PREPARED BY:
Stanbic Bank Tanzania

Tanzania LNG:
A Macroeconomic Study

OCTOBER 2022

Foreword

This report is the latest in a series of macroeconomic studies that the Standard Bank Group ("Group" or "SBG") has conducted over the years to independently assess the potential impact of large-scale energy projects on the socio-economic development of countries across Africa.

The purpose of this report is to attempt to quantify and enumerate the socio-economic impact that the proposed multi-billion dollar liquefied natural gas (LNG) project in the United Republic of Tanzania could have on the country and its people. We hope that this report forms part of the debate and discussion among stakeholders on the relative merits and demerits of the project.

We recognise that the study is not exhaustive in its examination of the various socio-economic and environmental impacts of such an energy project. This is not an environmental impact assessment report.

As SBG we are committed to a just energy transition and view gas as a transition fuel in Africa. Adopting this view is key to balancing economic development and social upliftment with the reduction of global emissions by facilitating the switch from higher-emitting energy sources, such as wood and coal, to lower-carbon fuels, such as liquefied petroleum gas for cooking, and natural gas for the provision of baseload energy. More information on our Group's climate change policy can be found in our Standard Bank Group Climate Policy published March 2022 and available on our corporate homepage (**www.standardbank.com**)

The study is based on publicly available information and the production of this report was financed entirely by Stanbic Bank Tanzania ("SBT"), a subsidiary of Standard Bank Group.

ACKNOWLEDGMENTS

Stanbic Bank Tanzania would like to thank the Ministry of Energy of Tanzania ("MOE") for endorsing this study. Furthermore, we thank Tanzania Petroleum Development Corporation ("TPDC"), the Petroleum Upstream Regulatory Authority ("PURA") and the 'Operators' (Shell Plc. & Equinor ASA) for their cooperation and support. The report and the statistical analysis behind it would not have been possible without the input of Conningarth Economists. We would also like to acknowledge Research on Poverty Alleviation ("REPOA") for their contribution to the study. Thank you.

Management Team
Stanbic Bank Tanzania

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Executive Summary

INTRODUCTION

The purpose of this report is to provide an independent, objective assessment of the US$ 32.7bn Tanzania Liquefied Natural Gas ("**TLNG**") Project at Kela Fishing Village, Li'kongo, Lindi Region, Tanzania ("**the Project**"). The Project is being developed by ["**Newco**"] on behalf of "**Blocks, 1, 2 & 4**" which are located in southern Tanzania, in the offshore Rovuma Basin. The Project will also make major use of the existing – and recently refurbished – deep water port of Mtwara, Mtwara Region, United Republic of Tanzania ("**Tanzania**").

Stanbic Bank Tanzania ("**Stanbic Bank"**) (supported by Conningarth Economists ("**Conningarth**")), has prepared an independent study ("**The Report**") upon the macroeconomic impact of the Project, upon the Tanzanian economy (2020 GDP of US$ 65bn[1]). The Project will produce and sell LNG and Domestic Gas ("Domgas") between 2030 - 2059, ultimately extracted from multiple offshore deposits in two (2) blocks licenced to Blocks 1 & 4 (Operated by "**Shell**"'), and one (1) licenced to Block 2 (Operated by "**Equinor**"), under Production Sharing Agreements ("**PSAs**") largely arising from the 2004 Licensing Round. The Project may also sell Domestic Energy ("**Domenergy**"), but its electricity sale components have not been valued in this Report (due to their early stage), although Domestic Gas ("**Domgas**") components have been valued.

The Project is intended to have an annual LNG production capacity of 15 MTPA and will be Tanzania's first onshore LNG project, which in turn has followed the offshore discovery of 23 trillion cubic feet ("**Tcf**") Gas Initially in Place ("**GIIP**") in Blocks 1 & 4 (Shell, 2022); and more than 20 Tcf of offshore GIIP in Block 2 (Equinor 2018). In producing its LNG, the Project is calculated to utilise 24 Tcf of recoverable gas between 2030 – 2059 and note that per Wood Mackenzie ("**Woodmac**") reports noted in Section 6.3., the underlying natural gas contains zero CO_2 (Woodmac, 2021)

We note upfront that Stanbic Bank is not receiving a fee for this Report. Stanbic Bank is also cognisant of its commitments under Standard Bank Group's Climate Change Policy (announced 16th March 2022), with which this Report is aligned.

HEADLINES

- TLNG represents a landmark post-COP26 opportunity to develop Sub-Saharan Africa's ("**SSA**") cleaner energy resources (i.e. zero underlying CO 2 natural gas) and to promote Coal to Gas ("**CTG**") switching by key Asia-Pacific markets, as well as enhanced energy security for the world's natural gas consumers;
- The Project's costs represent roughly 50% of Tanzania's 2020 GDP;
- The Project can develop and monetise its discovered hydrocarbon resources in a safe, timely and economic way, in line with its goals to create value for the Government of Tanzania ("**GOT**") and Blocks 1, 2 & 4; to

1 www.imf.org/en/Publications/CR/Issues/2021/12/02/United-Republic-of-Tanzania-Request-for-Disbursement-under-the-Rapid-Credit-Facility-Press-510749 average of GDP data for 2019/2020 and GDP 2020/2021

optimise Tanzanian content ("**Local Content**", "**LC**") and to maximise recovery of Tanzania's discovered reserves and resources. The Report explores the Project's "**on-site**" (direct) impacts at a macroeconomic level as well as both its "**supply-chain**" (indirect) and "**economy-wide**" (induced) effects. The Project is also assumed to be the leading single source of repayment for TPDC's funding raised to follow its assumed rights to take a twelve (12) per cent (%) stake in Newco (for participation in the development of Blocks 1, 2 & 4, the LNG Plant and thus the wider Project);[2]

- The Report takes into consideration Tanzania's objectives in "Vision 2025", which sought to take Tanzania to middle-income status, as well as with Tanzania's current, Third Five Year Development Plan ("FYDP") (published in June 2021) which is intending to create a "Competitive and Industrial Economy for Human Development";

- Noting LNG market volatility since 2019 (and ongoing at date of drafting), in order to demonstrate for discussion purposes, the range of potential Project financial and economic results, the Report has modelled four (4) separate, consistent prices for the Project's LNG output, namely US$ 5.50, US$ 7.00, US$ 10.00 and US$ 12.00 per MMBTU Free on Board ("FOB"), i.e. sold at the Project's LNG loading jetty (2021 base line);

- The Report has been modelled to assume a Final Investment Decision ("FID") by 1 January 2025 (which start with the negotiation and agreement of a comprehensive Host Government Agreement ("HGA") between the Operators and the Government of Tanzania ("GOT")), that can be a catalyst for a growing Tanzania LNG and Domgas industry that establishes Tanzania as: a world-scale and world-class hydrocarbons and industrial producer incorporating Best Available Technology ("BAT"); for a Project taking FID in the Calendar Year of 2025; and which is developed by world-class Operators;

- More broadly, we see a need for Tanzania to have a clear vision of the next step in its national cleaner energy journey, assisted by TLNG's landmark development. Summarised, we see this a transition from biomass (including charcoal) which represents up to eighty two (82) per cent % of national energy production and seventy seven (77)% of Tanzanian consumption per IEA (2019)), HFO, diesel, paraffin, kerosene through hydroelectric power, natural gas, and LNG.

- The development of a Scope 1 & 2 Net Zero Emissions ("NZE") enabled Project will likely encompass a combination of: (potentially) buying some hydroelectric power from the (currently under development) Julius Nyrere Hydroelectric Power Plant ("JNHPP"); the Project producing Renewable Energy ("RE"); Carbon Capture Utilisation and Storage ("CCUS") (in time) as well as the potential use of Nature Based Solutions ("NBS"); for example, reforestation to mitigate, and in time start to reverse, national losses of biomass through consumption. NBS are intended to mitigate the Project's residual (post-abatement through BAT) CO_2 emissions. Taken together, the development of TLNG, its associated Domenergy and Domgas commitments, and the development of the Lindi and Mtwara regions, represents our Report's overall "Project Vision"; and

- We therefore argue for two considerations:

    1. Effective implementation – there is an immense and permanent loss to Tanzania if projects are implemented with incremental delays in a fast-changing LNG market context (for example, due to a delayed negotiation of a POD following a successful negotiation of the HGA) hence implementation

2 Although we model twelve (12) % as the arithmetical average of the Woodmac assumptions, we recognize this assumption may be subject to negotiation. Accordingly, in Section 4.5, we analyse increments of five (5) % through to thirty (30) % (inclusive of the central twelve (12) % assumption)

needs to become an increasing focus within the GOT. We note in the FYDP the implementation issue is specifically mentioned, with the effect it has "somewhat slowed down the implementation of development projects"; and

2. Tanzania becoming an anchor supplier to India, China and wider South-East Asia (e.g. Indonesia, Singapore). For example, at 2022, India and China are major LNG purchasing markets (as with other industries) with India's LNG consumption now c 22 MTPA and China's c 80 MTPA (Shell, 2022). Given Tanzania's central location in East Africa, we argue the Project ought to position itself to become a reliable LNG supplier to meet increasing Indian and Chinese demand, as both countries implement major CTG switching programmes. LNG analogies can be drawn with the roles of Indonesia and Malaysia to Japan in the past. We also use the examples of Australia (mining resources) and New Zealand (food), which have become reliable supply partners to China and, the key point, have developed major, domestic industries which are economic bedrocks within such economies and employ thousands of indigenous citizens and boost national prosperity. Across Asia, we note the CTG switching potential is enormous (for example, up to 175 BCFD is seen by a recent report (EQT, 2022) noting that TLNG's target natural gas production in this Report is a mere 2.5 BCFD – one point four (1.4%) of the potential incremental global target market), which also brings the added benefit of a new country LNG supplier.

KEY FINDINGS

The report offers several key findings:

1. Positive Economic Impact

LNG is of a transformational macro-economic importance for Tanzania. It is in line with the objectives of Vision 2025 and the objectives of the FYDP. FYDP clearly states that Tanzania needs eight (8) % annual growth to achieve its objectives, including consolidating lower middle-income status and achieving poverty alleviation. The Report is also in line with the thrust of Tanzania's Natural Gas Utilisation Master Plan (2016 – 2045) ("**NGUMP**") to boost industrialisation and promote the best chance of country economic diversification. LNG adds value by beneficiating Tanzania's natural resources on land, and in-country before generating massive export proceeds. This is distinct from the bulk of historical African resources projects which do not include beneficiation at the point of resource extraction. From the sale of such resources, the Project is likely to trigger a process of continuing and enduring Foreign Direct Investment ("**FDI**") in Tanzania.

In addition, the Project is expected to offer 200 mmscfd "**Committed Domgas Volumes**", which should allow Tanzania to develop (or continue to feed) multiple Domgas Projects (e.g. IPPs or industrial projects such as fertiliser, using the existing National Natural Gas Infrastructure ("**NNGI**"), which runs northwards from Madimba to Dar Es Salaam and has a throughout capacity of 738 mmscfd.

Specifically, concerning Gas to Power ("**GTP**") we have seen announcements related to both of the planned (1) [330] MW CCGT complex at Somanga Fungu, Lindi (185km North of the TLNG site), and the associated 200km transmission line ("**TX**") to Dar es Salaam, and (2) reference to a [300] MW GTP complex at Mtwara, which (upon TX upgrades) would be able to sell power to the East African Power Pool ("**EAPP**") and the Southern

African Power Pool ("**SAPP**") in multiple directions, as well as help meet domestic demand. Stanbic Bank is well-aware of the ongoing development of the 2GW JNHPP (which will materially increase Tanzania's installed power generation capacity), but also that a growing economy needs additional generation capacity (especially mid-merit and peaking capacity) In this regard, we note the Project's implementation is projected to (depending on selected LNG price scenario) increase Tanzania's GDP in the order of 6.5 – 7.5% p.a. (per Section 3.6)

2. Benefit to all

The Project makes sense for Tanzania as it offers a win-win for the GOT, Newco, future Domenergy Projects, future Domgas Projects, and civil society. It provides Tanzania with a massive future revenue stream and provides the basis for various linked and ancillary cash flow streams and economic developments (for example, Domenergy, Domgas, Condensate and Small-Scale LNG ("SSLNG") (road, rail and marine)). In terms of headline numbers, the Project's contribution is enormous:

i. Gross Domestic Product ("**GDP**") is envisaged to annually increase in real terms 2021 by US$ 7bn (US$ 5.50 scenario) through to US$ 15bn (US$ 12.00 scenario). We note that around 43 - 48% of GDP benefits accrue to the non-O&G sectors;

ii. In the US$ 5.50 scenario, Gross National Income ("**GNI**") (i.e. GDP excluding net foreign transfers) will increase by US$ 5.7bn p.a. through to US$ 13bn in the US$ 12.00 scenario;

ii. Tanzania's Balance of Payments ("**BOP**") are expected to benefit by US$ 3.4bn p.a. in the US$ 5.50 scenario through to US$ 8.2bn p.a. in the US$ 12.00 scenario;

iv. Fiscal proceeds are expected to range between US$ 2.2bn p.a. in the US$ 5.50 scenario through to US$ 6bn p.a. in the US$ 12.00 scenario;

v. Individually, the Project will boost Tanzania's long-term projected GDP growth from 6% to 6.5% in the US$ 5.50 scenario up to 7.5% in the US$ 12.00 scenario;

vi. In addition, in the US$ 5.50 scenario the Project provides some 277,356 on-site, supply chain and economy-wide job opportunities within Tanzania, rising to 647,048 in the US$ 12.00 scenario. The Project itself is assumed to directly employ 6,000 people in the construction phase and 500 in the operational phase through "On-Site" jobs, with these jobs massively outweighed by the creation of "Supply Chain" and "Economy-Wide" jobs, that arise from TLNG's procurement spending and contribution to national savings and investment. Whilst these numbers appear large at face value, using the US$ 5.50 scenario as an example, they are proportionately less (5.6%) as a percentage of Tanzania's total employment (4.9 million people) than its impact on GDP, which is 8.33% (0.5% / 6%) per below; and

vii. The Project will also be the catalyst for future Domenergy and Domgas Projects. Standard Bank explicitly notes the Project's economic contribution from these aspects is understated **as we do not include** the projected benefits of, for example, SSLNG (e.g. that sells output in Tanzania for less than the cost of imported diesel); any Domenergy or new Domgas Project (which use the Project's supplied Domgas) within this Report, or existing power generation unit or industrial customer whose existing source of natural gas will be replaced in time by the Project's Domgas. In addition, other potential examples we exclude is the Project's ability to fund a national programme of rural PV (including BES and inverters), LPG, natural gas or other substitutes for the historic and ongoing mass use of biomass/charcoal in non-urban Tanzania (as well as in Dar Es Salaam (MOFA, 2018)).

3. Key Decisions and Risks

At date of drafting, Stanbic Bank has three primary concerns with respect to the implementation of the Project (and associated projects):

a. Security

In Mozambique, there was a progressive worsening of the security climate within Cabo Delgado province after 2017 leading to the 2021 Force Majeure declaration by Mozambique LNG ("**MLNG**") and Rovuma LNG ("**RLNG**") that remains in place at date of drafting (although the situation has stabilised and shown an improvement due to the arrival of Rwandan and SANIM forces (including those of the GOT)). The physical distance from Madimba (the NNGI start point) running southwards to Northern Mozambique's Afungi Peninsular MLNG/RLNG site is only around **85 kms**, hence we expect the GOT will keep a close eye on the security situation in Lindi/Mtwara regions at all times, with a need for close cooperation on security with Mozambique. Stanbic Bank notes that security issues are outside of our professional competence but that we have developed a high familiarity with them over time;

b. "Domenergy"

Since Stanbic Bank's LNG/Domgas Macroeconomic Studies of 2014, 2018 and 2019, it is generally clear to market observers that global energy markets and clients have increasingly evaluated, inter alia: (1) the evolution of RE, including associated storage (e.g. BES), and (2) Decarbonisation technologies to reduce emissions from Carbon Fuels. Stanbic Bank believes these issues are also important in SSA and can supplement and complement the traditional "Domgas" or Domestic Market Obligation ("**DMO**") discussions that have long been a feature of emerging markets resource negotiations with Governments. Through this Report, Stanbic Bank has a clear "**Domenergy Vision**", which we believe is shared by Newco and which contains options for the GOT. Non-exclusively, we believe this vision post HGA will encompass the following:

i. The potential option for the Project to purchase some clean energy from the JNHPP, which is under advanced construction (at date of drafting), which must be balanced with long-term security of supply for the Project (taking account of drought examples in Brazil or Zambia, for example, and security of supply of key LNG feedstock examples (such as Egypt, for instance);

ii. The backstop provision of RE and CCGT by Newco to feed the Project's electric power requirements (e.g. basic power requirements as well as use of lower CO_2 emitting electric drive technology). Significantly, the Project's ordinary usage of RE should allow the Project to sell surplus power (through CCGT operations) to the Tanzanian grid during ordinary daytime hours. In essence, this allows the provision of **incremental Domgas** in the form of MWhs (a typical industry calculation in European energy markets) and reduces Tanzania's exposure to a future risk of diesel/Heavy Fuel Oil ("**HFO**") price quantum and volatility;

iii. The provision of "traditional" **Domgas** to GOT. We envisage Newco will offer Committed Domgas Volumes of 200 mmscfd, which is likely to be negotiated with the GOT. Unusually within SSA, Tanzania has its existing National Natural Gas Infrastructure ("**NNGI**") which can become the delivery mechanism to industrial and commercial customers, i.e. Gas to Industry ("**GTI**") as well as to the traditional GTP. There is also the possibility of expanding distribution networks in the Dar Es Salaam metropolitan area, noting the scale of biomass consumption.

iv. On top of Domgas and Domenergy (Domgas equivalent), there is the potential for TLNG to produce SSLNG (e.g. to be sold as diesel substitute fuel to "**LNG Trucks**"), which LNG trucks can also supply

other customers to substitute diesel (as well as themselves consuming such LNG). SSLNG could potentially supply Tanzania's own gas to domestic industrial/logistical customers in Tanzania and across East Africa (especially land-locked countries, likely undercutting the price of imported diesel/gasoil, which will likely be refined in other global regions (e.g. Saudi Arabia, India)). This Report assumes that it is possible to sell SSLNG in-country at the LNG FOB prices generally assumed in this Report. Another possibility is to use marine transport of SSLNG to either of Tanga, Dar Es Salaam (potentially connecting with the Standard Gauge Railway ("**SGR**") and Mtwara; and

v. Noting that Mtwara is a natural deep-water harbour and East Africa's leading port in between Nacala and Mombasa (a distance of 728 nautical miles – Mtwara being 345 nautical miles north of Nacala), and which will be used for the Project's offshore operations), we believe that Mtwara port has the chance to offer marine SSLNG (a.k.a. "**LNG Bunkering**") to passing ocean traffic at the LNG FOB prices per this Report. We note per Shell's 2022 LNG Outlook, around 30% of new ships (by tonnage) are being fuelled by LNG (as opposed to more expensive and dirtier, HFO and diesel), hence the demand for marine LNG bunker fuel will only increase over time as the world and Africa moves towards cleaner maritime energy).

c. Regional Gas

This Report focuses on TLNG, but we note that TLNG is of close proximity to MLNG and RLNG (the Likong'o site is 220kms from Afungi and Mtwara only c 120kms). In the course of 2022 it is expected that, in Mozambique: (1) Coral FLNG will start production, with the possibility of a Coral 2 FLNG under active discussions; (2) MLNG will commence its return to the Afungi site and (3) RLNG will progress its development plan options. It is therefore reasonable to assess the issue of Regional Gas and TLNG. Tanzania is naturally central to East Africa (N.B, Tanzania shares a border with eight (8) countries of which six (6) are land-locked). Per this Report, Tanzania can theoretically supply Kenya and Uganda with piped natural gas, as well as other points further away, with potential advantages also seen to being able to supply gas to the Afungi site (for security of supply and maintenance purposes) and power to Northern Mozambique. In addition, per the above, we can see how fuelling Trucks with SSLNG may become a plausible business side-line for Tanzania (whether intra-Tanzania or further away, noting its geographical and infrastructure advantages), with Marine Bunkering also possible. Accordingly, post HGA-signing, we recommend the GOT closely evaluates its Regional Gas supply options. Inter alia, considerations will include:

i. Customer affordability – for example, Uganda can likely afford natural gas purchases (as the FID of the integrated c 230,000 BPD Lake Albert oil development and EACOP pipeline has been taken and future oil proceeds are assured, but can Malawi (for example, aside from logistics)? Alternatively, can Kenya's alternative LNG pricing options into Mombasa work regarding piped gas sales by Tanzania? Mombasa will have low shipping costs to be supplied from either Mozambique, the Arabian Gulf or Yemen LNG (upon its return to operations).

ii. Tanzania's ability to supply the targeted purchase natural gas volumes by the third country in parallel with its own domestic sales and sales to other third countries;

iii. Infrastructure build-out (e.g. EACOP's construction will soon commence. Can a gas pipeline be built in parallel with it?). In passing, this could also supply inland Tanzania (e.g. Mwanza) as well as Uganda. Could Dodoma be connected through a NNGI spur line? Or is SSLNG supplied by rail (the SGR) from Dar Es Salaam more appropriate? Our key point is that Tanzania now has choices for Domgas and SSLNG to consider in parallel with developing the Project.

iv. Pricing – Domgas pricing can sometimes be competitively negotiated as the ultimate source of supply is in-country. However, regional gas is still exported gas by a supplier country and pricing needs to be evaluated against alternative sales options for the supplier and / or import options for the buyer (for example, Tanzania selling piped gas or LNG to Kenya).

d. Implementation

Aside from the security example mentioned above, Stanbic Bank is cognisant of the sheer scale and logistical challenges of implementing large-scale onshore LNG construction projects in SSA. As an example, within South Africa, during the broad 2007-2012 period, there were numerous power, pipeline and infrastructure sector examples of cost overruns and delayed completion, which in the power sector cases have led to sustained underperformance and disputes/litigation (which endures in 2022). In order to preserve value for Tanzania and the Operators, every effort should be taken to minimise these.

4. Leading role for GOT

We consider the GOT should take a leading role in creating the appropriate commercial, fiscal and legal conditions to enable the timely development of a globally competitive Project. Following the HGA signature, this could encompass:

a. Promptly reviewing pre-FEED work, FEED work before then reviewing and approving Newco's POD submission such that it can declare FID in 2025;

b. Determining its position on the implementation challenges raised within this Report such that those challenges can be responded to and are of reduced likelihood of occurrence;

c. Determining its position on the Domenergy Vision outlined within this Executive Summary, such that Domenergy (and / or Domgas) will not be an obstacle to the Project implementation and its benefits can be realised for all Tanzanians; and

d. Per Section 5.3, taking on board learning points from (1) the onshore Mozambican LNG experience (e.g. limited pre-FID expenditure by either of the public sector or private sector around the region of the Afungi site and thus achieving limited local employment, LC, benefits etc) and (2) the onshore Ugandan oil experience (where the Government of Uganda ("**GOU**") proactively borrowed money / allocated funds to ensure the needed – in time – Hoima International Airport ("**HIA**") – as well as various regional roads surrounding the upstream Lake Albert development were built and funded ahead of the project FID (which occurred in early 2022).

Summary Project Description

The Project will be located at Kela fishing village, close to the town of Li'Kongo, around 20km north of Lindi, which officially is a second-tier port within Tanzania (and in turn is c 120kms north of Mtwara by road, the leading port in Southern Tanzania). The site area is 2,071 hectares, 460km south of Dar Es Salaam and is owned by TPDC. The Project will produce approximately 15 MTPA of annual LNG output, using mid-scale trains (e.g. indicatively, either 10 x 1.5 MTPA or 5 x 3 MTPA), and is targeted to be Scope 1 & 2 NZE technology from First Gas, potentially including the use of CCUS and / or NBS.

Assuming 100% availability, the Project will require in the order of 2,543 mmscfd natural gas feedstock, inclusive of 200 mmscfd feedstock required to provide the Committed Domgas Volumes, which adds up to 928 MCF p.a. (0.93 Tcf) at full production for the plateau period (2030-2052), before production declines.

Between 2030-2059, 24.2 Tcf of recoverable natural gas feedstock will be required to be delivered from Blocks 1, 2 & 4. To produce the recoverable feedstock, the Report assumes that twenty-four (24) individual wells will need to be drilled across the blocks (per Woodmac on RLNG (offshore)). In contrast to the MLNG and RLNG macroeconomic studies prepared by Standard Bank in 2014 and 2019, the Report also assumes that an additional thirty-six (36) individual wells will be required to be drilled between 2038 - 2043 as an incremental "**Mid-Life**" Upstream investment by Newco. This will facilitate plateau production until 31 December 2052 and overall production until 31 December 2059. We note the LC aspects relating to the Mid-Life Upstream investment will need to be agreed nearer to the time.

Block 1 & 4 is operated by Shell (following its acquisition of BG Group plc in 2016, the Operator since 2010, who in turn farmed-in to Ophir's original blocks). Block 2 is operated by Equinor (formerly Statoil). We note that Shell and Equinor have agreed a 2021 Memorandum of Understanding confirming a Joint Development of the Project (The Citizen, 2021).

The EPC Contracts (or equivalent) of the Project components (both onshore and offshore) will be assigned to a consortium of companies able to perform the activities in line with targeted timing and costs.

Under this Report, FID is targeted for 2025, with the completion of all trains scheduled for 1 January 2030. Production and cash flows have then been modelled until 31 December 2059, with a step down in production modelled after 31 December 2052 until final cessation of production on 31 December 2059. Noting the Paris Agreement's NZ target date of 2050 and notwithstanding key countries later target Net Zero dates (e.g. China 2060, India 2070), the average life of the Report's modelled LNG production (i.e. 50.1% is **2043**, seven (7) years before the target Paris Agreement NZ date.

Financial Analysis

Section 2 outlines the Report's Financial Analysis. Almost entirely based upon the published (under subscription or available for purchase) Woodmac Reports for:

- MLNG onshore costs (Mozambique);
- RLNG offshore costs (Mozambique); and
- Blocks 1, 2 &4 fiscal systems (Tanzania)
    - ***Stanbic Bank prepared*** a Project Screening Model ("**PSM**") which forms the basis for macroeconomic analysis in Section 3. Above and beyond the Woodmac Reports, Stanbic Bank also used:
        - TotalEnergies' CO_2 disclosures for MLNG (Total, 2021);
        - the IEA's projected CO_2 taxes for "**Other Emerging Markets & Developing Countries**" (as a proxy for Tanzania) (IEA, 2021); and
        - PWC's summary of corporate taxation for Tanzania (PWC, 2021), all of which are publicly available and are detailed in Section 6.3.

We outline full details of assumptions used in Section 2 (for transparency) and reference them in Appendix 6.3. The assumed Upstream Capex is US$ 15.6bn and LNG Plant Capex is US$ 17.1bn, making total Project Capex of US$ 32.7bn (around 50% of Tanzania's 2020 GDP). Once the above was prepared, Stanbic Bank reviewed its assumptions with Shell and Equinor (as Operators) for reasonableness for a reference Macroeconomic Study of this kind. The review process – "**Operator Disclosures**" - included comments and mutual discussion upon, inter alia: assumed LNG Pricing (see below); LNG plant capacity and production split between LNG and Domgas; Timing Assumptions; Capex; Opex; Abex; Drilling Programmes and assumed post-tax IRR for the LNG Plant (the Midstream Project). As noted in Section 2.7, the calculated Investor IRR (a post-tax number based on this Report's public domain assumptions) ranges from in-line with published Investor IRRs for LNG Projects (for the US$ 12.00 scenario) to 500 bps below published Investor IRRs (in the US$ 5.50 scenario). In turn, this range may impact the Investor appetite to take a FID upon TLNG.

Once the assumptions were agreed to be reasonable by Stanbic Bank and the Operators, the assumptions were input into a public domain, open-source financial model titled "**Multi-Field Upstream, Pipeline and LNG Economics**" published by Columbia Centre on Sustainable Investment ("**CCSI**"), which can be downloaded at [**https://ccsi.columbia.edu/sites/default/files/content/Open-Fiscal-LNG-Model-v2.xlsx**].

The CCSI model financial analysis was then carried forward to the Cost Benefit Analysis ("**CBA**") performed by Conningarth in their work in Section 3, which in turn flowed on to the Macroeconomic Impact Assessment Model ("**MIAM**") from which national macroeconomic results for Tanzania were produced (as well as snapshot results upon the impact of the Project upon the Lindi and Mtwara regions).

Through this Report, Stanbic Bank has modelled four LNG pricing scenarios, which are seen as representing equal probabilities of occurrence. The selected FOB Pricing scenarios were per MMBTU (1) US$ 5.50; (2) US$ 7.50; (3) US$ 10.00 and (4) US$ 12.00 (indexed, base line 2021). Through this Report, the Project generates two different revenue streams: LNG (approximately 98% of revenues) and Domgas (approximately 2% of revenues). This Report currently excludes condensate revenues (around 2% of revenues, due to the early stage of the business case). Within Section 2, we outline key elements of the financial analysis.

In order to make this Report as comparable as possible to Stanbic Bank's 2014 and 2019 MLNG and RLNG Macroeconomic Studies (for ease of analysis by GOT and Civil Society (given the previous reports are in the public domain)), the Report generally outlines the Project's financial reporting in the same manner as did those Reports. Before noting the results, it is important to note significant headline differences between the three LNG projects, which affects an easy comparability by the reader:

- The Project's output is 50% larger than the 10 MTPA MLNG plant then assumed in the 2014 MLNG Macroeconomic Study (by volumes), but is broadly comparable to the 2019 RLNG Macroeconomic Study;
- MLNG's assumed capital costs were provided within the 2014 market environment, whereas RLNG's estimates were made within the 2018-2019 costing environment. Similarly, TLNG's estimates have been made in the 2021 environment. Here, we note the date of drafting and ongoing issues in 2022 (e.g. the return of inflation);
- RLNG's pricing profile is derived from Poten's then current Lender Financial Model case (prior to indexation), whereas the 2014 MLNG Macroeconomic Study included a flat nominal LNG pricing assumption of US$ 12 MMBTU. As noted for TLNG, four pricing scenarios (indexed) have been assumed of US$ 5.50, 7.00, 10.00 and 12.00 MMBTU;

- In the 2014 Study, Mozambique's GDP was US$ 15bn whereas 2018 GDP is US$ 14bn (which affects the relative baselines). As noted above, Tanzania's GDP is US$ 65bn;
- In the 2014 study, prices were based at 2014 whereas in the 2019 Report prices are based to 2018. In this 2022 TLNG study, prices are based to 2021.

Given the stage of Project development, expected capital costs are subject to a range of uncertainties (e.g. Pre-FEED estimates, FEED estimates, EPC tendered prices). That said, economic analysis requires a single number to be set in order for messages to be easily communicated to the GOT and Civil Society. Therefore, the broad funding required to build the Project within the Report is an assumed, (all-in) nominal US$ 32.7bn. Although the PSM includes a seven (7) year construction schedule, the bulk of expenditure is largely incurred between 2025-2030 (i.e. post-FID capex).

In terms of financing structure, the Report assumes that all Upstream, Midstream and Domgas costs will be funded by the licensors/shareholders in Newco pro-rata to their interests in Blocks 1, 2 & 4. For the TLNG upstream development, Newco plans to fund development costs through equity. For the LNG Plant, it is assumed by the GOT that construction costs will be funded through a mixture of equity and project finance debt (for example, a 70:30 LNG Plant Debt to Equity ratio). The issue of financing plays little role in this Report as it is largely focused on macroeconomic and commercial concerns.

From a financial perspective, Standard Bank concludes that in each case the results are highly attractive for the GOT. On a non-discounted basis, in the US$ 5.50 LNG pricing scenario, the GOT earns 59.3% of the available take, in nominal terms, over the first 25 years of plant operations. In the US$ 12.00 LNG pricing scenario, the GOT earns slightly higher 66.5%, over the same period. In the MLNG Study, the comparable percentage was 62% (two train scenario and a comparable gas price) and in the RLNG Study, the average percentage was 65.2% (average across low and high capex scenarios).

On a discounted basis, the discounted take (which includes the time value of money) calculates the total Tanzania Inc take is 242.0% in the US$ 5.50 scenario (N.B. the CCSI model presents information in this format) reducing to 82.7% in the US$ 12.00 scenario, over the same period.

In the MLNG Study, the comparable percentage was 88% (two train scenario) and in the RLNG Study, the average percentage was 92.5% (average across the low and high capex scenarios). Therefore, the Project is of immense importance to Tanzania.

Economic Analysis

Conningarth' s macroeconomic analysis was comprised of two elements. Firstly, a CBA that utilised the same common costing / timing / fiscal platform (with each LNG FOB price scenario being the sole differentiator) as the Financial Analysis above. The CBA was also accompanied by a Benefit Cost Ratio ("**BCR**") analysis. The CBA as supplemented by indexation for Revenues and Opex, before deflation to 2021 constant prices, generally found the same results as the Stanbic Bank financial analysis.

Secondly, a MIAM based upon the latest Social Accounting Matrix ("**SAM**") model for Tanzania (2018 – the latest available) was also performed. As with the Financial Analysis, the economic analysis used the four LNG FOB pricing scenarios. As with previous reports prepared with Stanbic Bank, Conningarth focused its Macroeconomic analysis upon a conventional set of output variables: GDP, GNI, Employment, BOP, fiscal contribution, capital utilisation and

distribution of income. Again, this is to promote comparability and transparency for the GOT and by Civil Society, for what is a crucial national transaction.

Across the four pricing scenarios, the Report shows the following transformative macroeconomic impacts, of unique importance to Tanzania (expressed in annual average 2021 real terms):

- GDP is envisaged to annually increase in real terms 2021 by US$ 7bn (US$ 5.50 Scenario) through to US$ 15bn in the US$ 12.00 scenario.
- We note that between 43% - 48% of GDP benefits accrue to the non-O&G sectors, with the leading other sector beneficiaries being, in the US$ 5.50 scenario, Agriculture (22%) and Financial & Business Services (6%);
- In the US$ 5.50 scenario, GNI (i.e. GDP excluding net foreign transfers) will increase by US$ 5.7bn p.a. through to US$ 13bn in the US$ 12.00 scenario;
- The Project will benefit national capital formation to an annual amount of US$ 50bn in the US$ 5.50 scenario and US$ 58bn in the US$ 12.00 scenario. Significantly, these construction costs will be funded by foreigners and not by Tanzania's relatively limited domestic savings;
- In the US$ 5.50 scenario the Project provides some 277,356 on-site, supply chain and economy-wide job opportunities within Tanzania, rising to 647,048 in the US$ 12.00 scenario. The Project itself is assumed to employ 6,000 people in the construction phase and 500 in the operational phase, with these jobs massively outweighed by the creation of supply chain and economy-wide jobs, that arise from TLNG's procurement spending and contribution to national savings and investment;
- The BOP impact is calculated as US$ 3.4bn p.a. in the US$ 5.50 scenario through to US$ 8.2bn p.a. in the US$ 12.00 scenario;
- Annual fiscal proceeds are expected to range between US$ 2.2bn p.a. in the US$ 5.50 scenario through to US$ 6bn p.a. in the US$ 12.00 scenario;
- The Project increases total household income per capita by 9.8% in the US$ 5.50 scenario through to 19% in the US$ 12.00 scenario; and
- We should be clear the impact of the Project is underestimated as we do not include any of the subsequent economic benefits of the Domgas supplied by the Project being processed in Tanzania through any subsequent Domgas project, or the Domgas being sold for a premium, as well as the Project's Domenergy contribution to security of supply or to domestic benefits arising from the Project's provision of SSLNG into LNG Trucks and / or LNG Bunkering (for LNG sold at or above the FOB price scenarios assumed in this Report), or existing (or upgraded) Tanzanian power generation or industrial customers being supplied at a future date by the Project's Domgas (after their current supply of natural gas (e.g. from Songo Songo or Mnazi Bay) would have been exhausted).

Noting typical challenges facing National Oil Companies ("**NOCs**") in SSA, a pertinent question is the size and structure of TPDC's assumed US$3.9bn Project funding requirement (see below). Each one (1%) equity investment stake by TPDC in the Project's development phase requires (before leverage) an amount of US$ 327m funding (calculated US$ 32.7bn divided by 100). Therefore, the US$ 3.9bn base assumption for twelve (12) % forms part of an overall range of US$ 1.6bn – US$9.8bn. The implications of this are discussed in Section 4.5 below. Stanbic Bank assumes

the Project is one of the major sources of income in time for TPDC's funding requirements. Per Section 4.5 below, we also discuss various considerations surrounding that TPDC is likely to undertake a significantly larger number of activities in Tanzania than its investment in TLNG. Another pertinent issue is the long-term potential creation of a Sovereign Wealth Fund ("**SWF**") or Domestic Stabilisation Fund ("**DSF**") in Tanzania. We assume the balance of GOT's proceeds will be used generally (e.g. when not used to fund badly needed health, social and transportation infrastructure, as well as addressing the major national issue of reducing biomass consumption, in parallel with providing increased energy access and additional energy alternatives for Tanzania's non-urban population).

Commercial Analysis

At date of drafting, the bulk of commercial issues relating to the Project relate to issues surrounding the sale of LNG to global markets in the current ongoing Energy Transition environment (but may be supplemented by geographical / security developments). These issues are not generally Tanzanian or macro-economic in nature. However, given: the recent COP26 and pending COP27 summits; the scale of (and wildly divergent views/opinions upon) commentary on the Energy Transition; the fast-moving nature of the global energy industry (e.g. at date of drafting, Russia / Ukraine dynamics and its implications for Western European energy (and security policy); and associated energy economics, Stanbic Bank has chosen to assess two global issues in detail in Section 4. In this regard, we also note Standard Bank Group's (our parent) recent publication of our Climate Change Policy (SBG, 2022) with its associated obligations.

Within Section 4, we briefly assess:

- Long-term LNG demand and supply within the context of a new East African LNG producer, envisaged to commence production in 2030 and endure until 2059. Clearly, geographical advantages are permanent when targeting major coal-consuming markets such as India (and wider Southeast Asia (e.g. Indonesia)) and China). However, there are wider questions about the impact of potential demand-side innovations to address, above and beyond the obvious target of up to 175 BCFD CTG switching (EQT, 2022);
- Noting potential developments in CO_2 emission abatement technology that may be in place for a LNG project taking FID in 2025 (and which enters production in 2030) and being developed by IOCs with market-leading NZE commitments and obligations (namely Shell and Equinor), commentary upon the likely direction of travel for TLNG's CO_2 emissions for the reference period (2025-2059), i.e. FID through to cessation of LNG production;

In addition to the above, per earlier signalling, within Section 4, Stanbic Bank addresses the linked issues of "Domenergy" and "Domgas". We have initially addressed the crucial issues above, so do not repeat points here. However, we believe that Tanzania's post-2022 approach to the linked issues of Domenergy and Domgas (as relates to a major hydrocarbon export project) is likely to be of global salience and of future influence (e.g. for SSA's oil or mining sectors). At date of drafting, we see a spectrum of outcomes that can include new domestic industries (e.g. SSLNG) naturally not envisaged by a historic 2004 PSA Licensing Round. Ahead of our detailed analysis, Stanbic Bank sees these issues as vital for Tanzania to address (without prejudice to the FID timetable):

- Key issues must always be addressed surrounding the role of a potential onshore "**Aggregator**" (assumed to be TPDC per 2015 Petroleum Law); its credit risk; its corporate structure; pricing and supply portfolio; legislation; fiscal provisions; the nature and structure of any downstream Domgas tenders and independent economic regulation etc;
- Stanbic Bank is strongly supportive of Domgas, to the extent the development of the 15 MTPA is not

impacted as a result (as LNG is of far larger macroeconomic benefit to Tanzania than Domgas. We are not downplaying the importance of Domgas but note that a single MBTU can only be used once for a single purpose, whether within Tanzania or elsewhere). As market observers, Stanbic Bank would assume that additional exploration/appraisal commitments could be negotiated by GOT (subject to the below) to ensure that Domgas benefits above and beyond the plateau Project production (2030-2052);

- A comment that Stanbic Bank made in another Macroeconomic Study is that Marginal Field Terms ("**MFTs**") are always available to be proposed by a sovereign government to potential developers and existing producers. This is something that Angola has had some success developing in recent years, with regard to its mature fields. Inherent options available to the GOT include (1) MFTs and / or licence extensions for either / or of Songo Songo and Mnazi Bay, noting residual volumes and likely future TPDC priorities, as well as the offshore Block 3 that was handed back to the GOT in 2014 by BG Group (could it be connected to Block 4, for example, for Domgas purposes?); and
- We expect the Report's assumption of 200 mmscfd Committed Domgas Volumes, will be reflected by Newco within its POD submission to the GOT, and will be subject to negotiation.

From a TPDC perspective (discussed in Section 4.5), Stanbic Bank believes it is very important to monitor TPDC's long-term funding options. As noted, per the base assumption in this Report, TPDC is required to fund 12% of the Project capex (i.e. US$ 3.9bn), but within an overall assumed range of five (5)% to thirty (30)%. The Project will be TPDC's largest single ever exposure (but will be a one-off) and thus if executed well, TPDC will be in a strong position for the period 2030-2059.

In relation to the Project, Stanbic Bank understands that Newco is developing an equity lifting (or "**Affiliate Buyer**") LNG sales model whereby all shareholders in Newco including, inter alia, TPDC will be eligible to purchase and sell LNG pro-rata to their licensor interests in Newco (i.e. for TPDC, twelve (12)% of Blocks 1, 2 & 4 and 12% of the Project), subject to the discussion in Section 4.5.

From Stanbic Bank's lay perspective, this is a material opportunity for TPDC to potentially develop a regional LNG sales business and to compliment this with increasing experience and developing skills concerning international LNG sales. Clearly, obvious areas of partnership and / or diversification include: SSLNG; LNG Trucking; LNG Bunkering; and potentially Bio-LNG. At a basic level though, TPDC's base assumed credit proposition (to borrow US$ 3.9bn to follow its participation rights) is materially enhanced through direct access to the cash flow arising from twelve (12) % of the LNG sales proceeds and can include multiple options, e.g. partner finance; customer / trader finance; bank finance; Debt Capital Markets ("DCM"); SWF finance etc. This though, under an assumed LNG Plant project financing structure, will require very careful consideration of bankability, target customers, LNG sales partnerships and customers' shipping and logistical arrangements.

From a policy perspective, Stanbic Bank considers it very important for GOT and TPDC to have a close alignment in terms of how TPDC's borrowings will be repaid and over what timeframe. For example, will they be repaid solely by "dividend" payments from Newco upwards to TPDC (which will take longer)? Alternatively, will the GOT consent to some of its tax proceeds being utilised to repay TPDC's borrowings? This issue has implications for TPDC's autonomy and freedom to decide its actions in the 2030s. It is also linked to the creation of a future SWF/DSF by the GOT and what the GOT chooses to spend its future LNG proceeds upon.

Lastly, Stanbic Bank explores the issue of LC and makes certain observations based upon our ongoing experiences in each of Mozambique, Tanzania and Uganda, following their own hydrocarbons discoveries.

Next Steps & Conclusion

- Within the 2014 and 2019 Macroeconomic Studies, Standard Bank outlined LNG's benefits to Mozambique, inclusive of Domgas (which was individually assessed in 2018). Based on our Mozambique experiences, at the date of drafting, Mozambique can be considered a partial success only. Positively, Coral FLNG is on time and to budget and is expected to achieve first gas in 2022. After insurgency disrupted a post-FID MLNG (and to a lesser extent RLNG), MLNG is expected to return to site this year and recommence construction (2022) with RLNG expected to take FID in 2023. Accordingly, noting Afungi's site proximity to TLNG, we urge Tanzania to take on board certain learning points from the experience of its near neighbour. In the Report, we make a few key points:

- The Project is wholly economically beneficial for Tanzania. To pick just two examples, in the US$ 5.50 scenario, GNI will increase by US$ 5.7bn p.a. through to US$ 13.0bn in the US$ 12.00 scenario. Alternatively, In the US$ 5.50 scenario the Project provides some 277,356 on-site, supply chain and economy-wide job opportunities within Tanzania, rising to 647,048 in the US$ 12.00 scenario;

- Given scale, it is clear the Project is Tanzania's best ever economic opportunity and will hopefully be the start of a development sequence that increases Tanzania's income level categorisation (in line with Vision 2025), from its current lower-middle income level (per World Bank definitions as advised in FYDP to one that can comfortably consolidate its lower-middle income status (again, per FYDP), in a global Energy Transition environment;

- Moving forward, changing global events such as Asia-Pacific's move towards cleaner energy offer Tanzania a "once in an existence" opportunity to become a major natural gas supplier to India, wider South-East Asia (e.g. Indonesia, Singapore) and China for the 2030s and beyond (facilitating their CTG switching, with Tanzania adding to the global LNG supplier pool and promoting diversity of supply, thus reducing a buyer's credit risk, topical at date of drafting);

- Within Tanzania, the Project has a number of options to procure its own energy requirements. Subject to security of supply considerations, there is the option to procure some cleaner electricity from JNHPP (consistent with security of supply requirements). We argue that the wider concept of Domenergy (inclusive of Domgas) is a radical development in emerging market export projects and should be seized by Tanzania, noting its long-term benefits. Through using BAT, the scope of the opportunity runs from RE, Domgas and CCGT through to SSLNG and Marine Bunkering. The physical scale, resources and presence of TLNG allows it to be the fulcrum of a new cleaner energy, export base complementing existing Tanzania's hydropower strengths, and focusing upon a reduction of biomass / charcoal consumption by Tanzania's non-urban population and within Dar Es Salaam (a major demand centre);

- After the completion of Pre-FEED post HGA signing (e.g. in late-2022 / early-2023), the GOT could progress "**Enabling Infrastructure**" to facilitate TLNG FID and execution, and ensure there are visible benefits for the Lindi and Mtwara regions ahead of the Project FID. Stanbic Bank note, with the benefit of hindsight, the long-standing onshore Mozambican LNG developments (onshore and offshore) did not include game-changing front-loaded investment expenditure by private or public investors in Cabo Delgado outside of the LNG project site at Afungi. Post insurgency, this has led to a 2022 emphasis on LC expenditure by TotalEnergies, ahead of a potential return to the MLNG site. In contrast, in respect of its own oil development,

Uganda (through the GOU) spent material sums, pre-Project FID on building the HIA and multiple access roads (thus, Enabling Infrastructure) around the area of Lake Albert / Hoima. We see angles here for GOT to explore around the coastal road (both road widening and building town/village bypasses), building new 400 KV TX coastal infrastructure (ahead of inland TX infrastructure), building an extension of the NNGI (both northwards and southwards), progressing a diversification of Mtwara port to become an Export Processing Zone ("**EPZ**") (among others). The intention is to ensure a fast post-FID Project implementation; high LC and public acceptance (promoting TLNG's social licence to operate and implicitly providing regional security benefits). Subsequently, we also see the potential for the Mtwara Corridor Development ("**MCD**") and an east to west TX line from Mtwara to Songea (representing "**Complementary Infrastructure**");

- Bringing it together, we see the possibility of the development of a major cross-border economic corridor (the "**Rovuma Corridor**" spanning Lindi, Mtwara regions and Cabo Delgado province) encompassing a Second Rovuma River Crossing (near the coast), LNG-relevant LC, services, fabrication, light manufacturing, organised employment, training and skills development programmes; agricultural, agro-processing and tourism co-operation by Mozambique and Tanzania for their mutual benefit and joint economic interest. More radically, the corridor could become a cross-border Special Economic Zone ("**SEZ**") with fiscal incentives for non-O&G players, contributing to a wider process of "Rovuma Industrialisation". In the above regard, we note that **US$ 87bn** of onshore FIDs have been made/are planned across **US$ 3.3bn** (2019 figures) of Lindi/Mtwara/Cabo Delgado GDP, with **US$ 11bn** of LC required across the same regions. Stanbic Bank remains confident that these LNG investments will significantly change the underlying countries; and

- When submitted by Newco, the Project's POD should be promptly approved to the extent possible. Our main concern is physical implementation of the Project, a "First Of A Kind" ("**FOAK**") nature in Tanzania. As with the implementation concern expressed in FYDP, we are concerned the scale of bureaucratic requirements and obligations could affect the speed of Project execution.

