

TANZANIA KEY EXISTING LPG INFRASTRUCTURE AND EQUIPMENT IN OPERATIONS

LPG is primarily imported in Tanzania through the ports of Dar es Salaam and Tanga. Currently we import two LPG carrier ships (pressurized condition) with capacity of 5000 metric tons. The main LPG facilities include receiving and storage facilities, LPG cylinder re-filling plants, and LPG cylinder distribution warehouses. LPG is distributed to the regions/upcountry through tarmac road network, which is well connected to all regions, except in rural areas where there is still shortage of standardized roads. In the year 2022, there was no new investment in LPG-receiving facilities, therefore, the total storage capacity for LPG receiving facilities in Dar es Salaam and Tanga remained at 15,750 MT as shown in Table 1. The number of upcountry LPG storage and filling plants have increased with the storage capacity increasing from 1,910 metric tons in the year 2021 to 2,055 metric tons in the year 2022 as shown in Table 2. In the year 2022, the LPG business continued to grow with LPG imports increasing by 1% to 250,200 metric tons compared to 248,216 metric tons imported in 2021.

S/N	Name	Location	Capacity (MT)
1	Taifa Gas Tanzania Limited - Kigamboni LPG Facility	Vijibweni Industrial Area, Kigamboni, Dar Es Salaam	7,450
2	Oryx Energies Tanzania Limited- Kigamboni LPG Facility	Vijibweni Industrial Area, Kigamboni, Dar Es Salaam	3,100
3	Manjis Gas Supply Limited- Kigamboni LPG Facility	Vijibweni Industrial Area, Kigamboni, Dar Es Salaam	2,900
4	Lake Gas T Limited- Tanga LPG Facility	Chumbageni, Tanga	1050
5	Lake Gas T Limited- Kigamboni LPG Facility	Vijibweni Industrial Area, Kigamboni, Dar Es Salaam	750
6	Oilcom Tanzania Limited-Kurasini LPG Facility	Kurasini, Dar Es Salaam	500
Total Capacity			15,750

Table 1: List of current LPG receiving facilities/terminals in Dar Es Salaam and Tanga

S/No.	Facility Name	Region	Capacity (MT)
1	Lake Gas Limited - Arusha LPG Facility	Arusha	55
2	Manjis Gas Limited - Arusha LPG Facility	Arusha	180
3	Orange Gas Limited - Arusha LPG Facility	Arusha	262
4	Taifa Gas Tanzania Limited - Arusha LPG Facility	Arusha	46
5	Acer Petroleum Tanzania Limited - Arusha LPG Facility	Arusha	50
6	Oryx Energies Tanzania Limited - Dodoma LPG Facility	Dodoma	110
7	Lake Gas Limited – Dodoma LPG Facility	Dodoma	20
8	Taifa Gas Tanzania Limited - Dodoma LPG Facility	Dodoma	146
9	Taifa Gas Tanzania Limited - Geita LPG Facility	Geita	23
10	Oryx Energies Tanzania Limited - Iringa LPG Facility	Iringa	25
11	Lake Gas Limited - Iringa LPG Facility	Iringa	30
12	Taifa Gas Tanzania Limited - Iringa LPG Facility	Iringa	23
13	Taifa Gas Tanzania Limited - Bukoba LPG Facility	Kagera	23
14	Taifa Gas Tanzania Limited - Kigoma LPG Facility	Kigoma	23
15	Oryx Energies Tanzania Limited - Moshi LPG Facility	Kilimanjaro	110
16	Taifa Gas Tanzania Limited - Moshi LPG Facility	Kilimanjaro	23
17	Taifa Gas Tanzania Limited - Lindi LPG Facility	Lindi	23
18	Taifa Gas Tanzania Limited - Babati LPG Facility	Manyara	23
19	Taifa Gas Tanzania Limited - Musoma LPG Facility	Mara	23
20	Oryx Energies Tanzania Limited - Mbeya LPG Facility	Mbeya	50
21	Taifa Gas Tanzania Limited - Mbeya LPG Facility	Mbeya	46
22	Taifa Gas Tanzania Limited - Morogoro LPG Facility	Morogoro	46
23	Oryx Energies Tanzania Limited - Mwanza LPG Facility	Mwanza	260

