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Leveraging a Large Capital Investment to Develop Local Value Chains

'Local Content' in the Construction of Tanzania's LNG Facility



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Abbreviations and Acronyms

APZ	Agricultural Processing Zone	MNRT	Ministry of Natural Resources and Tourism
BoT	Bank of Tanzania	NACTE	National Council for Technical Education
CIIP	Competitive Industries and Innovation Program	NBS	National Bureau of Statistics
CGS	Credit Guarantee Scheme	NDT	Non-Destructive Testing
CRB	Contractors Registration Board	NEEC	National Economic Empowerment Council
CSO	Civil Society Organization	NGO	Non-Governmental Organization
DfID	UK Department for International Development	NORAD	Norwegian Agency for Development Cooperation
DPS	Development Partners	NPLs	Non-Performing Loans
EDC	Enterprise Development Center	NQI	National Quality Infrastructure
EPC	Engineering, procurement and construction contractor	PFI	Participating Financial Institution
EPZA	Export Processing Zones Authority	PMO	Prime Minister's Office
EU	European Union	PMU	Project Management Unit
FEED	Front End Engineering Design	POPC	President's Office Planning Commission
FIs	Financial Institutions	PPD	Public-Private Dialogue
FID	Final Investment Decision	PPP	Public-Private Partnership
FDI	Foreign Direct Investment	PTFC	Practical Training Facilitation Center
FYDP	Five Year Development Plan	SEZ	Special Economic Zone
GIZ	Gesellschaft für Internationale Zusammenarbeit	SIDO	Small Industries Development Organization
GoT	Government of Tanzania	SMEs	Small and Medium Enterprises
HGA	Host Government Agreement	SWD	Supplier and Workforce Development
HSSE	Health, Safety, Security and Environment	TBS	Tanzania Bureau of Standards
JV	Joint Venture	TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
IMF	International Monetary Fund	TFDA	Tanzania Food and Drugs Authority
IOCs	International Oil and Gas Companies	TIC	Tanzania Investment Centre
IQM	Internal Quality Management	TNBC	Tanzania National Business Council
ISIC	International Standard Industrial Classification	TPA	Tanzania Ports Authority
ISO	International Organization for Standardization	TPDC	Tanzania Petroleum Development Corporation
LC-OSS	Local Content One-Stop Shop	TPSF	Tanzania Private Sector Foundation
LCP	Local Content Policy	UNIDO	United Nations Industrial Development Organization
LNG	Liquefied Natural Gas	VETA	Vocational Education and Training Authority
MEM	Ministry of Energy and Minerals	VSO	Voluntary Services Overseas
MEL	Monitoring, Evaluation and Learning	WBG	World Bank Group
MIT	Ministry of Industry and Trade		
MMBtu	Million British thermal units		

I. Acknowledgements

This report is part of a broader engagement by the World Bank in a debate concerning local content in Tanzania aimed at identifying the potential linkages between the development of off-shore gas fields and the strengthening of domestic value chains. The effort began with the organization of a series of public-private dialogues (PPD) that took place over 2014-2015 with high level participants from the Government, the private sector, and the donor community. The key messages and lessons learned from that initiative can be found in the publication *"Maximizing Domestic Value Added in the Oil and Gas Industry – Sharing lessons learned through public private dialogues in Tanzania"* (WBG 2016).

During this period the World Bank undertook a parallel assignment designed to contribute to the stakeholder dialogue: to first assess the business and employment opportunities associated with the planned Tanzania LNG project and then to estimate the potential degree of local participation. A summary of the findings from that broad diagnostic exercise are provided in this short report, which also includes a snapshot of the case studies of "priority" industries.¹ The preliminary findings of the report have been discussed with stakeholders from the private and the public sector, including Government agencies, international oil and gas companies operating in Tanzania, local private sector representatives, and development partners. A series of workshops was organized in July 2014 to present the results of the first phase of the analysis, followed by a second round in May 2015, and a final round in the summer and fall of 2016 to discuss the final results.