- Lastly, a phase that Stanbic Bank often uses in such studies is the need for an "Incorporated" national approach to project execution, summarised in the phrase "Inc". On reviewing the FYDP, we were pleased to note the reference to "**Malaysia Inc**" (dating back to 1983) as an inspiration for Tanzania. We cannot argue a better example ourselves.

We commend this Report to the GOT and to Civil Society for review and scrutiny and thank all concerned for their assistance in its preparation.

Key Terms & Definitions

DEFINED TERM	DEFINITION
2014 Macroeconomic Study	Standard Bank's independent Macroeconomic Study (for Anadarko Petroleum Corporation ("APC"), on behalf of Area 1) on the impact of MLNG on Mozambique, public domain since September 2014
2018 Macroeconomic Study	Standard Bank's independent Macroeconomic Study (for Shell, in respect of the Afungi GTL & Power Project), which was privately released to relevant private and public stakeholders in November 2018
2019 Macroeconomic Study	Standard Bank's independent Macroeconomic Study (for ExxonMobil, on behalf of Area 4), on the impact of RLNG on Mozambique, public domain since March 2019
Abex	Abandonment Expenditure (i.e. Decommissioning)
ACFTA	African Continental Free Trade Area
AFDB	African Development Bank
Affiliated Buyers	LNG buyers who are Affiliates (members of the same group of companies) as individual shareholders/licensors in Newco
Aggregator	The monopoly, wholesale purchaser and seller of natural gas envisaged by the 2015 Petroleum Law, expected to be TPDC or an affiliate
ARA	Amsterdam Rotterdam Antwerp
Area 1	Concession originally led by APC (as Operator) in Area 1 of the Rovuma Basin, now led by TotalEnergies
Area 4	Concession originally led by Eni East Africa as Operator, now MRV (owned by ENI, ExxonMobil, CNPC)
ASEAN	Association of South East Asian Nations
BAT	Best Available Technology
BBL	Barrels
Bcf	Billion cubic feet
Bcfd	Billion cubic feet per day

DEFINED TERM	DEFINITION
BCR	Benefit Cost Ratio
BES	Battery Energy Storage
Bio LNG	A biofuel made by processing organic waste flows
Bn	Billion
BOE	Barrel of Oil Equivalent
BOP	Balance of Payments
BP	BP Energy Outlook (2022)
Bpd	Barrels per Day
CAGR	Compound Annual Growth Rate
Capex	Capital Expenditure
CBA	Cost Benefit Analysis
CCGT	Combined Cycle Gas Turbine
CCSI	Columbia Centre on Sustainable Investment
CCUS	Carbon Capture, Utilisation and Storage
CO_2	Carbon Dioxide
COMESA	Common Market for Eastern & Southern Africa
Committed Domgas Volumes	TLNG's assumed proposal in the POD to deliver 200 mmscfd for TLNG
Complementary Infrastructure	Infrastructure which is not "TLNG Vital" but can contribute to the regional growth of Lindi, Mtwara regions and wider Tanzania
CTG	Coal to Gas (Switching)
DCF	Discounted Cash Flow
DCM	Debt Capital Markets
DFI	Development Finance Institution
DGSP	Domgas Sales Price

DME	Dimethyl Ether

DEFINED TERM	DEFINITION
DMO	Domestic Market Obligation
Domenergy	A combination of Domestic Gas and Domestic Electrical Energy (produced by TLNG), encompassing RE, CCGT and the sale of natural gas to the Aggregator (potentially also encompassing SSLNG), which represents this Report's Domenergy Vision
Domgas	Domestic Gas, treated by the Project, also known as a DMO
Domgas Project	Domestic Gas Project
DSF	Domestic Stabilisation Fund
EAC	East African Community
EACOP	East Africa Crude Oil Pipeline
EAPP	Eastern African Power Pool
EATF	Energy & Agriculture Transformation Fund (higher and widened Energy Access, reduced Biomass, agricultural modernisation)
Economy-Wide Impact	The induced impact of the Project defined in the Executive Summary
EITI	Extractive Industries Transparency Initiative
Enabling Infrastructure	As envisaged by this Report, associated coastal road extensions, upgrades, bypasses in Lindi & Mtwara regions; the NNGI extension (north and south); a 400 KV TX extension (from Dar Es Salaam to Mtwara, and potentially south to Mozambique) as well as a second (and coastal) Rovuma River crossing between Tanzania and Mozambique
EOI	Expression of Interest
EPC	Engineering, Procurement & Construction
EPCC	Exploration & Production Concession Contract (Mozambique)
EPZ	Export Processing Zones
Equinor	Equinor ASA
EQT	EQT Corporation, USA

ESIA	Environmental & Social Impact Assessment
ExxonMobil	Exxon Mobil Outlook for Energy (2021)

DEFINED TERM	DEFINITION
FCOE	Full Cost of Electricity
FDI	Foreign Direct investment
FEED	Front End Engineering & Design
FGD	Focused Group Discussion
FID	Final Investment Decision for the Project
First Gas	The initial production of LNG from TLNG (modelled at 1 January 2030)
FOAK	First Of A Kind
FRU	Floating Regasification Unit
FSRU	Floating Storage and Regasification Unit
FSU	Floating Storage Unit
FOB	Free On Board
FV	Future Value
FX	Foreign Exchange
FYDP	(Third) Five Year Development Plan (2021/2022 – 2025/2026), published June 2021
GDP	Gross Domestic Product refers to and measures the domestic levels of production in a country. It represents the monetary value of all goods and services produced within a nation's geographic borders over a specified period of time
GHG	Greenhouse Gases
GIIGNL	International Group of LNG Importers
GIIP	Gas Initially In Place
GJ	Gigajoule
GNI	Gross National Income measures the levels of production of all the citizens or corporations from a particular country working or producing in any country

GOK	Government of Kenya
GOM	Government of Mozambique
GOT	Government of Tanzania

DEFINED TERM	DEFINITION
GOU	Government of Uganda
Greenfield	Development of a project in an area where no project currently exists. For example, TLNG at Kela Fishing Village, Likong'o is a greenfield project, whereas Mtwara is an existing port, thus TLNG's offshore developments are partly brownfield operations
GTI	Gas to Industry
GTP	Gas to Power
HFO	Heavy Fuel Oil
HGA	Host Government Agreement
HIA	Hoima International Airport (Uganda)
HOAs	Heads of Agreements
HV	High Voltage
IDC	Interest During Construction
IEA	International Energy Agency
IFPR	International Food Policy Research Institute
IMF	International Monetary Fund
IMO	International Maritime Organisation
IRR	Internal Rate of Return
JCC	Japan Crude Cocktail
JNHPP	The 2,115 MW Julius Nyrere Hydro Power Plant (under construction), from which the Project may buy certain amounts of electric power
K	Thousands
KIP	Kabaale Industrial Park (Uganda)

Km	Kilometres
LC	Local Content
LCOE	Levelised Cost of Electricity
LCP	Local Content Policy

DEFINED TERM	DEFINITION
LDCs	Least Developed Countries
LGAs	Local Government Authorities
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
Mn	Million
MCC	Millennium Challenge Compact
MCD	Mtwara Corridor Development
Mcf	Thousand Cubic Feet
MFT	Marginal Field Terms
MIAM	Macroeconomic Impact Assessment Model
MMBTU	Million British Thermal Units
MOF	Materials Offloading Facility
MOU	Memorandum of Understanding
mmscfd	Thousand Standard Cubic Feet per day
MTG	Methanol to Gasoline
MTO	Methanol to Olefins
MTPA	Million Tonnes Per Annum
MW	Megawatts
MWh	Megawatt Hours
NBS	Nature Based Solutions
NDP	National Development Plan

NEP	National Energy Policy
NERT	New Emission Reduction Technology
Newco	A SPV formed to own and implement the Project, which is proportionately owned by the Licensors in Blocks 1, 2 & 4. Per Woodmac information, we assume that TPDC owns 12% of Newco and the Investors in Blocks 1, 2 & 4 proportionately own the remaining 88%. We discuss the potential range of equity stakes in Section 4.5

DEFINED TERM	DEFINITION
NGUMP	National Gas Utilisation Master Plan (2016 – 2045)
NNGI	National Natural Gas Infrastructure, a [542]km natural gas pipeline extending from Madimba gas processing facility running northwards to Dar Es Salaam, which can be extended northwards (e.g. to Tanga, Mombasa (Kenya)); North-West (e.g. parallel to EACOP to Mwanza to Uganda, with a potential spur line to Dodoma) and southwards (e.g. to Afungi (Mozambique), with an understood throughput capacity of 738 mmscfd
NOC	National Oil Company
NPV	Net Present Value
NRGI	Natural Resource Governance Institute
NZE	Net Zero Emissions
O&G	Oil & Gas
O&M	Operations & Maintenance
OCGT	Open Cycle Gas Turbine
OGRMA	Oil & Gas Revenues Management Act (2019)
On-Site Impact	The direct impact of the Project defined in the Executive Summary
Operator Disclosures	Defined in the Executive Summary
Operators	Together, Shell and Equinor
Opex	Operating Expenditure
p.a.	Per Annum
Petroleum Act	The Petroleum Act,2015
POD	Plan of Development
PP	Profit Petroleum

Project	The Tanzania LNG Project, including all associated onshore (e.g. MOF and LNG Jetty) and input offshore drilling, gathering and transport infrastructure
Project Vision	Defined in the Executive Summary
PSA	Production Sharing Agreement
PSM	Project Screening Model

DEFINED TERM	DEFINITION
PURA	Petroleum Upstream Regulatory Authority
PV	Photovoltaic Solar
PWC	PriceWaterhouseCoopers
RCF	Rapid Credit Facility
RE	Renewable Energy
REPOA	Research on Poverty Alleviation
Report	This independent Macroeconomic Study
RFI	Request for Information
Rovuma Basin	Offshore basin at the mouth of the Rovuma River, containing large natural gas reserves and resources, non-unitised (in most cases) but spanning two countries containing Area 1 and Area 4 (Mozambique), plus Blocks 1, 2 & 4 (Tanzania)
Rovuma Corridor	The total / aggregation of Lindi, Mtwara regions (Tanzania) and Cabo Delgado province (Mozambique) which have individual GDPs of US$ 1.2bn, 1.6bn and 0.5 bn respectively, which forms the core of the North East and South East Clusters identified by SADC (2019). Rovuma Industrialisation is defined in the Executive Summary.
S&I	Savings & Investment
SADC	Southern Africa Development Community
SAM	Social Accounting Matrix
SANIM	SADC Mission in Mozambique
SAPP	Southern Africa Power Pool
SEZ	Special Economic Zone

SGR	Standard Gauge Railway (under construction in TZ)
Shell	Shell plc
SME	Small & Medium-Sized Enterprise
SOC	Social Rate of Discount
SOE	State Owned Entity

DEFINED TERM	DEFINITION
SPA	Sale & Purchase Agreement
SPV	Special Purpose Vehicle
SRTP	Social Rate of Time Preference
SSA	Sub-Saharan Africa
SSI	Songo Songo Island
SSLNG	Small-scale Liquefied Natural Gas, inclusive of associated storage and regasification options (e.g. FRU, FSU and FSRU)
Stanbic Bank	Stanbic Bank Tanzania together with the Standard Bank of South Africa
Supply Chain Impact	The indirect impact of the Project defined in the Executive Summary
SWF	Sovereign Wealth Fund
TANESCO	Tanzania Electricity Supply Corporation
Tanzania	The United Republic of Tanzania
Tanzania Inc	GOT interests aggregating the income arising from GOT taxation and TPDC income, as well as the wider macroeconomic benefits arising from this Report
TBA	To Be Announced
Tcf	Trillion Cubic Feet
TCRP	Tanzania Covid19 Socioeconomic Response Plan
TPA	Tonnes Per Annum
TPD	Tonnes Per Day
TPDC	Tanzania Petroleum Development Corporation
TX	Transmission

TZ	Tanzania
US$	United States Dollars
USA	United States of America
VAT	Value Added Tax
Vision 2025	The Tanzanian Development Vision (1999)
WHT	Withholding Tax
Woodmac	Wood Mackenzie, a leading publisher of Oil & Gas, Electricity and Energy Transition research, among others

DEFINED TERM	DEFINITION

Chapter 1

Introduction

Purpose of this report

The purpose of this Report is to provide an independent, objective assessment of the Project. Stanbic Bank supported by Conningarth Economists, has prepared an independent Macroeconomic Study upon the financial and macroeconomic impact of the Project upon Tanzania (arising from its production and sale of LNG and Domgas), as well as providing an initial snapshot of its impact upon its host Lindi and Mtwara regions over the period 2030-2059.

The Report explores the Project's on-site impacts at a macroeconomic level as well as both its supply chain and economy-wide effects. This study entails a CBA and a MIAM of the Project.

The Project is sub-divided in two key sub-components, namely:

- US$ 15.6bn **Upstream** Projects (which relates to the offshore development, extraction and transportation of recoverable natural gas through an assumed twenty-four (24) offshore production wells across Blocks 1, 2 & 4), which are augmented between 2038-2043 by a US$ 18bn incremental thirty-six (36) "Mid-Life" Upstream drilling project (to ensure the 2.5 BCFD plateau natural gas production extends to 2052 and overall production to 2059)). Over the period to 2059, some 24.2 Tcf natural gas feedstock is required for the Project's assumed LNG production; and
- A US$ 17.1bn **Midstream** LNG Plant (inclusive of associated facilities), through which the above natural gas is processed and then converted into LNG. The assumed point of sale is the LNG Jetty, where the LNG is sold FOB by the licensors in Newco to Affiliated Buyers (including TPDC, for the whole period 2030-2059).

The macroeconomic impacts of the construction, operational and the re-investment phases of the Project on Tanzania 's economy were projected, with a specific focus on the Lindi and Mtwara regions. Notably, the on-site (direct), supply chain (indirect) and economy-wide (induced) impacts of the Upstream and Midstream elements of the Project were quantified. The economic impact of the Projects is assessed using a standard means of analysis called a MIAM, which flows on sequentially from a CBA analysis and Stanbic Bank's Financial Analysis in Section 2.

Chronology of Activities

The Project chronology to date and Report-assumed Implementation Schedule is as follows:

TABLE 1. 1 CHRONOLOGY OF ACTIVITIES

ASSUMPTIONS	DATE
Issue of PSA Terms (Licensing Round)	2004
Ophir awarded Block 1	2005
Ophir awarded Block 4	2006
Equinor signed Block 2 licence (as Operator)	2007
BG farm into Ophir's Blocks 1 & 4 (as Operator)	2010
First discovery Block 1	2010
First discovery Block 2	2012
HOA signed to pursue Joint LNG Development (across Blocks 1, 2 & 4)	2014
Shell acquires BG Group	2016
Equinor impairs its investment in Block 2	2021
MOU signed for LNG Joint Development between Shell & Equinor	2021
Assumed HGA Signing	2022
Modelled FID	1 January 2025
Modelled First Gas	1 January 2030
Modelled end of Plateau Period (i.e. 2,543 mmscfd)	31 December 2052
Modelled end of Operating Period	31 December 2059

Assumptions

- The final date of drafting is 18th February 2022. For transparency to Civil Society, this was the date the summary presentation of what became this full Report was first presented by Stanbic Bank to the GOT Negotiation and Technical Teams in Arusha, Tanzania. The date has also been selected to avoid any potential short-term Report judgments arising from the Russia-Ukraine invasion, which started on 24th February 2022;
- As noted in detail in Section 2, only public domain information or information publicly available (under payment of subscription / one-off charges to all potential public customers); or publicly available financial modelling platform software (i.e. CCSI) has been used in relation to the Report, except with regard to the Operator Disclosures in Section 2 (all of which are individually disclosed). Graphs/tables extracted from third parties are referenced, the Report's own graphs/tables etc. are not;
- Accordingly, in producing this Report, Stanbic Bank has not had access to the Open Book Economic Model being jointly developed by the Operators and GOT as part of HGA negotiations;
- Although Stanbic Bank previously prepared LNG Macroeconomic Studies in 2014 and 2019, and a Domgas Study in 2018 for Mozambique, such studies represent background information only. The Report is a standalone study upon the Project in Tanzania in February 2022;
- We assume the Project FID will take place in 2025, following the signing and effectiveness of the HGA, and the successful conclusion of, among others, subsequent pre-FEED, FEED and EPC Tender activities;
- From the perspective of our in-house Petroleum Engineer (who has reviewed this Report), we have assumed that the Technical Information provided by Woodmac and / or that discussed with the Operators is correct (given reasonable industry uncertainties at this stage of a material Project development);
- Stanbic Bank understands the Project will sell one hundred (100) % of its LNG output on an FOB basis to Affiliated Buyers of Newco (including TPDC) for the period 2030-2059. We have therefore ignored shipping considerations and assumed the four (4) PSM LNG FOB pricing scenarios represent the price at which LNG is sold by the Project to such Affiliate Buyers and, in turn, the taxation regime under the PSA through which GOT secures its fiscal income envisaged by Sections 2 and 3
- At the date of drafting, Stanbic Bank has not included the impact of TLNG's condensate sales. This is due to the limited commercial development of the condensate business case. Indicatively, the Operators expect that Condensate will account to around 2% of the revenues of TLNG.
- Through this Report, Stanbic Bank is not providing financial advice. We assume that in time, any of Newco (Or individual licensors or shareholders in Newco), GOT and / or TPDC may engage Financial Advisers upon the Project (or their investments in the Project) and this Report does not intend to cut across any of their potential scopes of work in any form (for example, Project capital structure or debt raising and / or debt raising by TPDC);
- Conningarth have based their SAM as at prevailing 2018 information, which has been updated for all publicly available information thereafter. The macroeconomic indicators presented herein in Section 3 are an illustrative example of the macroeconomic outcomes that may be possible from the Project, based upon the assumptions outlined herein, which were underpinned by more detailed assumptions, but cannot be assured or guaranteed (for example, because of any risk factors outlined in this Report); and

- Although we acknowledge they will be required to be assessed in time, for clarity, we have ignored for the purposes of this Report:
- All legal, tax, technical, accounting, insurance, shipping and environmental considerations surrounding the Project; and
- Security considerations. Although discussing physical security matters in detail is outside of Stanbic Bank's professional competence, they are clearly an ongoing issue given (1) the prevailing Force Majeure for each of MLNG and RLNG (Mozambique); (2) the official involvement of GOT forces in the SANIM forces currently active in Cabo Delgado and (3) sporadic security issues within Southern Tanzania;

Project Summary

DESCRIPTION

Per company disclosures, as respective Operators of Blocks 1, 2 & 4, Shell and Equinor have discovered GIIP of over 43 Tcf (between 2010-2014, with Equinor also drilling additional wells in 2015 and 2018) (Shell 2022, Equinor 2018, Woodmac 2021).

The selected primary route to market is an onshore LNG plant (of 15 MTPA capacity) to be located at Kela Fishing Village, Likong'o, Lindi Province (20k north of the town of Lindi, designated a minor seaport within the FYDP), to be supplemented by sales of Domenergy (including Domgas and potentially SSLNG). The LNG plant is likely to comprise multiple mid-scale LNG trains (indicatively 10 x 1.5 MTPA or 5 x 3 MTPA). Overall gas production is 2,543 mmscfd, of which 200 mmscfd has been assumed as Domgas (8% of production, excluding Domenergy, blended across the three blocks).

Offshore operations (e.g. arrival, laydown, assembly and then drilling) will be centred at the major deep water seaport of Mtwara (around 120kms south of the LNG plant site). Mtwara port was recently upgraded by Tanzania Ports Authority from 400 KTPA to 750 KTPA capacity, through increasing available concrete working surfaces as well as building a 300m jetty.

Outlined in Section 2 in detail, total Project development expenditure to First Gas is US$ 32.7bn, divided between US$ 15.6bn Upstream Capex and US$ 17.1bn LNG Plant Capex. Thus, each one 1) % ownership stake of an investor / licensor in Newco requires a funding requirement of US$ 327m (before leverage). In contrast to certain other regional LNG developments, a significant Mid-Life Upstream Capex of US$ 18.4bn is required to ensure plateau production until 2052, and then – the Report assumes gradually declining production until 2059. Thus, lifecycle Capex costs are US$ 51.1bn.

The Project will be developed by Newco. Newco's assumed licensors/shareholders for this Report are as follows:

TABLE 1.2: PROJECT INVESTORS / LICENSORS

Parties		Assumed Interests	Role
Shell, MEDCOENERGI, PAVILION ENERGY	Blocks 1 & 4	44%	Operator (Shell)
equinor, ExxonMobil	Block 2	44%	Operator (Equinor)
	TPDC	12%	

Per Section 4.5, TPDC's equity stake is under negotiation between GOT and Newco. This Report assumes twelve (12) %, being the arithmetical average of Woodmac information on Blocks 1, 2 & 4. However, in Section 4.5, we outline a range of options between five (5) % and thirty (30) %.

GEOGRAPHICAL LOCATION

Please find below the Project location (per Map Studio, 2022). The onshore LNG plant is located south of Mchinga (at Kela fishing village, close to Likong'o); to the immediate south of the Airstrip and 20km north of Lindi. The Project's offshore upstream operations (both initial and Mid-Life) will be centred at Mtwara, to the southeast of Lindi. Visually, the limited physical distance to MLNG/RLNG, represented by Palma and the air strip to its southeast (and potential synergies thereof) can be readily discerned by the reader.

FIGURE 1.1: PROJECT LOCATION MAP

AERIAL REPRESENTATION

Please see below the Project's aerial view in relation to the town of Lindi (visualised in a general South to South Westerly direction from the air). Source: Shell on **www.youtube.com**.

FIGURE 1.2: PROJECT SITE LOCATION AERIAL VIEW

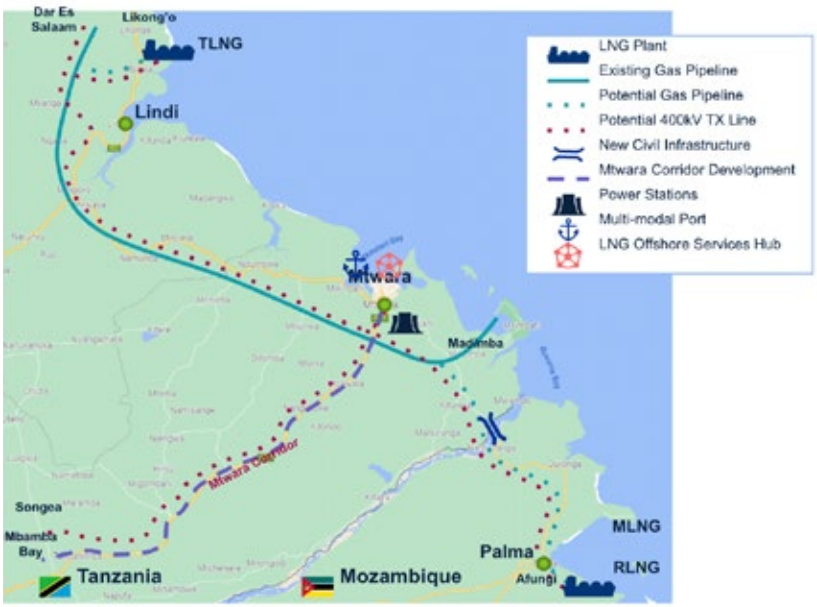
Please see below the Project concept (looking in a south westerly direction from the air), which comprises several mid-scale LNG trains, storage tanks and an LNG export jetty. In this representation, the MOF is not shown.

FIGURE 1.3: PROJECT SCHEMATIC AERIAL VIEW

ANCILLARY OPTIONS & INVESTMENTS

The below schematic shows the importance that TLNG, MLNG and RLNG (as well as Mtwara) can have across Southern Tanzania and Northern Mozambique). We highlight the existing NNGI and potential/planned gas and power TX infrastructure (per this Report).

FIGURE 1.4: ANCILLARY OPTIONS & INVESTMENTS



Noting the multi-faceted objectives of the African Continental Free Trade Agreement ("ACFTA"), EAPP, SADC and SAPP, we envisage that the GOT may consider in parallel with ongoing discussions surrounding TLNG the following initiatives, for which TLNG can be seen as a catalyst and driver:

1. Extending the NNGI pipeline (which runs from Madimba in a northerly direction to Dar Es Salaam), further northwards to Tanga (Tanzania) and then on to Mombasa (Kenya). As a result of it being the terminus of EACOP (which took FID in early 2022) and loading point of Uganda's oil exports (up to c 230 KBPD initially), Tanga is expected to grow into a centre of economic activity in Tanzania (and thus source of potential natural gas demand). Next, Mombasa is a well-known major port in East Africa and the entry point to Kenya (which does not currently have access to any sources of natural gas). There is also the option to extend the NNGI southwards from Madimba to Afungi (Mozambique), the location of MLNG and RLNG, which cross-border distance is only 85kms. We can see multiple arguments in favour of this. Firstly, it allows gas connectivity between the various LNG plants (and their supporting fields) thus promoting future maintenance flexibility across the various plants and fields. Secondly, it promotes cross-border gas trading (for example, if there was insufficient Regional Gas in Tanzania, Mozambique could potentially supply its surplus gas to Kenya, for example). Thirdly, it facilitates Mtwara becoming a potential GTP hub for the EAPP and SAPP. More broadly, increased regional connectivity between Mozambique and Tanzania (the Rovuma Corridor) can only be for mutual trade and benefit (noting Mozambique's security challenges which have sporadically been encountered in Southern Tanzania too). Lastly, there are then inland Regional Gas supply options for Tanzania, where assuming extension of the NNGI to Tanga/Mombasa, there could encompass a parallel

natural gas pipeline built alongside the EACOP pipeline (e.g. Tanga to Uganda (via Mwanza), potentially including a spur to Dodoma from Dar Es Salaam). The inland Tanzania elements could perhaps also be executed by SSLNG (using the SGR). We address these issues more in Section 4.4;

2. Presently, Tanzania does not have any existing HV capacity running south from the Dar Es Salaam region (i.e. from Somanga, around 240kms south of Dar Es Salaam, to Mtwara (per Section 4.4)). There are existing proposals to build a 400 KV TX line from Somanga to Mtwara running above the NNGI servitude, a distance of around 200km, as well as from Mtwara (running west) to Songea, which connects to the Zambia interconnector. As well as intra-Tanzania HV power TX, a southern extension from Mtwara to Mozambique has also been proposed, which runs from Mtwara south into Mozambique as follows – Awasse (with links to the Afungi site) – Macomia – Metoro - Namiolo. A recent example of these plans is shown hereto

   https://clubofmozambique.com/news/mozambique-edm-wants-to-extend-electricity-network-to-tanzania-209056/].

   Clearly, if the Project is proposing to produce Domenergy, in the form of RE and CCGT power, this will need to be evacuated in order to benefit the Tanzanian electricity grid. TX investment would also be necessary to facilitate Mtwara to be a future EAPP/SAPP GTP hub. We envisage bi-directional 400 KV lines will be needed to be built down the TZ coast (inclusive of JNHPP being able to supply the Project) and to link to Mozambique;

3. Expanding coastal Road capacity and building bypasses around towns and villages in Lindi and Mtwara regions. Clearly, a major US$ 32.7bn construction project in the Lindi and Mtwara areas will entail a huge increase in road traffic (e.g. lorries, earth moving / construction / mechanical equipment during the seven year (7) full construction period, buses for workers etc.). More broadly, the macroeconomic growth projections outlined in this Report clearly shows there are national GDP benefits arising from the Project, as well as massive regional benefits for each of Lindi and Mtwara. As is well known in emerging markets lacking transport alternatives, GDP growth promotes increased traffic and congestion Accordingly, we recommend a major road expansion/bypass programme in each of the Lindi and Mtwara regions, ideally contractually agreed and under construction before TLNG's FID (e.g. by 1 January 2024, a year before the target Project FID of 2025). As well as having major economic benefits (e.g. reduced journey time, facilitating the fastest possible Project construction period), there will also be social benefits (e.g. reduced risk of traffic accidents in villages, potentially involving children, as well as increased national, regional and local integration of Tanzania);

4. Along similar lines to the NNGI and TX expansions, on a forward-looking basis, the GOT could propose a more significant second Rovuma River crossing to Mozambique. There is already an existing bridge substantially inland (the Unity Bridge opened in 2010, running from Mtambaswala (Tanzania) to Negomano (Mozambique)). However, this is around 160kms inland from the coast (where commerce and public transport would ordinarily be most expected to occur). Noting the envisaged existence of US$ 87bn of multiple coastal LNG plants / offshore bases (from Li'Kongo, within 100 (Mtwara) - 220kms (Afungi) of each other), we recommend that a Second Rovuma River Crossing could be considered between Mwambo (Tanzania) and Mutita (Mozambique) inclusive of border / customs control facilities, fairly close to the ferry location and shown in Figures 1.1 and 1.4. We are aware of various SSA examples. For example, the Katembe Bridge in Mozambique, which among others shortens journey times between South Africa (KZN province)

and Maputo, as well as long-standing Southern African examples such as Beit Bridge (SA-Zimbabwe) and Victoria Falls Bridge (Zimbabwe-Zambia), which opened as far back as 1905. We are also aware of the recent landmark Kazungula Bridge completion (Botswana-Zambia), which curved design avoids incursions into each of Zimbabwe and Namibia. Further, we note the long-standing and highly popular Malaysia-Singapore border crossing (first opened in 1925), with connectivity supplemented after the signature of the ASEAN agreements (a potential proxy for ACFTA growth. Noting this, we believe that greater connectivity can and should develop between Southern Tanzania and Northern Mozambique (the Rovuma Corridor) and a well-sited bridge crossing can facilitate this. Crucially, we envisage that better road/logistical connectivity can facilitate enhanced cross-border LC, light manufacturing, fabrication, logistics, services, agriculture, agro-processing, organized employment, training and skills programmes and tourism synergies (e.g. more cross-border flights, two-country visas, two centre holidays) around the three (3) onshore LNG plants; and

5. Further, we include the MCD – intended to better connect Tanzania to Malawi and, in turn, Zambia through Mbamba Bay (on Lake Malawi). An ambitious development, the MCD will facilitate an already-modernised Mtwara port to become a multi-modal Port (potentially driven by iron ore, graphite and TLNG offshore operations, potentially also including an EPZ for mining output). As outlined in the FYDP, the intention is to build a railway line between Mtwara and Mbamba Bay which would service the targeted iron ore exports. There is also the possibility for the railway line to serve coal exports and a developing graphite option. In the original thinking around the MCD (dated 2010), there were also proposed links to Mozambique (e.g. through the Unity Bridge). Our general assumption now though, is the subsequent discovery of major natural gas and subsequent development of LNG has made Mozambique's development – and that of Tanzania - more coastal in nature. Coupled with the well-known security issues around the Mocimba Do Praia, Afungi and Palma areas, we expect the Mozambique – Tanzania development focus will now be centred on unlocking and developing the coast (per 4 above), before moving inland.

Following the economic analysis of Section 3 (including a snapshot of the Project impact on the Lindi and Mtwara regions) and the Commercial Analysis of Section 4, we pull together our thinking to suggest some integrated policy options for the GOT in Section 5.2 which we believe will have major LC benefits for each of Mozambique and Tanzania and thus promote additional mutual economic benefits. Thus, Stanbic Bank considers the two countries have a "Joint Economic Interest" in developing the Rovuma Corridor across the relevant three (3) regions/provinces, being Lindi, .

As a wider point, we believe that national infrastructure expenditure is a key means by which Tanzania's LNG proceeds can be practically transferred to regions other than Lindi and Mtwara. A crucial finding of this Report is around 43 - 48% of the GDP benefit of the Project (depending on LNG Price scenario) is distributed to the non-O&G sectors within Tanzania. We therefore encourage representatives of, among others, Tanzania's power, transportation, manufacturing, services, agriculture, agro-processing, consumer and tourism sectors (among others) to review the Report, with a view to determining how their own sectors can benefit.

Report Structure

Per The remainder of this document comprises the following chapters:

- Chapter 2: Financial Analysis;
- Chapter 3: Economic Analysis;
- Chapter 4: Commercial Analysis; and
- Chapter 5: Conclusion & Recommendations.

In addition, we also outline as background and supporting information the following Annexures:

- Annexure 1: Cost Benefit Analysis,
- Annexure 2: Social Accounting Matrix,
- Annexure 3: Third Party Bibliography,
- Annexure 4: Contact Details

Chapter 2

Financial Analysis

Assumptions and Methodology

Within this Report, Stanbic Bank almost entirely derived its analysis from the public domain (under subscription/ purchase or freely available) reports published by Woodmac on:

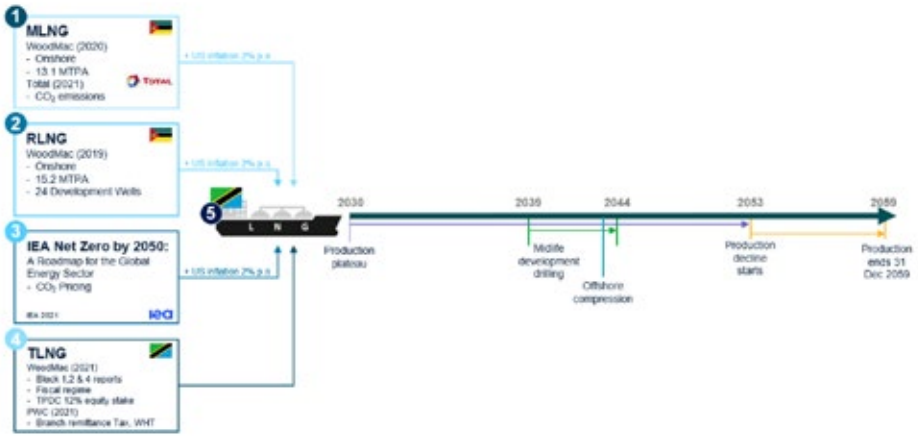
- comparable LNG development projects in Mozambique (MLNG / RLNG); and
- Tanzania's fiscal position outlined in Blocks 1, 2 & 4;

For transparency, the applicable reports are listed in **Appendix 6.3**. In the process of data collection, verification and preparing its calculations, Stanbic Bank engaged with the Operators. The assumptions used throughout the PSM are almost entirely those used by Woodmac (adjusted for inflation for the later implementation of TLNG, compared to the assumed implementation schedule of MLNG and RLNG) with the following specific amendments made, being the "**Operator Disclosures**":

- 15 MTPA onshore; 2543 mmscfd (2.5 Bcfd) offshore gas production of which 200 mmscfd represents Domgas
- Plant capex assumption of US$ 1,000 per tonne, thus US$15bn
- Mid-life development drilling of 36 new wells (6 wells p.a. for 6 years, 2038 - 2043)
- US$5.5bn Exploration & engineering study costs incurred to date
- Abex is included in Opex (calculated at 10% of Capex), plus Local Content (representing 17% of capex, 40% of O&M)
- 30-year production with production decline starting in 2053
- Major RE production built into the LNG plant
- Four LNG FOB price scenarios considered.
    - US$5.50 / MMBTU;
    - US$7.00 / MMBTU;
    - US$10.00 / MMBTU; and
    - US$12.00 / MMBTU

The only exceptions to the above (i.e. the Report used Woodmac and the Operator Disclosures) are TotalEnergies' disclosure of MLNG CO_2 emissions (2021); carbon tax values extracted from the IEA Net Zero by 2050 document (2021) and PWC's general taxation guide to Tanzania (2021). The below schematic highlights the assumptions used and how they feed into the methodology used in the Financial Analysis in this Section 2:

FIGURE 2.1: PSM METHODOLOGY SCHEMATIC



The agreed assumptions have been used in the CCSI model - Sustainable Investment: Multi-field Natural Gas Upstream, Pipeline and LNG Economics model.

https://ccsi.columbia.edu/sites/default/files/content/Open-Fiscal-LNG-Model-v2.xlsx

The CCSI model provides forecasted returns of a LNG project separately to the Investor and to the respective Government (in this Report's case, GOT). These estimates are based on fiscal, market, technical and corporate input variables, many of which are forward looking assumptions (and inherently subject to uncertainty). The analysis provides Investors with an indicative post-tax IRR, allowing the Investor to determine whether to go ahead with the investment (i.e. take FID or stop the Project), and allows the GOT to compare their fiscal regimes with their peer countries and to assess how much revenue will flow into the state coffers from a particular project.

The CCSI model assesses the financial returns of the Upstream Project, separately from the LNG Plant Project, on a tolling regime, whereby the LNG plant charges the Upstream gas suppliers a tolling fee for its services (i.e. processing the natural gas into LNG) and is taxed separately from the Upstream by the GOT.

The Project structure is segmented whereby upstream and midstream are separate Project entities for regulatory and tax purposes within Tanzania. The PSM upstream fiscal regime is based on the Woodmac assumed PSA fiscal arrangements for Tanzania, whilst the midstream (LNG plant) taxation is based on general legislation in Tanzania. In a segmented structure, it is expected that the fiscal regimes provided in the current PSAs will be levied on the upstream (which will comprise both the offshore blocks and pipelines taking the raw natural gas to shore), but a different fiscal regime will be agreed and levied on the LNG plant. It is anticipated that the LNG plant is taxed as a normal business entity in Tanzania (i.e. under the standard income tax regime) but subject to the rules set out in the Finance Act 2016 and Written Laws (Miscellaneous Amendments) Act 2017 for O&G projects. Subject to the discussion in Section 4.5, we assumed that TPDC also has a twelve (12) % interest in the LNG plant so that incentives for TPDC and all other Investors are aligned across the value chain. As a practical matter, we assume all of this will be negotiated and agreed within the HGA.

Production estimates are based on the size of the LNG plant and the amount of natural gas production is assumed as required for it to operate at maximum capacity; projected domestic demand for the gas; and the estimated output capacity of the offshore blocks (1, 2 & 4).

Most of the gas will be processed and exported as LNG. It is accepted that any offshore gas not exported as LNG will be supplied to the Tanzanian domestic market in the form of Domgas. The LNG Plant is located relatively close to the existing pipeline trunk line (the NNGI) that currently supplies the domestic market with Domgas (centred on Dar Es Salaam), with some local sales occurring in Mtwara.

Based on historical prices for onshore gas supplied by Songo Songo and Mnazi Bay, we continued to assume an average Domgas Sales Price ("**DGSP**") of US$4 per MMBTU for offshore produced gas by the Project and supplied to the domestic market.

The life of the Project is assumed 30 years: 2030 - 2059.

All MLNG and RLNG Capex / Opex financial assumptions have been inflated at 2% p.a. to reflect the TLNG timeline (relative to the 2019/2020 assumed timetable for MLNG and RLNG).

The following detailed assumptions were used in the Cash Flow Analysis and transferred into the CBA analysis of the Project and depicted in a series of Tables per below.

PSM LNG Price Scenarios

The PSM financial analysis considered four (4) LNG price scenarios on an FOB basis (without any assessment of their probability of occurrence):

- US$5.50 / MMBTU;
- US$7.00 / MMBTU;
- US$10.00 / MMBTU; and
- US$12.00 / MMBTU

The four (4) price scenarios were considered, discussed and agreed with the Operators for reasonableness. The four (4) different scenarios allow for a comparison of returns, fiscal proceeds and macroeconomic impacts across potentially changing LNG price environments. We note that at date of drafting, the short-term price of LNG cargos is currently trading at much higher levels than the LNG Price scenarios, per the below, although this has no bearing

on this Report.

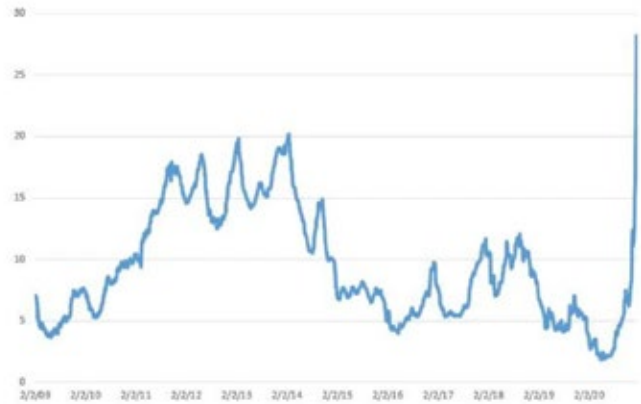


FIGURE 2.2: BENCHMARK LNG PRICE (ASIA) (US$ / MMBTU)

Source: S&P Platts Global

With recent weather uncertainties and global supply concerns, it is expected that prices will remain higher than the recent past throughout 2022, seen by the below Henry Hub natural gas spot price forecast.

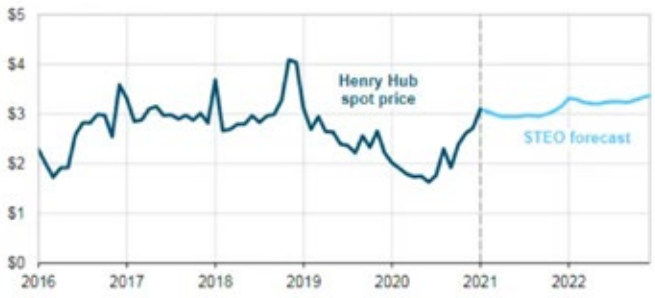


FIGURE 2.3: MONTHLY HENRY HUB NATURAL GAS SPOT PRICE (JAN 2016 – DEC 2022) (US$ / MMBTU)

Source: U.S. Energy Information Administration, Short-Term Energy Outlook

Traditionally, in its crucial Asia-Pacific demand markets, LNG has been priced as a percentage of Brent Crude Oil, or in terms of the closely linked Japan Crude Cocktail ("**JCC**"), with contract prices reset on a periodic basis (e.g. monthly or quarterly). This has meant that LNG prices can be volatile. Per our conclusions in Section 3.7, this may have implications for the predictability of revenue receipts by the GOT (which in turn may impact upon post-LNG socio-economic spending programme decisions in a low oil price environment (such as that of 2020)). As an example of this volatility, please see below historic fifty-year (50) Brent Crude Oil Prices (per Trading Economics), from 1972 to

the date of drafting. The volatility from c 2005 to the present day is visually evident.

FIGURE 2.4: HISTORIC BRENT CRUDE OIL PRICE

Within the Report, the financial analysis was performed with each of the above LNG price scenarios, with prices adjusted for inflation throughout the Project life. Cost assumptions remained constant across the four (4) PSM scenarios for modelling purposes (i.e. only the assumed FOB LNG prices changed).

Project Costs

The project costs were largely imputed from Woodmac's reports on MLNG (onshore costs) and RLNG (offshore costs – as RLNG's supporting fields are located in deeper water than MLNG and are thus more reflective of TLNG's development). Thus, TLNG's cost assumptions are largely extrapolated from two regional LNG projects in development. Capex costs were assumed to be similar on an planned installed capacity adjusted basis, with similar timing considerations. Note these costs were assumed (1) prior to the Force Majeure being declared on MLNG and RLNG in 2021 and (2) the inclusion of inflation (at 2% p.a.) to reflect the passage of time between for example, the MLNG FID (2019) and that of TLNG (2025). Note the bulk of TLNG's Project Costs relate to the offshore costs, both initial and Mid-Life additional drilling (comprising c.66% of total costs), whereas MLNG and RLNG pertains to onshore costs.

The 15 MTPA LNG plant, on a NZE pathway, is calculated to cost US$ 15bn (real 2021). The below Table 2.1 highlights

the upstream capex (US$ mn) considered in the financial analysis, incurred up to the end of the construction period

Nominal	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Exploration, Pre-FEED & FEED	5,028.3	-	5,028.3	-	-	-	-	-	-	-	-
Production Facilities	1,110.8	-	-	-	-	197.1	221.7	226.1	230.7	235.3	-
Processing Equipment	1,455.5	-	-	-	-	262.4	289.5	295.3	301.2	307.2	-
Subsea	1,933.9	-	-	-	-	-	344.6	421.8	430.2	438.8	298.4
Development Drilling	2,417.4	-	-	-	-	-	430.8	527.2	537.8	548.5	373.0
Pipeline	3,224.2	-	-	-	-	-	-	1,034.6	1,083.9	1,105.6	-
Engineering Studies	451.1	208.1	106.1	54.1	82.8	-	-	-	-	-	-
Total	**15,621.1**	**208.1**	**5,134.4**	**54.1**	**82.8**	**459.5**	**1,286.5**	**2,505.0**	**2,583.8**	**2,635.5**	**671.4**

TABLE 2.1: KEY UPSTREAM CAPEX ASSUMPTIONS

The Mid-Life Upstream capex (supporting the drilling of thirty-six (36) new development wells) is required to ensure the 2,543 mmscfd natural gas production (i.e. LNG plant feedstock) volumes remain sufficient to maintain LNG production at the full capacity of 15 MTPA until December 2052. This is included in the financial analysis and shown in the below Table 2.2:

Nominal	Total	2039	2040	2041	2042	2043	2044
Exploration, Pre-FEED & FEED	-	-	-	-	-	-	-
Production Facilities	-	-	-	-	-	-	-
Processing Equipment	-	-	-	-	-	-	-
Subsea	-	-	-	-	-	-	-
Development Drilling	17,298.3	2,742.2	2,797.1	2,853.0	2,910.1	2,968.3	3,027.6
Offshore Compression	1,082.2	-	-	-	-	1,082.2	-
Engineering Studies	-	-	-	-	-	-	-
Total	**18,380.5**	**2,742.2**	**2,797.1**	**2,853.0**	**2,910.1**	**4,050.5**	**3,027.6**

TABLE 2.2: KEY UPSTREAM CAPEX ASSUMPTIONS - MID-LIFE CAPEX

Table 2.3. on the following page, highlights the LNG Plant assumptions in terms of timing, construction periods and Capex. The financial analysis assumes that the LNG Plant operates on a Tolling basis, charging a tariff (per MMBTU)

that results in a 10% post-tax IRR for the LNG Plant, and its Investors (including TPDC).

Assumptions	US$m unless stated	Assumptions	US$m unless stated
Index Start Date	1 January 2021	Cost of Capital	10%
Construction Start Date	1 January 2024	TPDC Equity Stake	12%
Construction Period	84 months	GOT Discount Rate	5%
Operating Period	30 years		
End of Operating Period	31 December 2059	LNG Plant Tariff	US$ 2.93 mmbtu (2021)
Inflation	2% p.a.		US$ 3.50 mmbtu (2030)
Capex			
2024	1,532.0	Straight Line Depreciation	5 years
2025	3,099.9	Income Tax	30%
2026	2,838.9	Branch Remittance & WHT	10%*
2027	3,913.5		
2028	3,247.1		
2029	1,940.9		
2030	542.3		
Total	17,114.6		

TABLE 2.3: KEY LNG PLANT ASSUMPTIONS

As noted, the potential range of TPDC equity stakes in discussed in Section 4.5. Per PWC (2021), we note that Tanzania levies each of a branch remittance tax and withholding tax ("WHT") on foreign entities operating in Tanzania. The CCSI Model used does not make provisions for branch remittance and withholding taxes. As such, as a proxy, we modelled an increase in the income tax rate by an additional 6.16% accounting for the foreign investor entire Net Profit After Tax to remitted abroad. This increase in Income Tax results in the same net effect of including branch remittance tax and WHT. Below we highlight a working example of the proxy calculation:

TABLE 2.4: WHT AND BRANCH REMITTANCE TAX PROXY CALCULATION

Net Profit		100.00
Income Tax (30%)	-	30.00
NPTAT		70.00
TPDC (12%)		8.40
Investor (88%)		61.60

Accordingly, an additional 6.16 for every 100 (61.60 x 10%) would be remitted/paid (as the TPDC dividend remains in

country). We therefore model an increase in the income tax rate by an additional 6.16%.

