE STRATEGIC SIGNIFICANCE OF NTORYA

Regular readers will have seen our recent article highlighting the **vast onshore Ntorya gas project**, and explaining its strategic importance as **the only gas field that has the scale and production readiness to meet Tanzania's forecast short, medium (up to 5 years) and medium-to-long-term (5 to 10 years) natural gas needs:**

https://tanzaniapetroleum.com/2025/01/28/ntorya-gas-field-tanzanias-next-oil-gas-mega-project/

As highlighted in that article, **Tanzania currently has two producing gas fields** Songo-Songo and Mnazi Bay, with a combined production capacity of ~240 Mmcfd. **Those gas fields are much smaller than Ntorya**. Also, production at Mnazi Bay is currently declining (but with plans to restore capacity by drilling additional wells), and the operator of Songo Songo is involved in a major legal dispute with the government and is therefore greatly limiting investment in the field.

The Ntorya project is pivotal to meet the demand for gas set out in this report

The existing offshore finds near Lindi, have not yet been given the green light for development and are probably at least 7 to 8 years from production. The soon to be auctioned blocks are also mostly deep sea, and are obviously years behind the Lindi project. **All the offshore assets will also be significantly more costly to develop and maintain than the onshore Ntorya project.**

As such, **the Ntorya project is pivotal to meet the demand for gas set out in this report**. At Tanzania Petroleum, we anticipate news from TPDC and the Ntorya JV partners very soon and, considering the importance of the project, we will be sure to provide ongoing coverage and insights.

CONCLUSION

Natural gas is needed by Tanzania and the region to provide reliable power supply alongside weather dependent renewables. Also, for gas powered vehicles, clean cooking fuel, and for industry. As detailed throughout this article, that **forecast demand is truly enormous**. It is also based on clear plans and targets, backed by government policies, and supported by commensurately vast amounts of funding.

Tanzania now has a proven ability to deliver very large strategic national projects

As well as the health and environmental benefits, the **dependable nature of natural gas** as a power source, will encourage investment and ensure improved **prosperity for Tanzania** and the region.

In addition to domestic **energy security** and meeting local gas demands, Tanzania plans to become **a 'Regional Energy Hub' – exporting electricity and natural gas**. Due to its location and exceptional natural gas assets, Tanzania is incredibly well positioned to be able to do this. This will generate **very significant revenues for Tanzania**. It will also extend those **energy security, environmental, economic and health benefits across the African continent and beyond.**

The hard work has been done in terms of regulatory frameworks and reform. The government has been working hard to build the necessary trust and relationships with other governments and with investors and financiers.

Furthermore, **Tanzania now has a proven ability to deliver very large strategic national projects**. For example, the Julius Nyerere hydroelectric dam and the world-class Standard Guage Railway (SGR) project. Not to mention the directly related projects such as gas fired power plants, Mtwara–Dar es Salaam Natural Gas Pipeline, and power connectors to other countries that have already been delivered.

This then is a story of **dramatic numbers in relation to Tanzanian natural gas demand**. It is a good news story about an **ambitious, realistic roadmap to greater health and prosperity for Tanzania**. More than that, considering the clarity of targets, government backing, funding and delivery track record, this is a story we can believe in and can expect to come to fruition.

Forecast demand is truly enormous. It is also based on clear plans and targets, backed by government policies, and supported by commensurately vast amounts of funding

Tanzania Petroleum will continue to monitor developments in this space and will provide further coverage and insights.