24	Lake Gas Limited – Mwanza LPG Facility	Mwanza		55
25	Taifa Gas Tanzania Limited - Mwanza LPG Facility	Mwanza		146
26	Taifa Gas Tanzania Limited - Njombe LPG Facility	Njombe		23
27	Taifa Gas Tanzania Limited - Sumbawanga LPG Facility	Rukwa		23
28	Taifa Gas Tanzania Limited - Songea LPG Facility	Ruvuma		23
29	Oryx Energies Tanzania Limited - Isaka LPG Facility	Shinyanga		50
30	Taifa Gas Tanzania Limited - Shinyanga LPG Facility	Shinyanga		23
31	Taifa Gas Tanzania Limited - Kahama LPG Facility	Shinyanga		23
32	Taifa Gas Tanzania Limited - Singida LPG Facility	Singida		23
33	Taifa Gas Tanzania Limited - Tabora LPG Facility	Tabora		23
34	Taifa Gas Tanzania Limited - Tanga LPG Facility	Tanga		23
TOTAL				2,055

Table 2: LPG Facilities and their storage capacities in Mainland Tanzania

1. LPG Ships

Pressure gas carriers, also fully pressurized ships type (capacity of 3,000-10,000 metric tons) These ships are the simplest of all gas carriers in terms of containment systems and cargo-handling equipment and carry their cargoes at ambient temperature. Independent pressure vessels with a typical design vapor pressure of 17.5 bar are used as cargo tanks (type C tanks). Ships with higher design vapor pressure are in service; 18 bar is quite common; few ships can accept pressure up to 20 bar. No thermal insulation or a reliquefaction plant is necessary and cargo can be discharged by either pumps or compressors.

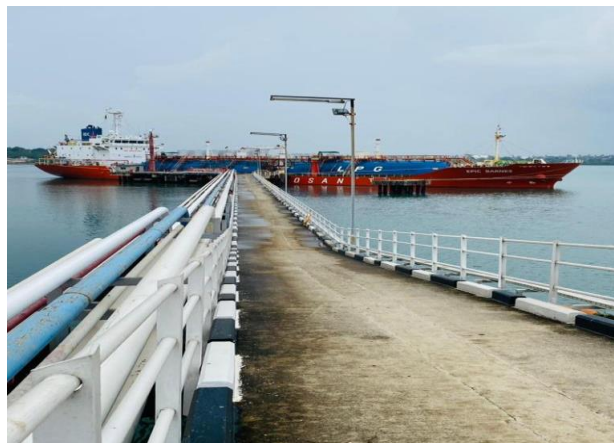


Figure 1: LPG ship cargo receiving facility.

2. LPG trucks

LPG dispensing truck/LPG dispensing tanker/LPG delivery truck is used to transport liquefied petroleum gas. Also, can be used as mobile gas station after equipped with gas dispenser, LPG gas pump. The LPG tanker material uses a specialised steel for high pressure tanker, which is ant-corrosive and keeps good stability at low or high temperature. LPG tanker trucks are basically equipped with safety valve, emergency shut-off valve, thermometer, pressure gauge for the safety use.



Figure 2: LPG truck.

3. Tanks/Storage Vessels

(a) Spheres

The LPG spherical tank is a fixed-pressure vessel at normal temperature, with a single-layer tank structure, dedicated to storing liquefied petroleum gas, using steel plates for the vessel, with excellent performance, safety and reliability. Spherical storage tanks have a smaller surface area, greater corrosion resistance, and are moisture and corrosion resistant. Spheres are the largest LPG storage vessels starting about 1000 metric tons and above.



Figure 3: Spheres

(b) Bullets

Bullets are classified as above ground LPG bullets, underground/buried LPG bullets and Mounded LPG bullets with capacity to store up to 1500 metric tons.