Project Operations

The table below highlights the assumed LNG Plant production uptime, product loss ratio and LNG Plant Opex. We included an Opex assumption of US$ 3.50/Mcf (2030) and escalated it over the life of the project by the assumed inflation rate. We note that the Abex costs are included in the Opex costs over the life of the LNG Plant and are assumed at 10% of the Capex (per above).

Production (mmcfd)	2030	2035	2040	2045	2050	2055	2060
% Uptime*	94	94	94	94	94	94	-
% Product Loss	-	-	-	-	-	-	-
Opex US$m (incl Abandonment costs)	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**
Plant	142	393	434	480	529	585	-

TABLE 2.5: KEY LNG PLANT ASSUMPTIONS - PRODUCTION AND OPEX

CO_2 Emissions

Project specific CO_2 intensity is becoming central to energy projects' capital allocation and investment decisions, particularly for greenfield projects with long project lives (noting the Paris Agreement timelines).Shell have targeted being a NZE business by 2050, and also have interim targets along the way. In October 2021, Shell set a target to reduce absolute emissions by 50% by 2030, compared to 2016 levels, which covers all Scope 1&2 emissions. This additional commitment is aligned with their existing targets: to reduce the carbon intensity of the energy products sold by 20% by 2030, by 45% by 2035, and by 100% by 2050.

Equinor has made public declarations of support to the Paris Agreement and a NZE future. Equinor have committed to becoming a leading company in the global energy transition, contributing to a net zero society via, reducing emissions from their production of Oil & Gas, accelerating investment in RE, investing in low-carbon technology and NBS.

Whilst Tanzania does not currently levy a specific tax on CO_2 emissions, a cost of mitigating the impact of TLNG's carbon intensity has been considered and included in the Report's financial analysis equivalent to a full offset of Scope 1 & 2 emissions in Tanzania (given the Project's lifecycle to 2059).

The costs included in the PSM could be used by the Project to mitigate its own CO_2 emissions: via offset initiatives in Tanzania (for example, Carbon Sinks through NBS); the protection and preservation of existing forested areas; the planting of new vegetation to recreate a forest environment; restoring nutrients to poor soil, encouraging growth of endemic species; land for agroforestry crops, or NERT investing in new carbon reducing technology in the future.

GHG emission intensity for the Project:

- Calculated Upstream + LNG plant Scope 1+2 emission figures;

- 25kgCO_2/boe, per Total (2021) for MLNG;
- The average emission intensity from Shell's public disclosures across Upstream & Integrated Gas divisions is 22.26kgCO_2/boe;
- The above number is converted from Shell's corporate disclosure of 0.159 tCO_2e/tHC for Upstream & Integrated (Shell Sustainability Report, 2020); and
- 2021's published IEA NZE by 2050 scenario - a roadmap for the global energy sector - proposes incremental CO_2 pricing for the electricity generation, industry and energy production sectors. We have extracted its discussion pricing for Other Emerging Market and Developing Economies as a proxy for Tanzania.

TABLE 2.6: IEA NET ZERO EMISSIONS CARBON PRICING

US$ (2019) per tonne of CO_2e	2025	2030	2040	2050
Other emerging market & developing economies	3	15	35	55

- The Project assumes a flat US inflation rate of 2% p.a. on the proposed pricing for the periods between the different incremental pricing steps.
- The Project uses the estimated emission intensities, and the proposed IEA NZE carbon pricing that enables the modelling of the economic impact of GHG emission taxes on the Project.

Tanzania Inc Revenues

UPSTREAM

The "Tanzania Inc" (i.e. GOT as a whole including TPDC) share of project revenues come from multiple taxation / equity income sources inclusive of:

- **State Participating Interest** – According to Woodmac, TPDC has slightly different back-in investment rights across Blocks 1, 2 & 4. For the Report purposes, and subject to the discussion of Section 4.5, we have averaged them out at [12]% in the Upstream, thus TPDC will receive [12]% of the post-tax upstream profits
- **Taxation** - 30% Tax on Newco profit share for the Upstream Project.
- **Profit Sharing** - The Profit Petroleum generated by each development area will be split between the GOT

and the Investors in Newco on the basis of the below production rates

Threshold	Production Rate (mmcfd)	GoT Share	Investor Share
Threshold 1	300	30.0%	70.0%
Threshold 2	600	35.0%	65.0%
Threshold 3	900	37.5%	62.5%
Threshold 4	1 200	40.0%	60.0%
Threshold 5	1 500	45.0%	55.0%
		50.0%	50.0%

TABLE 2.7: PRODUCTION SHARING THRESHOLDS

Note: Per the PSA documentation, the TPDC share is included in the Investor share, which infers that the true GOT share will be higher, as it includes [12]% of the Investor share

- **Royalties** - levied at 5%, will be physically paid by TPDC on behalf of the Investor share

The Upstream Investors are entitled to Cost Recovery (for expenditure upon capex, opex etc.) which is on a straight-line basis of up to 70% of annual production. Cost Recovery allows the Investors to recover their investment and share of operating costs associated with the Upstream Projects.

LNG PLANT

- **State Participating Interest** – The Report assumes that TPDC will have an option to participate in the LNG plant pro rata to its interests in the Upstream Project and exercise an option to indeed participate. Section 2 therefore assumed (and subject to the discussion in Section 4.5) that TPDC will hold a twelve (12) % stake in the LNG Plant. As a part-owner of Newco, TPDC will therefore receive twelve (12) % of the post-tax LNG Plant profits
- **Taxation** - 30% Tax on LNG Plant profits

Note: We assume that the LNG plant will operate under a tolling structure (often seen in US LNG projects), with the tolling fee set to a 10% (nominal) breakeven post-tax IRR.

PSM RESULTS

The below table highlights the Project Cashflows, across the four (4) different PSM LNG price scenarios, and then shows the split in cashflows that are due to the Investors, and those due to the GOT. For this calculation we include the cashflows due to TPDC (as an assumed twelve (12) % minority Investor in Newco), with the GOT cashflows (as TPDC is wholly owned by the GOT) noted separately. Table 2.8 below then highlights the respective Project returns (from a financial perspective, for each of the four (4) LNG price scenarios, for the full project period (from construction out

to the end of LNG Plant operations in 2059)

US$ mn unless stated	US$ 5.50 MMBTU FOB	US$ 7.00 MMBTU FOB	US$ 10.00 MMBTU FOB	US$ 12.00 MMBTU FOB
Net Project Cashflow	132,336	185,965	293,224	362,647
Investor (ex TPDC)	53,880	69,903	101,948	122,690
Government (incl TPDC)	78,456	116,062	191,276	239,957
Investor IRR Upstream (Post-Tax)	5.0%	8.6%	13.2%	15.3%
Investor IRR Plant (Post-Tax)	10.0%	10.0%	10.0%	10.0%
Investor IRR Blended (Post-Tax)	7.7%	9.3%	11.8%	13.1%
GoT Total Income	**71,109**	**106,530**	**177,374**	**223,227**
GoT Fiscal Take (incl TPDC, non-discounted)	**59.3%**	**62.4%**	**65.2%**	**66.2%**
GoT Fiscal Take (incl TPDC, discounted)	**214.1%**	**111.7%**	**86.7%**	**82.0%**

TABLE 2.8: KEY PSM RESULTS TABLE | OPERATIONS 2030 - 2059

For comparative reasons, we also include the Key PSM results for a 25 year operating period, 2030 - 2054, to highlight the TLNG total GoT income in relation to the MLNG and RLNG projects in neighbouring Mozambique (which reports were published in 2014 and 2019 respectively).

US$ mn unless stated	US$ 5.50 MMBTU FOB	US$ 7.00 MMBTU FOB	US$ 10.00 MMBTU FOB	US$ 12.00 MMBTU FOB
Net Project Cashflow	117,550	166,191	263,473	326,439
Investor (ex TPDC)	47,799	62,158	90,874	109,461
Government (incl TPDC)	69,750	104,033	172,599	216,978
Investor IRR Upstream (Post-Tax)	5.0%	8.6%	13.2%	15.3%
Investor IRR Plant (Post-Tax)	10.0%	10.0%	10.0%	10.0%
Investor IRR Blended (Post-Tax)	7.7%	9.3%	11.8%	13.1%
GoT Total Income	**63,232**	**95,557**	**160,207**	**202,052**
GoT Fiscal Take (incl TPDC, non-discounted)	**59.3%**	**62.6%**	**65.5%**	**66.5%**
GoT Fiscal Take (incl TPDC, discounted)	**242.0%**	**115.1%**	**87.7%**	**82.7%**

TABLE 2.9: KEY PSM RESULTS TABLE | OPERATIONS 2030 - 2054

The above table is referred to in the Executive Summary, where reference is made to the GOT take across LNG price scenarios. Whilst the overall Net Project Cashflows and GOT Total Income figures are slightly lower in the 25-year scenario (as fewer years of revenues are included), the GOT fiscal take as a percentage does not differ greatly.

Key Discussion Points

From the PSM Results, we note:

- In three of the four LNG price scenarios, the post-tax Investor IRR is below public blended LNG project IRR benchmarks

  - e.g. LNG Canada (Canada) 13%, Pluto/Scarborough LNG (Australia) ~13.5%
  - However, in the US$ 12.00 LNG price scenario, the post-tax investor IRR is 13.1%

- However, note the projected **Tanzania Inc** income is very large in all cases, per table 2.8 above, (noting that TPDC owns 12% of TLNG (per the base assumption of this Report100) but GOT taxes % of TLNG), as follows:
  - **US$ 71.1bn** (US$5.50 MMBTU)
  - **US$ 106.5bn** (US$7.00 MMBTU)
  - **US$ 177.4bn** (US$10.00 MMBTU)
  - **US$ 223.2bn** (US$ 12.00 MMBTU)

- However, this income level must be balanced against the need for the Investors to achieve minimum Investor post-tax IRR hurdle rate for them to invest in the US$ 32.7bn TLNG (which in turn generates the above income for GOT).

- In considering the Investor IRR results, we note the February 2022 regional Sovereign bond yield for c. 10Y maturity at c. 7% (Kenya 11.4Y for 7.0%) as a proxy for Tanzanian sovereign IRR
  - prior to TLNG project-specific risk elements being added.

Outside of the PSM specifics, we must also consider TPDC's ability (with or without the help of GOT) to fund its share to follow their twelve (12)% upstream back-in rights, and matching LNG plant participation (see Section 4.5).

Chapter 3

Economic Analysis

Tanzania: An Overview

As noted in the Executive Summary, Tanzania is naturally central to East Africa (it shares a border with eight (8) countries of which six (6) are land-locked. Please see below a country map, where Tanzania's centrality within East Africa is visually apparent.

FIGURE 3.1: MAP OF TANZANIA

Source: Wikipedia

Tanzania has the largest population in East Africa 58,552,845 (July 2020 est.[3]) and the lowest population density; almost a third of the population is urban. Tanzania's youthful population – about two-thirds of the population is under 25 – and three quarters are under 35 (FYDP) - is growing rapidly because of the high total fertility rate of 4.8 children per woman. Progress in reducing the birth rate has stalled, sustaining the country's nearly 3% annual population growth. The maternal mortality rate has improved since 2000, yet it remains very high because of early and frequent pregnancies, inadequate maternal health services, and a lack of skilled birth attendants – problems that are worse among poor and rural women. Tanzania has made strides in reducing under-5 and infant mortality rates, but a recent drop in immunization threatens to undermine gains in child health. Malaria is a leading killer of children under 5, while HIV is the main source of adult mortality. As such, the fiscal proceeds from TLNG have multiple health sector allocation possibilities.

3 https://theodora.com/wfbcurrent/tanzania/tanzania_people.html

For Tanzania, most migration is internal, rural to urban movement, while some temporary labour migration from towns to plantations takes place seasonally for harvests. Tanzania was Africa's largest refugee-hosting country for decades, hosting hundreds of thousands of refugees from the Great Lakes region, primarily Burundi, over the last fifty years. However, the assisted repatriation and naturalization of tens of thousands of Burundian refugees between 2002 and 2014 dramatically reduced the refugee population.

Tanzania has achieved high growth rates based on its vast natural resource wealth and tourism with GDP growth in 2009-17 averaging 6%-7% per year. Tanzania has largely completed its transition to a market economy, though the government retains a presence in sectors such as telecommunications, banking, energy, and mining (e.g. TANESCO, TPDC).

As elsewhere in SSA, the economy depends on agriculture, which accounts for slightly less than one-quarter of GDP and employs about 65% of the work force, although gold production in recent years has increased to about 35% of exports. All land in Tanzania is owned by GOT, which can lease land for up to 99 years.

The financial sector in Tanzania has expanded in recent years and foreign-owned banks account for about 48% of the banking industry's total assets. Competition among foreign commercial banks has resulted in significant improvements in the efficiency and quality of financial services, though interest rates are still relatively high. Banking reforms have helped increase private-sector growth and investment.

The World Bank, the IMF, and bilateral donors have provided funds to rehabilitate Tanzania's aging infrastructure, including rail and port, which provide important trade links for inland countries. In 2013, Tanzania completed the world's largest Millennium Challenge Compact ("**MCC**") grant, worth US$698 million.

The GOT elected in 2015 developed an ambitious development agenda focused on creating a better business environment through improved infrastructure, access to financing, and education progress, but implementing budgets remains challenging for the GOT.

TANZANIA AND COVID-19

Like virtually every other country in the world, Tanzania has recently been preoccupied with COVID 19 and its potential fallout - not only on people but also the impact on the health system and the economy as a whole.

The global COVID-19 outbreak has led to the collapse of the tourism sector and amplified the need for significant financing to tackle the health and economic effects of the pandemic. Tanzanian authorities requested emergency Fund financial assistance through the Rapid Credit Facility ("**RCF**") and Rapid Financing Instrument ("**RFI**") lending facilities of the IMF. The RCF and RFI financing will help Tanzania to mount an appropriate response to the pandemic by addressing the urgent health, humanitarian, and economic costs in the face of the ongoing COVID-19 wave. The IMF lending facilities will unlock resources directed at strengthen the health sector, including purchasing equipment to test, treat, and manage the COVID-19 crisis.

The IMF approved US$567.25 million in emergency financial assistance under the RCF and RFI to support the authorities' efforts in responding to the pandemic by addressing the urgent health, humanitarian, and economic costs. The resources are also expected to play a catalytic role in their efforts to mobilize additional support from development partners. The authorities also commit to strengthening governance and transparency to ensure that the financial resources are efficiently spent on addressing the crisis.

TANZANIA: RECENT ECONOMIC DEVELOPMENTS AND OUTLOOK

Led by the impact of COVID, a number of factors acted as a drag on the Tanzanian economy in 2020/21[4]. The number of tourist arrivals in 2020 collapsed by 60%, a significant drag on economic growth as the sector is estimated to contribute (directly and indirectly) 17% of GDP (FYDP). GOT expenditure, which accounts for about 20% of the economy, declined by more than 9% in real terms (compared to 14% growth in 2019 and 7% average growth over the 2016-19 period). Credit extended to the private sector in 2020 declined marginally in real terms (-0.2%) compared to 7% growth in 2019 and 5% average growth over the 2016-2019 period. Other indicators, including electricity generation (-4.3%), imports of capital goods (-13%), and tax collection (VAT, excises and other taxes (-0.5, -2.2 and -3.7% respectively) also point to a much lower growth rate for 2020. Inflation remained stable at 3.3% throughout the pandemic despite an accommodative monetary policy.

The pandemic and the associated slowdown in economic activity have resulted in an increase in poverty and negatively affected employment. The World Bank estimates that poverty increased by about 1 million people in 2020 to about 27.1%, further showing the need for the Project to contribute to national economic goals. The Bank also estimate, that in June 2020 alone about 140,000 formal jobs were lost, and some 2.2 million nonfarm informal workers suffered income losses.

The fiscal position deteriorated due to a revenue shortfall and spending pressures to continue the government's public infrastructure drive. The overall fiscal deficit is expected to have widened to 2.5% of GDP by end-FY2020/21. The GOT offset some of the fall in revenues with cuts to current spending of 0.5% of GDP, while accelerating the pace of development spending to 7% of GDP compared to 6.5% in the previous year.

The pandemic adversely impacted on the country's current account. Tourism receipts for the year were estimated to have declined by about 55%, while traditional goods exports are estimated to have declined by approximately 40%. Imports of services are also projected to decline by around 25% due to lower demand for travel and transportation, helping offset some of the decline of inbound tourists. Overall, the current account deficit is estimated to have widened to 1.9% of GDP in FY2020/21 up from 1.6% of GDP in FY2019/20.

Gross international reserves declined but remain at a healthy level, helped by debt relief and external financing.

The pandemic has led to a significant decline in the growth of credit to private sector in 2020, but the full impact on the financial sector remains to be seen.

OUTLOOK AND RISKS

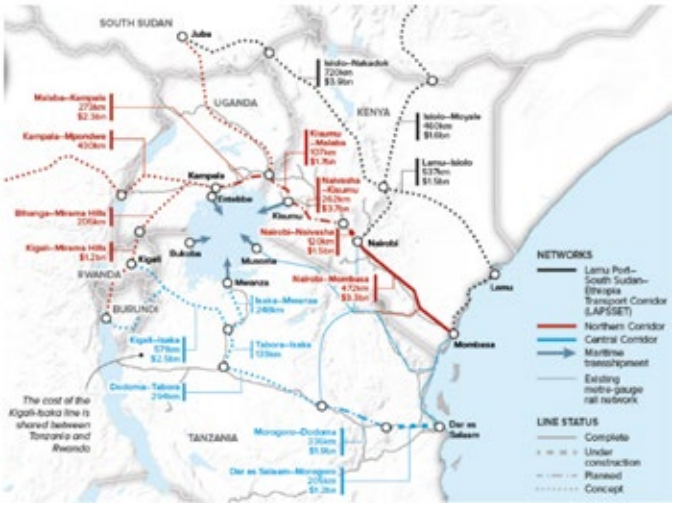
At the date of drafting, the GOT has implemented a comprehensive plan to tackle the COVID 19 shock - the Tanzania COVID-19 Socioeconomic Response Plan ("**TCRP**"). The TCRP encompasses the National Deployment and Vaccination Plan (NDVP) which details the authorities plans to vaccinate 20 percent of the population with support of the COVAX facility, and the National COVID-19 Response Plan, which covers the broader health sector strategy to bring the pandemic in Tanzania under control. The TCRP also addresses financing needs in other areas, such as tourism, education, water, and social protection. The TCRP estimates that some US$1.6bn (or 2.2% of GDP) is needed in FY2021/22 to cover Tanzania's response to COVID-19.

4 www.imf.org/en/Publications/CR/Issues/2021/09/16/United-Republic-of-Tanzania-Requests-for-Disbursement-Under-the-Rapid-Credit-Facility-and-465880

The medium-term macroeconomic outlook will be influenced by the direction of COVID-19 as well as the broader policy and reform agenda of the GOT. Conditional on satisfactory implementation of the authorities' TCRP, growth was expected to recover to 4% in 2021 and further pick up to about 5.5% in the following years. If economic reforms announced by the new administration and the envisaged improvements in the business climate materialise, then medium-term growth could reach 6% annum (which we assume as our base line for this Report). We expect the publication of multiple economic outlooks after the date of drafting.

In 2022, growth is expected to gain momentum on the back of private consumption (55% of GDP), supported by cuts to income tax and other levies, including VAT, as well by the 30% reduction in the mobile money tax following protests in July and August 2021. Investment (43% of GDP), both public and private, will continue to be stimulated by the country's numerous infrastructure projects (i.e. SGR, ports, energy infrastructure and road upgrades). Important are the upcoming construction phases of the SGR project, which ultimately aims to link Tanzania to Rwanda and Uganda, before crossing these two countries to reach Burundi and the DRC, as part of the East African Railway Master Plan.

FIGURE 3.2: PLANNED REGIONAL SGR NETWORK



Source: Oxford Analytica, 2019

In addition, and importantly, in February 2022, the parallel FIDs of the Tilenga and Kingfisher upstream oil projects (Uganda) occurred, as well as the FID for the construction of the EACOP. EACOP will transport crude from Uganda's oil fields (c 200 km northwest of Kampala) to the coastal port of Tanga in Tanzania (around 200km north of Dar Es Salaam). In Section 4.4, we analyse EACOP's gas options further including the potential expansion of the NNGI both north to Tanga (and potentially Mombasa) and south to Afungi (Mozambique), which has implications for each of Domgas and Regional Gas.

FIGURE 3.3: EACOP PLANNED ROUTE

Source: www.eacop.com

In the short term, the foreign trade elements are expected to contribute negatively to growth. The need to import materials for infrastructure projects, as well as medical equipment and vaccines, will push up the import bill. This will be only partially offset by increased export earnings (e.g. gold, gems, and tobacco).

Despite the increase in imported goods and persistently high commodity prices, inflation will nevertheless remain below the central bank's 5.0% target supported by appropriate monetary policies that have anchored inflation expectations in the 3.5 - 4.0% range. After a widening of the current account deficit to accommodate the urgent response to the pandemic, the deficit is projected to remain around 3.0% of GDP over the medium-term as the tourism sector slowly recovers. Similarly, the fiscal deficit will increase in FY2021/22 to about 3.9% of GDP to cover COVID- related spending returning to below 3.0% of GDP over the medium-term.

Tanzania is facing an urgent BOP need while the external position is expected to deteriorate further in 2021/22. Emergency imports of medicines, testing materials, and protective equipment are urgently required to respond to further waves of the pandemic. Acquiring and distributing vaccines are top priorities, which also entail an expansion of vaccine deployment infrastructure. Consequently, the current account deficit is expected to deteriorate by about 2.5% of GDP to 4.5% in 2021/22. The IMF Staff estimates an immediate BOP financing need of US$ 1.1bn that, if not addressed, would result in severe economic disruption.

Scope & Methodology

The purpose of this Report is to provide an analysis of the Project's macroeconomic impact, namely the construction and operation of integrated offshore natural gas production facilities producing 2543 mmscfd (Upstream elements) and an onshore LNG plant producing 15 MTPA (Midstream elements). This Report's main focus was to measure the nature and magnitude of the impact of the investment in the Project on Tanzania's economy with respect to macroeconomic indicators such as GDP, GNI, employment opportunities, capital utilisation (investment), the

distribution of income, BOP and GOT revenue. A comprehensive analysis was undertaken to ensure that all the relevant impacts were measured. Where values were involved, price calculations were made in constant prices. This implies that the effect of inflation is excluded from calculations throughout the production period (2030 – 2059).

The socio-economic impacts of both the construction and operational phases of the Project on the Tanzania economy were measured. Notably, the on-site, supply chain and economy-wide impacts of the Project were quantified. For example, one direct effect of the Project is the creation of jobs for the Project's workers. Indirect effects spread out from the direct effects to reach areas or population far removed from the Project's intended or original purpose. The indirect effects refer to the impact of the Project on the suppliers of inputs to the Project. Induced effects include the economic impact of the paying out of salaries and wages to those employed by the Project and industries that are indirectly linked to the LNG Project. The multiplier effect of that income is the induced effect. These terms are another way of referring to the initial, secondary and tertiary impacts that ripple throughout the economy when a change is made to a given input level.

The methodology employed in this study consists of two components: firstly, it comprises of a cash flow analysis (also referred to as a financial CBA, for which Section 2 forms an input) and economic CBA of the Project. Next, there is then a MIAM of the Project. The analysis follows sequentially: the results from the economic CBA serve as an input for the macroeconomic analysis. For analytical purposes, the total macroeconomic impact of the Project investment was disaggregated into the following components:

- The impact of the initial investment phase (i.e. the construction phase) which is expected to commence in 2025 (with pre-FID activities taking place before) and be completed in 2030;
- The impact of the everyday operations of the completed infrastructure of the Project over its lifetime (2030-2059), as supplemented by the incurrence of the mid-life Upstream capex and
- The reinvestment of savings, in the Tanzania economy. The savings are generated mostly from the profits of the Project).

In order to measure all of the economic implications regarding economic indicators such as GDP, GNI and employment associated with the construction, operational and savings/re-investment phases of The Project, a partial general macroeconomic equilibrium analysis was conducted, based on the latest, updated SAM for Tanzania. The SAM approach is outlined in Section 6.2

CBA Introduction

The methodology employed in this Report consists of two components: firstly, a CBA of the Project; and, secondly, a MIAM of the Project. These analyses follow a sequential path, i.e., the results from Section 2 serve as inputs to the financial and economic CBAs, which in turn serves as an input to the MIAM.

CBA

A CBA has been undertaken to evaluate the viability of the Project. A CBA is considered to be the most acceptable tool for ascertaining the economic viability of public and public/private sector infrastructure development projects.

The CBA method provides a logical framework for evaluating developmental projects; thus, serving as an aid in the project approval decision-making process. The core principle of CBA can be described as the comparison of costs and benefits. The only factor that complicates this technique is the discounting of future costs and benefits to present values.

The CBA used in the private sector is normally referred to as a Financial CBA and the CBA that is used in the public sector is referred to as an Economic CBA. The term Financial CBA is very similar to the concept of "Cash Flow Analysis", which is used in the private sector to determine the financial viability of a specific project. The "Financial CBA "is also considered as an interim step in performing an Economic CBA as well as a MIAM of the Project.

The main differences between the use of the CBA in the public sector and its use in the private sector is discussed in Table 3.1.

TABLE 3.1: PRIVATE SECTOR (INVESTOR) AND PUBLIC SECTOR CBA DIFFERENCES

Evaluation Criteria	Private Sector (Investor) Financial Analysis	Public Sector (Government) Economic Analysis
1. From the point of view of	Shareholders	Community
2. Goal	Maximise net value of firm	Apply scarce resources effectively and efficiently
3. Discount rate	Market rate or weighted marginal cost of capital plus uncertainty and risk premium	Social time-preference rate. This rate reflects the view on how future social benefits and costs should be valued when compared with present ones.
4. Value unit	Market price	Opportunity cost (Shadow Prices)
5. Dimensions	Limited to aspects of decision-making that may affect profits	All aspects necessary for a rational decision
6. "Advantages"	Money income	Additional goods, services, products, income and/or cost savings
7. "Disadvantages"	Money payments and depreciation calculated according to GAAP	Opportunity costs in terms of goods and services foregone

Source: A manual for Cost Benefit Analysis in South Africa with specific reference to Water Resource Development, WRC Report TT 598 /14.

CBA CONCEPTS

Financial CBA and Economic CBA

A Cash Flow analysis forms the basis of the CBA. A publicly downloaded Excel Spreadsheet embedded with figures pertaining to both the Project's Upstream as well as LNG Plant components (i.e. CCSI model per [**https://ccsi.columbia.edu/sites/default/files/content/Open-Fiscal-LNG-Model-v2.xlsx**] served as an input to the CBA.

The purpose of the financial analysis was to determine to what extent the Project will be in a position to be sustainable as a going concern as well as to become a financially and commercially sound project. The same set of costs and revenue are applied for both the Financial and Economic CBA.

The economic viability of TLNG was determined through a Financial CBA as well as an Economic CBA.

An economic appraisal must necessarily estimate flows of benefits and/or costs. For an Economic CBA, one seeks

to estimate the magnitudes of both benefits and costs of a project (relative to some well-defined counterfactual) in order to establish whether or not going ahead with the project would increase social welfare. This is the role of the Economic CBA which is based on shadow pricing. The shadow price of a commodity and services is defined as its social opportunity cost, i.e. the net loss (gain) associated with having one unit less (more) of it. The losses and gains have to be assessed in terms of a well-defined criterion or objective, which is referred to as 'social welfare'. The Financial CBA evaluates project from the private sector's / shareholder / investor point of view.

Important differences exist between CBA in the public sector and profit determination in the private sector. The first difference is found in the fact that private enterprises are largely concerned with interests of their owners or shareholders (Investors) when profits are being calculated while the interests of the community are the focus of the CBA in the public domain.

In the second place CBA differs from pure profit determination in that all variables in the latter case are measured in terms of market prices, while the economic and/or social benefits in the former case are often provided at subsidised prices so that the market prices of inputs and outputs, where they exist, often do not reflect the actual economic and/or opportunity costs and benefits.

To calculate the NPV of any potential investment, the weighted sum of all future values (FV) is calculated. By using exponential discounting the future values are discounted over time (t) using a constant, positive discount rate (r).

Benefits and costs in CBA are expressed in monetary terms and are adjusted for the time value of money. All flows of benefits and costs over time are expressed on a common basis in terms of their NPV, regardless of whether they are incurred at different times.

Shadow prices

Shadow prices are the opportunity costs of products and services when the market price, for whatever reason, does not reflect these costs in full. Examples include: shadow wages of labour where the fact that minimum wages are fixed, is taken into account; a shadow price for fuel (where taxes and subsidies are excluded), the marginal cost of generating 1 kilowatt-hour of electricity, etc.

The opportunity cost (marginal social cost) approach uses, as the shadow price of production inputs, the production that is given up elsewhere by withdrawing these inputs from their alternative use. On the other hand, for the shadow price of outputs (the marginal social benefit), the additional incremental benefit achieved by undertaking the Project, relative to the situation had the Project not been undertaken, is used. In this way an attempt is made to accentuate internal considerations in order to find a reliable measure of the acceptability to the community of projects.

Externalities

Externalities are the effects of a project on the environment, ecology or general standard of living of a community which are not reflected by the market prices of inputs or outputs.

Absent developments (under discussion) such as an agreed global market for CO_2 emissions, externalities are difficult to include in project assessment because they cannot be directly allocated to the project and furthermore are difficult to quantify. The requirement that prices of products and services should reflect their relative scarcity value

on the basis of all costs and benefits continues to apply, however, and therefore externalities should be considered in the analysis of a project. For example, the cost to the community of polluted air can be approached by using the degree to which the project sponsor (and by extension its customers) is prepared to bear the cost of mitigating emissions as a measure of the (global) community's willingness to pay for cleaner air. Where it is suspected that a project will produce some form of externality this aspect should be carefully investigated.

CBA CRITERIA

The following standard CBA criteria are used in the evaluation of the Project:

- NPV;
- IRR; and
- BCR

The detailed definition of these standard evaluation criteria is as follows:

NPV

According to this method, the difference between the benefits and costs (the net benefit) in a specified future year is discounted to the present using a discount rate. The discounted sum of all these net benefits over the economic life of a project is defined as the NPV. In terms of the terminology set out above, the following formula is used;

$$\sum_{t=1}^{N}\left(\frac{b_t}{(1+i)^t}-\frac{c_t}{(1+i)^t}\right)$$

$$where b_t = benefit\ in\ year\ t$$

$$c_t = cost\ in\ year\ t$$

$$i = social\ discount\ rate$$

The criterion for the acceptance of a project is that the NPV must be positive; (i.e. greater than zero) in other words, funds will be voted for a project only if the analysis produces a positive NPV. Where a choice has to be made between mutually exclusive projects, the project with the highest NPV will be chosen since it maximises the net benefit to the community.

IRR

The IRR is the discount rate at which the present values of cost and benefits are equal. It is therefore the value of the discount rate r that satisfies the following equation:

$$\sum_{t=1}^{N}\left(\frac{b_t}{(1+i)^t}-\frac{c_t}{(1+i)^t}\right)=0$$

$$where b_t = benefit\ in\ year\ t$$

$$c_t = cost\ in\ year\ t$$

$$i = IRR$$

Only projects with an IRR higher than the discount rate, which forms a lower limit, will be considered for funding. IRR must be handled carefully because there are situations in which the mathematical solution of the above equation is not unique. This happens when the stream of net benefits over the assessment period changes its sign (positive or negative) more than once. Importantly, we note the Project IRR (a pre-tax number) is different from the Investor's post-tax IRR (shown in Section 2.6).

Discounted BCR

The discounted BCR is the ratio of the present value of the benefits relative to the present value of the costs, i.e.

$$BCR = \frac{\sum_{t=1}^{N} \frac{b_t}{(1+i)^t}}{\sum_{t=1}^{N} \frac{c_t}{(1+i)^t}}$$

$$where b_t = benefit\ in\ year\ t$$

$$c_t = cost\ in\ year\ t$$

$$i = social\ discount\ rate$$

A project is potentially worthwhile if the BCR is greater than 1. This means that the present value of benefits exceeds the PV of costs. Under this decision rule, if alternatives are mutually exclusive, the alternative with the highest BCR would be chosen.

CBA Results

The results of the CBA are presented for the Financial CBA and the Economic CBA. As already indicated, the Financial CBA calculates the viability from the point of view of the Investors whereas the Economic CBA is presented from the point of view of the Community. The Financial CBA is conducted in nominal prices (including inflation) whereas the Economic CBA is undertaken in constant 2021 prices.

The CBA of the Project is undertaken for four (4) different FOB LNG Price scenarios, namely:

- US$ 5.50 MMBTU;
- US$ 7.00 MMBTU;
- US$ 10.00 MMBTU; and
- US$ 12.00 MMBTU.

The detailed results for the Financial CBA scenarios are provided in Table 3.2.

TABLE 3.2: CBA RESULTS - FINANCIAL CBA – LNG PRICE SCENARIOS (NOMINAL PRICES).

2030-2059 US$ mn	US$5.50 MMBTU	US$7.00 MMBTU	US$10.00 MMBTU	US$12.00 MMBTU
COSTS				
Capital Costs	51 116	51 116	51 116	51 116
Operational Costs	29 073	29 073	29 073	29 073
Total Costs	80 189	80 189	80 189	80 189
TOTAL REVENUE	**208 361**	**261 991**	**369 249**	**438 672**
CBA RESULTS				
Discount Rate	10%	10%	10%	10%
NPV	2 966	10 592	25 844	35 715
BCR	1.11	1.4	1.97	2.34
IRR (Pre-Tax)	**11%**	**14%**	**18%**	**20%**

At the lowest revenue scenario of US$ 5.50 MMBTU, the Project yields a NPV of nearly **US$ 3 Billion** at a Discount Rate of 10%, a pre-tax IRR of 11%. The Project satisfies positively all CBA evaluation criteria.

For instance, the US$ 7.00 MMBTU attain an NPV of about **US$ 10.6 billion** and a pre-tax IRR of 14%. At a US$ 10.00 MMBTU the project achieves a very substantial profit of nearly **US$ 25.8 billion** and a pre-tax IRR of 18%. At a US$ 12.00 MMBTU the project achieves a very substantial profit of nearly **US$ 35.7 billion** and a pre-tax IRR of 20%. The risk of the project, which is depicted by the BCR, shows significant scope for unforeseen events in terms of lower income and higher expenditure occurrences. The 1.11 BCR the lowest US$5.50 MMBTU scenario shows that there a 11% scope for changes in income and expenditure items before the Project will experience financial distress. At the higher revenue scenario of US$10.00 MMBTU, the BCR is 1.97 which depicts a risk cushion of nearly 100%.

TABLE 3.3: CBA RESULTS - ECONOMIC CBA – LNG PRICE SCENARIOS, (CONSTANT PRICES).

2030-2059 US$ mn	US$5.50 MMBTU	US$7.00 MMBTU	US$10.00 MMBTU	US$12.00 MMBTU
COSTS				
Capital Costs	41 621	41 621	41 621	41 621
Operational Costs	35 478	35 478	35 478	35 478
Total Costs	77 099	77 099	77 099	77 099
TOTAL REVENUE	**84 570**	**106 335**	**149 865**	**178 040**
CBA RESULTS				
Discount Rate	10%	10%	10%	10%
NPV	**-1 868**	**3 533**	**14 334**	**21 325**
BCR	0.8	1	1.4	1.68
IRR (Pre-Tax)	**9%**	**12%**	**16%**	**18%**

Measured from the point of the community applying the Economic CBA, the Project is slightly weaker than the Financial CBA. The middle and higher revenue scenarios of US$ 7.00 MMBTU, US$ 10.00 MMBTU and US$ 12.00 MMBTU easily makes the cut whereas the low revenue scenario is just below the benchmark of 10% IRR and obtain a 9% IRR. The reason why the Economic CBA is slightly lower is mainly due to the fact that the Economic CBA has a "relatively" higher discount rate. Both CBAs use a 10% Discount Rate, but the prices of the Financial CBA have been inflated by the assumed USA inflation rate of 2% per annum.

MIAM Introduction

The macroeconomic impact of the Project is calculated by utilising a SAM for Tanzania. A SAM is a comprehensive, economy-wide database that contains information about the flow of resources that takes place between the different economic agents that exist within an economy (i.e. business enterprises, households, government, etc.) during a given period of time – usually one calendar year. Thus, a SAM is a matrix that incorporates the interrelationships that exist between the various economic agents in the economy, including the distribution of income and expenditure amongst household groups.

The latest available SAM for Tanzania (2018) has been developed and updated by Conningarth to take into account the current national accounts data, based on the IFPRI's existing SAM platform. In addition, economic data and information were obtained, inter alia, from the Central Bank of Tanzania, the World Bank, DBSA, the Food & Agriculture Organisation Database and other sources (Thurlow, 2018). The SAM was therefore adjusted and modified to meet the specific requirements of the Report.

Given that Tanzania is presently a developing country without a significant manufacturing sector (c 5.8% of GDP per the FYDP), and also, given the size of the Project (c 50% of Tanzania's GDP), it is clear that most of the capital goods required for the Project will have to be imported. As such, the import intensity of the Tanzanian economy is thus likely to increase significantly - an important assumption in this study is that the import intensity is likely to increase by almost one third. Conningarth also hypothesise that, towards the latter part of the project, the import intensity is likely to decline along with the development of the Tanzanian economy.

It is imperative to recognise the importance of a project of this nature for the wellbeing of its citizens. Therefore, the macroeconomic impact assessment's objective is to demonstrate the economy – wide impacts of the Project.

In order to measure all of the economic implications regarding economic indicators such as GDP and employment associated with the construction, operational and savings/reinvestment phases of the project, a partial general macroeconomic equilibrium analysis was conducted, based on the latest updated SAM for Tanzania.

The impacts of economic interventions are measured in terms of standard economic and socio-economic performance indicators such as:

- GDP (value added to Tanzania's economy);
- GNI (net value added to Tanzania's economy);
- Employment creation (creation of new jobs for skilled, semi-skilled, and unskilled workers, with a major focus on Tanzanian nationals). The number of jobs for Tanzanian nationals will be known during he FEED process;

- Capital utilisation (procurement of machinery, transport equipment, buildings and other social and economic infrastructure);
- Income generated for low-income households (incremental income available to low-income households) as a specific measure of poverty alleviation;
- Fiscal Impact (contributions to GOT revenues);
- BOP; and
- Effectiveness Criteria (the GDP/Capital ratio, and the Labour/Capital ratio), where effectiveness indicators of projects are measured and compared to national and sectoral effectiveness indicators to demonstrate how efficiently a particular project employs the factors of production to arrive at a certain output.

In Section 6.2, a detailed explanation of the MIAM is provided.

MACRO-ECONOMIC ASSUMPTIONS

The MIAM assumptions are denoted in the Tables below. Table 3.4 provides the assumptions regarding the breakdown of capex and import intensity and Table 3.5 provides the assumptions on lifecycle LC.

TABLE 3.4: ASSUMED % BREAKDOWN OF CAPEX & IMPORT INTENSITY

Asset	Capital Structure
1. Furniture	0.4%
2. Rubber products	0.0%
3. Structural and Other Metal Products	32.0%
4. Machinery and equipment	7.8%
5. Electrical machinery and apparatus	4.9%
6. Manufacturing of transport equipment	1.5%
7. Other manufacturing and recycling	0.0%
8. Buildings	2.0%
9. Civil Construction	36.4%
10. Business activities (architects, attorneys, ect)	15.0%
Total	**100.0%**

Per source information from the Operators (with Oxford Economics), the Report assumed that 83% of the original capex will be imported and 17% will be sourced locally. We note the current import intensity of Tanzania (e.g. Tanzania SAM) is lower than the Project's assumed capital import intensity. This is mostly due to the complexity of TLNG and due to the fact that the primary manufacturing takes place offshore.

TABLE 3.5: ASSUMED LIFECYCLE LC CONTRIBUTIONS

	Capital Investment		
US$ mn	Total Capital Spending	Goods and Services Produced in Tanzania	Goods & Services Imported
Upstream	34 002	3 400	30 601
LNG Plant	17 115	5 306	11 809
Total	**51 116**	**8 706**	**42 411**

As calculated above, 83% of the original capex will be imported and 17% will be sourced locally as LC. Noting the Project's US$ 51bn life cycle expenditure this is a very large amount spent in Tanzania (and will be supplemented by that for other Domenergy and Domgas Projects).

Table 3.6 provides the assumptions regarding the breakdown of O&M cost. LC is discussed thereafter.

TABLE 3.6 ASSUMED % BREAKDOWN OF O&M COST

Operational Cost	Assumed Operating & Maintenance Cost
Agriculture	16.5%
Mining	29.0%
Non-fuel chemicals incl. plastics and rubber	5.6%
Metal and non-metal mineral products	9.9%
Machinery equipment incl. transport	10.5%
Fuels	4.0%
Other manufacturing	0.1%
Electricity and water	3.1%
Construction	0.8%
Trade and repair services	0.0%
Restaurants and hotels	0.2%
Transport and communication services	1.0%
Financial and business services	18.3%
Government, social and community services	0.9%
Total	**100%**

Per source information from the Operators (with Oxford Economics), the Conningarth Tanzanian SAM Structure and CO_2 assumptions the Report assumed that sixty (60)% of the original O&M will be imported and forty (40)% will be sourced locally.

DISCUSSION OF ECONOMIC INDICATORS AND LEVELS OF IMPACT

As noted, a partial general macroeconomic equilibrium analysis was performed, based on the SAM for Tanzania, to determine the nature and magnitude of the impacts of The Project on various economic indicators such as:

- GDP and GNI;
- Capital utilisation;
- Employment impact by skill level;
- Household income by income group;

- Fiscal impact to the GOT from tax revenues (e.g. income tax, Royalties and Profit Petroleum);
- Efficiency indicators for capital and labour, and
- The BOP.

The total impacts were calculated as the sum of the on-site, supply chain and economy-wide macroeconomic impacts stemming from the construction, operations and re-investment of savings of the Project. The meaning and measurement of these impacts are discussed below.

PROJECT DIRECT IMPACT

The "direct impacts" refer to the quantified tangible effects of the construction and operational phase components of the Project, that is, the impact of on-site activities.

PROJECT INDIRECT IMPACT

"Indirect impacts" refer to the effects of the Project on all other industries that supply inputs during the construction and operational phases (the supply chain). In terms of the construction phase, such inputs can refer to cement, steel and bricks, among others. With regard to the operational phase, they can refer to products such as electricity, fuel and chemicals. It is important to note that indirect impacts also include the materials that other firms would have to supply to the industries that supply products and services directly to the Project.

In order to explain the meaning of the concept of indirect impacts further, an example can be used. When the Project starts operating, it will require materials such as machinery and equipment, natural gas fuel (supplied by itself), lubricants, electricity (largely supplied by itself), and even inputs such as stationery and bank services. In order to produce these products and services, the relevant suppliers in turn require certain inputs from other producers in different economic sectors. The indirect impacts therefore represent the total interactions that occur in the economy in order to supply the direct materials and services used by the Project, as well as the products and services that complement those used by the Project.

These interactions are expressed in terms of their contributions to GDP/GNI, employment creation and income, as well as other macroeconomic variables.

PROJECT INDUCED IMPACT

The induced impacts are the effects throughout the Tanzanian economy of paying out salaries, wages and dividends of direct shareholders and indirect companies in Tanzania. These induced impacts also take into account the salaries and wages paid by the Project's suppliers. The spending of these additional salaries and wages creates a multiplier effect through their boost of demand for various consumable goods that need to be supplied by various economic sectors. So, an initial amount of spending by the Project (i.e. payment of wages and salaries) leads to increased consumption spending, thus boosting national income and increases GOT tax revenue.

Multipliers that are found by using direct and indirect effects are known simple multipliers. When direct, indirect and induced effects are used, the multipliers are called total multipliers.

ECONOMIC FEATURES IMPACTING ON THE MAGNITUDE OF THE MULTIPLIER EFFECTS

The multiplier effect comes about because injections of new demand for goods and services into the circular flow of income stimulate further rounds of spending – in other words "one person's spending is another's income". This can lead to a bigger eventual final effect on output, employment and other indicators.

The value or magnitude of the multiplier depends on a number of key features and determinants present in an economy. Some of these are briefly discussed below:

Propensity to consume

The higher is the propensity to consume domestically produced goods and services, the greater is the multiplier effect. The GOT can influence the size of the multiplier through changes in direct taxes. For example, a cut in the rate of income tax will increase the amount of extra income that can be spent on further goods and services. The flip side of this is that if the propensity to save is high, extra income will be saved rather than spend, leading to a lower multiplier.

Propensity to import

An important factor in the context of this Report which affects the size of the multiplier is the propensity to purchase imports. If, out of extra income, people or companies spend money on imports, this demand is not passed on in the form of fresh spending on domestically produced output. It leaks away from the circular flow of income and spending, reducing the size of the multiplier.

Propensity to tax

A high propensity to tax reduces the amount of extra income that can be spend on additional goods and services.

Availability of spare capacity in the economy

The multiplier process also requires that there is sufficient spare capacity for extra output to be produced. In the aggregate, if short-run supply is inelastic, the full multiplier effect is unlikely to materialise, because increases in demand will lead to higher prices rather than a full increase in real national output. In contrast, when short run supply is perfectly elastic an increase in aggregate demand causes a large increase in national output. In such a case, businesses in the economy have the capacity to expand production to meet increases in demand.

Avoidance of crowding out

Crowding out can occur when increased government spending or lower taxes lead to a rise in government borrowing and/or inflation. This causes interest rates to rise and has the effect of slowing down economic activity.

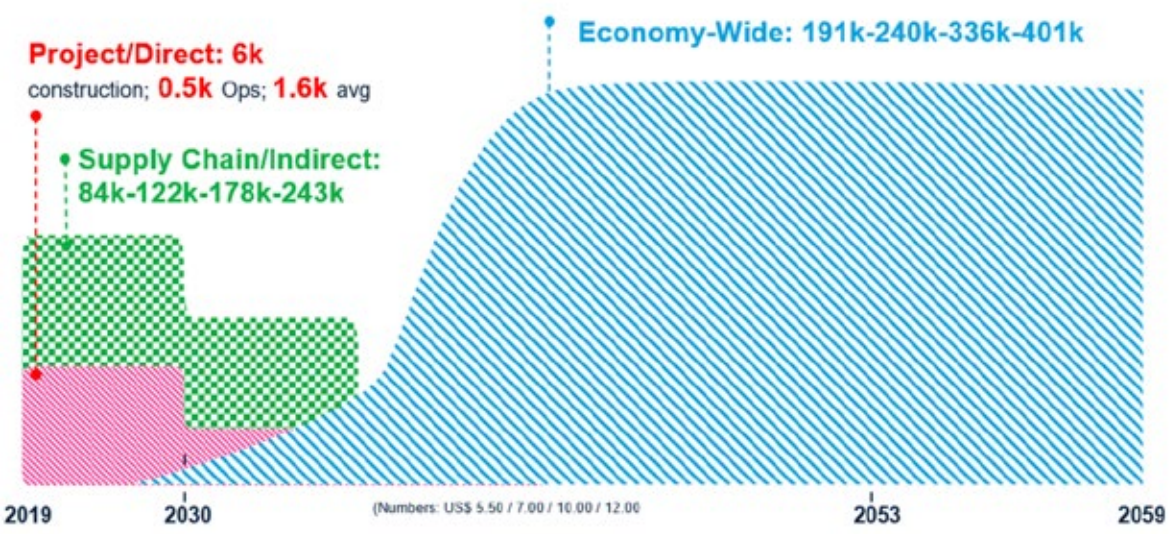
Consumer and business confidence

When consumer and business confidence are high, the willingness of consumers and producers to spend the increase in income or profits is enhanced, leading to higher growth in the economy.

RE-INVESTMENT IMPACT

The Reinvestment Impact is sometimes not included as part of the total impact, but it is clearly very important. This impact is generated mostly through the revenue flowing to the GOT, which serves as another injection into the Tanzanian economy (assuming these funds are spent prudently by the GOT, including upon regions and sectors that do not directly benefit from TLNG, e.g. not Lindi or Mtwara regions). Interestingly, its biggest relative impact is on employment numbers. The increase of the normal tax revenue to GOT emanating from the existence of the Project is assumed to be spend on social services such as health, education, etc. Please see below the following representation which demonstrates this across the range of the four (4) selected LNG Price scenarios.

FIGURE 3.4: POTENTIAL NATIONAL EMPLOYMENT SCHEMATIC - ALL SCENARIOS



Given Tanzania's dynamics, per Section 5.2, we recommend the GOT considers a SWF and a DSF, with particular emphasis on high-impact energy measures that will affect the bulk of Tanzania's population (for example, substituting the use of biomass and charcoal for off-grid PV, inverters, LPG, investing in increased energy access and agricultural modernisation, among others). We give this the label of an EATF. We have noted the provisions of the OGRMA and discuss this in Section 5.2.

It is assumed the foreign partners in the Project (88%), the primary Investors will repatriate all of their profits, even though some profits will be ploughed back into potential, future Upstream Projects (or other projects such as NBS or NERT) in the Tanzanian economy at large.

TOTAL IMPACT

The construction, operational and re-investment phases of the Project will impact the economy, but construction is a once-off event that will last a maximum of five (5) years (with only a portion of this at full intensity), while the Project's operational phase and re-investment are long term impacts, potentially stretching over multiple decades (in this Report, a thirty (30) year operational period is used – 2030 - 2059). The impacts of the different individual components were integrated in order to come to an annualised macroeconomic impact of the total Project. As such,

the macroeconomic impact of the construction phase was annualised (i.e. 5 years summed then divided by 30), to match that of the operational phase. In the discussion below we will only refer to the final stage when the Project is fully operational, given this is the most material phase.

In the subsequent sections the results will be discussed. The four (4) LNG price scenarios are discussed separately.

DISCOUNT RATES AND US$ INFLATION RATE

The Financial Discount Rate (Market Rate) of nominal 10% is in line with that which is being applied in the O&G sector internationally (usually labelled NPV10). It reflects the cost of capital and the inherent risk factor in the industry. The Financial CBA applied in this study is based on nominal prices/current prices.

The Social Discount Rate used in this Economic CBA entails a uniform 10% real discount rate involving all the major components of the project. This is in line with the discounting rates used by international development finance organisations such as the AFDB and the World Bank.

The Social Rate of Discount (SOC) is considered as one of the methods for calculating the discount rate for intra-generational projects. The SOC is calculated and based on the rate of return of the next best alternative use of funds. Generally, the next best alternative use of funds is thought to be the average return on investment in the private sector.

The Real Social Discount Rate is based on the principle of t**he Social Rate of Time Preference (SRTP)** Method, which is one of the methods of calculating a real discount rate for intra-generational projects. The SRTP is the rate at which households are willing to trade a unit of current consumption in exchange for more future consumption. The SRTP seems appropriate because it proves to be much more stable and does not fluctuate with the business cycle such as other rates.

Table 3.7 contains the recommended discount rate used by various countries around the world. As is to be expected the discount rates vary significantly among countries but they are almost all lower.

TABLE 3.7: REAL SOCIAL DISCOUNT RATES IN SELECTED COUNTRIES AND INSTITUTIONS

COUNTRY	DISCOUNT RATE (PERCENT)	THEORETICAL BASIS
Canada	Pre- 2007 rate 10%, after 2007 rate is 8%	SOC approach
China	8% for short term and medium-term projects: lower than 8% for long-term projects	Weighted Average Approach
France	Real discount rate set since 1960:set at 8% in 1985 and 4% in 2005	1985 : To keep a balance between public and private sector investment
Germany	1999 : 4% 2004 : 3%	Based on federal refinancing rate, which was over the late 1990s was 6% nominal: average GDP deflator (2%) giving 4% real.
India	12%	SOC Approach
Italy	5%	SRTP Approach
New Zealand	Before 2008 standard rate of 10%. Post 2008 default of 5%	SOC Approach
Norway	1978 : 7% 1998: 3.5%	Government borrowing rate in real terms
Pakistan	12%	SOC approach
Philippines	1991: 8% : SOC rate annually reviewed	SOC approach
Spain	6% for transport : 4% for water	SRTP approach
United Kingdom		SOC approach until 1980s; thereafter SRTP approach
US (Office of Management & Budget)	Before 1992 : 10%;after 1992 : 7%	Mainly SOC approach
US (Congressional Budget Office & General Accounting Office)	Rate of marketable Treasury debt with maturity comparable to project span	SRTP approach
US (Environmental Protection Agency)	Intragenerational discounting: 2-3% subject to sensitivity analysis in the range of 2-3% and at 7%. Intergenerational discounting : range of 0.5-3% and at 7%	SRTP approach

Source: Asian Development Bank (ADB). Zhuang et al (May 2007).

Note: Following the release of the third edition of the RSA official CBA Manual, the above table updates the discount rates for Canada (now 5%) and New Zealand (5%). The inherent inflation rate of the US$ is assumed as 2%per annum over the project period.

Please add this note under all the sectorial tables (US$5.50 mmbtu, US$7.00 mmbtu, US$10.00 mmbtu)

Note: * Labour Reflects only the Formal Agricultural Sector

MIAM Results

The results of the MIAM Analysis are presented for the four (4) LNG price scenarios (per MMBTU): US$5.50; US$7.00; US$10.00 and US$ 12.00 separately (in different sub-sections). They are presented in a standardised manner.

MACROECONOMIC IMPACT - US$5.50 SCENARIO

Major Project Benefits: US$5.50 Scenario

Figure 3.5 below summarises the major project benefits. However, the details that add to this summary will be discussed in the subsequent portion of this section.

FIGURE 3.5: DIRECT MACROECONOMIC IMPACT - US$5.50 SCENARIO

Economic Growth Impact - US$5.50 Scenario

TABLE 3.8: AVERAGE ANNUAL LIFETIME PROJECT OPERATIONAL IMPACT - US$ 5.50 SCENARIO)

Economic Indicators	Direct Impact
Operational GDP (US$ mn)	3 847
Capital formation (US$ mn)	41 757
Employment [# of job opportunities] Construction (Direct and Indirect)	6 000
Employment [# of job opportunities] Operational	500

The Project will annually generate US$ 3,847mn of GDP, while capital formation is in the order of US$ 41,757mn. The potential number of annual jobs p.a. to be created and then sustained is estimated to be 500 during the Project's operational phase.

Regarding the wider impact of the Project, Table 3.9 provides a summary of the different types of impacts as well as the total impact of the Project on the major economic indicators.

TABLE 3.9: COMBINED MACROECONOMIC IMPACT - US$5.50 SCENARIO

US$m (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**4 038**	**973**	**1 964**	**6 975**
Gross National Income ("**GNI**")				5 651
Impact on capital formation	42 186	2 722	4 733	49 641
Impact on employment [# of job opportunities]	**1 651**	**83 966**	**191 739**	**277 356**
- Skilled employment	783	21 031	54 448	76 262
- Semi-skilled employment	545	36 393	74 591	111 530
- Unskilled employment	323	26 542	62 700	89 565
Impact on Households				**1 494**
- Low Income Households				231
- Medium Income Households				198
- High Income Households				1 064

All values are presented as Average per annum over the Period 2030-2059,US$mn 2021 Constant Prices

Table 3.10 depicts the impact of the construction, operational and reinvestment phases of the Project in the economy, where the construction phase is a once-off event that will last a few years (up to 2030), whilst the operational and reinvestment phases have longer-term impacts, stretching over the entire Project life cycle (2030 – 2059).

TABLE 3.10: IMPACT OF RESULTS OF MAIN PROJECT COMPONENTS - US$5.50 SCENARIO

	GDP (US$ mn)	Capital (US$ mn)	Employment (Numbers)
Operational	5 454	45 869	149 791
Construction	648	1 573	38 602
Savings / Investment Impact	874	2 200	88 964
Total	**6 975**	**49 641**	**277 356**

In Figure 3.6, the significant economic impacts in terms of GDP, Capital Formation and Employment creation are generated during the Project's operational phase. Important to note is that the impacts generated by the S&I phase are sizeable relative to the construction phase impacts.

FIGURE 3.6: RESULTS OF MAIN PROJECT COMPONENTS (PHASES) – US$ 5.50 SCENARIO

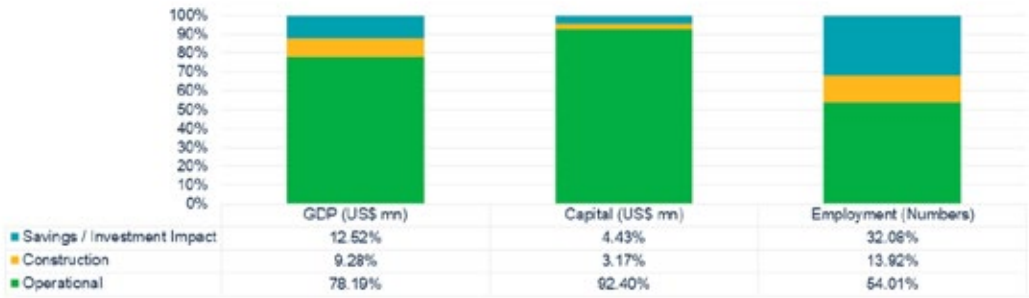
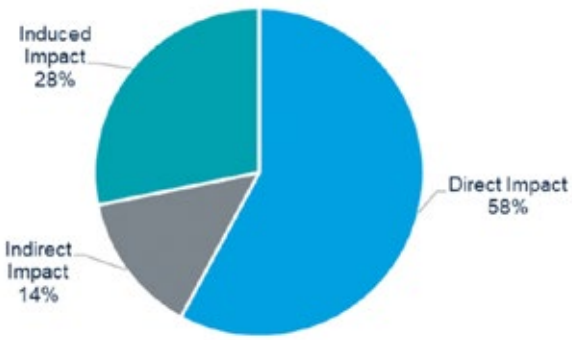


Figure 3.7 illustrates the annual GDP created by the Project (per project phase) over its lifespan. The first years form the construction phase, with meaningful production or output of the Project materialising from 2030 onwards (when net revenue starts to flow). Thereafter, reinvestment/savings decisions will continue to be made until 2059.

FIGURE 3.7: PROJECT COMPONENTS GDP IMPACT - US$5.50 SCENARIO

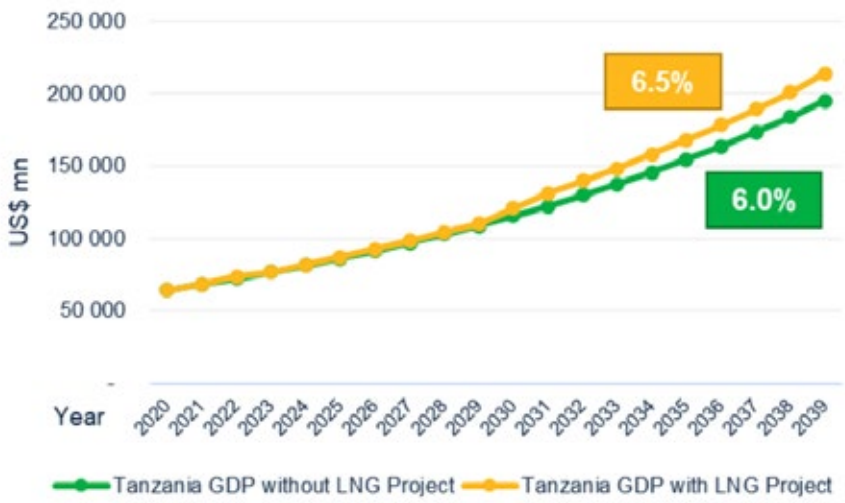
Figure 3.8 allocates the total GDP impact to the different types of impacts. On average, the direct impact amounts to 58% of the total GDP impact value, the indirect impact to 14% and the induced impact to 28% of the total GDP impact value.

FIGURE 3.8: PERCENTAGE SHARE OF GDP IMPACT – US$ 5.50 SCENARIO



Post COVID, the Tanzanian economy is expected to increase by roughly 6.0% over the period 2030-2059, according to Figure 6.4 (graph only displaying 20-year projection) 30 Year GDP Project predictions. However, with an assumed US$ 5.50 LNG Price scenario, the MIAM predicts that this growth can increase by 0.5 percent points, bringing the average growth to around 6.5% points.

FIGURE 3.9: IMPACT OF THE PROJECT ON TANZANIA GDP GROWTH – US$ 5.50 SCENARIO



The detailed impacts of various components of the Projects to GDP and GNI are presented in Table 3.11. The lower impact of the Project on the GNI relative to that on the GDP can be deduced, with leakage (outflow) from Tanzania in terms of the direct impacts being important (especially during the operational phase).

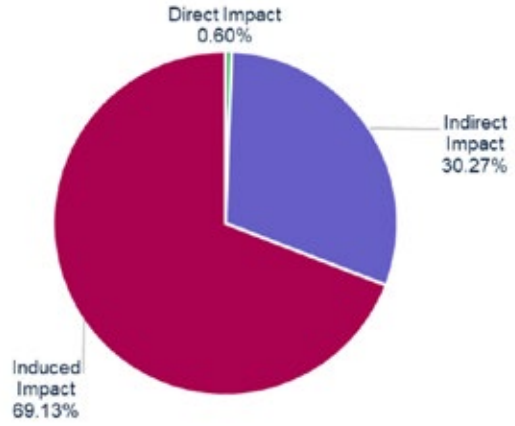
TABLE 3.11: IMPACT ON GDP AND GNI – US$ 5.50 SCENARIO

	Operational	Construction	Savings	Total
GDP	5 454	648	874	6 975
GNI	4 143	643	865	5 651
Outflow of Primary Income (Capital & Wages)	1 311	5	9	1 324
Percentage of Outflow	24%	1%	1%	19.0%

Employment Impact (Numbers) - US$5.50 Scenario

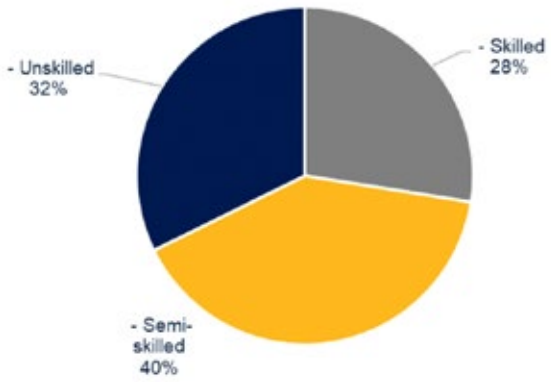
Approximately 69.13% of the total jobs that will be created by the Project will be created as a result of the induced impact, which reflects the additional labour remuneration (and thus consumer spending) and generation of gross operative surpluses from the suppliers to the Project. The direct impact attributes 0.60% of the total jobs sustained (noting 500 on-site employees). The indirect contribution is 30.27%.

FIGURE 3.10: PERCENTAGE SHARE OF VARIOUS LINKAGE IMPACTS – US$ 5.50 SCENARIO



From Figure 3.11 it is Interesting to note is that 32% of the jobs that will be created for unskilled workers, whilst 40% will be for semi-skilled workers. The remaining 28% of jobs are skilled workers, implying that skilled labour will have to migrate into the Project focus area. With almost one-in-three workers on the project being skilled, there is potential for skills transfer to occur, thus up-skilling the Tanzanian labour force. Note that FYDP emphasises the need for skills development across Tanzania, especially soft skills. This point applies to all LNG price scenarios. In Section 4.6, we assess the issue of LC and how this can interface with employment.

FIGURE 3.11: PERCENTAGE SHARE OF VARIOUS SKILL LEVELS: US$ 5.50 SCENARIO

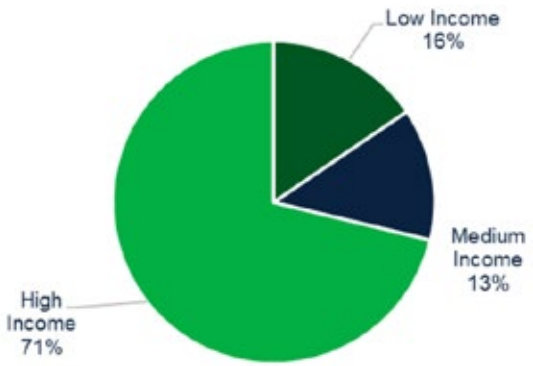


Household Income - US$5.50 Scenario

Although an individual household is considered to be the smallest economic unit within an economy, combined they make up around three quarters of total GDP. The average household size tends to be bigger in LDCs and Tanzania is no exception, with an average of 4.6 persons per household[5].

Due to the Project, per Figure 3.12, it is expected that household per capita income will grow on average over the period of 2030-2059. 16% of this total household impact will go to the Lower Income group which will boost consumption expenditure for this vulnerable group. Notably, 71 % of the additional household consumption expenditure stimulated by the Project, will be accrued by high income households, which is synonymous with skilled and some semi-skilled households. It should be borne in mind that this calculation includes wages, salaries and dividends emanating from the Project (e.g. by sub-contractors) and does not include elements of GOT income which are the domain of fiscal policy (e.g. GOT spending money on infrastructure that is not in Lindi or Mtwara regions or upon national heath care).

FIGURE 3.12: PERCENTAGE SHARE OF VARIOUS INCOME LEVELS – US$ 5.50 SCENARIO



In summary, per Table 3.12 below, the Project is expected to increase household income and in so doing, boost households' consumption expenditure and GDP growth. The average household income in Tanzania will increase by US$115 on average per annum over the Project period which entails approximately an increase of nearly 10%. The high-income group will grow by US$820 (10.14%), the medium income by US$76 (9.01%) and the low income by US$25 (9.18%) on average per annum over the project period.

TABLE 3.12: CONTRIBUTION TO TANZANIA HOUSEHOLD INCOME – US$ 5.50 SCENARIO

	Total	High Income	Medium Income	Low Income
Current Status				
Household Income (US$ mn)	15220	10498	2199	2522
Average Income per Household (US$)	1172	8085	847	278
Impact of LNG Project				
Total Household Impact (US$ mn)	1494	1064	198	231
Impact per Household (US$)	115	820	76	25
Percentage Impact per Household	**9.82%**	**10.14%**	**9.01%**	**9.18%**

5 www.statista.com/statistics/1134581/average-household-size-in-tanzania-by-area/

Sectoral Impact - US$5.50 Scenario

It should be noted that the sectoral results show that the Project is expected to have a wide effect on the economy of Tanzania. According to Table 3.13, the Mining sector (within which the Project sits) is the economy's largest beneficiary (52% of GDP generated by the Project) of the total GDP impact of the Project, followed by the agriculture with 22% of GDP generated by the Project.

In terms of employment, the agriculture sector is expected to be the largest beneficiary (26% of total employment, in this scenario), owing to the sector's high employment multiplier. The trade and accommodation sector benefits to the tune of 21% of the jobs created and the manufacturing sector benefit by 16% of jobs created. Notably, only 3% of all the jobs created by the Project are in the mining sector (into which LNG - an extractive industry involving beneficiation falls). This is not unexpected given the Project's capital-intensive nature.

TABLE 3.13: PROJECT SECTORAL IMPACT - US$5.50 SCENARIO

	GDP (US$ mn)	GDP %	Employment (#)	Employment %
1.Agriculture	1 530	22%	72 209	26%
2.Mining	3 655	52%	7 003	3%
3.Manufacturing	369	5%	44 613	16%
4.Electricity & water	60	1%	1 403	1%
5.Construction	185	3%	14 673	5%
6.Trade & accommodation	230	3%	58 596	21%
7.Transport & communication	364	5%	23 103	8%
8.Financial & business services	414	6%	19 442	7%
9.Community services	168	2%	36 314	13%
Total	**6 975**	**100%**	**277 356**	**100%**

Fiscal Impact - US$5.50 Scenario

Table 3.14 illustrates the Project's total fiscal impact. GOT revenue consists of taxes directly related to the Project (approximately US$ 1 444 Million in nominal values over the Project period), plus taxes indirectly related to the Project (US$ 647.1 Million) plus taxes related to the savings/reinvestment aspect of the Project (US$93.49 million).

Overall, this portion of TLNG will contribute on average US$ 2 185 million per annum to GOT coffers, of which 66,10% will be in the form of direct taxes, 29.6% in the form of indirect taxes, whilst taxes on reinvestment/savings will contribute 4.3% to the GOT tax take.

TABLE 3.14: PROJECT FISCAL IMPACT - US$5.50 SCENARIO

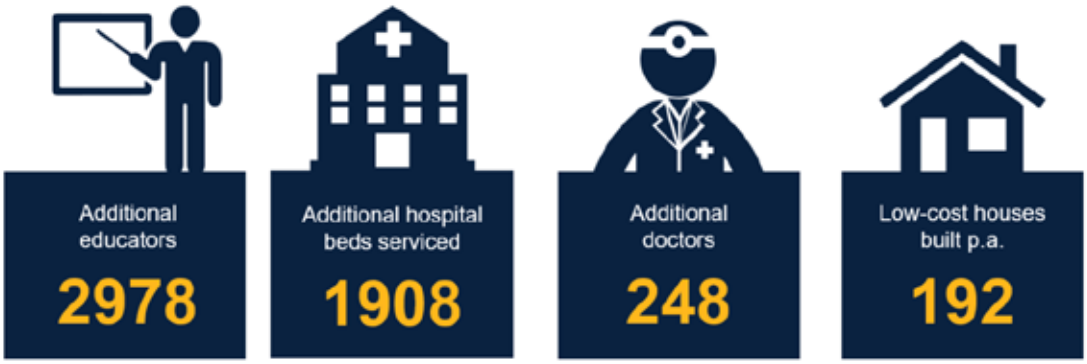
	Fiscal Impact (US$ mn)
A. Project Related Taxes	**1 444.43**
Total GoT Profit Share	528.22
Total Royalties	221.78
Total Taxes	694.42
B. Project Indirect Taxes	**740.63**
B1.Indirect Operational and Construction	647.14
B2. Savings Re-Investment	93.49
Total Fiscal (A+B)	**2 185.06**

All values are Presented as Average per annum over the Period 2030-2059,US$mn 2021 Constant Prices

The Project's additional fiscal resources shown in Figure 3.13 (on an aggregate basis) will support the GOT's efforts to achieve the United Nations' eight Millennium Development Goals, particularly 'achieve universal primary education' (goal 2),'reduce child mortality' (goal 4) and 'combat HIV/AIDS, malaria, and other diseases' (goal 6).

Within the TZ context, we note Vision 2025's goal of achieving a "High Quality Livelihood" for all Tanzanians, including access to "quality primary health care for all", "universal primary education" and "the attainment of a level of tertiary education" ...[that is] 'required to respond and master the development challenges at all levels". Outside of the Project's direct benefits (see elsewhere), such outcomes can arise from the fiscal proceeds paid to GOT.

FIGURE 3.13: ADDITIONAL SOCIAL INFRASTRUCTURE FROM FISCAL PROCEEDS - US$5.50 SCENARIO



BOP - US$5.50 Scenario

Tanzania traditionally has a major BOP deficit (excluding grants) as a result of a wide trade deficit and negative net balance in the services and income account that explain the perpetual current account deficit. The Project is expected to increase the national import bill over the medium term as machinery and equipment are imported as part of the Project's construction (although not funded by the GOT in the most part, but largely by foreign private capital with no impact on Tanzania's savings). However, benefits will be shown over the Project lifetime once exports start to flow. Table 3.15 outlines the relevant numbers.

TABLE 3. 15: BOP - US$5.50 SCENARIO

	Annual Average Total 38 Years 2021-2059	Annual Average First 20 Years 2021-2041
A. Project LNG Balance of Payment (BoP)		
Income of International Trade (+)		
Exported LNG (2343 MSCFD = 15MTPA LNG sold	3 407	2 809
Domestic Gas (200 MSCFD) - Import substitution Diesel and/or fertiliser	192	159
Physical Imports of Capital Equipment and Services (drilling) during Construction	-891	-1 398
Investor - Financing of Capex and Services during Construction (Imports and Domestic Purchases)	942	1 479
TPDC - per above, assuming it will also be funded by international funds	128	202
Repayment of Original Capital to Investor	-1 071	-1 681
Repatriation of Profits by Investor	626	103
Imports of Intermediate Goods & Services during Operational Period	-375	-278
LNG BoP	2 960	1 393
	-	-
B. Broader Economy BoP Impact through Re-investment (incl. indirect imports)	-	-
Benefits (Exports and Imports Substitution)	482	358
Total Imports	-98	-73
Reinvestment BoP	385	286
C. Total Balance of Payment (BoP) of A and B	3 344	1 679

All values are presented as average per annum over the period 2030-2059, US$mn 2021 Constant Prices

Economic Effectiveness Criteria - US$5.50 Scenario

Given that Tanzania is a lower middle-income country, it seems appropriate to include a social efficiency indicator among the effectiveness measures in Table 3.16, and to compare it to relevant Tanzanian economic averages. The impact of the initiative on increasing the economic welfare of local households was demonstrated using a poverty alleviation ratio. The percentage of increased household income generated by the Project that goes to low-income households served as a proxy for this.

The effectiveness indicators for capital investment efficiency highlight the capital-intensive nature of TLNG. For each US$ of capital invested in the project, US$0.14 additional GDP is generated compared to US$0.46 generated from an equivalent capital investment on an average Tanzanian project. This implies that the capital employed in the Project is less efficient in generating output as compared to capital invested in the average Tanzania project.

Similarly, the labour-to-capital ratio reveals that, for each US$1 million of capital investment in the Tanzania Project, 5.6 new jobs will be created. An equivalent capital investment in the average Tanzanian project would create 37.5 jobs, which is once again indicative of the capital intensity of the Project.

TABLE 3.16: ECONOMIC EFFECTIVENESS CRITERIA - US$5.50 SCENARIO

	GDP/Capital Ratio	Labour/Capital Ratio	Low/Total Income Households Ratio
Results	**0.14**	**5.59**	**15.49%**
Comparative Sectoral Results			
Agriculture, hunting, forestry and fishing	0.46	36.09	14.99%
Mining and quarrying	0.35	23.81	15.13%
Manufacturing	0.47	49.43	15.11%
Electricity, gas and water supply	0.40	23.58	14.75%
Construction	0.41	45.34	15.60%
Wholesale and retail trade	0.48	73.17	15.30%
Transport, storage and communication	0.36	33.09	14.86%
Financial, insurance, real estate and business services	0.25	21.34	14.99%
Community, social and personal services	0.35	46.64	15.87%
Total	**0.46**	**37.51**	**15.02%**

As shown above, TLNG is significantly more capital intensive than the average Tanzanian project or business.

Combined Macroeconomic Impacts - US$5.50 Scenario

The total impact of the Project is summarized in Table 3.17. It includes all construction, operational and re-investment impacts. Table 3.17 also shows the impact of the on-site (direct), supply chain (indirect) and the economy wide (induced) sub-categories.

TABLE 3.17: COMBINED MACROECONOMIC IMPACTS - US$5.50 SCENARIO

Impact (US$ mn)	On-Site	Supply Chain	Economy Wide	Total
Impact on GDP	4 038	973	1 964	6 975
Impact on GNI				5 651
Impact on capital formation	42 186	2 722	4 733	49 641
Impact on employment [national job opportunities]	1 651	83 966	191 739	277 356
Impact on Households				**1 494**
Household Income per Household				**115**
Fiscal Impact				**2 185**
Balance of Payments				**3 344**

Note: Annual average real

Regional Macroeconomic Impact: US$5.50 Scenario

The economic, physical, and demographic parameters of the Lindi and Mtwara regions which are directly impacted by TLNG are depicted in Box 1. It is important that the regional impacts of both Lindi and Mtarwa be put into context.

BOX 1: ECONOMIC, PHYSICAL AND DEMOGRAPHIC PARAMETERS

- As noted by REPOA (2021), Lindi's nominal 2019 GDP is Tzs 2 770 427mn (US$ 1196.21) with a per capita GDP of Tzs 2 758 183 mn (US$ 1 191) Mtwara's GDP (at current market price) in 2019 was Tzs 3 805 851 mn (US$ 1643.9), while per capita GDP was Tzs 2,622,775 mn (US$ 1133)
- Mtwara's population increased from 888,882 (1988 census) to 1,124,481 in 2002 and reached 1,451,078 in 2019 while Lindi's population is 1,004,439 in 2019 which is relatively lower.
- The southern region's strategic location provides an advantage of large markets of COMESA, EAC and SADC member countries, including Comoros, Mozambique and Madagascar.
- The regional road network covers 6149.8 kilometres and connects through the Mtwara corridor road to bigger markets in the country, including Dar es Salaam and other regions.
- Mtwara's five (5) district councils, are served with a natural gas fired power plant. The region also has a large volume of natural gas with [the NNGI] that can be accessed by large energy users at [an] affordable price.
- The literacy rate for the population aged 5 years and above in Lindi region was 63 percent. Literacy rate was higher among those aged between 10 and 49 years and was also higher among the urban population (74 percent) than the rural population (61 percent). While Mtwara records a slight increase (0.45%) of pre-primary enrolment from 1,422,720 in 2018 to 1,429,155 in 2019

Tables 3.18 and 3.19 depicts the macroeconomic regional impacts of the Tanzania LNG projects for Lindi and Mtwara region respectively.

From Table 3.18, It is evident that this project will have a significant impact on the Lindi region, for instance, the impact on the average Income per household over the period is US$ 5479 (Calculated as: US$ 1,191 per capita * 4.6 persons per household, refer to Box 1). If this increase is added to the current average income per household of Lindi region of US$ 6,868 then the impact of the project nearly doubles the average income per household to US$ 12,347.

TABLE 3.18: LINDI - TOTAL REGIONAL IMPACT - US$5.50 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**2 979**	**136**	**521**	**3 636**
Impact on GNI				2 705
Impact on capital formation	26 738	383	1 256	28 377
Impact on employment [# of job opportunities]	**2 200**	**14 636**	**50 866**	**67 702**
- Skilled employment	1 185	3 798	14 444	19 427
- Semi-skilled employment	670	6 529	19 788	26 987
- Unskilled employment	345	4 309	16 634	21 288
Impact on Households				**169**
- Low Income Households				27
- Medium Income Households				22
- High Income Households				120
Impact on household income per household over programming period (avg. US$)				6 868
Impact on household income per household over programming period (avg. TZS)				15 885 221

All values are Presented as Average per annum over the Period 2030-2059,US$mn 2021 Constant Prices

From Table 3.19, It is evident that this project will have a significant impact on the Mtwara region. For instance, the impact on the average Income per household over the period is US$ 5,212 (Calculated as: US$ 1,133 per capita * 4.6 persons per household, refer to Box 1). If this increase is added to the current average income per household of Mtwara region of US$ 4,906 then the impact of the project nearly doubles the average income per household to US$ 10,118.

TABLE 3.19: MTWARA - TOTAL REGIONAL IMPACT - US$5.50 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**5**	**117**	**574**	**2 244**
Impact on GNI				1 718
Impact on capital formation	15 448	382	1 312	17 142
Impact on employment [# of job opportunities]	**1 038**	**11 710**	**53 151**	**65 899**
- Skilled employment	486	2 938	15 093	18 518
- Semi-skilled employment	345	5 068	20 677	26 090
- Unskilled employment	207	3 708	17 381	21 291
Impact on Households				**147**
- Low Income Households				24
- Medium Income Households				19
- High Income Households				104
Impact on household income per household over programming period (avg. US$)				4 906
Impact on household income per household over programming period (avg. TZS)				11 346 587

All values are Presented as Average per annum over the Period 2030-2059,US$mn 2021 Constant Prices

MACROECONOMIC IMPACT - US$7.00 SCENARIO

Major Project Benefits: US$7.00 Scenario

Figure 3.14 below summarises the major Project benefits for the US$ 7.00 LNG Price scenario. The details that underpin this summary are discussed in detail in the subsequent portion of this section.

FIGURE 3.14: DIRECT MACROECONOMIC IMPACT - US$7.00 SCENARIO

Economic Growth Impact - US$7.00 MMBTU Scenario

TABLE 3.20: AVERAGE ANNUAL LIFETIME PROJECT OPERATIONAL IMPACT – US$ 7.00 SCENARIO

Economic Indicators	Direct Impact
Operational GDP (US$ mn)	4 988
Capital formation (US$ mn)	41 757
Employment [# of job opportunities] Construction (Direct and Indirect)	6 000
Employment [# of job opportunities] Operational	500

The Project will annually generate UDS 4,988mn of GDP, while capital formation in the order of US$ 41,757mn. The number of annual jobs p.a. to be created and then sustained is estimated to be 500 during the Project's operational phase (constant across all scenarios).

Regarding the wider impact of the Project, Table 3.21 provides a summary of the different types of impacts as well as the total impact of the Project on the major leading economic indicators.

TABLE 3.21: COMBINED MACROECONOMIC IMPACT - US$7.00 SCENARIO

US$m (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**5 180**	**1 244**	**2 463**	**8 887**
Impact on GNI				7 303
Impact on capital formation	42 186	3 421	5 936	51 543
Impact on employment [# of job opportunities]	**1 651**	**122 356**	**240471**	**364 477**
- Skilled employment	783	30 540	68 286	99 609
- Semi-skilled employment	545	52 643	93 548	146 736
- Unskilled employment	323	39 172	78 636	118 131
Impact on Households				**1 828**
- Low Income Households				280
- Medium Income Households				241
- High Income Households				1 307

All values are presented as average p.a. over the Period 2030-2059,US$mn 2021 Constant Prices

Table 3.22 depicts the impact of the construction, operational and reinvestment phases of the Project in the economy. The construction phase is a once-off event that will last up to five (5) years (substantially less at full intensity), whilst the operational and reinvestment phases have longer-term impacts, stretching over the entire life cycle of the Project.

TABLE 3.22: IMPACT OF RESULTS OF MAIN PROJECT COMPONENTS - US$7.00 SCENARIO

	GDP (US$ mn)	Capital (US$ mn)	Employment (Numbers)
Operational	6 951	46 724	184 460
Construction	648	1 573	48 750
Savings / Investment Impact	1 289	3 246	131 266
Total	**8 887**	**51 543**	**364 477**

In Figure 3.15, the significant economic impacts in terms of GDP, Capital Formation and Employment creation are generated during the operational phase of the Project. Important to note is that the impacts generated by the savings/re-investment phase are sizeable relative to the construction phase impacts.

FIGURE 3.15: RESULTS OF MAIN PROJECT COMPONENTS (PHASES) – US$ 7.00 SCENARIO

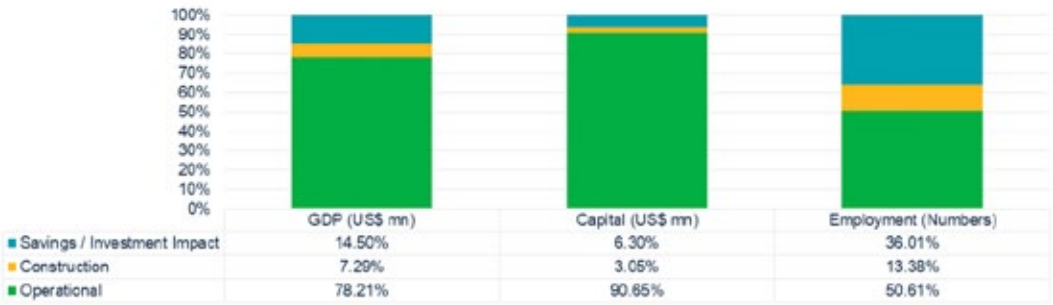


Figure 3.16 illustrates the annual GDP created by the Project (per project phase) over its lifespan. The first years form the construction phase. Project output starts in 2030, with net revenue flowing from then. Subsequently, reinvestment/savings decisions arise and accrue.

FIGURE 3.16: PROJECT COMPONENTS GDP IMPACT - US$7.00 SCENARIO

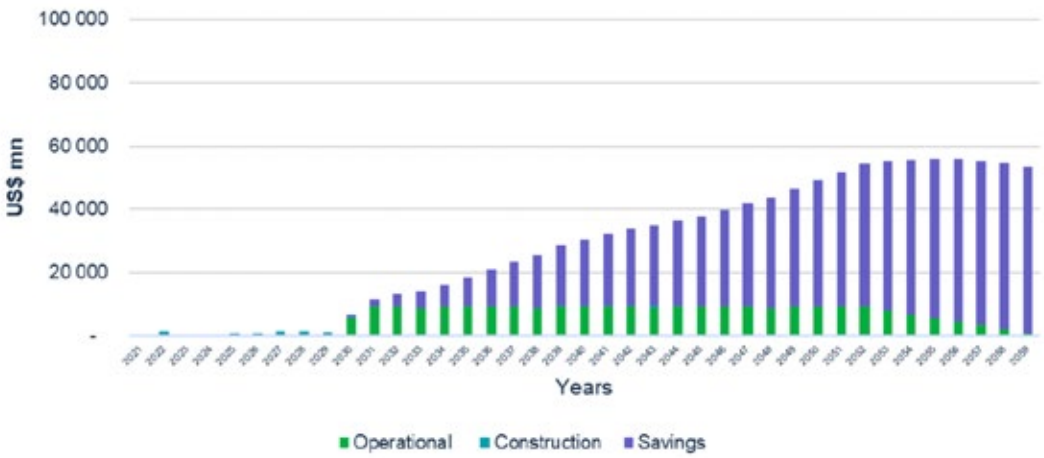
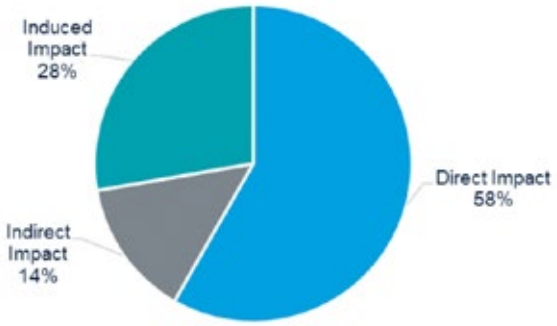


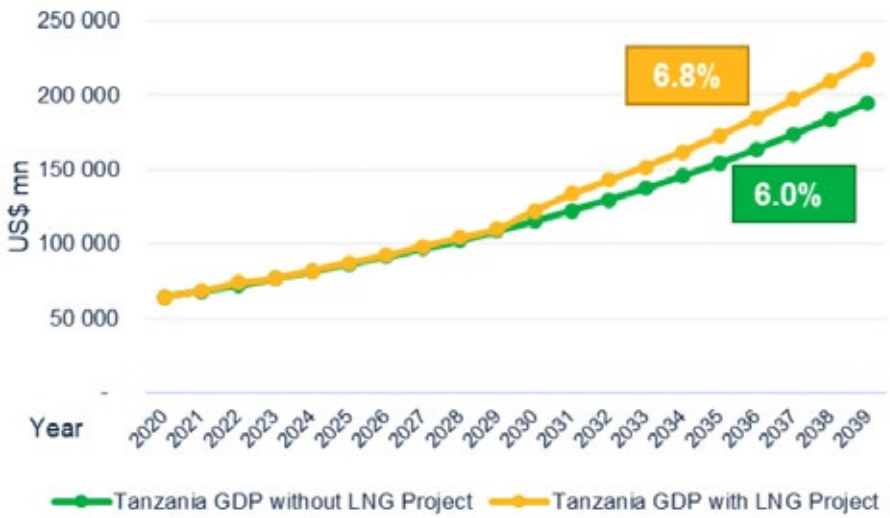
Figure 3.17 allocates the total GDP impact to the different types of impacts. On average, the direct impact amounts to 58% of the total impact value, the indirect impact to 14% and the induced impact to 28% of the total GDP impact value.

FIGURE 3.17: PERCENTAGE SHARE OF GDP IMPACT – US$ 7.00 SCENARIO



Post COVID, Tanzania's GDP is expected to annually increase by roughly 6.0 % over the period 2030-2059. However, per the US$ 7.00 FOB Scenario, the MIAM predicts that this growth can increase by 0.8 percent points, bringing the average growth to around 6.8 percent points.

FIGURE 3.18: IMPACT OF THE PROJECT ON TANZANIA GDP GROWTH – US$ 7.00 SCENARIO



The detailed impacts of various components of the Projects relative to GDP and GNI are presented in Table 3.23. The lower impact of the Project on the GNI relative to that on the GDP can be deduced, with leakage (outflow) from Tanzania in terms of the direct impacts being important (especially during the operational phase).

TABLE 3.23: IMPACT ON GDP & GNI – US$ 7.00 SCENARIO

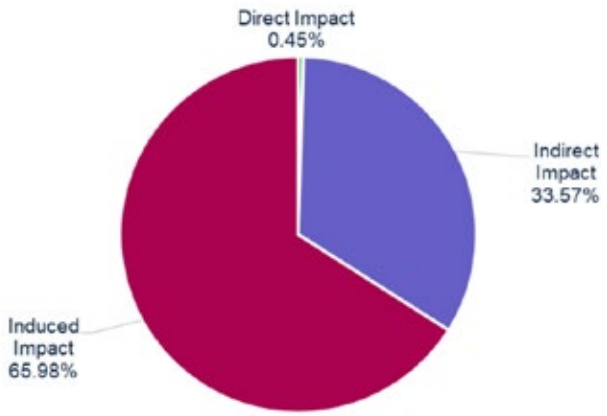
	Operational	Construction	Savings	Total
GDP	6 951	648	2 060	9 658
GNI	5 383	643	2 040	8 066
Outflow of Primary Income (Capital & Wages)	1 567	5	20	1 592
Percentage of Outflow	23%	1%	1%	16.5%

All values are presented as average p.a. over the Period 2030-2059,US$mn 2021 Constant Prices

Employment Impact (Numbers) - US$7.00 Scenario

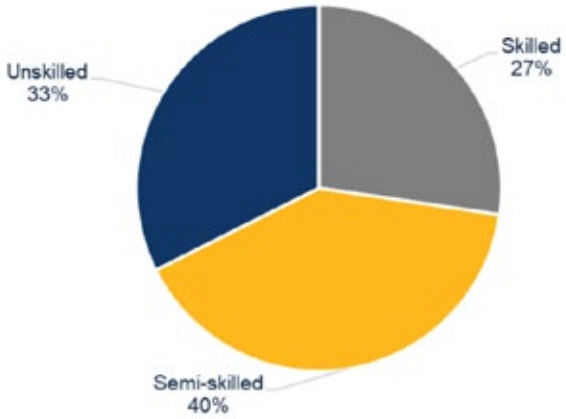
Approximately 65.98% of the total jobs that will be created by the Project will be created as a result of the induced impact, which reflects the additional labour remuneration (and thus consumer spending) and generation of gross operative surpluses from the Project suppliers. The on-site impact (i.e. 500 operational jobs plus annualised construction) attributes 0.45% of the total jobs sustained. The indirect contribution is 33.57%.

FIGURE 3.19: PERCENTAGE SHARE OF VARIOUS LINKAGE IMPACTS – US$ 7.00 SCENARIO



From figure 3.19 it is interesting to note is that 33% of the jobs that will be created for unskilled workers, whilst 40% will be for semi-skilled workers. The remaining 27% of jobs are skilled workers, implying that skilled labour will have to migrate into the Project focus areas (for example, Lindi and Mtwara regions). With almost one-in-three workers on the Project being skilled, there is potential for skills transfer to occur, thus up-skilling the Tanzanian labour force.

FIGURE 3.20: PERCENTAGE SHARE OF VARIOUS SKILL LEVELS – US$ 7.00 SCENARIO:

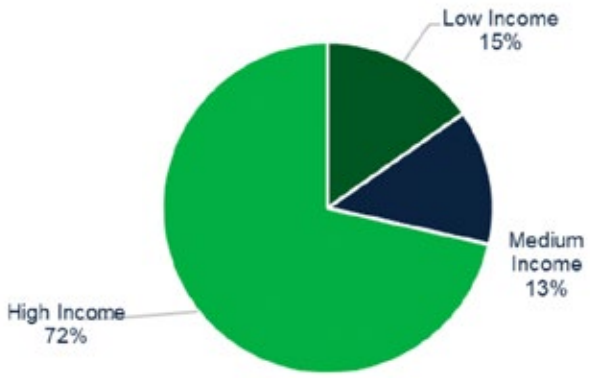


Household Income - US$7.00 Scenario

Although an individual household is considered to be the smallest economic unit within an economy, combined they make up around three quarters of total GDP. The average household size tends to be bigger in LDCs and Tanzania is no exception, with an average of 4.6 persons per household.

Per Figure 3.21, it is expected that household per capita income will grow on average over the period of 2030-2059. 15% of this will go to the Lower Income group which will boost consumption expenditure for this vulnerable group. Notably, 72 % of the additional household consumption expenditure stimulated by the Project, will be accrued by high income households, which is synonymous with skilled and some semi-skilled households.

FIGURE 3.21: PERCENTAGE SHARE OF VARIOUS INCOME LEVELS – US$ 7.00 SCENARIO



Per Table 3.24, the Project is expected to increase household income and in so doing, boost households' consumption expenditure and GDP growth. The average household income in Tanzania will increase by US$141 on average per annum over the project period which entails approximately an increase of 12%. The high-income group will grow by US$1 007 (12.45%), the medium income by US$93 (10.95%) and the low income by US$31 (11.11%) on average per annum over the Project period.

TABLE 3.24: CONTRIBUTION TO TANZANIA HOUSEHOLD INCOME – US$ 7.00 SCENARIO

	Total	High Income	Medium Income	Low Income
Current Status				
Household Income (US$ mn)	15 220	10 498	2 199	2 522
Average Income per Household (US$)	1 172	8 085	847	278
Impact of LNG Project				
Total Household Impact (US$ mn)	1828	1307	241	280
Impact per Household (US$)	141	1007	93	31
Percentage Impact per Household	**12.01%**	**12.45%**	**10.95%**	**11.11%**

Sectoral Impact - US$7.00 Scenario

It should be noted that the sectoral results show that the Project is expected to have a wide effect on the economy of Tanzania. According to Table 3.25, the Mining sector is the economy's largest beneficiary (54% of GDP generated by the Project, into which sector LNG falls) of the total GDP impact of the project, followed by the agriculture with 22% of GDP generated by the Project.

In terms of employment, the agriculture sector is expected to be the largest beneficiary (26% of total employment, in this scenario), owing to the sector's high employment multiplier. The trade and accommodation sector benefits to the tune of 21% of the jobs created and the manufacturing sector benefit by 16% of jobs created. Notably, only 3% of all the jobs created by the Project are in the mining sector. This is not unexpected given the capital-intensive nature of the Project (i.e. only 500 operational employees).