LPG above ground storage tanks are horizontal pressure vessels which are intended for the pressurized storage of Liquefied Petroleum Gas (LPG) under ambient temperature. In above ground storage facility, tanks are mounted on steel or concrete pedestal / support above the ground. The safety distances as per norms are more than Mounded and Underground storage tank installation. This is because of the smaller vessel-to-vessel spacing and due to the smaller safety distance requirement between the mounded storage vessels and items such as control rooms, buildings, roads etc. LPG storage tanks are equipped with following basic equipment's: Pressure gauge, Temperature gauge, Rochester Gauge, Roto gauge, Safety Relief Valve, Shut-Off valve, and Excess Flow Check Valve



Figure 4: Bullets

(c) LPG cylinders

LPG cylinders are made of high-quality steel. They are safe, easy to handle, and easy to transport. They are tested and filled in high-tech plants, in compliance with the regulations and the highest environmental safety standards. The cylinders are filled with liquid-state LPG. At the end of this process, the cylinder is weighed and subjected, first, to a further quality check to verify the presence of any leaks, then to a quantity check to verify the filling compliance with current regulations. Each cylinder is equipped with a seal cap which certifies the verification, control, and approval for sale. All cylinders are tested every 5-10 years. After use, the customer must return the cylinder to the authorized dealer from which he purchased it. Only by doing so it is possible to carry out the necessary safety checks and allow for a new and correct refilling.

We would like to remind you that it is against Tanzania laws under LPG industry regulations and rules and provides criminal sanctions if the cylinders are filled unlawfully.



Figure 5: LPG Cylinders

(d) Regulators

In the distribution system, regulators control the flow from higher pressure to lower pressure. Regulators sense if the pressure in a line drops below a specified set point and opens, allowing more gas to flow. On the other hand, if demand rises above a set point, the regulator will be close to adjusting the downstream pressure. There are two main types of LPG regulators, the first stage and the second stage.

First Stage Regulator

LPG is stored under pressure in cylinders and must be regulated before it can be used safely. First-stage regulators are designed to reduce the pressure of LPG from the storage vessel to a level that can be safely handled by the second-stage regulator. First-stage regulators are typically located near the LPG bottle and are available in a variety of sizes and connection types.



Figure 6: First stage regulator

Second Stage Regulator

A second-stage regulator often referred to as an LPG caravan regulator further reduces the pressure to an accurate measure for safe LPG appliance operation. In some cases, both first and second regulator types are used in a two-stage LPG gas regulator system to achieve the best pressure reductions for your appliances.



Figure 7: Second stage regulator

(e) Cylinders Valves

Compressed gas cylinders require the installation of at least one valve. This valve allows the cylinder to contain gases and allows gas to be filled into or emptied from the cylinder. The cylinder valve is the most vulnerable part of the compressed gas package and requires a thorough understanding to maximize its performance. There are four basic valve types: the pressure seal valve, the packed valve, the O ring valve, and the diaphragm valve. There are several versions or designs within each of the four basic types. A working knowledge of cylinder valves can improve processes, save time and money, prevent problems, maintain the life and integrity of the valve, and improve the safety of your operation.



Figure 8: Cylinder valves

(f) Piping & Gauging

There are several types of materials approved for gas work. The codes for the local compliance should always be checked but in general; steel pipes, copper pipes, yellow brass pipe, aluminium pipe, PVC pipes, PE pipes may be used.

Steel Pipes

Steel pipes can be used above ground if corrosion due to the environment and the conveying gas is of no problem. Steel pipes and copper pipes are the most common materials used inside buildings.

Copper Pipes

Copper pipes used in gas systems should be of type L or K and approved for gas.

Yellow Brass Pipes

Yellow brass pipes may be approved for inside installations.

Aluminium Pipes

Aluminium pipes should not be used in the ground. Aluminium is not approved in all areas.

PVC Pipes

PVC - Polyvinyl Chloride - pipes may be used in pipelines buried outside a building.

PE Pipes

PE - Polyethylene - pipes may be used in pipelines buried outside a building.

Flexible Connectors

Flexible connectors are used to connect appliances to gas sources. Flexible connectors must be approved.



Brass Alloy Pipe



PE pipe



Steel pipe

Figure 9: Pipes used in LPG facilities.

Gauging the tank or pipeline conditions in LPG systems is important to prevent equipment from overheating or rupturing due to overpressure. Devices such as gauges, switches, transmitters, and bypass level indicators all assist in maintaining the desired conditions and instate process safety.



Pressure gauge



Temperature gauge

Figure 10: Pressure and temperature gauges.