TABLE 3.25: PROJECT SECTORAL IMPACT - US$7.00 SCENARIO

	GDP (US$ mn)	GDP %	Employment (#)	Employment %
1.Agriculture	1 916	22%	95 511	26%
2.Mining	4 766	54%	8 539	2%
3.Manufacturing	454	5%	57 726	16%
4.Electricity & water	73	1%	1 800	0%
5.Construction	222	2%	19 259	5%
6.Trade & accommodation	291	3%	78 354	21%
7.Transport & communication	459	5%	30 690	8%
8.Financial & business services	498	6%	24 838	7%
9.Community services	209	2%	47 759	13%
Total	**8 887**	**100%**	**364 477**	**100%**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

Fiscal Impact - US$7.00 Scenario

Table 3.26 illustrates the total fiscal impact of the Project. GOT revenue consists of taxes directly related to the Project (approximately US$ 2 192mn in annual nominal values over the Project period), plus taxes indirectly related to the Project (US$ 777.41mn) plus taxes related to the savings/reinvestment aspect of the Project (US$ 137.94mn).

This portion of the Project will contribute on average US$ 3 108 million per annum to the GOT's coffers, of which 70.5% will be in the form of direct taxes, 29.5% in the form of indirect taxes, whilst taxes on reinvestment/savings will contribute 4.4% to the GOT's tax take.

TABLE 3.26: PROJECT FISCAL IMPACT - US$7.00 SCENARIO

	Fiscal Impact (US$ mn)
A. Project Related Taxes	**2 192.40**
Total GoT Profit Share	1 002.23
Total Royalties	278.86
Total Taxes	911.30
B. Project Indirect Taxes	**915.36**
B1.Indirect:Operational and Construction	**777.41**
B2. Savings Re-Investment	**137.94**
Total Fiscal (A+B)	**3 107.75**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

The Project's additional fiscal resources shown in Figure 3.13 (on an aggregate basis) will support the GOT's efforts to achieve the United Nations' eight Millennium Development Goals, particularly 'achieve universal primary education' (goal 2),'reduce child mortality' (goal 4) and 'combat HIV/AIDS, malaria, and other diseases' (goal 6).

Within the TZ context, we note Vision 2025's goal of achieving a "High Quality Livelihood" for all Tanzanians, including access to "quality primary health care for all", "universal primary education" and "the attainment of a level of tertiary

education" ...[that is] 'required to respond and master the development challenges at all levels". Outside of the Project's direct benefits (see elsewhere), such outcomes can arise from the fiscal proceeds paid to GOT.

FIGURE 3.22: ADDITIONAL SOCIAL INFRASTRUCTURE FROM FISCAL PROCEEDS - US$7.00 SCENARIO

BOP - US$7.00 Scenario

Tanzania traditionally has a major BOP deficit (excluding grants) as a result of a wide trade deficit and negative net balance in the services and income account that explain the perpetual current account deficit. The Project is expected to increase the national import bill over the medium term as machinery and equipment are imported as part of the Project's construction (although not funded by the GOT in the most part, but largely by foreign private capital with no impact on Tanzania's savings). However, benefits will be shown over the Project lifetime once exports start to flow. Table 3.27 outlines the relevant numbers with major annual average benefits of US$ 4.4bn arising.

TABLE 3.27: BOP - US$7.00 SCENARIO

	Annual Average Total 38 Years 2021-2059	Annual Average First 20 Years 2021-2041
A. Project LNG Balance of Payment (BoP)		
Income of International Trade (+)		
Exported LNG (2343 MSCFD = 15MTPA LNG sold	4 286	3 534
Domestic Gas (200 MSCFD) - Import substitution Diesel and/or fertiliser	192	159
Physical Imports of Capital Equipment and Services(drilling) during Construction	-891	-1 398
Investor - Financing of Capex and Services during Construction (Imports and Domestic Purchases)	942	1 479
TPDC - per above, assuming it will also be funded by international funds	128	202
Repayment of Original Capital to Investor	-1 071	-1 681
Repatriation of Profits by Investor	850	290
Imports of Intermediate Goods & Services during Operational Period	-582	-418
LNG BoP	3 874	2 166
	-	-
B. Broader Economy BoP Impact through Re-investment (incl. indirect imports)	-	-
Benefits (Exports and Imports Substitution)	712	529
Total Imports	-144	-107
Reinvestment BoP	568	422
C. Total Balance of Payment (BoP) of A and B	**4 442**	**2 588**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

Economic Effectiveness Criteria - US$7.00 Scenario

Given that Tanzania is a lower middle-income country, it seems appropriate to include a social efficiency indicator among the effectiveness measures in Table 3.28, and to compare it to relevant Tanzanian economic averages. The impact of the initiative on increasing the economic welfare of local households was demonstrated using a poverty alleviation ratio. The percentage of increased household income generated by the Project that goes to low-income households served as a proxy for this.

The effectiveness indicators for capital investment efficiency highlight the capital-intensive nature of TLNG. For each US$ of capital invested in the Project, US$ 0.17 additional GDP is generated compared to US$ 0.46 generated from an equivalent capital investment on an average Tanzanian Project. This implies that the capital employed in the Project is less efficient in generating output as compared to capital invested in the average Tanzania project.

Similarly, the labour-to-capital ratio reveals that, for each US$ 1mn of capital investment in the Tanzania Project, 7 new jobs will be created. An equivalent capital investment in the average Tanzanian project would create over 37 jobs, which is once again indicative of the capital intensity of this project.

TABLE 3.28: ECONOMIC EFFECTIVENESS CRITERIA - US$7.00 SCENARIO

	GDP/Capital Ratio	Labour/Capital Ratio	Low/Total Income Households Ratio
Results	**0.17**	**7.07**	**15.33%**
Comparative Sectoral Results			
Agriculture, hunting, forestry and fishing	0.46	36.1	14.99%
Mining and quarrying	0.35	23.8	15.13%
Manufacturing	0.47	49.4	15.11%
Electricity, gas and water supply	0.40	23.6	14.75%
Construction	0.41	45.3	15.60%
Wholesale and retail trade	0.48	73.2	15.30%
Transport, storage and communication	0.36	33.1	14.86%
Financial, insurance, real estate and business services	0.25	21.3	14.99%
Community, social and personal services	0.35	46.6	15.87%
Total	0.46	37.5	15.02%

As shown above, TLNG is far more capital intensive than the average Tanzanian project or business.

Combined Macroeconomic Impacts - US$7.00 Scenario

The total combined macroeconomic impact of the Project is summarised in Table 3.29. It includes the construction, operational and re-investment impacts of the Project, as well as the impact of on-site (direct), supply chain (indirect) and economy wide (induced) activities.

TABLE 3.29: COMBINED MACROECONOMIC IMPACTS - US$7.00 SCENARIO

Impact (US$ mn)	On-Site	Supply Chain	Economy Wide	Total
Impact on GDP	5 180	1 244	2 463	8 887
Impact on GNI				7 303
Impact on capital formation	42 186	3 421	5 936	51 543
Impact on employment [national job opportunities]	1 651	122 356	240 471	364 477
Impact on Households				**1 828**
Household Income per Household				**141**
Fiscal Impact				**3 108**
Balance of Payments				**4 442**

Regional Macroeconomic Impact - US$7.00 Scenario

The economic, physical, and demographic parameters of the Lindi and Mtwara regions which are directly impacted by the Project are depicted in Box 2. It is important that the macroeconomic impact of the Project should be evaluated against this background.

BOX 2: ECONOMIC, PHYSICAL AND DEMOGRAPHIC PARAMETERS

- As noted by REPOA (2021), Lindi's nominal 2019 GDP is Tzs 2 770 427mn (US$ 1196.21) with a per capita GDP of Tzs 2 758 183 mn (US$ 1 191) Mtwara's GDP (at current market price) in 2019 was Tzs 3 805 851 mn (US$ 1643.9), while per capita GDP was Tzs 2,622,775 mn (US$ 1133)
- Mtwara's population increased from 888,882 (1988 census) to 1,124,481 in 2002 and reached 1,451,078 in 2019 while Lindi's population is 1,004,439 in 2019 which is relatively lower.
- The southern region's strategic location provides an advantage of large markets of COMESA, EAC and SADC member countries, including Comoros, Mozambique and Madagascar.
- The regional road network covers 6149.8 kilometres and connects through the Mtwara corridor road to bigger markets in the country, including Dar es Salaam and other regions.
- Mtwara's five (5) district councils, are well served with a natural gas fired power plant. The region also has a large volume of natural gas with [the NNGI] that can be accessed by large energy users at [an] affordable price.
- The literacy rate for the population aged 5 years and above in Lindi region was 63 percent. Literacy rate was higher among those aged between 10 and 49 years and was also higher among the urban population (74 percent) than the rural population (61 percent). While Mtwara records a slight increase (0.45%) of pre-primary enrolment from 1,422,720 in 2018 to 1,429,155 in 2019.

Table 3.30 and 3.31 depicts the macroeconomic regional impacts of the Tanzania LNG projects for Lindi and Mtwara region respectively.

The Project will have a significant impact on the Lindi region. For instance, the impact on average Income per household over the period is US$ 8,092 (see Table 3.29), with the current (2019) average Income per household over the period being US$ 5,479 (Calculated as US$ 1,191 per capita * 4.6 persons per household), then the impact of the project nearly doubles the average income per household to US$ 13,571.

TABLE 3.30: LINDI - TOTAL REGIONAL IMPACT - US$7.00 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**2 979**	**136**	**521**	**3 636**
Impact on GNI				2 705
Impact on capital formation	26 738	383	1 256	28 377
Impact on employment [# of job opportunities]	**2 200**	**14 636**	**50 866**	**67 702**
- Skilled employment	1 185	3 798	14 444	19 427
- Semi-skilled employment	670	6 529	19 788	26 987
- Unskilled employment	345	4 309	16 634	21 288
Impact on Households				**167**
- Low Income Households				32
- Medium Income Households				50
- High Income Households				84
Impact on household income per household over programming period (avg. US$)				8 092
Impact on household income per household over programming period (avg. TZS)				8 715 896

From Table 3.31, it is evident that this project will have a significant impact on the Mtwara region. For instance, the impact on average Income per household over the period is US$ 5780 (see Table 3.31), with the current (2019) average Income per household over the period being US$ 5212 (Calculated as US$ 1133 per capita * 4.6 persons per household), then the impact of the project nearly doubles the average income per household to US$ 10992.

TABLE 3.31: MTWARA - TOTAL REGIONAL IMPACT - US$7.00 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**1 843**	**178**	**657**	**2 678**
Impact on GNI				2 102
Impact on capital formation	15 448	500	1 584	17 531
Impact on employment [# of job opportunities]	**3 713**	**19 096**	**64 150**	**86 959**
- Skilled employment	1 942	4 956	18 217	25 115
- Semi-skilled employment	1 154	8 518	24 956	34 627
- Unskilled employment	617	5 623	20 978	27 217
Impact on Households				**211**
- Low Income Households				42
- Medium Income Households				64
- High Income Households				106
Impact on household income per household over programming period (avg. US$)				5 780
Impact on household income per household over programming period (avg. TZS)				13 368 497

MACROECONOMIC IMPACT - US$10.00 SCENARIO

Major Project Benefits: US$10.00 Scenario

Figure 3.23 below summarises the major Project benefits. However, the details underpinning this summary will be discussed in the subsequent portion of this section.

FIGURE 3.23: DIRECT MACROECONOMIC IMPACT - US$10.00 SCENARIO

Economic Growth Impact - US$10.00 Scenario

Table 3.32 illustrates the average annual lifetime operational impact of the Project (2030-2059). The Project will annually generate US$ 7,271mn of GDP, while capital formation in the order of US$ 41,757mn. The number of annual jobs p.a. to be created and then sustained is estimated to be 500 during the Project's operational phase.

TABLE 3.32: AVERAGE ANNUAL LIFETIME PROJECT OPERATIONAL IMPACT – US$ 10.00 SCENARIO

Economic Indicators	Direct Impact
Operational GDP (US$ mn)	7 271
Capital formation (US$ mn)	41 757
Employment [# of job opportunities] Construction (Direct and Indirect)	6 000
Employment [# of job opportunities] Operational	500

US$ Million; 2021 Constant Prices

Regarding the wider impact of the Project, Table 3.33 provides a summary of the different types of impacts as well as the total impact of the Project on the major economic indicators.

TABLE 3.33: COMBINED MACROECONOMIC IMPACT - US$10.00 SCENARIO

US$m (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**7 463**	**1 786**	**3 450**	**12 699**
GNI				10 565
Impact on capital formation	42 186	4 817	8 314	55 317
Impact on employment [# of job opportunities]	**1 651**	**178 781**	**336 795**	**517 227**
- Skilled employment	783	43 673	95 640	140 096
- Semi-skilled employment	545	77 758	131 018	209 322
- Unskilled employment	323	57 350	110 137	167 809
Impact on Households				**2 496**
- Low Income Households				378
- Medium Income Households				326
- High Income Households				1 792

Table 3.34 depicts the impact of the construction, operational and reinvestment phases of the Project in the economy. The construction phase is a once-off event that will last a maximum of five (5) years (substantially less at full intensity). The operational and reinvestment phases have longer-term impacts, stretching over the entire Project life cycle.

	GDP (US$ mn)	Capital (US$ mn)	Employment (Numbers)
Operational	9 932	48 408	252 690
Construction	648	1 573	48 750
Savings / Investment Impact	2 119	5 336	215 787
Total	**12 699**	**55 317**	**517 227**

TABLE 3.34: IMPACT OF RESULTS OF MAIN PROJECT COMPONENTS - US$10.00 SCENARIO

In Figure 3.24, the significant economic impacts in terms of GDP, Capital Formation and Employment creation are generated during the operational phase of the Project. Important to note is that the impacts generated by the S&I phase are far larger than the construction phase impacts.

	GDP (US$ mn)	Capital (US$ mn)	Employment (Numbers)
Savings / Investment Impact	16.69%	9.65%	41.72%
Construction	5.10%	2.84%	9.43%
Operational	78.21%	87.51%	48.85%

FIGURE 3.24: RESULTS OF MAIN PROJECT COMPONENTS (PHASES) – US$ 10.00 SCENARIO

Figure 3.25 illustrates the annual GDP created by the Project per project phase over its lifespan. The first years form the construction phase, with meaningful production or output of the Project materialising from 2030 onwards, with net revenue flows leading to subsequent reinvestment/savings decisions.

FIGURE 3.25: PROJECT COMPONENTS GDP IMPACT - US$10.00 SCENARIO

Figure 3.26 allocates the total GDP impact to the different types of impacts. On average, the direct impact amounts to 59% of the total impact value, the indirect impact to 14% and the induced impact to 27% of the total GDP impact value.

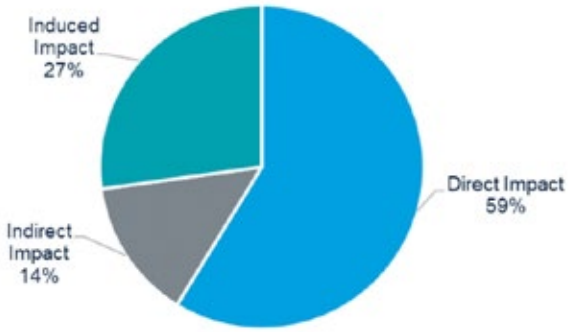


FIGURE 3.26: PERCENTAGE SHARE OF GDP IMPACT – US$ 10.00 SCENARIO

Post COVID, the Tanzanian economy is expected to increase by roughly 6.0 % over the period 2030-2059. However, per the MIAM with the US$ 10.00 Scenario, this growth can increase by 1.2%, bringing the average growth to around

7.2%.

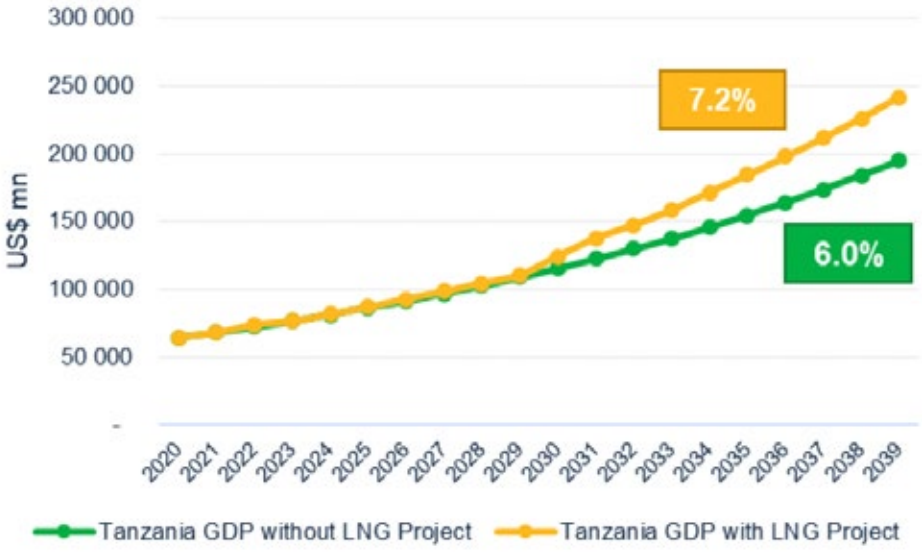


FIGURE 3.27: IMPACT OF THE PROJECT ON TANZANIA GDP GROWTH – US$ 10.00 SCENARIO

The detailed impacts of various components of the Projects to GDP and GNI are presented in Table 3.35. The lower impact of the Project on the GNI relative to that on the GDP can be deduced, with leakage (outflow) from Tanzania in terms of the direct impacts being important (especially during the operational phase).

	Operational	Construction	Savings	Total
GDP	9 932	648	2 119	12 699
GNI	7 824	643	2 098	10 565
Outflow of Primary Income (Capital & Wages)	2 109	5	21	2 134
Percentage of Outflow	21%	1%	1%	16.8%

TABLE 3.35: IMPACT ON GDP AND GNI – US$ 10.00 SCENARIO

All values are Presented as Average p.a. over the Period 2030-2059,US$mn 2021 Constant Prices

EMPLOYMENT IMPACT (NUMBERS) - US$10.00 SCENARIO

Approximately 65.12% of the total jobs that will be created by the Project will be created as a result of the induced impact, which reflects the additional labour remuneration (and thus consumer spending) and generation of gross operative surpluses from the suppliers to the Project. The direct impact attributes 0.32% of the total jobs sustained.

The indirect contribution is 34.57%.

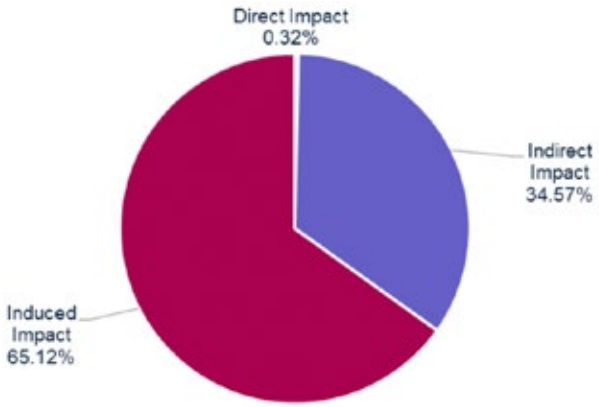


FIGURE 3.28: PERCENTAGE SHARE OF VARIOUS LINKAGE IMPACTS – US$ 10.00 SCENARIO

From Figure 3.28 it is Interesting to note is that 32% of the jobs that will be created for unskilled workers, whilst 41% will be for semi-skilled workers. The remaining 27% of jobs are skilled workers, implying that skilled labour will have to migrate into the project focus area. With almost one-in-three workers on the project being skilled, there is potential for skills transfer to occur, thus up-skilling the Tanzanian labour force.

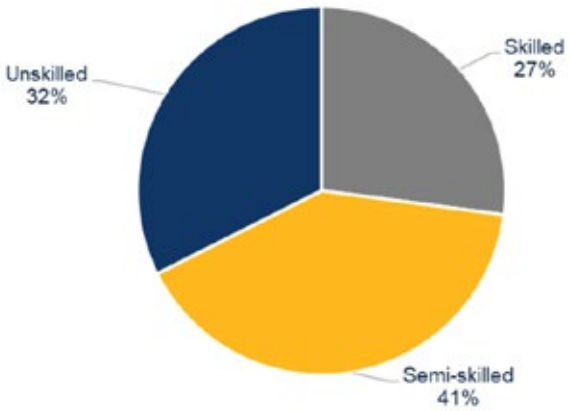


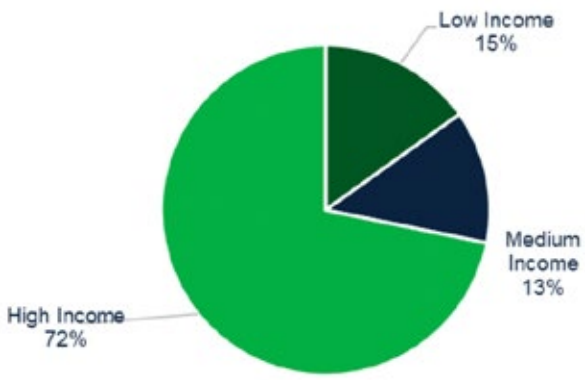
FIGURE 3.29: PERCENTAGE SHARE OF VARIOUS SKILL LEVELS – US$ 10.00 SCENARIO:

Household Income - US$10.00 Scenario

Although an individual household is considered to be the smallest economic unit within an economy, combined they make up around three quarters of total GDP. The average household size tends to be bigger in LDCs and Tanzania is no exception, with an average of 4.6 persons per household.

it is expected that household per capita income will grow on average over the period of 2030-2059. 15% of this will go to the Lower Income group which will boost consumption expenditure for this vulnerable group. Notably, 72 % of the additional household consumption expenditure stimulated by the Project, will be accrued by high income households, which is synonymous with skilled and some semi-skilled households.

FIGURE 3.30: PERCENTAGE SHARE OF VARIOUS INCOME LEVELS – US10.00 SCENARIO



Per Table 3.36, the Project is expected to increase household income and in so doing, boost households' consumption expenditure and GDP growth. The average household income in Tanzania will increase by US$ 192 on average per annum over the project period which entails approximately an increase of nearly 16.40%. The high-income group will grow by US$ 1 380 (17.07%), the medium income by US$ 126 (14.82%) and the low income by US$ 42 (14.98%) on average per annum over the Project period.

TABLE 3.36: CONTRIBUTION TO TANZANIA HOUSEHOLD INCOME – US$ 10.00 SCENARIO

	Total	High Income	Medium Income	Low Income
Current Status				
Household Income (US$ mn)	15 220	10 498	2 199	2 522
Average Income per Household (US$)	1 172	8 085	847	278
Impact of LNG Project				
Total Household Impact (US$ mn)	2 496	1 792	326	378
Impact per Household (US$)	192	1 380	126	42
Percentage Impact per Household	16.40%	17.07%	14.82%	14.98%

Sectoral Impact - US$10.00 Scenario

It should be noted that the sectoral results show that the Project is expected to have a profound effect on the economy of Tanzania. According to Table 3.37, the Mining sector is the economy's largest beneficiary (55% of GDP generated by the Project, into which LNG falls), followed by the agriculture with 21% of GDP generated by the Project.

In terms of employment, the agriculture sector is expected to be the largest beneficiary (26% of total employment, in this scenario), owing to the sector's high employment multiplier. The trade and accommodation sector benefits to the tune of 22% of the jobs created and the manufacturing sector benefit by 16% of jobs created. Notably, only 2% of all the jobs created by the Project are in the mining sector. This is not unexpected given the capital-intensive nature of the Project (i.e. 500 on-site operational jobs).

TABLE 3.37: PROJECT SECTORAL IMPACT - US$10.00 SCENARIO

	GDP (US$ mn)	GDP %	Employment (#)	Employment %
1.Agriculture	2 684	21%	136 582	26%
2.Mining	6 984	55%	11 004	2%
3.Manufacturing	624	5%	80 407	16%
4.Electricity & water	99	1%	2 481	0%
5.Construction	294	2%	27 289	5%
6.Trade & accommodation	414	3%	113 461	22%
7.Transport & communication	647	5%	44 107	9%
8.Financial & business services	663	5%	34 054	7%
9.Community services	291	2%	67 842	13%
Total	**12 699**	**100%**	**517 227**	**100%**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

Fiscal Impact - US$10.00 Scenario

Table 3.38 illustrates the total fiscal impact of the Project. GOT revenue consists of taxes directly related to the Project (approximately US$ 3 697.8mn in annual nominal values over the Project period), plus taxes indirectly related to the Project (US$ 1 037mn) plus taxes related to the savings/reinvestment aspect of the Project (US$ 226.7mn).

TABLE 3.38: PROJECT FISCAL IMPACT - US$10.00 SCENARIO

	Fiscal Impact (US$ mn)
A. Project Related Taxes	**3 697.82**
Total GoT Profit Share	1 957.16
Total Royalties	393.03
Total Taxes	1 347.63
B. Project Indirect Taxes	**1 264.73**
B1.Indirect Operational and Construction	1 037.96
B2. Savings Re-Investment	226.76
Total Fiscal (A+B)	**4 962.54**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

The Project's additional fiscal resources shown in Figure 3.13 (on an aggregate basis) will support the GOT's efforts to achieve the United Nations' eight Millennium Development Goals, particularly 'achieve universal primary education' (goal 2),'reduce child mortality' (goal 4) and 'combat HIV/AIDS, malaria, and other diseases' (goal 6).

Within the TZ context, we note Vision 2025's goal of achieving a "High Quality Livelihood" for all Tanzanians, including access to "quality primary health care for all", "universal primary education" and "the attainment of a level of tertiary education" ...[that is] 'required to respond and master the development challenges at all levels". Outside of the Project's direct benefits (see elsewhere), such outcomes can arise from the fiscal proceeds paid to GOT.

FIGURE 3.31: ADDITIONAL SOCIAL INFRASTRUCTURE FROM FISCAL PROCEEDS - US$10.00 SCENARIO

BOP - US$10.00 Scenario

Tanzania traditionally has a major BOP deficit (excluding grants) as a result of a wide trade deficit and negative net balance in the services and income account that explain the perpetual current account deficit. The Project is expected to increase the national import bill over the medium term as machinery and equipment are imported as part of the Project's construction (although not funded by the GOT in the most part, but largely by foreign private capital with no impact on Tanzania's savings). However, benefits will be shown over the Project lifetime once exports start to flow. Table 3.39 outlines the relevant numbers.

TABLE 3.39: BOP - US$10.00 SCENARIO

	Annual Average Total 38 Years 2021-2059	Annual Average First 20 Years 2021-2041
A. Project LNG Balance of Payment (BoP)		
Income of International Trade (+)		
Exported LNG (2343 MSCFD = 15MTPA LNG sold)	6 042	4 984
Domestic Gas (200 MSCFD) - Import substitution Diesel and/or fertiliser	192	159
Physical Imports of Capital Equipment and Services (drilling) during Construction	-891	-1 398
Private Sponsor - Financing of Capex and Services during Construction (Imports and Domestic Purchases)	942	1 479
TPDC - per above, assuming it will also be funded by international funds	128	202
Repayment of Original Capital to Private Sponsor	-1 071	-1 681
Repatriation of Profits by Private Sponsor	1 293	655
Imports of Intermediate Goods & Services during Operational Period	-689	-512
LNG BoP	5 947	3 887
	-	-
B. Broader Economy BoP Impact through Re-investment (incl. indirect imports)	-	-
Benefits (Exports and Imports Substitution)	1 170	869
Total Imports	-237	-176
Reinvestment BoP	933	693
C. Total Balance of Payment (BoP) of A and B	**6 880**	**4 580**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

Economic Effectiveness Criteria - US$10.00 Scenario

Given that Tanzania is a lower middle-income country, it seems appropriate to include a social efficiency indicator among the effectiveness measures in Table 3.40, and to compare it to relevant Tanzanian economic averages. The impact of the initiative on increasing the economic welfare of local households was demonstrated using a poverty alleviation ratio. The percentage of increased household income generated by the Project that goes to low-income households served as a proxy for this.

The effectiveness indicators for capital investment efficiency highlight the capital-intensive nature of the Project. For each US$ of capital invested in the project, US$ 0.23 additional GDP is generated compared to US$ 0.46 generated from an equivalent capital investment on an average Tanzanian project. This implies that the capital employed in the project is less efficient in generating output as compared to capital invested in the average Tanzania project.

Similarly, the labour-to-capital ratio reveals that, for each US$ 1 million of capital investment in the Tanzania Project, 9 new jobs will be created. An equivalent capital investment in the average Tanzanian project would create 37 jobs, which is once again indicative of the capital intensity of this project. However, as explained elsewhere, the numerous economic benefits provided by TLNG facilitates wider economic growth.

TABLE 3.40: ECONOMIC EFFECTIVENESS CRITERIA - US$10.00 SCENARIO

	GDP/Capital Ratio	Labour/Capital Ratio	Low/Total Income Households Ratio
Results	**0.23**	**9.35**	**15.14%**
Comparative Sectoral Results			
Agriculture, hunting, forestry and fishing	0.46	36.1	14.99%
Mining and quarrying	0.35	23.8	15.13%
Manufacturing	0.47	49.4	15.11%
Electricity, gas and water supply	0.40	23.6	14.75%
Construction	0.41	45.3	15.60%
Wholesale and retail trade	0.48	73.2	15.30%
Transport, storage and communication	0.36	33.1	14.86%
Financial, insurance, real estate and business services	0.25	21.3	14.99%
Community, social and personal services	0.35	46.6	15.87%
Total	**0.46**	**37.5**	**15.02%**

As shown above, the Project is far more capital intensive than the average Tanzanian project or business, but benefits low income households pretty much the same.

Combined Macroeconomic Impacts - US$10.00 Scenario

The total impact of the Project is summarized in Table 3.41. It includes the construction, operational and re-investment impacts of the Project, which also shows the impact of on-site (direct), supply chain (indirect) and economy wide (induced) activities.

TABLE 3.41: COMBINED MACROECONOMIC IMPACTS - US$10.00 SCENARIO

Impact (US$ mn)	On-Site	Supply Chain	Economy Wide	Total
Impact on GDP	7 463	1 786	3 450	12 699
Impact on GNI				10 565
Impact on capital formation	42 186	4 817	8 314	55 317
Impact on employment [national job opportunities]	1 651	178 781	336 795	517 227
Impact on Households				**2 496**
Household Income per Household				**192**
Fiscal Impact				**4 963**
Balance of Payments				**6 880**

Regional Macroeconomic Impact - US$10.00 Scenario

The economic, physical, and demographic parameters of the Lindi and Mtwara regions which are directly impacted by the Project are depicted in Box 3. It is important that the macroeconomic impact of the Project should be evaluated against this regional background.

BOX 3: ECONOMIC, PHYSICAL AND DEMOGRAPHIC PARAMETERS

- As noted by REPOA (2021), Lindi's nominal 2019 GDP is Tzs 2 770 427mn (US$ 1196.21) with a per capita GDP of Tzs 2 758 183 mn (US$ 1 191) Mtwara's GDP (at current market price) in 2019 was Tzs 3 805 851 mn (US$ 1643.9), while per capita GDP was Tzs 2,622,775 mn (US$ 1133)
- Mtwara's population increased from 888,882 (1988 census) to 1,124,481 in 2002 and reached 1,451,078 in 2019 while Lindi's population is 1,004,439 in 2019 which is relatively lower.
- The southern region's strategic location provides an advantage of large markets of COMESA, EAC and SADC member countries, including Comoros, Mozambique and Madagascar.
- The regional road network covers 6149.8 kilometres and connects through the Mtwara corridor road to bigger markets in the country, including Dar es Salaam and other regions.
- Mtwara's five (5) district councils, are well served with "natural gas fired power plant". The region also has a large volume of natural gas with [the NNGI] that can be accessed by large energy users at [an] affordable price.
- The literacy rate for the population aged 5 years and above in Lindi region was 63 percent. Literacy rate was higher among those aged between 10 and 49 years and was also higher among the urban population (74 percent) than the rural population (61 percent). While Mtwara records a slight increase (0.45%) of pre-primary enrolment from 1,422,720 in 2018 to 1,429,155 in 2019.

Table 3.42 and 3.43 depicts the macroeconomic regional impacts of the Project for Lindi and Mtwara region respectively.

It is evident that this project will have a significant impact on the Lindi region with regards to the US$10.00 Scenario, for instance, the current impact on the average Income per household over the period is US$ 5479 (Calculated as: US$ 1191 per capita * 4.6 persons per household, refer to Box 3). If this increase is added to the average income per household of Lindi region of US$ 11482 (see Table 3.42), then the impact of the project nearly doubles the average income per household to US$ 16 961.

TABLE 3.42: LINDI – TOTAL REGIONAL IMPACT - US$10.00 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**4 611**	**196**	**827**	**5 634**
Impact on GNI				4 265
Impact on capital formation	26 738	577	1 827	29 143
Impact on employment [# of job opportunities]	**613**	**21 419**	**74 029**	**96 060**
- Skilled employment	297	5 232	21 022	26 551
- Semi-skilled employment	200	9 316	28 798	38 314
- Unskilled employment	116	6 871	24 209	31 195
Impact on Households				**275**
- Low Income Households				43
- Medium Income Households				35
- High Income Households				197
Impact on household income per household over programming period (avg. US$)				11 482
Impact on household income per household over programming period (avg. TZS)				26 556 941

It is evident that this project will have a significant impact on the Mtwara region with regards to the US$10.00 Scenario, for instance, the current impact on the average Income per household over the period is US$ 5212 (Calculated as: US$ 1 133 per capita * 4.6 persons per household, refer to Box 3). If this increase is added to the average income per household of Mtwara region of US$ 8 201 (see Table 3.43), then the impact of the project nearly doubles the average income per household to US$ 13 413.

TABLE 3.43: MTWARA - TOTAL REGIONAL IMPACT - US$10.00 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**2 852**	**215**	**1 025**	**4 092**
Impact on GNI				3 243
Impact on capital formation	15 448	677	2 305	18 429
Impact on employment [# of job opportunities]	**1 038**	**24 932**	**93 361**	**119 331**
- Skilled employment	486	6 101	26 512	33 099
- Semi-skilled employment	345	10 829	36 319	47 493
- Unskilled employment	207	8 001	30 531	38 739
Impact on Households				**238**
- Low Income Households				37
- Medium Income Households				31
- High Income Households				170
Impact on household income per household over programming period (avg. US$)				8 201
Impact on household income per household over programming period (avg. TZS)				18 969 243

MACROECONOMIC IMPACT - US$12.00 SCENARIO

Major Project Benefits: US$12.00 Scenario

Figure 3.32 below summarises the major Project benefits. However, the details underpinning this summary will be discussed in the subsequent portion of this section.

FIGURE 3.32: DIRECT MACROECONOMIC IMPACT - US$12.00 SCENARIO

Economic Growth Impact - US$12.00 Scenario

Table 3.44 illustrates the average annual lifetime operational impact of the Project (2030-2059). The Project will annually generate US$ 8,741mn of GDP, while capital formation in the order of US$ 41,757mn. The number of annual jobs p.a. to be created and then sustained is estimated to be 500 during the Project's operational phase.

TABLE 3.44: AVERAGE ANNUAL PROJECT OPERATIONAL LIFETIME IMPACT

Economic Indicators	Direct Impact
Operational GDP (US$ mn)	8 749
Capital formation (US$ mn)	41 757
Employment [# of job opportunities] Construction (Direct and Indirect)	6 000
Employment [# of job opportunities] Operational	500

Regarding the wider impact of the Project, Table 3.45 provides a summary of the different types of impacts as well as the total impact of the Project on the major economic indicators.

TABLE 3.45: COMBINED MACROECONOMIC IMPACT - US$12.00 SCENARIO

US$m (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	**8941**	**2180**	**4132**	**15253**
GNI				12 756
Impact on capital formation	42188	5996	9954	58139
Impact on employment [# of job opportunities]	**1651**	**243430**	**401967**	**647048**
- Skilled employment	721	61814	114582	177116
- Semi-skilled employment	529	110936	156438	267903
- Unskilled employment	401	70680	130948	202029
Impact on Households				**2 953**
- Low Income Households				452
- Medium Income Households				390
- High Income Households				2 111

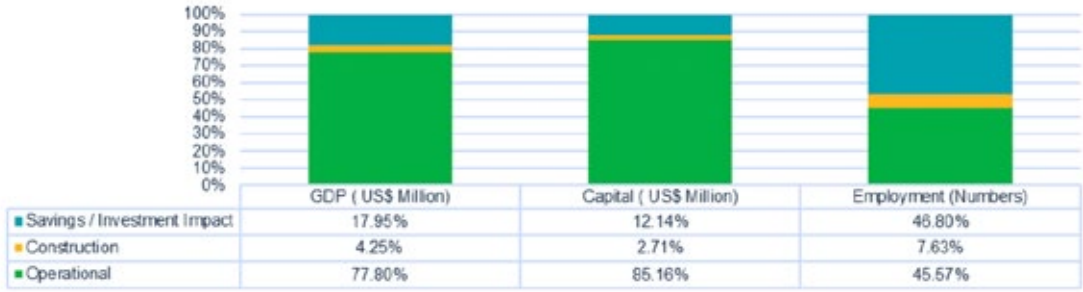
Table 3.46 depicts the impact of the construction, operational and reinvestment phases of the Project in the economy. The construction phase is a once-off event that will last a maximum of five (5) years (substantially less at full intensity). The operational and reinvestment phases have longer-term impacts, stretching over the entire Project life cycle.

TABLE 3.46: IMPACT OF RESULTS OF MAIN PROJECT COMPONENTS - US$12.00 SCENARIO

	GDP (US$ mn)	Capital (US$ mn)	Employment (Numbers)
Operational	11867	49508	294846
Construction	648	1575	49374
Savings / Investment Impact	2739	7056	302827
Total	**15253**	**58139**	**647048**

In Figure 3.33, the significant economic impacts in terms of GDP, Capital Formation and Employment creation are generated during the operational phase of the Project. Important to note is that the impacts generated by the savings/re-investment phase are sizeable relative to the construction phase impacts.

FIGURE 3.33: RESULTS OF MAIN PROJECT COMPONENTS (BY PHASES) – US$ 12.00 SCENARIO



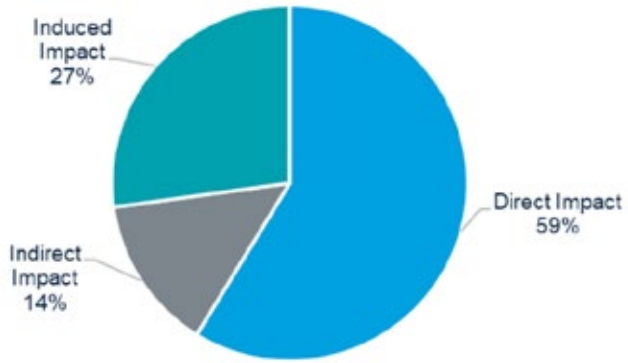
	GDP (US$ Million)	Capital (US$ Million)	Employment (Numbers)
Savings / Investment Impact	17.95%	12.14%	46.80%
Construction	4.25%	2.71%	7.63%
Operational	77.80%	85.16%	45.57%

Figure 3.25 illustrates the annual GDP created by the Project per project phase over its lifespan. The first years form the construction phase, with meaningful production or output of the Project materialising from 2030 onwards, with net revenue flows leading to subsequent reinvestment/savings decisions.

FIGURE 3.34: PROJECT COMPONENTS GDP IMPACT - US$12.00 SCENARIO

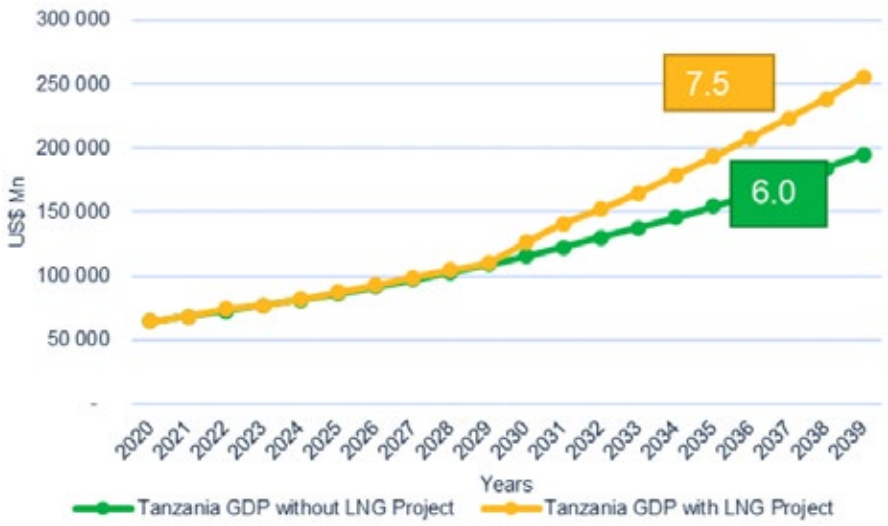
Figure 3.26 allocates the total GDP impact to the different types of impacts. On average, the direct impact amounts to 59% of the total impact value, the indirect impact to 14% and the induced impact to 27% of the total GDP impact value.

FIGURE 3.35: PERCENTAGE SHARE OF GDP IMPACT – US$ 12.00 SCENARIO



Post COVID, the Tanzanian economy is expected to increase by roughly 6.0 % over the period 2030-2059. However, per the MIAM with the US$ 12.00 FOB Scenario, this growth can increase by 1.5%, bringing the average growth to around 7.5%.

FIGURE 3.36: IMPACT OF THE PROJECT ON TANZANIA GDP GROWTH – US$ 12.00 SCENARIO



The detailed impacts of various components of the Projects to GDP and GNI are presented in Table 3.47. The lower impact of the Project on the GNI relative to that on the GDP can be deduced, with leakage (outflow) from Tanzania in terms of the direct impacts being important (especially during the operational phase).

TABLE 3.47: IMPACT ON GDP AND GNI – US$ 12.00 SCENARIO

	Operational	Construction	Savings	Total
GDP	11 867	648	2 739	15 253
GNI	9 401	643	2 712	12 756
Outflow of Primary Income (Capital & Wages)	2 466	5	27	2 497
Percentage of Outflow	21%	1%	1%	16.4%

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

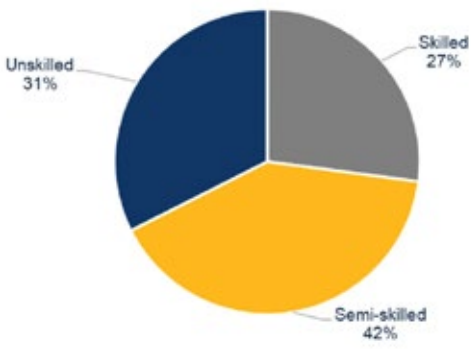
Employment Impact (Numbers) - US$12.00 Scenario

Approximately 62.07% of the total jobs that will be created by the Project will be created as a result of the induced impact, which reflects the additional labour remuneration (and thus consumer spending) and generation of gross operative surpluses from the suppliers to the Project. The direct impact attributes 0.26% of the total jobs sustained. The indirect contribution is 37.68%.

FIGURE 3.37: PERCENTAGE SHARE OF VARIOUS LINKAGE IMPACTS – US$ 12.00 SCENARIO

From Figure 3.38 it is Interesting to note is that 31% of the jobs that will be created for unskilled workers, whilst 42% will be for semi-skilled workers. The remaining 27% of jobs are skilled workers, implying that skilled labour will have to migrate into the project focus area. With almost one-in-three workers on the project being skilled, there is potential for skills transfer to occur, thus up-skilling the Tanzanian labour force.

FIGURE 3.38: PERCENTAGE SHARE OF VARIOUS SKILL LEVELS – US$ 12.00 SCENARIO

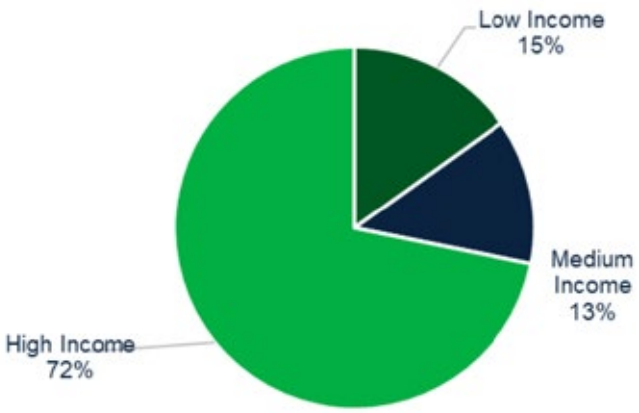


Household Income - US$12.00 Scenario

Although an individual household is considered to be the smallest economic unit within an economy, combined they make up around three quarters of total GDP. The average household size tends to be bigger in LDCs and Tanzania is no exception, with an average of 4.6 persons per household.

it is expected that household per capita income will grow on average over the period of 2030-2059. 15% of this will go to the Lower Income group which will boost consumption expenditure for this vulnerable group. Notably, 72 % of the additional household consumption expenditure stimulated by the Project, will be accrued by high income households, which is synonymous with skilled and some semi-skilled households.

FIGURE 3.39: PERCENTAGE SHARE OF VARIOUS INCOME LEVELS – US$ 12.00 SCENARIO



Per Table 3.48, the Project is expected to increase household income and in so doing, boost households' consumption expenditure and GDP growth. The average household income in Tanzania will increase by US$ 227 on average per annum over the project period which entails approximately an increase of nearly 19.40%. The high-income group will grow by US$ 1 626 (20.11%), the medium income by US$ 150 (17.75%) and the low income by US$ 50 (17.92%) on average per annum over the Project period.

TABLE 3.48: CONTRIBUTION TO TANZANIA HOUSEHOLD INCOME – US$ 12.00 SCENARIO

	Total	High Income	Medium Income	Low Income
Current Status				
Household Income (US$ mn)	15 220	10 498	2 199	2 522
Average Income per Household (US$)	1 172	8 085	847	278
Impact of LNG Project				
Total Household Impact (US$ mn)	2953	2111	390	452
Impact per Household (US$)	227	1626	150	50
Percentage Impact per Household	19.40%	20.11%	17.75%	17.92%

Sectoral Impact - US$12.00 Scenario

It should be noted that the sectoral results show that the Project is expected to have a profound effect on the economy of Tanzania. According to Table 3.49, the Mining sector is the economy's largest beneficiary (57% of GDP generated by the Project, into which LNG falls), followed by the agriculture with 19% of GDP generated by the Project.

In terms of employment, the agriculture sector is expected to be the largest beneficiary (26% of total employment, in this scenario), owing to the sector's high employment multiplier. The trade and accommodation sector benefits to the tune of 23% of the jobs created and the manufacturing sector benefit by 17% of jobs created. Notably, only 2% of all the jobs created by the Project are in the mining sector. This is not unexpected given the capital-intensive nature of the Project (i.e. 500 on-site operational jobs).

TABLE 3.49: PROJECT SECTORAL IMPACT - US$12.00 SCENARIO

	GDP (US$ mn)	GDP %	Employment (#)	Employment %
1.Agriculture	2952	19%	157536	24%
2.Mining	8720	57%	14328	2%
3.Manufacturing	808	5%	110377	17%
4.Electricity & water	156	1%	4159	1%
5.Construction	252	2%	23944	4%
6.Trade & accommodation	498	3%	146518	23%
7.Transport & communication	743	5%	54261	8%
8.Financial & business services	735	5%	40441	6%
9.Community services	392	3%	95485	15%
Total	15253	100%	647048	100%

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

Fiscal Impact - US$12.00 Scenario

Table 3.50 illustrates the total fiscal impact of the Project. GOT revenue consists of taxes directly related to the Project (approximately US$ 4 674.1mn in annual nominal values over the Project period), plus taxes indirectly related to the Project (US$ 1 210 mn) plus taxes related to the savings/reinvestment aspect of the Project (US$ 235.8mn).

TABLE 3.50: PROJECT FISCAL IMPACT - US$12.00 SCENARIO

	Fiscal Impact (US$ mn)
A. Project Related Taxes	**4 674.14**
Total GoT Profit Share	2 576.68
Total Royalties	466.92
Total Taxes	1 630.53
B. Project Indirect Taxes	**1 445.74**
B1.Indirect:Operational and Construction	**1 209.98**
B2. Savings Re-Investment	**235.77**
Total Fiscal (A+B)	**6 119.88**

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

The Project's additional fiscal resources shown in Figure 3.13 (on an aggregate basis) will support the GOT's efforts to achieve the United Nations' eight Millennium Development Goals, particularly 'achieve universal primary education' (goal 2),'reduce child mortality' (goal 4) and 'combat HIV/AIDS, malaria, and other diseases' (goal 6).

Within the TZ context, we note Vision 2025's goal of achieving a "High Quality Livelihood" for all Tanzanians, including access to "quality primary health care for all", "universal primary education" and "the attainment of a level of tertiary education" ...[that is] 'required to respond and master the development challenges at all levels". Outside of the Project's direct benefits (see elsewhere), such outcomes can arise from the fiscal proceeds paid to GOT.

FIGURE 3.40: ADDITIONAL SOCIAL INFRASTRUCTURE FROM FISCAL PROCEEDS - US$12.00 SCENARIO

BOP - US$12.00 Scenario

Tanzania traditionally has a major BOP deficit (excluding grants) as a result of a wide trade deficit and negative net balance in the services and income account that explain the perpetual current account deficit The Project is expected to increase the import bill over the medium term as machinery and equipment are imported (although this is funded by foreign capital and not by limited local savings). Once the Project output starts in 2030 and LNG exports commence, the BOP position dramatically improves. Table 3.51 outlines the relevant numbers.

TABLE 3.51: BOP - US$12.00 SCENARIO

	Annual Average Total 38 Years 2021-2059	Annual Average First 20 Years 2021-2041
A. Project LNG Balance of Payment (BoP)		
Income of International Trade (+)		
Exported LNG (2343 mmscfd = 14MTPA LNG sold)	7 179	5 922
Domestic Gas (200 mmscfd) - Import substitution Diesel and/or fertiliser	192	159
Physical Imports of Capital Equipment and Services(drilling) during Construction	-891	-1 398
Private Sponsor - Financing of Capex and Services during Construction (Imports and Domestic Purchases)	942	1 479
TPDC - per above, assuming it will also be funded by international funds	128	202
Repayment of Original Capital to Private Sponsor	-1 071	-1 681
Repatriation of Profits by Private Sponsor	1 579	889
Imports of Intermediate Goods & Services during Operational Period	-774	-575
LNG BoP	7 285	4 996
B. Broader Economy BoP Impact through Re-investment (incl. indirect imports)		
Benefits (Exports and Imports Substitution)	1 202	893
Total Imports	-244	-182
Reinvestment BoP	957	711
C. Total Balance of Payment (BoP) of A and B	8 242	5 708

All values are presented as average p.a. over the period 2030-2059, US$mn 2021 Constant Prices

Economic Effectiveness Criteria - US$12.00 Scenario

Given that Tanzania is a lower middle-income country, it seems appropriate to include a social efficiency indicator among the effectiveness measures in Table 3.52, and to compare it to relevant Tanzanian economic averages. The impact of the initiative on increasing the economic welfare of local households was demonstrated using a poverty alleviation ratio. The percentage of increased household income generated by the Project that goes to low-income households served as a proxy for this.

The effectiveness indicators for capital investment efficiency highlight the capital-intensive nature of the Tanzania Project. For each US$ of capital invested in the project, US$ 0.26 additional GDP is generated compared to US$ 0.46 generated from an equivalent capital investment on an average Tanzanian project. This implies that the capital employed in the project is less efficient in generating output as compared to capital invested in the average Tanzanian project.

Similarly, the labour-to-capital ratio reveals that, for each US$ 1 million of capital investment in the Tanzania Project, 11 new jobs will be created. An equivalent capital investment in the average Tanzanian project would create 37 jobs, which is once again indicative of the capital intensity of this project. However, as explained elsewhere, the numerous economic benefits provided by TLNG facilitates wider economic growth.

TABLE 3.52: ECONOMIC EFFECTIVENESS CRITERIA - US$12.00 SCENARIO

	GDP/Capital Ratio	Labour/Capital Ratio	Low/Total Income Households Ratio
Results	**0.26**	**11**	**15.30%**
Comparative Sectoral Results			
Agriculture, hunting, forestry and fishing	0.46	36	14.99%
Mining and quarrying	0.35	24	15.13%
Manufacturing	0.47	49	15.11%
Electricity, gas and water supply	0.40	24	14.75%
Construction	0.41	45	15.60%
Wholesale and retail trade	0.48	73	15.30%
Transport, storage and communication	0.36	33	14.86%
Financial, insurance, real estate and business services	0.25	21	14.99%
Community, social and personal services	0.35	47	15.87%
Total	**0.46**	**37**	**15.02%**

As shown above, the Project is far more capital intensive than the average Tanzanian project or business but benefits low income households pretty much the same.

Combined Macroeconomic Impacts - US$12.00 Scenario

The total impact of the Project is summarized in Table 3.53. It includes its construction, operational and re-investment impacts of the Project. The Table also shows the impact of on-site (direct), supply chain (indirect) and economy wide (induced) activities.

TABLE 3.53: COMBINED MACROECONOMIC IMPACTS - US$12.00 SCENARIO

Impact (US$ mn)	On-Site	Supply Chain	Economy Wide	Total
Impact on GDP	8941	2180	4132	15253
Impact on GNI				12756
Impact on capital formation	42188	5996	9954	58139
Impact on employment [national job opportunities]	2600	243430	401018	647048
Impact on Households				2953
Household Income per Household				227
Fiscal Impact				6120
Balance of Payments				8242

Regional Macroeconomic Impact - US$12.00 Scenario

The economic, physical, and demographic parameters of the Lindi and Mtwara regions which are directly impacted by the Tanzania LNG Project are depicted in Box 4. It is important that the macroeconomic impact of the Tanzania LNG Project should be evaluated against this background.

BOX 4: ECONOMIC, PHYSICAL AND DEMOGRAPHIC PARAMETERS

- As noted by REPOA (2021), Lindi's nominal 2019 GDP is Tzs 2 770 427mn (US$ 1196.21) with a per capita GDP of Tzs 2 758 183 mn (US$ 1 191) Mtwara's GDP (at current market price) in 2019 was Tzs 3 805 851 mn (US$ 1643.9), while per capita GDP was Tzs 2,622,775 mn (US$ 1133)
- Mtwara's population increased from 888,882 (1988 census) to 1,124,481 in 2002 and reached 1,451,078 in 2019 while Lindi's population is 1,004,439 in 2019 which is relatively lower.
- The southern region's strategic location provides an advantage of large markets of COMESA, EAC and SADC member countries, including Comoros, Mozambique and Madagascar.
- The regional road network covers 6149.8 kilometres and connects through the Mtwara corridor road to bigger markets in the country, including Dar es Salaam and other regions.
- Mtwara's five (5) district councils, are well served with "natural gas fired power plant". The region also has a large volume of natural gas with [the NNGI] that can be accessed by large energy users at [an] affordable price.
- The literacy rate for the population aged 5 years and above in Lindi region was 63 percent. Literacy rate was higher among those aged between 10 and 49 years and was also higher among the urban population (74 percent) than the rural population (61 percent). While Mtwara records a slight increase (0.45%) of pre-primary enrolment from 1,422,720 in 2018 to 1,429,155 in 2019.

Table 3.54 and 3.55 depicts the macroeconomic regional impacts of the Tanzania LNG projects for Lindi and Mtwara region respectively.

It is evident that this project will have a significant impact on the Lindi region with regards to the US$12.00 Scenario, for instance, the current impact on the average Income per household over the period is US$ 5479 (Calculated as: US$ 1191 per capita * 4.6 persons per household, refer to Box 3). If this increase is added to the average income per household of Lindi region of US$ 13585 (see Table 3.54), then the impact of the project nearly doubles the average income per household to US$ 19 064.

TABLE 3.54: LINDI – TOTAL REGIONAL IMPACT - US$12.00 SCENARIO

US$ mn (unless stated differently)	Direct impact	Indirect impact	Induced impact	Total impact
Impact on GDP	5 524	239	991	6 754
Impact on GNI				5 150
Impact on capital formation	26 739	718	2 188	29 646
Impact on employment [# of job opportunities]	612.61	29 164	88 497	118 274
- Skilled employment	299.08	7 406	25 243	32 947
- Semi-skilled employment	189.76	13 291	34 432	47 912
- Unskilled employment	123.77	8 468	28 823	37 414
Impact on Households				322
- Low Income Households				50
- Medium Income Households				41
- High Income Households				231
Impact on household income per household over programming period (avg. US$)				13 585
Impact on household income per household over programming period (avg. TZS)				31 421 783

It is evident that this project will have a significant impact on the Mtwara region with regards to the US$12.00 Scenario, for instance, the current impact on the average Income per household over the period is US$ 5212 (Calculated as: US$ 1 133 per capita * 4.6 persons per household, refer to Box 3). If this increase is added to the average income per household of Mtwara region of US$ 9 703 (see Table 3.55), then the impact of the project nearly doubles the average income per household to US$ 14915.

TABLE 3.55: MTWARA – TOTAL REGIONAL IMPACT - US$12.00 SCENARIO

US$ mn (unless stated differently)	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Impact on GDP	3 417	262	1 228	4 907
Impact on GNI				3 914
Impact on capital formation	15 449	843	2 759	19 050
Impact on employment [# of job opportunities]	1 038.39	33 947	111 761	146 746
- Skilled employment	490.21	8 635	31 900	41 025
- Semi-skilled employment	326.84	15 450	43 474	59 251
- Unskilled employment	221.34	9 861	36 387	46 470
Impact on Households				280
- Low Income Households				44
- Medium Income Households				36
- High Income Households				200
Impact on household income per household over programming period (avg. US$)				9 703
Impact on household income per household over programming period (avg. TZS)				22 444 116

MACROECONOMIC IMPACT - ALL SCENARIOS

Table 3.56 below presents a comparative combined macroeconomic impact for the four (4) LNG Price scenarios, looking at key economic indicators such as GDP, GNI and Employment Opportunities. As expected, the US$12.00 scenario yields the largest macroeconomic impact. However, each of the US$ 5.50, US$ 7.00 and US$10.00 scenarios lead to very large outcomes for Tanzania.

TABLE 3.56: COMBINED IMPACT COMPARISON – ALL LNG PRICE SCENARIOS

US$m (unless stated)	US$5.50 mmbtu	US$7.00 mmbtu	US$10.00 mmbtu	US$12.00 mmbtu
Impact on GDP	**6 975**	**8 887**	**12 699**	**15253**
Impact on GNI	5 651	7 303	10 565	12756
Impact on capital formation	49 641	51 543	55 317	58139
Impact on employment [# of job opportunities]	**277 356**	**364 477**	**517 227**	**647048**
- Skilled employment [# of job opportunities]	76 262	99 609	140 096	177116
- Semi-skilled employment [# of job opportunities]	111 530	146 736	209 322	267903
- Unskilled employment [# of job opportunities]	89 565	118 131	167 809	202029
Impact on Households	**1 494**	**1 828**	**2 496**	**2953**
- Low Income Households	231	280	378	452
- Medium Income Households	198	241	326	390
- High Income Households	1 064	1 307	1 792	2111

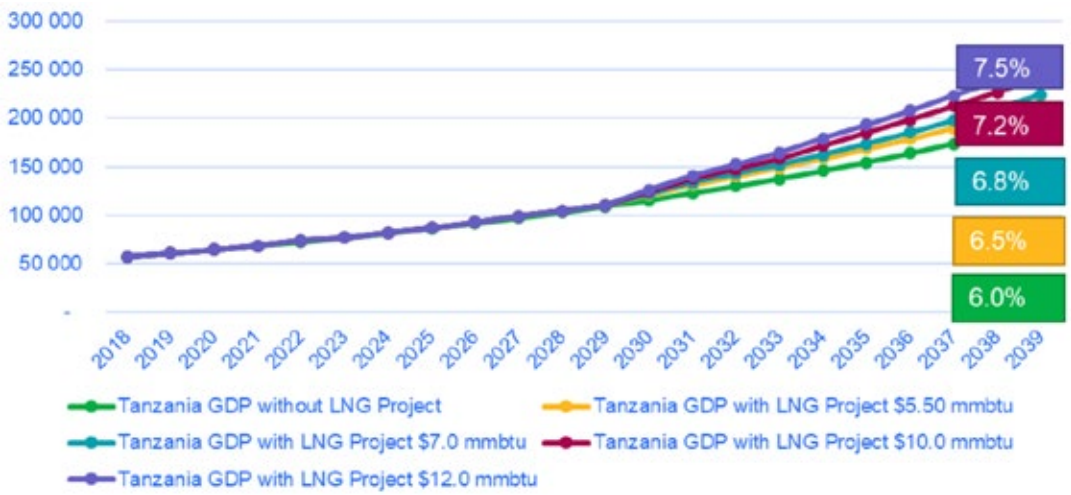
TLNG has multiple benefits with regard to its fiscal contribution to the GOT in terms of tax revenues (Royalties, Income Taxes etc.) as well as income accrued to the GOT in a form of its share of Profit Petroleum generated by this Project (paid as taxation to GOT and income paid to TPDC). To this end, it can be deduced that with regard to both Project related taxes and Project indirect taxes, the GOT Fiscus will benefit the most under the US$12.00 scenario relative to the three lower revenue scenarios.

TABLE 3.57: FISCAL IMPACT COMPARISON – ALL LNG PRICE SCENARIOS

	US$5.50 mmbtu	US$7.00 mmbtu	US$10.00 mmbtu	US$12.00 mmbtu
A. Project Related Taxes	**1 444.43**	**2 192.40**	**3 697.82**	**4 674.14**
Total GoT Profit Share	528.22	1 002.23	1 957.16	2 576.68
Total Royalties	221.78	278.86	393.03	466.92
Total Taxes	694.42	911.30	1 347.63	1 630.53
B. Project Indirect	**740.63**	**915.36**	**1 264.73**	**1 445.74**
B1.Indirect:Operational and Construction	647.14	777.41	1 037.96	1 209.98
B2. Savings Re-Investment	93.49	137.94	226.76	235.77
Total Fiscal (A+B)	**2 185.06**	**3 107.75**	**4 962.54**	**6 119.88**

Assuming development on time and to budget, TLNG will promote the economic growth of the Tanzania economy as well as promote its developmental objectives (e.g. UN Millennium Development Goals). Under the US$12.00 scenario, the Tanzania economy is projected to record an annual economic growth rate of 7.5 % which is an incremental impact on economic growth rate relative to the growth rates generated by the other three scenarios. That said, each of the other three LNG price scenarios lead to growth above the 6% baseline (and we note the exclusion of in-country Domgas benefits per the Executive Summary).

FIGURE 3.41: GDP GROWTH FISCAL IMPACT



Macroeconomic Postscript – LNG in Tanzania's economy

INTRODUCTION

Gas was first discovered in Tanzania in 1974. Production (through Songo Songo) started in 2004 and has helped the country to date (through supplying domestic power generation, industry and businesses) but has not transformed Tanzania. The primary reason for this is the limited volume (to date) of indigenous gas production and the selling price secured. Section 4.4.3 shows that production to date has been in the order of 200 mmscfd and is entirely sold to domestic customers.

Subsequent exploration activity has been led by the IOCs (e.g. BG Group (now Shell) and Statoil (now Equinor)). Whilst the post-exploration and appraisal development has taken time, the HGA is now being actively negotiated. The Project's production will be a very material – 2,543 mmscfd and will bring the GOT into the international gas sector.

Based on the numbers outlined in this Section 3, the development of TLNG represents a hugely beneficial opportunity for Tanzania. If used efficiently, natural resource proceeds can contribute to poverty reduction and help the country to achieve other social and economic objectives (e.g. improved education and health care). If successful, the exploitation and beneficiation of gas resources could place the country on a successful and inclusive economic growth path, in line with the objectives of Vison 2025 (for example, "achieve quality and good life for all; and a strong and robust global economy that can effectively withstand competition" and the FYDP).

However, experience has shown for multiple African/Latin American markets, the transition to an increase in natural resource reliance for any country can be fraught with pitfalls and far from straightforward. Upfront, we note most of the source material on what is labelled the "resource curse" relates to Oil and Minerals discoveries which are not beneficiated at the point of extraction (in contrast to LNG). In many cases, they also refer to countries that developed their resources in the colonial or early post-colonial periods (e.g. Nigeria, Gabon, Angola, DRC, Zambia etc), as opposed to the 1990s/2000s etc.

More recently, if we look at three new LNG-led or influenced development markets – Qatar, Papua New Guinea and Peru: Qatar has been a success beyond all doubt, whereas Papua New Guinea has not to date been an example of the label "resource curse', but has not perhaps grown as much as could have been hoped (noting COVID etc developments have slowed down the timing of additional trains (e.g. Papua LNG, PNG LNG expansion which are yet to take FID)). Additionally, Peru LNG has generally contributed to Peru's economic growth, supplementing its existing mining sector strengths. Conversely, there are multiple examples of hydrocarbons resources in the last forty (40) years being added to markets which have generally had a positive macroeconomic impact. Here, we could cite the UK, Norway, Canada, Malaysia, Australia or the USA, among others. Indeed, an ongoing case study is that of Guyana (e.g. at date of drafting, almost 50% projected GDP growth in 2022), only seven (7) years after first oil exploration discovery). Perhaps Suriname may follow next?

Based on material to date – including for Mozambique (which has not yet, but will soon, produce its first LNG cargo) – the transition to a gas-influenced economy places considerable demands on government, key stakeholders and governance in general. There are demands and requirements to develop a coherent medium-term economic and political strategy for the management of the resource proceeds, as well as to manage ensuing public expectations and to ensure effective service delivery (especially in the regions where the hydrocarbons are directly located). The

case of Mozambique is particularly interesting as the (well-covered) insurgency arose in Cabo Delgado in October 2017 prior to the production of any LNG (and indeed only four (4) months after the first FID of an offshore project). Here, the label "pre-resource curse" has been used (perhaps unfairly) as insurgency often occurs in the Middle East and Africa (e.g. Yemen, Sahel, Saudi Arabia in the 2000s etc).

Nonetheless, based on our understanding of the potential benefits arising from LNG, we would argue that close attention is required across a range of areas for GOT, including: fiscal and monetary policy formulation; industrial and trade policy; skills development (per earlier, noted within the FYDP), training and employment; and the development of robust and transparent institutional foundations for effective inclusive growth for national citizens, with particular focus on the Lindi and Mtwara regions. Based on Mozambique's announced public policy priority in 2022 ahead of a potential end to Force Majeure (viz higher and more rapid LC in Cabo Delgado), we argue there is also the need for a proactive focus on LC in Tanzania and a review of pre-LNG FID investment options by the GOT.

FISCAL & BOP COMMENTS

Given inherent uncertainties over the future evolution of LNG prices, but less so the physical demand for LNG (at least for the next ten (10) to fifteen (15) years), only estimates of future revenues can be made, which leads to the four LNG price scenarios outlined in Section 2, which flows through to the CBA and MIAM analysis in Section 3. To pick two examples of the real world, policy-implementation benefits for Tanzania from TLNG, we note that:

- Tanzania's 2021 annual nominal exports are US$ 6.6bn (Trading Economics, 2022)
- Tanzania's 2021 annual nominal imports of Refined Petroleum Imports are US$ 1.6bn (Exports, Imports and Trade Partners, 2022)

The corresponding annual average figures for net BOP impact for the various LNG price scenarios (over the Project lifetime) are:

- US$ 5.50 = US$ 3.3bn
- US$ 7.00 = US$ 4.4bn
- US$ 10.00 = US$ 6.9bn
- US$ 12.00 = US$ 8.2bn

Therefore, at the most basic level, it appears that TLNG will always be able to fund Tanzania's imports of refined products (an essential contributor to economic mobility and facilitating GDP growth), as well as providing a major boost to exports and net BOP. Thus, promoting macroeconomic stability. This is before the issue of SSLNG we discuss further in Section 4.4.3.

Alternatively, concerning Tanzania's fiscal deficits, we note average five-year (2015-2019) overseas aid grants of US$ 2.4bn p.a. (Trading Economics, 2022). Alternatively, the corresponding annual average figures for Fiscal impact for the various scenarios are:

- US$ 5.50 = US$ 2.2bn
- US$ 7.00 = US$ 3.0bn
- US$ 10.00 = US$ 5.0bn
- US$ 12.00 = US$ 6.1bn

Accordingly, even in the most conservative US$ 5.50 FOB LNG price scenario, Tanzania's fiscal proceeds from TLNG are higher than aid receipts for 2015 - 2019. Thus, TLNG assists in poverty alleviation and helps reduce external dependence. With Tanzania's population forecast to reach almost 60 million by the end of the 2020s an annual cashflow of (working off US$ 7.00 MMBTU) US$ 4.4bn over the lifetime of the resource translates into over US$ 70 per person p.a. and US$ 336 for the average Tanzanian household (70 x 4.6). This is a non-trivial sum and transformative within SSA.

As noted in Section 2.2 over the last 30 years there has been significant volatility in the Brent Crude Oil price (a proxy for international LNG prices). As noted, Stanbic Bank has modelled four (4) LNG Price scenarios to show the impact of this (in real terms). However, in the actual world, Governments often have to deal with a rise or fall in year-on-year fiscal proceeds (N.B. this was shown vividly in the period 2019 to 2020). The natural concern we have is that a future GOT administration may commit to public spending programmes when the level of fiscal proceeds then plummets (e.g. as in 2020) which may impact the ability for such programmes to be funded (which could then cause political / economic difficulties). Accordingly, we show a snapshot of the nominal fiscal proceeds across certain time periods, as an example of the practical year-on-year public spending risks that the GOT will face.

TABLE 3.58: GOT ANNUAL NOMINAL FISCAL PROCEEDS

US$ mn	2030	2035	2040	2045	2050
US$5.00	416.4	781.7	2 899.5	2 235.9	4 304.2
US$7.00	578.9	3 043.4	4 180.6	3 763.3	5 952.0
US$10.00	903.7	5 690.5	6 742.8	6 592.2	9 075.3
US$12.00	1 114.0	7 192.5	8 401.2	8 423.2	11 096.8

Accordingly, we suggest budgeting is made upon lower price assumptions (for grounds of prudence) with a pleasant surprise if revenue outturns are higher.

KEY ISSUES

Lead times for realisation of revenues from natural gas exploitation are long, generally longer than for oil, for example. A good example is Guyana's discoveries of offshore oil have been quickly monetised (i.e. less than five years from first exploration discovery of the Liza field into production). LNG development is extremely expensive, but once online, operating costs are usually small as a percentage of turnover (e.g. operating costs are c. 10% of turnover at plateau production (per this Report)). Thus, once LNG investments have been built, such investments typically yield a long and steady flow of revenue for the entire plateau production period (e.g. until 2052 with regard to the Project). The Report assumes up to 30 years of overall Project revenues from the LNG Plant (which have to be supplemented by a Mid-Life Upstream investment between 2038-2043). The pay-off from the natural resource proceeds is likely to be high (per this Report) but it is also uncertain (hence the Report uses four different LNG price scenarios).

Within Tanzania, to date, gas has been able to improve the domestic power generation fuel mix to more efficiently meet growing domestic energy demands (which will naturally further increase as a result of this Report's envisaged GDP growth arising from LNG production). In particular, it can reduce the risk of needing to revert to diesel/HFO consumption in the power sector and can balance an increased role for RE in Tanzania's energy mix (as gas-fired power provides load-following capacity upon sundown and / or cloudy days at lower emissions than HFO, diesel or coal-fired power). Thanks to its versatility, gas can be used extensively in the industrial sector and by enabling a

reliable and affordable access to energy, gas can help reduce energy costs and contribute to a sectoral diversification of the economy. Depending on price, it can also be used as a chemical feedstock (e.g. for fertiliser or methanol production). Given earlier onshore gas discoveries, Tanzania has some experience of GTI, especially in the Dar Es Salaam and Mtwara areas, and as noted has existing coastal natural gas infrastructure (the NNGI).

Gas can also be used in the production processes of a wide range of industries as a chemical feedstock and as a fuel source for industrial processes. Its low carbon intensity and the need for limited processing before end-use make it a choice fuel and feed stock for the production of fertilizers, petrochemicals and for high energy-consuming industries. Ammonia produced from natural gas is the chief ingredient of the nitrogenous fertilizer. Natural gas can also be converted to a variety of liquid fuels, such as methanol, diesel, ethanol and gasoline (subject to price of input feedstock).

Tanzania, despite making strides in diversifying its energy mix, still finds itself at the risk of reliable power supply in the future as a result of uncertainty in weather patterns and due to the country's continued economic growth (which, per this Report, will accelerate as a result of the Project). We note in Section 4 the importance of the JHNNP in availing affordable electricity to the growing Tanzanian population and economy, which is also a purchase option for the Project. However, this needs to be supported by diversified sources such as GTP and RE which would ensure a steady supply in the future (in addition to JNHPP). With an abundance of energy to supply we believe that the Rural Electrification Programme will also benefit in ensuring the majority of Tanzanians have access to affordable electricity. Accordingly, the provision of Domgas by the Project can facilitate the wider growth of the Tanzanian economy (which will grow further as a result of the LNG developments, per this Section 3) and reduce the risk of the future use of high-cost fuel imports within power generation in Tanzania. This notwithstanding, GDP growth will require more generation capacity and likely lead in time to GTP to more be used for mid-merit and peaking power (rather than base load).

Noting the extremely strong results the Project generates (across each LNG price scenario), we note the following issues for GOT to reflect on, most of which we expect will be addressed as themes running through the HGA negotiations:

1. Domestic versus Export Market sales options. Depending on the size of the underlying GDP and geographic scale (e.g. Australia is a good example), the allocation of (on an individual field or block basis) of a finite supply of recoverable gas production between domestic and export markets may be a delicate balancing act. The potential value of increased supply to the domestic market – for energy and to support downstream development, particularly given projections on population growth, industrial development and urbanization – needs to be traded off against the requirement of a guaranteed minimum throughput of natural gas to high value LNG sales (compared to Domgas) in order to justify the extremely high capital costs of constructing LNG trains (which in turn provides significant revenues to the GOT (as well as other macroeconomic benefits per this Report) and associated Domenergy/Domgas) with a reduced credit risk for Investors and financiers. Striking an acceptable balance between competing legitimate public policy concerns will require a transparent and coherent policy framework for the sector combined with careful and flexible stakeholder management, capable of responding to changing market conditions and developmental concerns.

2. Using public fiscal proceeds in the development of physical and human infrastructure capital. Revenue measures can be expected to transfer substantial resources to the public purse as TLNG enters production (from 2030) and is monetized. In Sections 1.4.4 and 5.3, we make various recommendations on potential infrastructure investments and we note the existing platform of the OGRMA. Similarly, in this Section 3, we show examples of

the educational, health and social outcomes that can be achieved through the modelled LNG proceeds. As noted in the FYDP, Tanzania needs 8% p.a. growth to achieve its objectives. We believe that a successful allocation of the LNG proceeds by GOT can help facilitate this goal. Conningarth frequently use the example of Dubai as a success story (e.g. as far back as 2008, oil only represented 2% of Dubai's GDP after diversification started in the 1970s (Arabian Business, 2010)). This is perhaps an extreme example (it takes atypical, long-term skilled sovereign management which few countries have been able to show) but shows the goals that Tanzania can reach for over time.

3. The fundamental objective and challenge facing the GOT can be considered as the efficient transformation of natural capital (i.e. deep water, higher cost, channeled, offshore GIIP) into other forms of productive capital that underpin the sustainable long-run growth of Tanzania, be they physical capital, such as transport infrastructure (e.g. road, rail (e.g. SGR), water, especially in regions other than Lindi and Mtwara), or human capital such as health, national access to water and education. Efficient and sound political management of the country's natural resources is thus a fundamental prerequisite to transform the resource proceeds into broad-based growth and a long-lasting socio-economic development (e.g. per the above Dubai example).

4. The often-noted one-size label "Dutch Disease" describes how natural resource proceeds can undermine the competitiveness of the 'non-resource' sector of the studied economy. It is contentious, not least as the Netherlands has remained a strong, world-class economy despite producing natural gas since the 1950s (through the Groningen gas field). Upfront, it is also worth noting that in Tanzania manufacturing presently represents only 5.8% of the economy (FYDP) and that adequate supplies of natural gas (e.g. Domgas) are likely to lead to more beneficiation in Tanzania. Nonetheless, in a currently small, open economy, such as Tanzania, the argument is that resource proceeds may set in motion two forces that together may squeeze the non-resource tradable sector. On the one hand, the booming sector may draw labour and capital away from other sectors. On the other, and often more powerfully, the rising income as a result of the resource proceeds may create a 'spending effect'. Some of this is manifest in terms of higher imports, but partly spills over on to the demand for so-called 'non-tradable' goods and services (those produced exclusively in the domestic economy). In response, these sectors may compete for scarce (skilled) national labour and other inputs, driving up domestic prices and thereby undercutting the competitiveness of the tradable-goods sector (export- and import-substituting goods). Here, we should note though that Tanzania does not presently have a large manufacturing sector (per above). The leading industry by far is Agriculture (27% of GDP) followed by Tourism (17% of GDP) (figures from FYDP). Indeed, the energy security created by TLNG (i.e. Domenergy, Domgas, the massive income streams) may well even help manufacturing, especially if combined with initiatives such as LC, SEZs, EPZs etc.

5. Tanzania's history and experience with precious metals has highlighted the importance of transparency and good governance on many occasions, noting Tanzania has long been a member of the EITI (meaning future LNG proceeds will also fall under this framework). Noting the existing OGRMA, it is therefore important to manage additional revenues carefully by creating an adequate macroeconomic and industrial policy framework before LNG production starts. A risk is that while the national economy may be richer (as conventionally measured) following the start of LNG production, it may also be more concentrated and more vulnerable to uncertainties of the global market (e.g. impact on GDP per capita or the risk of cuts in public spending per Section 3.7.2). Here, Azerbaijan's experience with oil is one to reflect on, where its SWF has seen large swings in income and expenditure since its formation). In theory, the expansion of Tanzania's natural gas sector may come at the expense of the expansion of high-productivity and labour-intensive activities in the rest of the economy, particularly cash-crop agriculture. However, given the numbers outlined in this Report (i.e. scale of Project impact, relative to existing Tanzanian data), we are sceptical on this potential outcome. As probable, is that the

LNG proceeds, if well invested (e.g. in a potential EATF that facilitates substitutes for biomass consumption (e.g. solar PV, LPG) and promotes agricultural modernisation) can transform Tanzania for the long-term.

6. Management of the risks of "Dutch Disease" requires a fiscal policy (supported by monetary policy) that seeks to moderate excessive aggregate demand pressures combined with a range of supply-side measures geared to the effective investment of resources and removal of bottlenecks, especially in the construction, transport and power sectors, so as to deploy the resource proceeds in a manner that supports the sustainable development of the non-resource sector (currently 94% of the Tanzanian GDP, per FYDP). We note we suggest certain measures are already taken prior to FID (e.g. investment in coastal roads/bridges, new HV TX lines, NNGI expansion, as well as complimentary investments (e.g. MCD) and non-energy/infrastructure sectors (e.g. tourism)). These policy measures need to be accompanied by measures geared towards the development of skills that support employment and job generation that strengthens the process of diversification. Fostering sound public investments and an efficient public financial management will undoubtedly help. In several cases, resource-rich countries become, over time, increasingly dependent on their exports to finance public expenditure (this even occurs to Saudi Arabia). Therefore, as the economy specializes, GOT revenues can become more volatile. In time, weak fiscal policies and expenditure control mechanism increase the risk that expenditure becomes dangerously pro-cyclical as boom-bust cycles emerge characterized by poor project evaluation, low productivity and the prevalence of incomplete 'white elephant' projects.

7. The fiscal issues touched on in the preceding paragraphs must also be analysed with the aim of ensuring intergenerational equity. As the LNG revenues will start flowing early in the 2030s, it is important to make sure that the future generations share in the benefits of the development of Tanzania's LNG and Domenergy sectors. This may be achieved by investment in financial assets – such as a SWF or DSF (including our mooted EATF) – but the objective may be more effectively pursued by investment in physical and human capital in the economy itself. Again, we repeat this is very important in regions outside of Lindi, Mtwara and potentially also Dar Es Salaam (which will inherently benefit as the largest business centre). The investment in human capital is especially important and was strongly referenced in FYDP.

8. Finally, Tanzania's public policy needs to support the creation of a regulatory framework that ensures appropriate environmental responsibility and economic efficiency. From a Project perspective, as well as national laws and corporate policies, it will need to comply with the Equator Principles to raise any external finance (which currently includes a Climate Change Risk Assessment). In country, issues such as to minimising CO_2 emissions; the monitoring and protection of the marine ecology need to be central to this regulatory framework. More broadly, concerning regulations, in global surveys, TZ ranks relatively low when it comes to acquiring construction permits, registering property, paying taxes and starting a business. Efforts to improve the institutional environment face may be challenged by the discovery of natural resources (since the latter can lead to institutional strain). Guarding against this requires, amongst other things, close monitoring of GOT revenues, to increase transparency and external visibility in audits and revenue collection.

Noting the above, we argue the macroeconomic results from this Section 3 are compelling for each scenario (although naturally the US$ 12.00 scenario produces the most transformational results (e.g. compared to the US$ 5.50 LNG price scenario results)). Assuming the HGA is negotiated and signed in 2022, which should trigger a roadmap to FID on or before 2025, we recommend major strategic thought is given by the GOT stakeholder teams to the above public policy considerations, for example in an update or addenda to the FYDP in the light of TLNG's major national macroeconomic impact and benefits (as recommended by this Report).

Chapter 4

Commercial Analysis

Sub-surface

Stanbic Bank primarily quotes Woodmac (see Appendix V) in this Section 4.1.

HISTORY

Exploration of oil and gas in Tanzania took place as early as 1952, with prospecting for oil taking place 1952-1964. Exploration and drilling took place along the coast on Mafia Island, Zanzibar, Pemba and Onshore in the Mandawa Salt Basin, with no significant hydrocarbon finds. In the next phase of exploration non-associated natural gas was discovered in 1974 from Songo, Kilwa district in Lindi Region (which became Songo Songo). In 1982, another natural gas discovery was realized in Mnazi Bay – Mtwara Mikindani.

Following the subsequent production of Songo Songo by Orca (2004) and Mnazi Bay Maurel & Prom (2006) fields (see below for details), the first material offshore discovery of natural gas in Tanzania was made in 2010, per Section 1.2.

BLOCKS 1 & 4

Block 1 was tendered in 2004 as part of the Third Licensing Round and was awarded to Ophir. The licence was awarded in 2005. A year later, Ophir bilaterally negotiated access to Blocks 3 & 4. Over 8,000 sq km 2D seismic was conducted 2005 – 2008, which was supplemented by a matching amount of 3D seismic over the 2010-2011 periods.

In 2010, BG Group farmed into Ophir's three blocks in return for a sixty (60%) stake and assuming the bulk of associated exploration costs. In 2010, three dry gas discoveries were made. In 2012, a second drilling campaign made two more exploration discoveries, drilled four appraisal wells as well as conducted a Drill Stem Test. In 2013, two more exploration wells were discovered as well as two appraisal wells conducted. In 2014, a final exploration well (successful) was drilled. Also, in 2014, Ophir farmed down half of its 40% remaining stake to Pavilion Energy of Singapore.

Woodmac argues that, post TLNG POD approval, there is likely to be additional appraisal work in Block 4, with also a possibility of additional exploration wells in the outbound of Block 1 (further away in time, but potentially material with scheduled production envisaged until 2059, with a major thirty six (36) Mid-Life incremental development well programme scheduled for 2038-2043).

Woodmac note 10 Tcf of 2P reserves in Block 1 and 6.6 Tcf in Block 4, supplemented by 400 Bcf contingent resources, making a total of 16.6 Tcf reserves and 400 Bcf contingent resources.

BLOCK 2

Block 2 was tendered in 2004 as part of the Third Licensing Round and was awarded to Equinor (then Statoil). The licence award was concluded in 2005. Over 6,000 sq. km 2D seismic was conducted in 2008, which was supplemented by 1,600 sq. km of 3D seismic over in 2011 (which was supplemented by an additional 5,500 sq. m 3D seismic in 2012).

The first exploration well was drilled in 2012, with multiple dry gas exploration discoveries made between 2012 – 2014.

Woodmac note 13.7 Tcf of 2P reserves, with 7 Tcf contingent resources. Thus, across the three blocks (1, 2 & 4), Woodmac ascribe **30.3 Tcf of reserves** and 7**.4 Tcf of contingent resources**.

LNG & Gas Technology Commentary

At date of drafting, we assume the following:

- Global economic growth (and economic prosperity for all) rests on access to reliable and price competitive energy sources. Within this requirement, environmental considerations are becoming increasingly important. Natural gas-fired power emits up to 60% fewer CO_2 emissions than coal-fired power (IEA, 2019; Shell/EQT, 2022). This results from a combination of the burning qualities of natural gas itself (compared to coal) and the higher burning/processing efficiency of CCGT compared to coal-fired boilers and steam turbines. An example of this have been the massive CO_2 emission intensity reductions experienced by the US since the mid-2000s. Therefore, a key argument in favour of LNG's international sale is that it facilitates CTG switching by the global power sector and reduces CO_2 emissions whilst still facilitating economic growth (through the provision of adequate, reliable power to growing economies). EQT argue there is 175 BCFD of potential additional CTG switching demand led by Asia-Pacific (EQT, 2022). As example of the minimal market share that TLNG requires to achieve for international CTG (on top of existing LNG demand), note that TLNG's target LNG production (in gas form, net of Domgas, which stays in Tanzania) is 2.3 BCFD of 175 BCFD (or 1.3%).
- Going forward, we assume that all new LNG Projects (e.g. the Project) will seek to achieve Scope 1&2 NZE in time. That is, when an individual LNG cargo is loaded at the Project's loading jetty, the individual LNG export project will be able to certify that it has achieved Scope 1 & 2 NZE through a combination of BAT, efficiency projects, potentially undertaking NBS projects (e.g. national reforestation to remedy biomass consumption) and ultimately, through potential CCUS if required (e.g. offshore sequestration). In the Tanzania context, reforestation appears an exciting option due to the scale of historic and ongoing biomass consumption noted in the Executive Summary (thus there is a massive addressable market from a NBS perspective). We recall from Section 2 that the funds from the Project's assumed self-taxation of CO_2 emissions will stay in Tanzania and will be reinvested (e.g. potentially in reforestation);
- An example of market developments is the Qatar North Field Expansion, whose integrated offshore gas field and LNG development also includes the use of PV solar (including major grid usage of PV solar) and CCUS. Then, there are the examples of each of Venture Global's two Project development which will use

CCUS (capturing up to 500,000 TPA), as well as Pluto LNG (Australia) which will use up to 500 MW RE for liquefaction. We also note the, post-date of drafting, the competitive appointment of JGC to prepare a FEED upon electric drives for a fourth LNG train at Cameron LNG.

- Looking forward, we expect the following:
    - Innovations in CCUS technology such that LNG production with CCUS can be Scope 1 & 2 NZE (noting TLNG's 2030 start of production);
    - on the demand side, innovations in CCGT technology such that power generation technology can significantly reduce its Scope 3 emissions (after purchasing gas on a Scope 1 & 2 NZE basis). For example, through installing CCUS. For example, in the UK, SSE and Equinor (one of the Operators) are developing a CCGT plant (Keadby) which will also include CCUS where the captured CO_2 will be transported to be stored in the southern North Sea. We also envisage industrial and heating innovations will reduce Scope 3 emissions;
    - In the medium term, we assume the Project will at all times sell Scope 1 & 2 NZE LNG FOB and will be able to certify this as such to its customers (e.g. under GIIGNL processes or similar, through a combination of options). We therefore do not expect any limits on the Project being able to sell its output for the Report period, absent material technological and economic market developments.

LNG Market Commentary

LNG is a minority subset of the global natural gas market but an important element (as it involves cross-border trade). At the macro-level, and noting all market projections differ (and are judged by their publication date), global natural gas demand is typically expected (e.g. by ExxonMobil, 2021) to soon surpass coal demand but not to surpass the demand for oil (even by 2050). Note that all current market projections (at date of drafting) predate the potential impact of the Russia – Ukraine invasion.

The main element of uncertainty on gas demand is, again subject to projections, the ability of RE and / or other energy carrier alternatives (e.g. hydrogen) to step up as plausible alternatives, which is not imminent at date of drafting. Noting its cross-border nature, LNG demand has grown consistently over time as fundamentally it enables resource long, lower value export markets to sell to resource short, higher value importing markets, as well as providing increased global energy diversity and security for market players. This premise, more recently, has been supplemented by energy transition considerations (i.e. per earlier, natural gas emits c 60% lower CO_2 than coal-fired power).

From the LNG buyer perspective, the two-country development of the Rovuma Basin is a material development, especially from an Asia-Pacific lens (which has a huge population, growing GDP and existing coal-fired power alternatives). Similarly, as gas markets and transport technologies develop, current, regionally segmented gas markets (which sustain high price differentials across markets) are gradually giving way to a more integrated gas markets, albeit with major price volatility. However, for some time, LNG spot prices have been high which indicates an imperfect and developing market. Whilst, as always, there is debate among analysts (especially if coming more from the environmentally-leaning perspective), most argue the demand for LNG will increase under all circumstances for at least the next decade (e.g. driven by Asia-Pacific CTG switching).

The Project is modelled to produce and sell 15 MTPA of LNG between 2030 – 2059. We ask the obvious question: **Can this output be sold for the entire production period for FOB prices within the range of this Report's FOB LNG price scenarios**? At date of drafting, we make three strategic energy observations:

- To ensure continued global GDP growth and an adequate standard of living for a growing global population (e.g. 9.7 billion in 2050, UN), more energy will be needed in the future. It is generally assumed that more of this energy will be electrical in nature, but few believe a largely electrified world is possible (especially if provided by low CO_2 emitting sources, with increasing levels of intermittent sources being utilised). Hitherto, two sources of primary energy have dominated the industrial world to date (Coal and Oil). An argument is often made that a general energy carrier – electricity – will next become the most important form of energy, with another potential carrier, hydrogen, also receiving lots of attention;

- Over the last 20 years, there has been increasing focus on the scale of CO_2 emissions (and more recently the quantum of methane emissions too, understood to be around 8% of global emissions (Flex LNG, 2022)). Accordingly, the direction of travel is for series of international agreements (e.g. agreed through the COP process) to move the world towards what is termed NZE. Within this path, there has presently been more progress on reducing Scope 1 & 2 emissions (i.e. supply-side sources of energy) from steps such as CTG switching and the introduction of RE, than there has been on reducing Scope 3 emissions (i.e. demand side customers reducing their use of energy, through improving their consumption technology, industrial processes and efficiency). It must always be borne in mind that energy produced is sold to customers, otherwise it would not be produced.

- There is also a debate on when and how NZE will be technically possible. Global treaties (e.g. the Paris Agreement) have required the world to move towards no more than 2 degrees temperature growth since the pre-industrial age by 2050 (with best efforts to achieve no more than 1.5 degrees). However, several important countries, e.g. China, Nigeria (2060) and India (2070) do not presently agree with the 2050 target but have signed up to later targets (effectively a dissenting view). Nonetheless, Shell (2022) note that 88% of global emissions are now covered by country CO_2 targets, so emission recording and measurement is now a global baseline, albeit with debates around a technically and economically realistic implementation date.

Within this backdrop, what are current trends in the LNG market? Ignoring the recent dislocation caused by the Russia Ukraine invasion (likely on balance to be LNG demand positive - due to the visible credit risk shown for cross-border pipeline gas from Russia into Europe, a very large and seasonal gas market – cold winters, high heating demand), the general demand trend remains positive. In all recent years except 2020 (where demand was flat due to Government-imposed mobility restrictions (due to COVID) but did not fall as did oil (c 8%)), LNG demand has increased.

2021 global LNG demand was stated as **382 MTPA** with an expectation of a short-term increase of 25 MTPA in 2022 to **407 MTPA** (Flex LNG, 2022). This marginally differs from Shell's 2021 LNG trade number of 380 MTPA, but no doubt will in turn only be marginally different to pending GIGNL releases. At date of drafting, there is some risk that LNG spot price increases will limit the scale of increases in 2022 demand, although Europe's increased LNG purchases are noted. Most importantly, if Germany now buys a portion of its gas requirements through LNG this will create a step change upwards in the global LNG market. Germany's gas consumption is 87 BCM p.a. (BP, 2021) the equivalent of 63 MTPA. **If, for example, half of this becomes LNG in time (for security of supply reasons), this is the equivalent of the new build of each of TLNG and RLNG**. Italy is also expected to reduce its reliance upon Russian gas over time. Others will likely follow.

Russia Ukraine notwithstanding, the base LNG demand drivers are: a growing global population and the need for more global energy in order to facilitate global GDP and increased standards of living, which is driven by Asia Pacific (the bulk of global population); the need for more, cleaner energy; encouraging CTG switching; diesel/HFO to gas switching (e.g. by the global marine sector); and the need for globally increasing RE capacity to have a natural gas backstop to underpin their inherent intermittent supply. This last point is particularly important as 2021 has shown multiple grid examples of major RE intermittency (i.e. low levels of delivered power compared to installed capacity), for example, Germany, USA or UK.

The further one moves forward in time, the more there is speculation, and uncertainty, based on the rate of technological progress from other alternative supply sources of energy or energy carriers (e.g. RE, BES, Green Hydrogen etc). Nonetheless, most commentators are comfortable on LNG demand for at least the next ten (10) to fifteen (15) years under all circumstances (e.g. BP, 2022, below). This was before the likely "step-up" in European demand arising from the Russia Ukraine invasion (e.g. Germany, Italy etc), which may extend the timeframe significantly to the right.

On this matter, Shell's forecast **2040 LNG demand** remains in the order of 700 MTPA (the demand range is about 600 - 750 MTPA). Within this, a number of LNG Plants (and their supporting production fields) that currently supply 2021's LNG demand will not be producing in 2040 due to field depletion (or will produce significantly smaller amounts). An example of this point in the future is the Project production tails off rapidly after 2052. Only 4 Tcf is projected to be produced between 2052-2059 (compared to 20.5 Tcf on plateau between 2030-2052). Shell (2022) projects around 425 MTPA of current and under construction capacity in 2040, leaving a ballpark requirement of 225 - 325 MTPA new capacity. In essence, this is a further demand driver for new supply in locations such as the USA, Canada, Qatar, Mozambique and Tanzania (perhaps less in Russia). Such supply will therefore backfill existing demand (as it is progressively added) and not solely rely on servicing incremental demand. Whether this number falls in time or stays flat is really a question of technological evolution (on each of the supply and demand sides).

BP's 2022 energy outlook has major variances depending on which scenario is selected. Its "New Momentum" scenario broadly reflects that of Shell (2022) and has over 1,000 BCM of LNG demand by 2040 (equivalent to around 720 MTPA), with LNG demand only plateauing between 2040-2050. BP's other two scenarios "Accelerated" and "Net Zero") show LNG demand reaching a plateau and then declining after 2030, but these are dependent on very large assumptions of demand-side innovation (e.g. efficiency and technology gains).

As noted earlier, although the Project sells its LNG from 2030-2059, over half of its output is sold by 2043, seven (7) years before the Paris Agreement's target for global NZE (noting in any case, the Project is intended to sell NZE Scope 1 & 2 output and huge amounts of gas will still be sold in 2050).

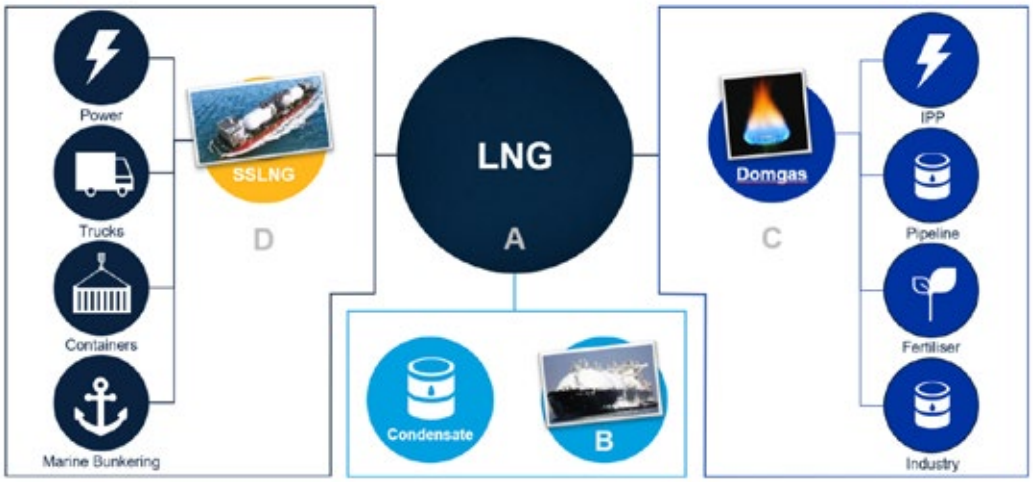
Domenergy

Schematically, Stanbic Bank understands the Project as follows:

- 2343 mmscfd is converted into LNG with 200 mmscfd sold as Domgas.
- In addition to this, TLNG will produce limited volumes of condensate whose commercial sales process is yet to be determined (hence not valued in this Report).

- The Project is envisaged to produce its own RE (with a CCGT back-up) to support electric drive technology (of lower emissions than previous gas turbine technology).
- Within the overall 15 MTPA of LNG production, Stanbic Bank sees some potential for SSLNG sales in Tanzania and Regionally (noting the Project's 2030 start date).
    - It may be in time that the Project sells the SSLNG or TPDC itself does (See Section 4.5).
    - We expect key target customers will include the mining industry in Tanzania (SSLNG as diesel substitute) as well as the transport industry (also SSLNG as diesel substitute).

FIGURE 4.1: DOMENERGY SCHEMATIC



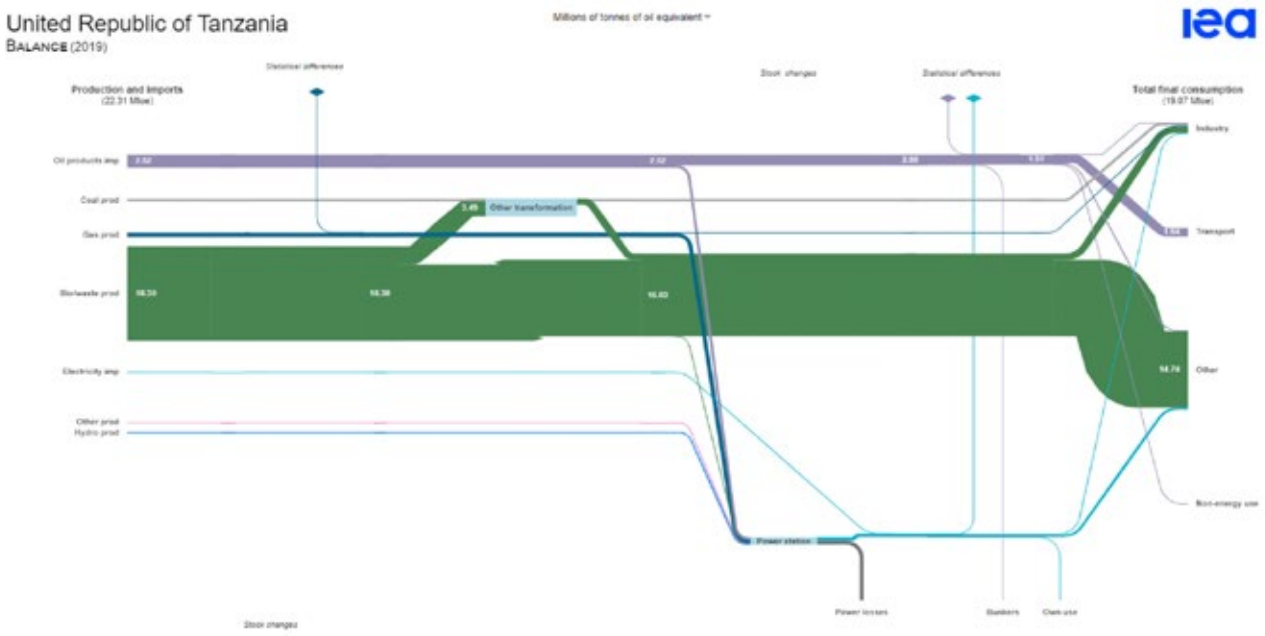
IEA SANKEY DIAGRAM

As shown below, per IEA (2019) being the latest published, the predominant form of energy in Tanzania is biomass which represents eighty two (82)% of primary energy production and seventy seven (77)% of final energy consumption. Stanbic Bank passionately believes that a social, environmental and economic mitigation on Tanzania's usage of biomass (upon adequate substitutes being economically made available) must be addressed as part of a successful TLNG development.

We believe that positive actions on this point by TLNG could form an important part of TLNG's social licence to operate, especially if accompanied by a visible public campaign. As well as TLNG fiscal proceeds facilitating a dedicated fund (EATF) to mitigate the use of biomass (e.g. through rural PV, improved rural electrification, off-grid solutions, LPG etc), we see a massive opportunity for the Project to engage in **reforestation** and **mitigate Tanzania's use of biomass**, as well as to contribute to wider agricultural modernisation.

From a Project perspective, the Report assumes the Project self-taxes itself at the IEA Road to Net Zero (2021) CO_2 rates for Other Emerging Markets and Developing Economies. We assume this amount will be recycled by GOT (or the Project) into qualifying projects in Tanzania that seek, as a minimum, to match (through offset / mitigation) any residual CO_2 emissions that TLNG may produce.

FIGURE 4.2: IEA SANKEY DIAGRAM: TANZANIA

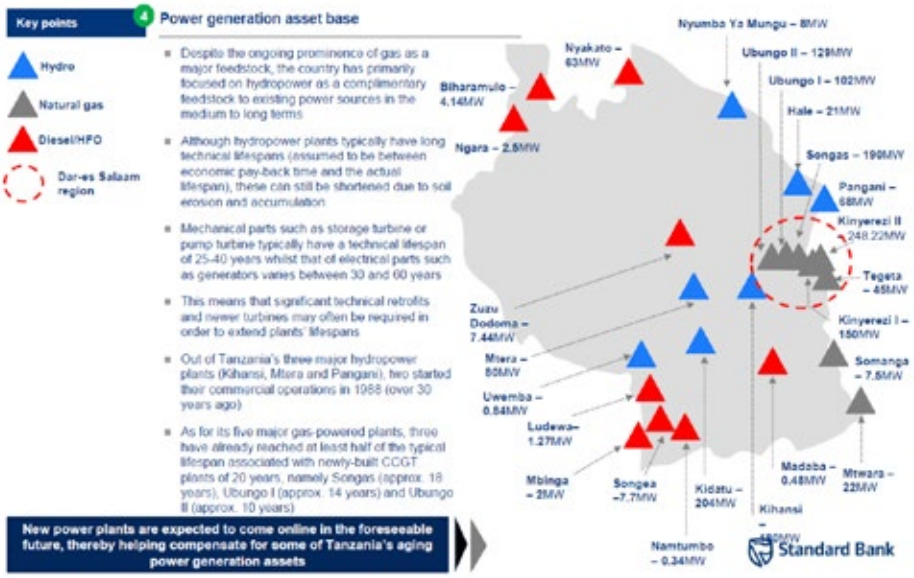


POWER SECTOR

Power Generation Map

Please find below an extract from Stanbic Bank's existing Tanzanian power sector summary which shows that, on the back of gas supply from Songo Songo and Mnazi Bay, Tanzania has invested in coastal GTP.

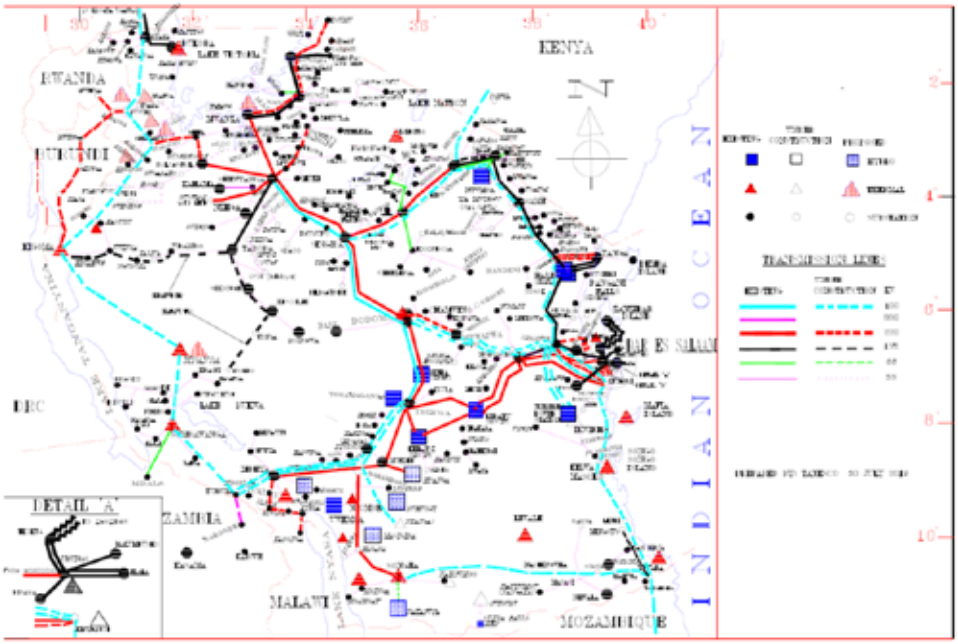
FIGURE 4.3: STANDARD BANK TANZANIA POWER SECTOR ANALYSIS



Power Transmission Map

Please find below TANESCO's grid map (2019), sourced from TANESCO. Of particular significance is the **envisaged** coastal 400 KV HV line (running north – south from Somanga to Mtwara, which can be extended to Mozambique) and the inland 400 KV line (broadly running east to west from Mtwara to Songea, which can be extended to the Zambia interconnector), both of which remain unbuilt (at date of drafting).

FIGURE 4.4: TANESCO GRID MAP



Commentary

Within the SADC region, Tanzania's electricity access is relatively low at 38% (World Bank, 2017, quoted in SADC and updated for 2019 data). For multiple reasons, for example, increasing economic equality, reducing biomass consumption, facilitating GDP growth (especially in rural areas), we expect an associated policy objective by the GOT (in parallel with the execution of the Project) will be to increase national electricity access.

In essence, whilst Tanzania has long-had existing gas-fired generation, it is ageing. Stanbic Bank is aware of the major development of the 2.1 GW JNHPP (which is a potential supply option for the Project), as well as significant RE developments. One the one hand, we envisage the additional Domgas should allow the modernisation (and / or conversion) of national gas-fired power infrastructure (from OCGT to CCGT). On the other, we envisage an extended NNGI (e.g. to Tanga and beyond, to Mombasa or to inland alternatives) will also allow additional GTP plants to be built nearer to Northern Tanzania load centres (reducing line losses). Over time, we expect gas-fired generation may become more mid-merit and peaking in nature, but it is still likely to be heavily used (as it offers load-following capacity to support RE and / or hydro-capacity). As an example, we envisage that 200 mmscfd should be able to facilitate c 1,400 MW of base load CCGT capacity (or higher mid-merit).

At date of drafting, the construction of the 2,115 MW JNHPP is making significant progress. Prior to its completion, Tanzania's installed generation capacity is 1,600 MW. As with Brazil or Zambia, Tanzania has been dependent on hydro power and thus is exposed to drought risk. Historically, this has been solved by HFO power (with gas-fired power already utilised). Going forward, we assume mid-merit and peaking needs should be solved by gas-fired power (for example, supplied by the Project's Domgas, see below).

Tanzania's high demand areas are the North/North-West (mining areas) and Dar Es Salaam. Expanding the mining sector to achieve higher economic growth will require more power. As noted above, each of Lindi and Mtwara regions lack a HV electricity grid connection to the country's core grid. Consequently, a key recommendation prior to the Project FID is that a 400 KV TX line between Dar Es Salaam and Mtwara be built as key **Enabling Infrastructure** (this will also allow JNHPP to supply to the Project), with a Phase 2 line from Mtwara to Songea (to connect with the Zambia interconnector) and MCD built as **Complementary Infrastructure**. A two-way grid connection will be needed to receive the Project's surplus power; to potentially lead to Mtwara as a GTP hub for EAPP and SAPP; to supply the Project itself with JNHPP power (e.g. in the event of any Project generation shortfall when the grid was long); to ensure adequate energy access for the, soon to be fast-growing, Lindi and Mtwara regions to facilitate regional growth (including an extension to Northern Mozambique as part of the **Rovuma Corridor** and to facilitate **Rovuma Industrialisation**), and to support ancillary projects with a view to maximising LC.

A likely innovation of the Project is that it plans to install PV solar (MW TBA) with a view to, when solar irradiation permits, supplying its own base power needs and its targeted electric drive LNG trains (which will massively reduce its Scope 1 & 2 GHG emissions). The PV solar is intended to work during normal projected irradiation and will be supplemented by a CCGT plant (e.g. for use on evenings, night time, cloudy days). Accordingly, when the PV generation is normal it should be possible for the CCGT plant to sell to the grid (reducing the need for HFO plants to potentially operate in daytime hours)

DOMGAS

From the national Domgas perspective, a natural gas value chain is an integrated process that can be broken down into its upstream, midstream and downstream components:

- First, from the Upstream perspective, the E&P companies need to explore, drill and extract natural gas from under the ground or under the sea. In Tanzania, upstream has historically mainly operated in a joint venture between TPDC (the NOC) together with junior (by international standards) IOCs (e.g. Orca, Maurel & Prom);
- Second, from the Midstream perspective, the transmission company links the gas fields to major points of consumption via pipeline (NNGI or Songo Songo pipeline from SSI) (N.B. this is also owned by TPDC); and
- Lastly, from the Downstream perspective, the Local Distribution Companies deliver the natural gas to respective industries and businesses (principally in the Dar Es Salaam area, but also Mtwara). The mid-stream and downstream is mainly operated by GASCO, a subsidiary of TPDC and IOCs.

In 2016, a NGUMP was issued by the GOT. With the benefit of hindsight, Stanbic Bank has reviewed the published document. We have three main comments:

- The volume of recoverable reserves in NGUMP appears on the high side, which flows through to the overall document and its discussion utilisation of such recoverable reserves. The NGUMP indicates onshore reserves of **8 Tcf** and Offshore of **47 Tcf**, making a total of **55 Tcf**. It then assumes **70%** are **recoverable**

across both categories, i.e. **38.5 Tcf**. The consequence of this is a document that is something of a broad list of gas demand aspirations, with no real consideration, for example, of the different cost structures (or reserves) of onshore or offshore production that will physically supply the assumed gas demand. No gas prices are included (for example, what could be an acceptable price to a seller of gas (onshore or offshore) which, in parallel, works within their buyer's industry and generates a particular IRR?). There are a whole range of niche and non-commercial technologies included in the document (e.g. Gas to Liquids (GTL), Di-Methyl Ether (DME), Methanol to Gasoline (MTG) which are not probability or price-adjusted, with no real example of working technical plants provided (in all cases). There is no summary cash flow model or post-tax IRR of any individual Domgas Project provided. In total, the uses of gas add up to 33 Tcf with LNG being a relatively restrained player (2 x 5 MTPA trains). The **33 Tcf** figure is significantly higher than the public domain information figure used within this Report (i.e. adding up the Woodmac Sales Gas for Songo Songo and Mnazi Bay and Shell and Equinor disclosures);

- With the need to allow for the passage of time for the depletion of the producing fields of Songo Songo and Mnazi Bay (i.e. for the 2016 to 2022 period), which potentially accounts to around 0.4 Tcf, the information within this Report indicates that the volume of recoverable reserves in NGUMP was probably too high:
    - Per Woodmac, Songo Songo has remaining sales gas of 195 BCF (see below);
    - Per Woodmac, Mnazi Bay has remaining sales gas of 368 BCF (see below);
    - The Report quotes a GIIP figure of "more than" 43 Tcf, which we practically assume is 43 Tcf, taken from Shell and Equinor (per Executive Summary and Appendix 6.3). The NGUMP assumes 70% recoverability. Based on this Report and the Operator Disclosures, the recoverability appears to be 56% (i.e. 24.25 Tcf divided by 43 Tcf).
    - Domgas production assumption declines 2052-2059 in a straight line from 200 to zero over the eight-year production decline period
    - Accordingly, by simply adding Woodmac and the Operator Disclosures, Stanbic Bank calculates a number of **roughly 24.8 Tcf recoverable**. This compares to the NGUMP figure of **38.5 Tcf recoverable**, a delta of some **13.7 Tcf**. Stanbic Bank is not indicating that one number is perceived as right or wrong, just that the order of magnitude of differences (coupled with no visible Domgas price in NGUMP) could take policy in two very different directions (depending on the reliance on the numbers).
    - As supplemental context, we note NRGI (2021) cites a number of **28.2 Tcf** recoverable (in turn referencing Rystad Energy) which is significantly nearer the Operator Disclosure figure than that of NGUMP.

Noting the existing fields, per Woodmac (2020), we understand the following:

- With its licence due to expire in October 2026, Songo Songo has remaining sales gas of 195 BCF. The Songo Songo West prospect is excluded from this number but is expected by Woodmac to have risked recoverable reserves of 280 BCF. Woodmac model current production at 90 mmscfd
- We do not analyse the Kilwani North field (in line with its production suspension)
- With its licence due to expire in 2031, Maurel & Prom's Mnazi Bay block has remaining sales gas of 368

BCF. Typical production is around 80 mmscfd although sales contracts can be executed up to 130 mmscfd. Similarly with Songo Songo, contingent resources of 205 BCF are excluded from this number.

Essentially, in round numbers, existing total production is around 175 mmscfd (90 mmscfd Songo Songo plus 85 mmscfd Maurel & Prom), or around 64 BCF p.a.. As noted earlier, the total production of the Project is 2543 mmscfd, inclusive of 200 mmscfd Domgas. Thus, the potential Project Domgas is higher than existing Tanzanian production and can be sustained until 2052 before it falls (175 mmscfd in 2053, 150 mmscfd in 2054, etc...).

Currently, we understand about 80% of domestically produced natural gas is used for GTP. Other uses are for GTI where a total of 37 industries have been connected, cooking for household and CNG for vehicles with one refilling station now at Ubungo. CNG can represent an efficient source of cooking fuel for households, restaurants and for centralized cooling facilities of large-scale retail customers like hotels and office buildings. However, we expect CNG to be outcompeted by SSLNG in time for larger volume customers (noting TLNG's production and our expectation of SSLNG in Tanzania). We note that markets such as Pakistan have historically prioritised CNG as a demand source and presently Egypt is also focusing on CNG. Concerning Pakistan, consumption peaked at around 200 mmscfd (falling due to reduced domestic production). Noting that Pakistan's population is 3.5x that of Tanzania and that Tanzania will almost certainly have access to SSLNG over the long-term (which is more energy dense than CNG) it is possible that CNG demand may be in the order of 50-75 mmscfd.

From a pricing perspective, Mnazi Bay Gas wellhead pricing began at US$ 3.40 MMBTU (indexed) in 2015. For Songo Songo, Woodmac note differential gas pricing of US$3.20 MCF. 2020 power sector pricing was stated as U$ 3.90 per MCF with industrial customers paying US$ 9.01 MCF (indexed), including transportation. We benchmarked these prices to the selected DGSP (per Section 2.1)

Lastly, we note that a fertiliser plant (which typically requires very cheap gas) has also been mooted in the past for Mtwara but is considered of lower probability given potential Domgas prices. Perhaps it is possible if domestically orientated (as in a smaller plant focused on Tanzania). In the SADC Gas Master plan, it was specifically noted the wider Southern & Eastern Africa region lacks each of a fertiliser and methanol plant, although the associated challenge of needing cheap feedstock to supply it competitively is well noted in the literature.

- Finally, as was well covered in the Natural Resource Governance Institute (''**NRGI**'') study (2021), since the 2016 NGUMP there has a been a significant global increase in installed volumes of RE generation (in particular PV, also noting off-grid options) due to its then declining costs (N.B. commodity prices have since changed). There seems no particular reason why Tanzania cannot (assuming adequate irradiation) install significant volumes of PV to serve regular daytime demand (with JNHPP serving base load demand (assuming adequate hydrology). Although PV is often argued to have a low Levelised Cost of Electricity (''**LCOE**''), this statement applies only when PV is generating power (perhaps 20% of annual hours) and ignores the Full Cost of Electricity (''**FCOE**'') (i.e. including grid services, the cost of the provision of dispatchable capacity when RE is not available (including their future costs of CO_2 emissions). In mature RE markets, there may also be high self-generation of off-grid PV (e.g. California). This leads to a trend known as ''the duck curve'' where daytime grid demand drops. In Tanzania, due to the volumes of current (and likely future GTP), either risk is not necessarily a major problem (as the natural gas and thus GTP is available to back-up the intermittent RE). However, it will reduce the volumes of GTP required. Here we must lastly note that JNHPP (had the demand instead been wholly procured as GTP) may impact GTP demand in the order of 300 mmscfd.

Per SADC (2019), a typical 2,000 TPD fertiliser plant requires around 60 – 80 mmscfd of natural gas feedstock, whereas a 5,000 TPD methanol plant requires around 160-200 mmscfd of natural gas. Per this Report, we assume the Project produces around 200 mmscfd Domgas. We note in the Mozambican case, targeted Domgas from the first two onshore plants was 100 mmscfd (MLNG, indicatively 2026) and 150 mmscfd (RLNG, indicatively 2027), with a view to additional amounts from the second phase of such projects of 300 mmscfd (MLNG) and 350 mmscfd (RLNG) respectively, making a potential long-term total of 900 mmscfd.

Given the ongoing Force Majeure affecting MLNG and RLNG, it is not expected that such Mozambican totals (i.e. **900 mmscfd**) will now be possible until, for example, **2032** (or similar, being the completion of the second set of onshore LNG trains, which we now assume will take FID around 2027). As context, TLNG's **200 mmscfd** is expected around **2030**, thus a total of **1,100 mmscfd by 2032**.

The SADC Gas Master Plan is clear in stating that world-scale (i.e. not just national / sub-regional) plants require cheap natural gas feedstock. Although price is not yet defined, **the combined Mozambican/Tanzanian Domgas volumes** indicate that a regional fertiliser/methanol complex may be possible in time. Based on this Report and the expected Mozambique Domgas balances it feels to Stanbic Bank that Tanzania's smaller Domgas volumes may best be used for national / regional GTP (perhaps with Regional Gas centred on Mtwara, connecting to EAPP and SAPP) with Mozambique's larger volumes used for regional Fertiliser/Methanol, centred on Afungi.

REGIONAL GAS

Noting the indicative numbers (based on public domain information) in Section 4.4.3 (i.e. please find below at Table 4.1 Stanbic Bank's **indicative** estimate in terms of Tanzania's ability to connect SSLNG or piped gas with the relevant country and merits of doing so. As base line, we generally assume that around 150 mmscfd is required (which broadly equates to around 52 MGJA) to feed 1,000 MW of base load CCGT.

In addition to the above calculations (i.e. Domgas 200 mmscfd + Songo Songo + Mnazi Bay volumes, c 170 mmscfd = 370 mmscfd, which latter licences need to be extended in the next few years (but of course production will eventually taper off). We have noted Mozambique Domgas numbers and expected schedule above.

We generally assume that if developing a regional piped gas business is desired by Tanzania there will also need to be a mix of licence extensions / MFTs for Songo Songo and Mnazi Bay, as well as the encouragement of additional exploration/development (e.g. perhaps through MFTs for the handed-back Block 3?).

TABLE 4.1: REGIONAL GAS PROS AND CONS

	PROS	CONS
Burundi	Presently, few advantages leap out for what is a small market. Technology may enable SSLNG to be transported by rail in time (through the SGR)	Fierce geographical obstacles. It is c 1,400 kms by rail from Dar Es Salaam (SGR not yet in place but under development)

	PROS	CONS
Comoros	Ability to sell SSLNG by boat, with regional geopolitical benefits	Small market, high cost and low economies of scale unless on "milk round" basis
Kenya	Piped gas distance from current NNGI terminus (Dar Es Salaam) to Mombasa is only c 450kms, with 300kms intra-TZ before Tanga, which will grow as a result of EACOP Kenya has multiple demand sources, such as existing HFO and diesel plants that can be fuel switched (hence the customer base exists), although its industrial demand is limited and installed RE base is growing. However, it also has a growing geothermal capability. Ability to partly divide costs between "building out Tanzania" objective and Regional Gas, for example, extending the NNGI north to Tanga and then onto Mombasa Ability to establish closer relations with Kenya through provision of natural gas Mombasa does not yet have an LNG import terminal, but surely this is only a matter of timing	Kenya has the ability to buy contract LNG from portfolio players, as well as strong underlying sourcing potential from Qatar, Oman, Mozambique and Yemen (low shipping costs) Can Tanzania guarantee adequate volumes of natural gas supply to ensure security of supply to Kenya (and / or Uganda)? By implication, pricing would have to be able to be benchmarked to Kenya's LNG alternative (for example, term LNG minus x) Noting ongoing global issues, we assume that Kenya would pursue a gas purchase mix of LNG and piped gas (for security of supply purposes) and would not be single-sourced. We assume natural gas flows would divide at Tanga (for Kenya and Uganda respectively), therefore both countries would have parallel concerns and requirements on security of supply regarding gas volumes
Madagascar	Ability to sell SSLNG by boat with regional geopolitical benefits	Small market, high cost and low economies of scale unless on "milk round" basis
Malawi	Few advantages leap out for what is a small market.	Fierce geographical obstacles. It is c 750kms by rail through the MCD (not yet in place) to Lake Malawi, with SSLNG needing to then be shipped over the lake to offloading destinations before Blantyre/Lilongwe (adding costs for breaking bulk multiple times)

	PROS	CONS
Mauritius	Ability to sell SSLNG by boat, with regional geopolitical benefits Ability to sell lower frequency larger cargoes (by conventional carrier)	Small market, high cost and low economies of scale unless on milk round
Mozambique	Although Mozambique would not be a natural gas customer, we see logic in extending the NNGI southwards to Afungi. Bi-directional flow ability may allow optimization of LNG plant maintenance; back-up security of supply for LNG plants and customers (in case of any underlying field disruptions); the ability for Mtwara to act as a regional GTP hub (EAPP and SAPP); and will ensure the Rovuma Basin region always had the feedstock to ensure adequate electricity supply (on both sides of the border) Prior to 2021's Force Majeure, MLNG Domgas was scheduled at 100 mmscfd and RLNG 150 mmscfd (in total, 2 x 50 mmscfd per train for MLNG and 2 x 75 mmscfd per train for RLNG), to increase to 900 mmscfd (by the completion of the next two trains, with 300 mmscfd from Area 1 (MLNG) and 350 mmscfd from Area 4 (RLNG)) Given the significant distances on the Mozambican side, the current lack of TX infrastructure (and associated line losses when they are built), our instinct is that northern Mozambique may become a natural electricity customer for Tanzania GTP (located at Mtwara)	Limited disadvantages seen given the geographical distances from NNGI and thus low cost (e.g. 85km from Madimba south to Afungi)
Rwanda	Presently, few advantages leap out for what is a small market. Technology may enable SSLNG to be transported by rail in time (through the SGR)	Fierce geographical obstacles. It is c 1,400 kms by rail from Dar Es Salaam (SGR not yet in place but under development)

	PROS	CONS
Uganda	The FID of the Lake Albert and EACOP developments will mean that by the late 2020s Uganda has the cash flow and credit quality to pay for natural gas (as it will have produced crude oil since 2025). Moreover, if the purchased LNG is priced on a Brent-linked basis, Uganda has the matching commodity and currency income. With Henry Hub linked purchases, Uganda would still have the matching currency income. Ability to build a natural gas pipeline in the same servitude (and broadly at the same time) as EACOP, reducing construction costs and complexity Ability for Tanzania to partly divide costs between "building out Tanzania" objective and Regional Gas, for example, extending the NNGI north to Tanga and connecting Mwanza to natural gas (noting that Mwanza is fairly close to the EACOP route), but could also be supplied by SSLNG through the SGR? Uganda is land-locked and has no natural ability to source LNG	Can Tanzania guarantee adequate volumes of piped gas to ensure security of supply to Uganda (in parallel with Kenya)? We assume flows would divide at Tanga (for Kenya and Uganda respectively), therefore both countries would have parallel concerns and requirements on security of natural gas supplies
Zambia	In theory, the c 1710km TAZAMA pipeline (which runs Dar Es Salaam to Ndola) has an existing servitude that can be exploited (e.g. by laying a new gas pipeline next to the existing liquids pipeline, which has upgrade options. Parallel activities can reduce costs). Conceptually, a new pipeline from Lindi could also be built (perhaps connecting to the existing servitude at Mbeja). This would not it seems be noticeably shorter than by using the entire TAZAMA servitude.	In c 3rd Quarter 2022, Invictus Energy drill exploration wells in Northern Zimbabwe. If natural gas is found, the obvious customer market is Zambia (roughly 400km to Lusaka and 800km to the Copperbelt (DRC lies beyond)). The status of Invictus Energy will be known in time well before the Project FID. We note the Recon Africa exploration play in Northern Namibia is also a potential gas supplier to Zambia.

In summary, the prospect of Regional Gas is exciting (especially for sales to Kenya and Uganda, as well as SSLNG) but there are some challenges. Firstly, TLNG has to progress towards FID. This facilitates 200 mmscfd of Domgas. Secondly, Mozambique's landmark onshore plants need to end Force Majeure and resume construction. This being the case, this could add up to 900 mmscfd over the period from 2032 (with 250 mmscfd potentially available from 2027).

TACKLING BIOMASS

As noted, eighty two (82)% of Tanzania's primary energy production and seventy seven (77)% of primary energy consumption is biomass (IEA, 2019). We have also noted that (per MOFA, 2018) a significant portion of Tanzania's biomass consumption is in the capital Dar Es Salaam (a city of over 4m people), with the highest regional GDP in Tanzania (thus the highest energy demand)), noting it is already partly connected to natural gas (e.g. there are limited distribution connections). As well as having a major CO_2 impact (e.g. inefficient energy processing and high economic and environmental costs), the use of biomass has an adverse gender impact too (many women play outsized roles in the collection, processing and consumption of such biomass, affecting their economic alternative choices on a daily basis, e.g. time spent cooking, less ability to secure paid employment, develop a career etc).

At a conceptual level, Stanbic Bank has the following ideas:

1. Per Section 2.5, this Report assumes that in advance of a formal CO_2 tax in Tanzania, the Project voluntarily taxes itself for its residual CO_2 output (at the rates assumed in the IEA Net Zero by 2050 Document). We further assume that such amounts are then redeployed in Tanzania upon projects that provide mitigation for TLNG's residual exposure to CO_2 (for example, NBS or NERT);

2. Given Tanzania's huge biomass output and consumption, we assume the Project and the GOT will look very closely at how the Project's voluntary self-taxation can be utilised on various projects that will encourage biomass switching / substitution, for example: increase in rural electrification; higher numbers of off-grid PV solar units and inverters; higher provision of LPG; increased distributed natural gas connections in Dar Es Salaam (a particular focus given the NNGI already extends to Dar Es Salaam). For example, could new distribution connections be created to local demand nodes?;

3. At a basic level, noting Tanzania's high biomass consumption, we expect the Project's self-taxation aspects concerning CO_2 (see Section 2.5) will focus to a strong degree upon funding reforestation projects that will have a high rural impact in Tanzania (e.g. providing employment as well as CO_2 mitigation);

4. We envisage that stakeholders could consider the formation of a EATF, which focuses upon increasing energy access, biomass substitution and agricultural modernisation. Whilst we expect major reforestation will take place inland, we recommend each of Lindi and Mtwara regions are considered for pilot regions for agricultural modernisation (given their importance to wider Project goals).

We would be pleased to discuss further and look forward to continued discussions on this topic. Stanbic Bank expects that post HGA signing they can become a major element of the Project's social licence to operate within Tanzania over its lifecycle.

TPDC Funding & NOC Considerations

Under the 2015 Petroleum Act, TPDC became the dedicated NOC for Tanzania (including the Aggregator of Domgas). In order to eliminate conflicts of interest, PURA was created to manage all licensing matters. Therefore, in the context of this Report, we have made various suggestions around looking at Licence extensions and / or the potential introduction of MFTs (especially concerning Songo Songo and Mnazi Bay, but also potentially including the handed-back Block 3?). These can be seen as comments addressed to PURA not to TPDC.

The decision to separate licensing decisions from the NOC is in line with best practice globally and has also been executed by multiple SSA jurisdictions in recent years. For example, Mozambique has INP; Angola ANPG, South Africa PASA, Uganda PAU etc.

The execution of the Project envisaged by this Report (including Domenergy, Domgas and / or SSSLNG) raises a number of financial, economic and commercial issues regarding TPDC. Summarised, TPDC (by virtue of it being the NOC) has, per this Report's assumptions:

- The ability to back-in to twelve (12)% of the Project (divided into two separate components, with two separate prevailing fiscal systems, for each of the Upstream and the LNG Plant);
- The obligation to fund such back-in right (which nominally needs US$ 32.7bn * 12% funding, i.e. US$ 3.9bn which we assume is required to be held in cash (or acceptable securities or other corporate guarantees) by the time of TLNG FID in 2025 (and will not be wholly spent or released until c 2030 (and 2031 in the case of completion support, which is normally only released after a sustained period of successful LNG Plant performance); and
- We understand that, attached to TPDC's right to own twelve (12) % of the Upstream / Plant, is the right to market and sell twelve (12)% of TLNG's LNG and one hundred (100)% of the Domgas (once purchased from the Project). The position with SSLNG will be negotiated

Although twelve (12) % has been assumed as TPDC's participation (per Woodmac), we understand this is subject to additional negotiations. Therefore, we have elected to show a TPDC equity participation range of five (5) % through to thirty (30) %, inclusive of the twelve (12) % assumption, per below

TABLE 4.2: TPDC FUNDING & LIFTING REQUIREMENTS RANGE

Assumed TPDC Participation %	Upstream Funding Requirement (US$ 15.6bn)	LNG Plant Funding Requirement (Pre-Gearing) (US$ 17.1 bn)	Total Funding Requirement (US$ 32.7 bn)	LNG Output Lifting Requirement (MTPA)
5	0.78	0.86	1.64	0.75
10	1.56	1.71	3.27	1.50
12	1.87	2.05	3.92	1.80
15	2.34	2.56	4.90	2.25
20	3.12	3.42	6.54	3.00
25	3.90	4.28	8.18	3.75
30	4.68	5.13	9.81	4.50

In the context of the above numerical pre-gearing TPDC funding range (US$ 1.64 – 9.81bn) and LNG Output lifting requirement (0.75 – 4.50 MTPA), we summarise some initial thinking as follows:

TABLE 4.3: TPDC FUNDING & NOC CONSIDERATIONS

TPDC ISSUE	COMMENTS
Context	Typically, as an emerging economy's gas market evolves, and especially when a market becomes an LNG exporter (and supplier of Domgas), TPDC's role will become more complex. At present, Tanzania has limited production (two near shore fields), only conducts domestic sales and has limited domestic infrastructure. Under the Petroleum Law, TPDC has been selected as the Aggregator of natural gas in Tanzania (exclusive wholesaler) and no gas market is presently envisaged. As a minimum, the Project will require (if this Report is taken at face value): • TPDC to fund (pre-potential LNG plant borrowing) US$ 3.9bn in order to follow its rights • TPDC to own twelve (12)% of LNG volumes, thus 1.8 MTPA (which can be independently or jointly marketed). This is equivalent to 94 MGJA per annum. We note that Tanzania does not presently produce LNG therefore TPDC has no ongoing LNG sales operations. We therefore expect this will be internationally marketed in partnership with the existing Operators/other Investors (with the potential for some regional sales on top); • TPDC to purchase 200 mmscfd of Domgas from the Project. This is on top of TPDC's existing gas purchasing business (e.g. up to 170 mmscfd), which will amortise over time. • TPDC to then market and sell such Domgas and / or Royalty Gas in Tanzania. This is on top of TPDC's existing gas marketing business. • TPDC to develop, own and operate extensions to the NNGI, both running north (to the Kenyan border through Tanga); northwest from Tanga (to the Ugandan border) and south (to the Mozambican border). This is one option. Alternatively, a bespoke cross-border entity (e.g. along the lines of ROMPCO or TAZAMA) could own the cross-border infrastructure limbs. Will a sovereign treaty be required to execute these developments between Tanzania and Uganda and / or Kenya? • The Project (or TPDC, see below) to sell SSLNG within Tanzania (for example, as a diesel substitute); at the Project Site or Mtwara (for example, as marine bunker fuel through Tanga, Dar Es Salaam or Mtwara) and regionally (e.g. to Comoros, Madagascar etc) Clearly, the above functions are very different and will require a significant increase in TPDC's organisational capacity – encompassing financial, human resources, corporate and legal elements, among others.

Organisational Design

In our 2018 Macroeconomic Study, we looked in detail at a Domgas Project in Mozambique. Regarding Mozambique's NOC (ENH), we assumed the NOC's gas operations would need to be divided into certain elements. For this Report, we look at TPDC as follows:

- Holdco:
  - Overall Group holding company, overseeing economically regulated (e.g. Domgas, pipelines) and economically unregulated activities (e.g. LNG sales, SSLNG sales)
- GasCo (alternatively TradingCo):
  - Purchaser of Domgas from the Project (likely to be held in the same function as purchases from Songo Songo and Mnazi Bay) which is on-sold to existing and new third-party customers, likely economically regulated
  - Sale of gas to existing and new third-party customers (including greenfield projects, in which TPDC may own a shareholding) within Tanzania, likely economically regulated
  - Will GasCo be the vendor of SSLNG within Tanzania? Or will it be the Project itself? How will a national distribution network be built and funded? Will TPDC hold a stake in excess of [12]% in this?
  - We can see how marine access to SSLNG can be assured at each of Tanga, Dar Es Salaam, the Project's dedicated port and Mtwara. Outside of marine bunkering, how does LNG get transported around Tanzania. Can it be railed on the SGR from Dar Es Salaam inland (e.g. to Dodoma or Mwanza)? How does it get to Dar Es Salaam? Most likely we expect it to be trucked or barged
  - Will TPDC own and operate the fleet of LNG trucks? Or the Project? Or will it be outsourced?
  - Will TPDC be the vendor of cross-border piped gas? For example, to Kenya and/or Uganda and/or Mozambique.
- InfraCo (alternatively PipeCo):
  - Pipeline (transmission and distribution) functions, likely economically regulated
  - Per above, how will cross-border pipeline arrangements be managed?

Other potential functions will include:

- EquityCo (for Exploration & Production Assets):
  - TPDC vehicle that holds the stake in individual blocks. Will this be Holdco itself or will be subsidiary EquityCo? We note TPDC's existing E&P asset ownership and operations
- EquityCo (for Domgas Projects):
  - TPDC vehicle that holds [minority] stakes in individual downstream projects (fuelled by Domgas). Will this be Holdco itself or will be a subsidiary EquityCo?

Regulatory and Conflicts of Interest

In most global markets, InfraCo activities will be independently regulated and subject to independent economic oversight (e.g. charging of transport tariffs to individual Domgas Projects, confirmation of pipeline access etc). We assume this will also be the case in Tanzania.

Will TPDC be allowed to own equity stakes in new individual downstream projects? For example, a fertiliser project focused on supplying the Tanzania market only, not an export business (i.e. In order to maximise local benefit and dilute the impact of potentially higher international gas prices impacting the price of fertiliser in Tanzania). Perhaps such project could be developed as part of a DSF and / or a EATF? Either way, the context is such projects will necessarily have to buy the gas from TPDC? How does this work when TPDC is a shareholder in such project? Governance will be a real issue. In mature markets, there are multiple experiences of the late 1980s – 2000s periods where similar companies were unbundled. For example, in the UK, British Gas was gradually split into BG, Transco/ Lattice, British Gas/Centrica among others.

Sources of Finance

In At a basic level, TPDC's credit proposition (to borrow US$ 3.9bn, whether from GOT and / or financiers for the LNG plant element) is theoretically enhanced through direct access to twelve (12) % of the LNG sales proceeds. However, there will be many specifics to work through.

A start point for the discussion is the issue of Completion Support, which would need to be provided to external financiers (although funding guarantees would also need to be provided to partners). To explain, in LNG Projects it is customary for there not to be a single contractor who is able to take the risk of all aspects of the Project's development and construction (e.g. subsurface, drilling, gathering lines, LNG Plant etc). In such situations, where project finance is raised (and it is expected that project finance will be sought for the LNG Plant elements), it is typical for the Lenders to be provided with deferred completion support. Specifically, this means that in addition to having to fund their own equity commitments, each Sponsor will be required to provide contingent credit support to the Lenders to the LNG Plant financing. Typically, this includes significant standby funding, the commitment for the Sponsors to keep a loan serviced whole and, ultimately, potentially for the Lenders to request repayment (if the Project completion is delayed long enough). This tends to lead to a flight towards the strongest balance sheets and may challenge local partners and / or weaker international partners. Clearly, in the above range, from a completion support perspective, TPDC assuming a 30% equity stake (meaning funding (and completion support) requirements are higher) is likely to be harder to fund than assuming a 5% stake.

On the face of it, we see the following sources of finance for TPDC with regards to TLNG:

- Borrowing from partners in Newco. This is often used in the industry but some feel there are trade-offs in terms of foregone influence and control (given the local partner/NOC will owe its partners US$ 3.9bn from the inception of development, subject to LNG Plant borrowings). This approach could also involve customer finance (for example, a partner provides a loan to TPDC in return for some access to TPDC's share of the LNG). Clearly, the higher the assumed TPDC stake, there will be greater challenges for the willingness of TPDC's partners to advance higher amounts of funding;

Sources of Finance

- Customer finance (which may include trader finance) is where an off taker of the LNG (e.g. destination off taker, trader or portfolio player) may provide a loan to TPDC in return for rights to purchase the LNG from TPDC. This option will need major structuring though, especially if funding is being raised for the LNG Plant. For example, in such case, the LNG Plant financing would need a guaranteed offtake (e.g. tolling by the Sponsors). In the case of TPDC, there may be a back to back tolling agreement with another market player. What would Lenders require in terms of support from TPDC's customer financier?;
- Banks / ECAs have traditionally been strong funders of LNG Projects. Given the strong separation between the Upstream and LNG Plant (Midstream) fiscal systems, we expect that Newco may look more at a project financing of the LNG plant. Assuming 70:30 gearing of US$ 17.1bn, a US$ 12bn project financing in a new market such as Tanzania would be challenging (noting the Energy Transition environment) and Lenders would no doubt place restrictions on TPDC (as an unfamiliar international market name). How would their credit analysis be impacted by TPDC potentially having up to a 30% equity stake and a 30% responsibility for LNG lifting and sales (which would ultimately service the debt)?;
- Capital Markets options are more likely after the LNG project has been completed and is operational (e.g. due to completion risk which bond holders do not traditionally assume);
- International SWFs (e.g. Chinese) have from time to time looked at LNG financings; and
- Potentially, TPDC could ask the GOT for funding. However, this then raises potential challenges for Tanzania's own Debt to GDP. At 2019, national debt to GDP was 37.8%. Using example numbers, the high end of the equity participation range (thirty (30)%) would require total TPDC funding of US$ 9.8bn (pre LNG plant borrowing). This is 15% of this Report's assumed GDP for Tanzania and, if borrowed by GOT in entirety, would take national debt to GDP to 52.8% and reduce the country's future fiscal flexibility.
- If one assumes that 70% of the LNG Plant funding requirement is borrowed (US$ 12bn), this would still leave a US$ 5.1bn TPDC LNG Plant funding requirement, of which TPDC's maximum exposure could be US$ 1.7bn (30%). This has to be added to the Upstream Funding requirement of 30% of US$ 15.6bn, i.e. US$ 4.7bn, making a total cash funding requirement of US$ 6.4bn. However, in this case, the challenge does not disappear for GOT. As noted above, the Lenders of the US$ 12bn LNG Plant financing would require completion support for 30% of the US$ 12bn from the GOT (being the shareholder of TPDC), thus the US$ 3.6bn would be recorded as a contingent liability of the GOT (until 2031) and thus impact the freedom to utilise GOT's funding lines.

Within the above, an important issue will be whether the other partners in Newco wish to raise a debt financing (e.g. to fund the LNG Plant) and what restrictions and obligations this places on all partners (e.g. contractual support for the financing and limits on freedom/ autonomy to conduct LNG sales). We have assumed a likely tolling structure. Leaving aside completion support (discussed above), this would also lead to some form of ongoing credit support requirements (see below)

Credit Support

TPDC will likely have to provide credit support in the following circumstances:

- To be resolved, per the above, to its Sponsor partners (for its own Project funding commitments); to its selected LNG sales partner (who may be the same entities) and to LNG Plant Lenders
- Credit Support to individual Domgas Projects in Tanzania for its term obligations to supply natural gas. This may become an important issue as such Domgas Projects may also look to raise project financing to fund their own project's construction;
- Potentially, to the Project for its obligation to purchase natural gas (Domgas) from the Project (in its capacity of Aggregator of natural gas in Tanzania). In the industry jargon, these are known as ''take or pay'' obligations (where the natural gas if not physically taken and sold to customers, must be paid for). The gas producer has otherwise incurred an economic loss;
- Potentially, to the Project for its obligation to purchase SSLNG (if TPDC becomes the marketer of SSLNG in Tanzania)

In this context, we note the scale of LNG and the volume of its turnover. As such, TPDC's term credit support requirements may become quite substantial (especially if TPDC wants to directly face LNG customers as well as Tanzanian downstream customers and potentially national/regional SSLNG customers). In this regard, we note that TPDC's loan borrowings (to fund the US$ 3.9bn back-in right) are highly substantial (and will be on TPDC's balance sheet)). This will be a long-term borrowing. The above elements will be more of a shorter-term, revolving nature but will become a permanent part of TPDC's funding and liquidity requirements. We can readily see how TPDC may quickly grow a substantial LC/Bank guarantee requirement within Tanzania. Based on industry rules of thumb under discussion in SA, it is understood around a 90-day working capital cycle is being discussed for LNG purchases, involving prepayment of a cargo and credit support for two subsequent cargoes. This may have a total working capital requirement in the order of US$ 100-120m (depending on prevailing prices). In the case of Sellers, buyers will be concerned they may have to buy spot LNG from other suppliers (in the case of Seller default). This is separate from any Domgas credit support requirements (for example, provided to the Project under ''take or pay'' arrangements). We note that TPDC in the future will have credit strengths (e.g., 1.8 MTPA of LNG ownership and sales) but these strengths should be carefully determined as to how they are allocated (for example, how much to Take or Pay payments for Domgas to be supplied to greenfield projects in new industries for Tanzania?).

The above is a short summary of an important and complex issue. Post HGA signature, we recommend that TPDC conducts a brainstorming workshop upon the commercial and financial implications of this Report for itself as a NOC.

Local Content

As we have noted in this Report, we consider the issue of LC could be seen in a wider context. Per this Report, TLNG envisages 17% LC of US$ 32.7bn capex = **US$ 5.6bn**. Prior to the ongoing Force Majeure in Mozambique, Stanbic Bank understands that MLNG had a monetary LC target of US$ 2.5bn (rough project costs US$ 25bn) and RLNG US$ 3bn (rough project costs US$ 30bn). Thus, **US$ 11.1bn** is due to be **bi-nationally** spent on LC on 43.3 MTPA / US$ 87bn of overall projects within 220kms in a north south direction (Likong'o – Afungi) over the broad period 2023 – 2030, and which pertains to an underlying regional/provincial GDP of **US$ 3.3bn** (2019).

For discussion purposes, we envisage and recommend a cross-border coastal **Rovuma Corridor** between **Likong'o** and **Afungi** (which perhaps could be extended further south to **Mocimba Do Praia**) which could become a centre for, among others: LNG-related LC; light manufacturing; services; fabrication; agriculture; agro-processing/fisheries developments; employment, training and skills programmes, as well as tourism (e.g. more flights, two-country visas, twin-centre holidays etc)). Within this general statement, we make a few observations that appear to form the basis of many areas of mutual joint economic interest for Tanzania and Mozambique:

- Tanzania has the NNGI in place and it is logical to extend it north and south. However, based on the numbers in this Report, we understand that Mozambique has around 150 Tcf natural gas resources in the Rovuma Basin whereas Tanzania has around 43 Tcf on its side of the border;
- Neither country has a strong electricity grid, close to the LNG sites, although Mtwara appears to be the most likely GTP site (to sell to the SAPP and / or EAPP);
- Tanzania appears to have the nearest proximate high-quality port (e.g. Mtwara is a larger and deeper water port than each of Palma or Mocimba Do Praia). However, Mozambique (Afungi) appears to have the more advanced industrial park concept and greater access to Domgas;
- We argue that both countries will benefit from improved road connections (e.g. widening for industrial traffic, bypasses around villages, small towns etc.), for example, between the Likong'o site (to the north) and Mocimba Do Praia (in the south), as well as a Second Crossing over the Rovuma River (near the coast), among others
- Moving south into Mozambique, we note TotalEnergies' increasing focus on LC in Cabo Delgado in 2022. A recommendation of this Report is for GOT to proactively focus on developing **Enabling Infrastructure** in Lindi and Mtwara regions, ahead of the Project FID (scheduled for 2025). It may also be the case that this recommendation organically extends to a focus on LC in Tanzania as well as job creation. In this regard, youth employment is a natural concern (noting the Cabo Delgado experience), with the need to also develop skills and employability through training. Further, it can be argued that a three region focus (**Lindi-Mtwara-Cabo Delgado**) may have the greatest **mutual economic benefits** from a security perspective, as well as the wider macroeconomy of both countries.

Concerning this development consideration, Stanbic Bank sees some theoretical parallels with the post-WW2 development of the Amsterdam-Rotterdam-Antwerp ("**ARA**") port/refinery/petrochemical nexus. Geographically, Antwerp is roughly 160kms south of Amsterdam with the three ports being increasingly interconnected over time. Economically, the 1950s recovery after WW2 saw the creation of multiple refineries and petrochemical plants in the region (for example, owned by Shell, Esso, BP, BASF) which over the course of the 1960s were increasingly connected by pipeline (Van Den Berghe, 2022). Clearly, having three (3) LNG export projects in close proximity allows a regional

economic network to develop, which are likely to be supplemented by additional LNG export projects (in the case of Mozambique). Within the LNG world, one could also cite the examples of Ras Laffan Industrial City (founded in 1996), within which Ras Laffan port occupies some 55km2. Ras Laffan industrial city itself occupies some 296km2.

Accordingly, we can see how TLNG, MLNG and RLNG can become the drivers of **Regional Industrialisation** based upon the **Rovuma Corridor**, which is broadly in line with the cluster approach of SADC (2019). In Tanzania's case, this is entirely in line with Vision 2025 and the FYDP)., with the development of a "regional LNG and renewable energy industrial model", encompassing economic development impacting upon (and vice versa) **Cabo Delgado** in Mozambique. Looking medium term, we therefore argue for a cross-border focus on shared LC, services, fabrication, light manufacturing, agricultural, food, fishery and agro-processing developments, ensuring maximum local employment and prosperity across the **Lindi, Mtwara, Cabo Delgado** sub-regions in both countries (noting the Mozambican LNG projects are multi-phase). Specifically, we argue the areas could be given the status of SEZs or EPZs (and associated legislation such as beneficial tax rates or bespoke capital allowances for non-upstream O&G activities), to promote the widest possible economic benefits to arise from the LNG developments.

Consistent with the above, we have the following specific suggestions:

- National upskilling and employment opportunities:
    - Given the cyclical nature of these projects with peaks during construction phase and troughs (intra-project FIDs) as well as proximity between TLNG and MLNG/RLNG
        - Potential/Opportunities to create regional hubs for training and upskilling as well as skills transfer in the form of internships/on the job training between the two geographies i.e. depending on timing could TLNG resources be brought to Mozambique to upskill and vice versa, with LNG workers being able to move onto Domgas projects, for example.
        - Possibility to create generic training programmes at scale that support critical skills in demand i.e. simulation training programmes, rope access, specialised welders etc.
        - Work visas, permitting etc. is a always a bottle neck and pain point. We generally understand a platform has been developed in Mozambique. Can this be adapted for TLNG?
- Community development/social economic programmes:
    - What opportunities exist for the creation of agricultural value chain solutions in the Rovuma Corridor for social economic uplift in communities and for the vast demand of construction period food requirements (e.g. at peak, a large train LNG construction plant workforce needs up to 1 million eggs per month) i.e. seeds, produce, technology transfer, infrastructure and transport and logistics.
    - Certain NGOs already have cross-border projects for female micro entrepreneurs in the trading and agricultural sectors. Is there an opportunity to create linkages/synergies, especially given the short distance of the Rovuma Corridor? Per Section 4.4.5, we also note the gender benefits from reducing biomass production and consumption;
    - Cross-border supply chain opportunities using social economic hubs through community associations: Health & Safety equipment like uniforms etc. There is an example from Uganda where fireproof textiles are now locally produced. Can similar linkages be created where parties provide textiles/material and skills transfer into Lindi and Mtwara regions? And / or Cabo Delgado?

    - Grass-root community initiatives from TLNG's inception are essential to support relocation of residents i.e. grass cutting/bush clearance/brick manufacture ideas, among others.

- SME Development:
    - Opportunities for JV's and matchmaking between regional partners i.e., could solutions be found for Tanzania and Mozambique SMEs to partner to respond to commercial opportunities? For example:
    - Regional LC platform for SME's. In Uganda, the Petroleum Authority of Uganda has a national supplier database. However, this includes foreign registered businesses;
    - TLNG could create a unique LC supplier platform to assess capabilities, readiness, build up RFP readiness. Within Mozambique, a commercial bank has developed a platform solution – could this be the answer for, and facilitation of cross-border solutions?;
    - Leading off LC: regional opportunities platform where Forward Work plans, RFPs get consolidated into one regional LNG platform solution. Important in this context is an enabling business/legal/fiscal enabling environment to support cross-border/Pan-African partnerships and making it easy to do business. Elsewhere, we have noted the possibility of SEZs or EPZs which can support these endeavours;
    - SME capacity building: it is critical to have programmes for:
        - Understanding the requirements for doing business with O&G sector and specifically LNG;
        - Understanding LNG projects;
        - Linkage programmes/matchmaking;
        - Health & Safety standards and basic awareness through to accreditation.
- Platform for industry insights, reports, updates etc. for region
- Lastly, following the above list, there remains the issue of access to finance and the associated cost of debt in local currency. Generic issues to be solved include: ability to secure performance guarantees (in the amount sought); access to capital equipment financing (e.g. to make the LC) and working capital (e.g. to fund associated costs, until the sub-contractor receives payment from TLNG / relevant contractor or sub-contractor)

Once TLNG enters Pre-FEED, we would recommend a workshop is held on this matter between TLNG and the GOT.

REPOA STUDY

As a subset of LC, Stanbic Bank engaged with local research institution, REPOA, to provide insights into the localised socioeconomic impact of the Project in the Mtwara and Lindi regions. REPOA aims to be a leading research institution in the region in the production and dissemination of knowledge that contributes to improving the lives of people by influencing socioeconomic policies.

The research conducted at the micro-level, sought to unpack potential direct, indirect and induced economic effects of the LNG investment on local communities and assess the type and scale of local businesses likely to develop in support of LNG activities such as the employment likely to be created, both at the areas localized within the project locations and within the greater Lindi and Mtwara regions.

REPOA conducted a survey across a sample size of 908 (780 structured questionnaires for households and 78 structured questionnaires for local enterprises, 13 Key Informants, 38 for Focus Group Discussions ("**FGDs**")). Respondents were interviewed at the micro level in Mtwara and Lindi regions. Households and local enterprises/ businesses were drawn randomly. Household sampling targeted respondents from the age group of 18 and above. 13 key informants responsible for policy and regulation at the Regional Administration and Local Government (PO-RALG) officials were also interviewed.

Two semi structured questionnaires were administered, one for in-depth individual household and enterprise interviews, and another for FGDs. The household questionnaire comprised of a structured section for interviewees' background, demographic information, and important observations on different aspects of poverty and citizen's perception on LNG investment. While enterprise questionnaire probed on the nature of business and enterprise perceptions of the investment. The FGDs questionnaire had a structured section for location details and demographic information of participants. Both questionnaires comprised a set of similar closed and open-ended questions. The objective was to assess the socio-economic impact of the LNG investment at the micro-level (individual households and enterprises).

The survey captured the perception of individual households and enterprises on the impact of natural gas along the value chain from its discovery to exploration, processing, and distribution between the different age groups and gender. Key concerns raised include:

- Allocation of land for investment
    - A designated area will need to be set aside for the development of the Project, and communities will lose this land. In line with global concerns, compensation will need to be fair
- Limited youth participation
    - Youths should be considered for every employment opportunity at the Project, so as to minimize the chronic problem of youth unemployment in the region. In so doing, it will create a well-learned society of youths who contribute to the wellbeing and socioeconomic benefit of future generations. Stanbic Bank notes the ongoing challenge of Cabo Delgado and hope this example resonates.
- Compensation
    - In previous gas projects in Tanzania, complaints on unfair compensation allowances were significant. Both regions relayed their unpleasant experiences that the compensations offered did not equate to the land that they possessed

We note the importance of continuing engagement with the local communities, addressing their concerns and ensuring that policy implementation works to the benefit of the local communities.

Project Discussion Points

TANZANIA'S STRUCTURAL ADVANTAGES

At face value, given our Section 2.7 comments about the current TLNG Investor post-tax IRR (in certain lower LNG Price scenarios) it may seem a little unusual to comment about Tanzania's structural LNG advantages. However, we make the following observations:

1. At date of drafting, the Project is intended to be a Scope 1 & 2 NZE project, with all net emissions (which cannot be determined with precision at the date of drafting) modelled to pay Carbon Taxes calculated at the IEA's Net Zero by 2050 (2021) CO_2 price assumptions for Other Emerging Market and Developing Economies. The inability to precisely calculate CO_2 emissions in 2022 (for a project taking FID in 2025 and starting operations in 2030) is due to the Project's commitment to use BAT, which is fast evolving in the space of LNG plant emissions. Earlier, we quoted the growing examples of projects in Qatar, US and Australia, all of which are using either of, or a combination of RE and CCUS.

   As well as the envisaged use of RE and electric drives, the Project is exploring the backstop use of CCUS. Newco will explain its strategies in this regard in its POD submission to the GOT, but we expect its LNG cargoes will be certified (at FOB Likong'o) as Scope 1 & 2 NZE. Our point is that as existing sources of LNG decline in production in certain locations (e.g. Trinidad & Tobago, Indonesia, Malaysia etc.), all new sources of production will be required to comply with similar environmental and CO_2 market requirements as will underpin the Project. Thus, the global LNG market will increasingly have the same environmental costs/restrictions as the Project.;

2. Tanzania has a competitive shipping distance to South East Asia (e.g. India, Singapore, Indonesia) as well as to East Asia (e.g. China). Such markets are expected to be major demand centres for LNG for the next 30 years, for reasons of supporting their economic growth as well as facilitating specific CTG switching (which promotes decarbonization). We specifically note that three (3) major markets – China / Nigeria (2060) and India (2070) already have NZE targets extending well-beyond 2050. In a similar vein, Tanzania is also well-placed to support the ongoing growth in marine bunkering (which will show fast growth in Asia-Pacific). Tanzania, of course, will add to the diversity of global LNG suppliers (as will Mozambique), a pertinent global issue at date of drafting;

3. Within Tanzania, the Project is likely to act as a catalyst for the creation of important regional Domenergy and Domgas sectors, as well as for the provision of nationally important **Enabling Infrastructure**. Within security of supply boundaries, the Project is a potential customer for JNHPP's hydroelectric power. Inter alia, the Project will also directly fund RE, CCGT power, with an ability to provide CCGT power to the Tanzanian grid (upon potential RE production supplying the LNG Plant). It will also commit to supply 200 mmscfd Domgas (for the benefit of increasing the fill ratio of the NNGI and raising the potential of Mtwara becoming a SAPP GTP hub). Further, we expect either of TLNG or TPDC will also look to develop an LNG Truck Filling Station at Likong'o, with an ability to supply additional filling stations by barge transport to Lindi, Mtwara, Tanga and Dar Es Salaam, with a discussion as to whether the SGR can play a role in transporting SSLNG. As noted above, we believe the GOT has a major opportunity to put in place Enabling Infrastructure (e.g. Lindi and Mtwara road widening and bypass construction, NNGI expansion north to Tanga and / or Mombasa, NNGI expansion south to Afungi; TX expansion from Dar Es Salaam to Mtwara; south to Mozambique and a second crossing over the Rovuma River (more coastal, to facilitate a growth in cross-border trade); as well as Complementary Infrastructure (for example, the MCD or TX expansion west from Mtwara to Somgea). In making such arguments, Stanbic Bank is wholly

cognizant of the experience of Mozambique (2017 – 2022) and the current assertive focus by TotalEnergies and GOM in Mozambique (post-insurgency) upon developing LC in Cabo Delgado prior to a targeted end of Force Majeure), as well as Uganda's sovereign focus on leading intra-regional investment pre-FID by the private sector on the underlying project. In addition, as we noted in Section 4.4.4, Regional Gas is also an option for Tanzania (including SSLNG); and

4. Lastly, as Section 3 clearly shows (and in common with our previous studies), executed onshore LNG projects have an immense development impact in SSA. On all metrics evaluated (e.g. GDP, GNI, BOP, Fiscals, Household Income etc.), the Project can make an unprecedented contribution to Tanzania (at a national level) as well as to Lindi and Mtwara regions. Bluntly, its cash flows and spin-offs can take Tanzania onto a different macroeconomic trajectory, **towards the FYDP's 8% annual GDP growth target**. Associated social challenges will be to ensure agricultural modernization, a reduction in biomass consumption, increasing national energy access and confirming that TLNG has a strong social license to operate until 2059.

VISION 2025 & THE FYDP

Vision 2025 states that "investment in infrastructure must be accorded the highest priority and be spear-headed by the Government". We could not agree more. Similarly, Vision 2025 argues "the development of the road network is absolutely essential for promoting rural development" and that [other infrastructure investment] "is also central to the stimulation of local and foreign investment". We also agree with this.

As noted in Sections 1.4.4 and 4.4.3, we believe it is crucial for Tanzania to push a strong domestic agenda prior to the Project FID (by initiating and developing the Enabling Infrastructure). We strongly believe this will have major benefits for the Lindi and Mtwara regions. However, in doing so, the GOT should have in mind the need to de-risk its own potential activities so this only occurs after the completion of an acceptable pre-FEED analysis by the Operators (e.g. in 2023, in order to achieve individual Enabling Infrastructrure FIDs in 2024, ahead of the Project FID in 2025). At date of drafting, we do not expect any decrease in the attractiveness of the LNG market in the next 12 months.

In a similar vein, FYDP makes a number of key comments concerning the development of the Tanzanian economy and the need to focus on implementation (among others). We also agree with these aspirations. We respectfully suggest the massive scale of TLNG requires an "all of Government" or "Tanzania Inc" approach by the GOT to deliver it. We noted the earlier FYDP reference to Malaysia Inc in 1983 and approve wholeheartedly of such logic.

We argue this Report, if supported, could be used in parallel with a signed HGA (between GOT and the Operators) to provide an addendum to the current FYDP to ensure all aspects of TLNG are dealt with by the FYDP and the amended FYDP includes multiple analyses arising from the scale and benefits of TLNG (as they impact on Tanzania).

UGANDA CASE STUDY

In the context of the Report on TLNG, we wish to outline a case study which provides one example for the GOT to consider going forward. This is the case of the GOU and its approach to its own oil developments over the last decade or so.

GoU Strategic Context

In 2008-2012, through engagements between the IOC's and relevant ministries, the GOU determined to establish a comprehensive and coordinated plan to deliver the necessary supporting infrastructure for the Lake Albert (upstream) and EACOP pipeline (Midstream) projects. Certain core considerations underpinned the planning framework:

1. The infrastructure was to be critical to the O&G developments;
2. The infrastructure was to have social and economic benefits beyond O&G, especially during the production phase;
3. Minimization of environmental impact; and,
4. Integration and concurrence with the Uganda's broader National Development Plan ("**NDP**")

The planning process was completed in 2012, with the following projects prioritized:

1. HIA – c.US$318mn
2. KIP – c.US$300mn
3. 700kms of critical "Oil Roads" - c.US$1bn
4. Expansion and integration of Water & Sanitation infrastructure - US$100mn - US$200mn

By way of background, each of HIA and KIP will be: located at the central point of the oil production sites near Lake Albert; will be close to the Central Processing Facility; and also a planned future Oil Refinery site. The airport will be Uganda's second international airport (located some 200kms plus northwest from Entebbe) and will play a crucial role in importing the equipment and people to develop each of the above upstream and midstream projects.

Project Sequencing:

Prior to commissioning the investments, GOU consulted with the IOCs with a view to determining a fit-for-purpose sequencing in the development of the supporting infrastructure. The sequencing adopted by GOU was:

1. Critical oil roads (e.g. to transport heavy equipment) must be completed within 6 months of the FID of the Upstream Projects and EACOP.
2. HIA to be completed within 6 months of such project FIDs.
3. KIP to be completed within 12 months of the FID of the Oil Refinery. The GOU is currently exploring options to accelerate the delivery of KIP.
4. Water and Sanitation projects to be completed by first oil production, currently expected to occur in 2025

GOU Financing Plan for Supporting Infrastructure:

GOU developed a financing plan that was anchored on the following principles:

1. Raising project specific financing rather general sovereign debt (i.e. loans for which the use of funds is disclosed)
2. Preference for concessional debt and Export Credit Agency ("ECA") facilities;
3. Stretching the tenor of overall public debt by targeting loans with tenors of ≥7years;
4. Stay within a maximum present value sovereign Debt-to-GDP ratio of 50%. In this regard, we note the discussion of Section 4.5 on the potential impact of TPDC funding requirements upon the GOT debt to GDP ratio;

5. Diversification of sources of capital on a geographical basis

At year-end 2021, GOU has closed or meaningfully progressed the financing relating to the following supporting infrastructure:

1. HIA – ECA facility (85% of $318mn) funded by UKEF.
2. Critical Oil Roads – 464km under construction with completion expected in 2022. Total cost of $672mn. Contractors (primarily Chinese) self-funded the construction with a guaranteed take-out by GoU upon the earlier of completion and or Year 3 of the project.
3. KIP – $300mn likely to be a Canadian and/or Scandinavian Export Credit Agency deal

Thus, the GOU contributed approximately **US$ 1bn of at-risk funding** (i.e. if there never was a FID, now an academic issue, the GOU would have had to service and repay the sovereign debt without future oil revenues as comfort) to facilitate an easier (and cheaper) post-FID development and construction period, which helps de-risk the period to First Oil. We recommend the above case study is closely evaluated by the GOT with regards to this Report's recommendations concerning Enabling Infrastructure.

In contrast, Mozambique's approach was largely of a legal and enabling (or facilitatory) nature. In the period to 2014, significant time was spent negotiating the Decree Law, generally seen as world-class. In essence, this was a landmark piece of legislation that allowed all future Mozambican LNG projects to have contractual certainty in perpetuity. The benefits of this were seen in the 2017 FID of Coral FLNG and then the 2019 FID of MLNG. However, beyond this, there were little to no investments made by the public sector in the region of the Afungi Site, noting that Cabo Delgado was the poorest province within Mozambique with US$ 545 GDP per capita in 2019 (i.e. no material road, port, water investments and / or employment, training or skills programmes, agricultural or agro-processing schemes). There was also no visible progress in the execution of targeted Domgas projects by the 2019 FID of MLNG.

For clarity, Stanbic Bank is not making a judgment upon the causality of the subsequent insurgency (noting it is a common occurrence across Middle East / Africa, e.g. Yemen, Sahel, Somalia etc) but simply observing that different Host Government / public policy approaches were followed in Uganda and Mozambique in relation to their material hydrocarbon discoveries.

Chapter 5

Conclusion & Recommendations

HGA Context

We understand the HGA is currently under negotiation between the Operators and GOT, and envisage it will establish, inter alia, the fiscal, legal and commercial terms for the LNG Plant, as well as clarifying the original PSAs for the Offshore Upstream elements (Blocks 1, 2 & 4) and how they will interact with the LNG Plant development. Among others, we understand the HGA discussions will also address the nature and scale of TPDC participation; the Project's fiscal framework (including any tax exemptions); Domgas; stability of fiscal terms and LC.

Assuming HGA signing, this means the GOT and the Operators will have agreed the above key terms before the IOCs can conduct pre-FEED activities. Assuming pre-FEED activities are then satisfactorily concluded in the next period, we assume the IOCs will then move into preparing the POD, issuing the FEED and EPC Tendering phase. As noted above, FID is targeted for 2025.

To help take the Project to a smooth FID, Stanbic Bank suggests the GOT engages an experienced multi-disciplinary advisory team (we are aware Baker Botts, international lawyers, have already been hired), potentially encompassing technical, commercial/market, financial, environmental and PR advisers. We respectfully suggest the massive scale of TLNG requires an "all of Government" or "Tanzania Inc" approach to deliver it. In this regard, we have previously noted Tanzania's FYDP reference to Malaysia Inc in 1983

Policy Options

Based upon the macroeconomic analysis in Section 3, we note the following policy options for GOT consideration (which Stanbic Bank does not outline in any proposed ranking):

TABLE 5.1: POLICY OPTIONS SUMMARY

OPTION	DESCRIPTIONS
1	**Facilitate Project FID ASAP** The Project FID underpins: the development of the Rovuma Corridor; industrialisation of the Lindi & Mtwara regions; supports the development of new national supply and value chains positively impacting on Tanzania's growth; jobs and skills development (potentially spanning national borders) and enhancing Tanzania's objective of middle-income status per Vision 2025 and FYDP. In passing, we note that Tanzania is now officially lower middle-income status (per World Bank, 2020, confirmed by FYDP, thus the Project is intended to consolidate this recent achievement and increase national GDP growth towards the FYDP's eight (8)% per annum national target.
2	**Use LNG proceeds to build out and connect Tanzania** Through the material LNG proceeds outlined in Section 3, we can readily see how Tanzania can strengthen its transport infrastructure (e.g. roads and rail, such as the developing SGR network; the new coastal HV TX line that can be built over the NNGI), in line with the FYDP, which would increase national mobility and flexibility, as well as promoting regional integration. This is a key means by which Tanzania's national development can be achieved. Comparative examples that Stanbic Bank like to quote are the building of the railways in Victorian England c 1850-1870 by national private investors and / or the building of the US Inter-State Highway System in the 1950s (through federal legislation). In addition, Section 3 outlines the increased education, health and welfare spending that can result from the GOT fiscal proceeds (across each LNG price scenario). Specifically, we are intrigued by the prospect of the GOT proactively focusing on facilitating Enabling Infrastructure prior to the LNG FID. We addressed earlier the public policy differences between the relevant Host Government approaches on the Mozambican LNG development and that of Uganda's Lake Albert/EACOP developments. Noting the examples we outlined in Section 1.4.4, we suggest the following: • In parallel with assumed Pre-FEED progression, GOT undertakes final feasibility studies on core potential Enabling Infrastructure developments such as the Lindi/ Mtwara region coastal road widening and bypasses; a second Rovuma River Crossing (inclusive of Mwambo – Mutita approaches); NNGI expansion (bi-direction, north and south) and a Dar Es Salaam – Mtwara HV TX backbone (which can be extended south to Mozambique and which facilitates EAPP and SAPP sales); • In 2023, GOT procures the various construction packages to execute the works (and determines its selected sovereign funding mechanism and source of funds). In parallel, Complementary Infrastructure (e.g. Mtwara – Songea and the MCD, is also progressed (e.g. 12 months behind the Enabling Infrastructure); and • Target Enabling Infrastructure FIDs for 2024, in order to show significant progress within Lindi/Mtwara regions by the time of TLNG FID (2025). **A secondary benefit is that it will give Newco confidence that Tanzania is completely committed to the Project which in turn will encourage its own FID in 2025.** An indicative time of works completion will be early 2026, by which time Lindi / Mtwara site activities will be ramping up. **This means there will be visible benefits in Lindi and Mtwara regions from 2024 through to 2059.**

3 **Develop updated FYDP and Domenergy Plan**

This Report outlines that non-O&G sectors receive between 43% - 48% of the national GDP benefit arising from the Project. Therefore, it is crucial that all sectors within Tanzania are evaluated to see how they can benefit and how the Tanzanian economy can be made future proof. Stanbic Bank has closely reviewed the FYDP. Potentially, upon support for this Report and signature of the HGA, we recommend a discussion with the Ministries of Finance and Planning on how to progress the interaction of the Project and the wider Tanzanian economy, potentially through an update to the FYDP (taking due account of TLNG).

4 **Evaluate the creation of a Tanzanian SWF & DSF**

Stanbic Bank has reviewed the OGRMA. Although it is early days, on or around FID, we would recommend that Tanzania start to explore whether it should create a SWF (often focused on external investments) or, and more likely in our view, a DSF which would focus on domestic investments. The OGRMA sets up a general Oil & Gas Fund with an emphasis on building funds up into a Revenue Savings Account. As drafted the objectives of the fund are fairly general, e.g. "social and economic development is enhanced", although at this stage there are some useful provisions (e.g. it will not provide credit to the GOT). Given Tanzania's growing and young population, the need to ensure youth employment, large and disparate logistics and need to increase national educational, healthcare, water/sanitation and social provision, we would envisage a DSF is more suitable in the medium term (for example, including an EATF concept – covering each of the agricultural, non-urban energy sectors, and increasing energy access, as well a focus on the regions that do not directly benefit from the LNG project).

5 **Determine the balance between Domenergy and Domgas**

In contrast to many LNG Projects, the Project is also focused on the provision of Domenergy (i.e. surplus electricity) to customers in Tanzania as well as the provision of Domgas. With the potential of buying power from JNHPP (balancing security of supply considerations), we also see the Project's RE and CCGT as being able to assist the provision of power in Tanzania (facilitating the completion of a HV coastal TX line, which in turn could lead to Mtwara becoming a EAPP / SAPP GTP hub)

Given the massive US$ revenues the Project provides Tanzania, we would argue it should also be used as a catalyst to encourage additional O&G exploration in Tanzania and / or an evaluation of MFT developments that can be commercialised (e.g. Block 3), or late cycle developments that can be extended (i.e. Songo Songo, Mnazi Bay). For example, it is clear that offshore deep-water gas is more expensive to develop than onshore gas. Thus, in order to more optimally fill existing onshore gas infrastructure (e.g. the NNGI) it may make more sense to try and optimise existing onshore gas discoveries with new MFTs. Naturally, both of the above options will enhance the wider economic development of the Lindi (where Songo Songo is located) and Mtwara regions (where Mnazi Bay is located).

6 **Execution Speed**

Globally, there are a number of examples of LNG Projects with fast-execution speed (e.g. Cheniere (USA), Venture Global (USA); Coral FLNG (Mozambique)). Assuming the HGA is executed in 2022, we would encourage GOT to focus on eliminating areas of delay such that FID can be taken in 2025 (from 2 - 2.5 years after HGA signing).

7	**Appropriate Fiscal and Revenue Management** In the period after FID per Section 3, Tanzania should consider boosting its internal national capacity to ensure future GOT revenues received are spent on beneficial projects that will underpin the national Energy Transition and enhanced Socio-Economic development (e.g. DSF, EATF, executing the "Connecting Tanzania" objective). The OGRMA has made a start in this regard.
8	**LC & Regional Co-operation promotes security** We have no doubt that TLNG will be the catalyst for deepening and broadening LC in Tanzania. Section 3 shows that 17% of US$ 32.7bn is a very large initial number (US$ 5.5bn – larger than TPDC's entire funding contribution of US$ 3.9bn, assuming twelve (12) % stake per Woodmac)) which will be supplemented by the mid-life Upstream expenditure (2038 – 2043) as well as ongoing LNG Plant O&M expenditure (2030-2059). Noting the minimum **US$ 87bn** quantum of the three LNG projects (TLNG, MLNG and RLNG) in **US$ 3.3bn** of regional/provincial GDPs, we argue that Tanzania and Mozambique could align a cross-border development concept (e.g. including a SEZ and / or EPZ) for the Lindi – Mtwara – Cabo Delgado regions, encompassing LNG-relevant activities, such as light manufacturing, fabrication, logistics, services, agriculture, agro-processing, employment/training/skills schemes and tourism (which is highly labour intensive). Although Stanbic Bank is not a security expert, we find persuasive the narrative that a significant increase in employment and prosperity across the three regions (including a focus on youth employment, skills and training) will minimise the risk of occurrence in Tanzania of the security issues experienced in Cabo Delgado, and lead to the highest probability of peaceful growth in Lindi and Mtwara regions (and complementing Cabo Delgado).

Conclusion & Recommendations

CONCLUSION

Per Vision 2025, the three (3) principal objectives are: "achieving quality and good life for all; good governance and the rule of law; and building a strong and resilient economy that can effectively withstand global competition". Through the process of this Report and specifically the macroeconomic results outlined in Section 3, Stanbic Bank hopes this Report can show the massive economic benefits of a well-executed TLNG for Tanzania, which fulfils the objectives of Vision 2025.

We believe the scale of the benefits indicates that a commercial approach should be taken by the GOT wherever possible regarding the HGA, with a view to securing the objectives outlined by Vision 2025 and targeted by the FYDP.

RECOMMENDATIONS

TABLE 5.2: PROJECT RECOMMENDATIONS SUMMARY

OPTION	DESCRIPTIONS
1	**Report Revalidation** Once the HGA is negotiated and agreed with the Operators (2022), to **revalidate the Report** findings through an amendment to this Report (the "**Amended Report**") that models the agreed HGA assumptions, followed by a **transparent and national** public/stakeholder engagement process. Subsequently, it may be that this Amended Report leads to an updated FYDP taking full account of the **agreed HGA assumptions**. We note the FYDP objective to achieve 8% national economic growth and a "**Competitive and Industrial Economy for Human Development**", which we believe can only be promoted by the execution of TLNG (which is then complemented by a multi-sector development strategy). We again note that 43-48% of the benefits to Tanzania's GDP arise from the non-O&G sectors and show the need for a multi-sector approach to TLNG.
2	**Regional Economic Model** GOT to commission a **Regional Economic Model** of the future impacts on Lindi and Mtwara regions to determine and guide TLNG's multi-faceted impact and influence the policy-makers in terms of subsequent actions (e.g. EATF, DSF). We argue there is sufficient time in the run up to the Project FID (2025) to facilitate this, also noting our various recommendations per this Report.
3	**Cross-Border co-operation** Noting the ongoing Mozambican security dynamic (including the involvement of GOT forces in SANIM in Mozambique) and steps taken to resolve it by all forces, GOT and GOM to consider discussing (arising from the various LNG/Upstream investments of Blocks 1, 2, 4 (Tanzania) and Areas 1 & 4 (Mozambique)), an optimal multi-stage **intra-region** and **regional strategy** to cover their Joint Economic Interest arising from the development of **43.3 MTPA US$ 87bn** of onshore LNG (within a maximum of 220kms of each other), entailing a **US$ 11.1bn** LC target in an underlying regional/provincial GDP of **US$ 3.3bn** (arising from Lindi, Mtwara, Cabo Delgado). As well as various infrastructure developments mentioned above, this could potentially comprise: LNG relevant LC; energy; transport and logistics; industrial parks; follow-on Domgas projects; fabrication; manufacturing; services; employment training and skills schemes; agriculture; agro-processing and tourism/visa co-operation (e.g. more flights, two-country visas, two-country holidays), noting their concurrent onshore LNG developments (assumed to be built 2023-2030 per this Report, and which will operate until the 2050s (and be supplemented by additional trains (in the case of Mozambique))).

4	**Revised NGUMP** Finally, we would suggest the NGUMP (2016) should be updated from its current base date to take account of market developments and information disclosures (e.g. assumed GIIP and technically and economically recoverable reserves (both onshore and offshore), downstream industry project costs/economics and affordable gas pricing). We would encourage the revised NGUMP (drafted in 2023?) conducts a realistic analysis of the price that individual assets can: pay for Domgas from TPDC (in turn buying from the Project); still achieve their target IRRs; and can be funded by financiers in the 2026 – 2027 period. This should also include analysis of the impact of RE, the JNHPP and SSLNG.

Finally, we thank GOT and the Operators for their co-operation and look forward to a future public engagement and discussion.

Appendices

Cost Benefit Analysis

The financial flows consist of the following components:

- Capital expenditure (C0), it is assumed that the capital expenditure (capex) is fully expended in year 0;
- Revenue for each year, which is the product of incremental volume in year n (Vn) and relevant tariff (T0) plus inflationary increase in tariff (assuming a constant inflation of i); and
- Operating expenditure (O0) plus inflationary increase.

The free cash flow is mathematically described as follows:

$$CF = -C_0 + \sum_{n=1}^{N} T_0 \times (1+i)^n \times V_n - \sum_{n=1}^{N} O_0 \times (1+i)^n$$

Financial performance of projects is measure by net present value (NPV), internal rate of return (IRR) and payback period. The NPV is calculated by discounting the revenue and operating expenditure in each year by the weighted average cost of capital (WACC). A WACC of 10% was assumed.

$$NPV = -C_0 + \sum_{n=1}^{N} \frac{T_0 \times (1+i)^n \times V_n}{(1+WACC)^n} - \sum_{n=1}^{N} \frac{O_0 \times (1+i)^n}{(1+WACC)^n}$$

IRR is obtained by solving for i% such that the resulting NPV is zero:

$$0 = -C_0 + \sum_{n=1}^{N} \frac{T_0 \times (1+i)^n \times V_n}{(1+IRR)^n} - \sum_{n=1}^{N} \frac{O_0 \times (1+i)^n}{(1+IRR)^n}$$

The payback period is obtained by solving for k (number of years) such that the undiscounted cash flow is zero

$$0 = -C_0 + \sum_{n=1}^{k} T_0 \times (1+i)^n \times V_n - \sum_{n=1}^{k} O_0 \times (1+i)^n$$

Financial viability is indicated by an NPV greater than zero and IRR greater that the WACC.

Social Accounting Matrix

THE STRUCTURE OF A SAM

When economic agents in an economy are involved in transactions, financial resources change hands. The SAM provides a complete database of all transactions that take place between these agents in a given period, thereby presenting a "snapshot" of the structure of the economy for that time period.

As a system for organizing information, a SAM presents a powerful tool in terms of which the economy can be described in a complete and consistent way:

- Complete in the sense that it provides a comprehensive accounting of all economic transactions for the entity being represented (i.e. country, region/province, city, etc.), and
- Consistent in that all incomes and expenditures are matched.

Consequently, a SAM can provide a unifying structure within which the statistical authorities can compile and present the national accounts.

The concepts of circular flow and double-entry bookkeeping

The most basic principles underlying a SAM are the concepts of circular flows and double-entry bookkeeping.

Circular flow

The concept of circular flows relates to a particular angle from which an economic system is viewed and traced. The various productive sectors (i.e. the "activities") in the economy act as producers and sellers of goods and services (i.e. the "commodities") to institutions such as households, business enterprises, and the government (the "purchasers" of the commodities). For their part, households, enterprises, and the government act as sellers of factor services to the various activities, who then becoming the purchasers of these factors (i.e. labour, capital, etc.).

Going one way around, the circular flow involves tracing out the flows of goods and services (i.e. the commodity markets). Going the other way around, the circular flow traces out the flows of funds (i.e. the factor markets). Transactions with the rest of the world can take place through both the commodity and factor markets. The figure on the following page presents a schematic representation of these flows.

According to this figure, a continuous flow of factor services exists from the factor markets to the activities in the economy, which in turn provides commodities (i.e. products/goods and services) to the commodity markets, from where these reach all of the institutions in the economy (i.e. households, enterprises and government). For their part, institutions provide factor services in factor markets, where activities act as purchasers.

The commodity market provides goods and services to two types of users. The first type of user includes the institutions, such as households, that use goods and services for purposes of final consumption (i.e. final goods). The second type of user is other producers in the economy that use goods and services in their own production process (i.e. intermediate goods). In addition, both the factor and commodity markets can interface with the rest of the world.

FIGURE 6.1: CIRCULAR FLOW OF ALL TRANSACTIONS IN AN ECONOMY

Source : McDonald, Punt et al.

Double-entry bookkeeping

The SAM captures the monetary value of economic transactions, and organises them into a series of "accounts". There are six major types of accounts that form the basis of a SAM:

- Commodity Accounts that capture the value of products/goods and services traded in an economy
- Activity Accounts that capture the value of products/goods and services produced in an economy
- Factor Accounts that capture the value of payments made to the essential factors of production (i.e. labour, capital, land, etc.)
- Institutional Accounts that capture the value of transactions by Business Enterprises, Households and Government, and
- The Rest of the World Accounts that capture the value of imports and exports

Structurally, a SAM is a square matrix, within which each account has both a row and a column. The column entries record the expenditures/payments/out-goings for each account, whilst the incomes/receipts/in-comings for each account are recorded as row entries. As such, a SAM is a form of double entry bookkeeping where each entry is a transaction (that has both price and quantity dimensions), that identifies both its source and destination. Therefore, the total expenditures by each account must be exactly equal to the total receipts for the account. As such, the respective row and column totals must equate.

Consequently, a SAM provides a complete and consistent set of information about an economic system in an efficient and, ultimately, simple way. Moreover, it will provide that information in a manner that is consistent with the aggregate/macro accounts for the SNA. Furthermore, in the context of an entire economy, a SAM will contain not only the information provided by the SNA, but also further details on the transactions between various groups of agents within the system.

Economic multipliers

Once a SAM has been developed, it becomes a powerful tool that can be used to conduct various macroeconomic analyses such as calculating sectoral multipliers. The multiplier concept is defined as the nature and extent of the impact/effect of an autonomous change in a specific economic quantity on another economic quantity or quantities. Samuelson (1970) defines the multiplier concept as follows:

"The multiplier is the number of which the change in investment must be multiplied in order to present us with the resulting change in income".

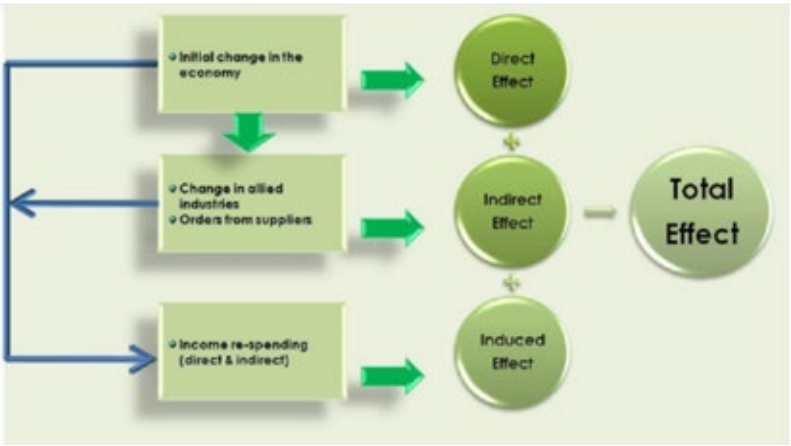
In order to make the multiplier concept more general, investment and income can be substituted respectively by other independent and dependent variables such as production output, interest rate changes, government and/or household expenditure, etc.

Direct, Indirect and Induced impacts

Sophisticated macroeconomic modelling, utilising a SAM as the database, highlights the direct impact that a specific project will have within its own industry environment, as well as the indirect impacts that The Project will have on upstream industries that supply The Project with key raw materials and other inputs; plus the induced impacts that The Project will have throughout the broader economy that result from the increased expenditure by households and other institutions that benefit from the income they derive from direct and indirect involvement in The Project.

These linkages are represented schematically in the figure on the following page.

FIGURE 6.2: SCHEMATIC REPRESENTATION OF DIRECT, INDIRECT, AND INDUCED IMPACTS



- **Direct multipliers:**The direct multiplier measures the direct impact emanating from a particular sector on itself. For instance, the direct multiplier will measure how an increase in the production of a particular sector will affect employment within the same sector. These direct impacts are most closelFigurey related to the sector and, as such, are probably the most important impacts from a strategic planning point of view.
- **Indirect multipliers:** Indirect multipliers reflect the impacts that a particular sector will have on all other industries that supply inputs (materials) for the operations taking place in the sector. These 'backward linkages' are important as they measure the broader impact that changes in the direct sector will have on the economy. Frequently, these indirect impacts are very significant, and may even exceed the direct impacts themselves.
- **Induced multipliers:** Economic impacts will result from the paying out of salaries and wages to people who are employed in a particular sector, as well as the salaries and wages paid by businesses operating in the sectors indirectly linked to this sector due to the supply of inputs. These additional salaries and wages lead to an increased demand for various consumable goods that need to be supplied by various economic sectors throughout the broader economy. Clearly, these induced impacts can be considerable and are measured by using induced multipliers.

Economic indicators

Macroeconomic modelling calculates the impact that a specific event such as an investment The Project would have on a variety of economic indicators. This section describes the most frequently measured indicators.

- **Gross domestic product**
  GDP reflects the magnitude of the value added in the economy. Value added consists of three elements, namely:
  - Remuneration of employees
  - Gross operating surplus (which includes, amongst others, profits and depreciation)
  - Net indirect taxes

  It is therefore possible to also assess the increase in new business sales by interpreting net indirect taxes. The same will apply to the increase in salaries and wages.
- **Capital formation**
  For an economy to operate at a specific level, an amount of capital stock is needed to support such level of activity. Capital, together with labour and entrepreneurship form the basic factors needed for production in the economy. The effectiveness and efficiency with which these factors are combined influences, the overall level of productivity/profitability of the production process.
- **Employment creation**
  Labour is a key component of the production process. Macroeconomic impact analysis determines the number of new employment opportunities that will be created by the construction and operation of a particular project. These opportunities are broken down into those created directly in the sector being analysed and those indirectly created and induced throughout the broader economy. The employment opportunities created during the construction phase will be mostly temporary, while those created during the operational phase will be mostly permanent.

- **Fiscal impact**
  The government is directly or indirectly affected by changes in economic activities occurring within the various sectors of the economy. Therefore, it is important to calculate the impact that the construction and operation of a particular project will have on government accounts (the fiscal impact). Usually, government receives income in the form of property income, direct tax (mainly personal tax and company tax) indirect tax (VAT – which results from additional household spending) and customs and excise tax and transfers. On the expenditure side there will be a cost to government in providing services. The net effect between income and expenditure is determined as part of the macroeconomic impact assessment.

- **Balance of payments**
  The construction and operation of the infrastructure will have direct, indirect and induced impacts on the export and import of goods and services across all of the various economic sectors that are interconnected with a project. Imports consist of direct and indirect material imports, as well as goods consumed by households that are imported as a result of the induced impact resulting from increased household income.

- **Household income**
  One of the elements of additional value-added (i.e. GDP) is remuneration of employees, which affects household income. Macroeconomic impact assessment measures the magnitude of the changes that will occur to both household income and spending/saving patterns as a result of the construction of The Project. The specific impact on Low Income Households can be isolated, measured, and reported on.

- **Effectiveness criteria**
  Besides the macro-economic impacts reflected above, the macro-economic impact of the projects is also evaluated in terms of "effectiveness" (efficiency) criteria. These criteria measure the extent to which The Project utilises resources effectively. Since capital is a scarce resource in South Africa, the effectiveness of the utilisation of capital in terms of labour/employment and GDP creation is measured in relation to the total South African economy.

  When evaluating the construction and operation of a project and the related activities, these efficiency criteria are the most reliable indicators as to whether or not the expansion will represent an effective use of capital. In order to make these comparisons, two key multipliers/ratios are calculated, i.e.
    - The GDP/Capital ratio, and
    - The Labour/Capital ratio

  Using these ratios, the contribution towards economic growth and job creation relative to the capital employed in The Project can be established. If the decision-maker considers continuous, long-term economic growth to be more important than job creation in the short-term, then the GDP/Capital ratio is the more important of the two measures of macroeconomic effectiveness. On the other hand, if job creation, particularly in the short term, has priority, the Labour/Capital ratio is more important.

APPLICATION OF THE SAM

The development of the SAM is very significant as it provides a framework within the context of the International System of National Accounts (SNA) in which the activities of all economic agents are accentuated and prominently distinguished. By combining these agents into meaningful groups, the SAM makes it possible to clearly distinguish between groups, to research the effects of interaction between groups, and to measure the economic welfare of each group. There are two key reasons for compiling a SAM:

- Firstly, a SAM provides a framework for organizing information about the economic and social structure of a particular geographical entity (i.e. a country, region or province) for a particular time period (usually one calendar year); and
- Secondly, to provide a database that can be used by any one of a number of different macro-economic modelling tools for evaluating the impact of different economic decisions and/or economic development programmes

The SAM's main contribution in the field of economic policy planning and impact analysis is divided into two categories:

As a primary source of economic information

As a detailed and integrated national and regional accounting framework consistent with officially published socio-economic data, a SAM instantly projects a picture of the nature of a country or region's economy. As such, it lends itself to both descriptive and structural analysis

As a planning tool

Due to its mathematical/statistical underpinnings it can be transformed into a macro-econometric model that can be used to:

- Conduct economic forecasting exercises/scenario building
- Conduct economic impact analysis both for policy adjustments at a national and provincial level and for large project evaluation
- Conduct self-sufficiency analysis i.e. gap analysis to determine, with the help of the inter industry and commodity flows contained in the provincial SAM, where possible investment opportunities exist, and
- Calculate the inflationary impacts on provincial level of price changes instigated at national level (i.e. administered prices, VAT, etc.)

To summarize, the SAM mechanism provides a universally acceptable framework within which the economic impact of development projects and policy adjustments can be reviewed and assessed at both national and provincial/regional levels. It serves as an extension to the official National Accounts of a country's economy and, therefore, provides a wealth of additional information, especially when disaggregated to more detailed levels.

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