This report was prepared by a World Bank team composed of Andrea Dall'Olio (Lead Economist, Finance and Markets Global Practice) and Barbara Calvi (Consultant, Finance and Markets Global Practice) with contributions by Gilles Cols (Consultant, Trade and Competitiveness Global Practice); Silvana Tordo (Lead Energy Economist, Energy and Extractives Global Practice); and Stefano Negri (Lead Private Sector Development Specialist, Trade and Competitiveness Global Practice). The report is based on background analytical work by DAI (Development Alternatives Inc.), produced by a team led by Mark Beare and composed of Zachary Kaplan, Emily Foster, Ulrich Ernst, John Chitsa, and Denisse Hamard. The DAI team worked in close collaboration with the World Bank team to elaborate the methodology of the analysis and prepare the initial forecasting model, based on desk research and stakeholders' interviews conducted during field work in Tanzania. The team would also like to acknowledge the overall guidance and collaboration provided since the inception of the work by Richard Boulter (former Team Leader for Sustainable Growth, UK Department for International Development Tanzania); the significant contributions on the forecasting model assumptions, as well as on the structure and content of the case studies provided by David Simmonds (Consultant, VSO International); the comments and suggestions on the summary presentation and preparatory interventions provided by Kate Sullam (Local Content Manager, BG Tanzania & Tanzania LNG Plant Project); the technical inputs on standards and certification programs provided by Martin Kellermann (Independent Consultant); and finally the support provided by the Tanzania Private Sector Foundation (TPSF) that was a key partner in the organization of roundtable dinners and seminars with the local private sector.

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II. Executive Summary

The discovery of large, deep-sea, natural gas reserves in Southern Tanzania and plans for their development have sparked a national discussion about how “local content” can be maximized in a way that benefits the economy as a whole. Energy production is not foreign to the country. Gas has been flowing from the on-shore and shallow water reserves of Songo Songo and Mnazi Bay since the mid-2000s, but the scale of those fields is limited.² In contrast, the off-shore reserves discovered in 2012 by a consortium of international oil companies (IOCs)³ are major finds that raised projections of total reserves to over 57 tcf⁴ and carry with them the potential to transform the country into an emerging, global, energy hot-spot. So it is in keeping with that good news that government and business leaders now want to know how those assets can be fully leveraged to strengthen and diversify Tanzania’s domestic economy and generate local employment.

Large-scale exploitation of Tanzania’s off-shore gas fields is justified only if much of the production can be exported. The proven 1.4 tcf of gas from on-shore reserves is considered more than sufficient to satisfy the country’s energy needs for the next two decades, even after future increases in consumption are taken into account. So developing the new fields only makes commercial sense if the product can be converted to liquid in a Liquefied Natural Gas (LNG) production facility and shipped to international markets. High value LNG exports will also offset the higher extraction, processing, and transport costs associated with the development of deep-water reserves.

It is estimated that an investment in the range of USD 30-40 billion will eventually be needed to develop Tanzania’s LNG production and export capability. Although the IOCs intend to develop their off-shore gas blocks independently a joint venture has been formed between them (the “LNG JV”) to build an on-shore production facility somewhere in the vicinity of Lindi. The investment required to develop that plant alone is estimated between USD 15-20 billion applied over a 5-7 year project timeframe. Adding that to the USD 15-20 billion expected to be dedicated to upstream developments and the total investment in Tanzania’s LNG export capability begins to approach USD 30-40 billion.

However, funding will not be secured until a final investment decision (FID) is made, and negotiation delays and the general downturn in gas markets worldwide have pushed that decision out to 2018/2019.⁵ This means gas production is not expected to commence before 2025. The FID is influenced by many factors affecting the commercial viability of the project, including projected gas prices and local market conditions. Local content requirements are very much part of the overall equation since they can have a significant impact on the project’s timing and cost.

This interval puts Tanzania in a unique position from a development standpoint because it gives the country more time to prepare local firms and workers for greater integration in the gas value chain, which works to reduce the risk that the country faces of falling into the common “resource curse” trap.⁶ Gas investments can benefit the Tanzanian economy and population in three ways: through gas-related fiscal revenue (that translates into public expenditure); from direct use of the gas; and from foreign direct investment (FDI) that increases value added⁷ and boosts employment. Since the first two benefits do not materialize until gas begins to flow, the immediate focus of policy makers should be on the attraction of FDI, and here firms and workers can take active steps to position themselves for a greater role in supply chains directly connected to the development of the LNG facility.

This study is a summary of analytical work performed by the World Bank Group (WBG) directed at helping the Tanzanians increase their participation in the construction of the LNG facility. The analysis had a threefold structure, which was to: 1) identify the main activities that make up the construction of the facility; 2) assess the types and potential levels of local participation attainable under base case and success case scenarios; and 3) propose interventions that could lead to increased local involvement. One overarching intent of the exercise is to give stakeholders improved information upon which future discussions about “expected” levels of local content can be grounded and interventions can be designed.

Overall, the analysis revealed that a significant, domestic shortage of oil- and gas-related industrial competencies is likely to limit local participation in the gas supply chain, but the construction of the LNG facility should spearhead opportunities for certain industries. Right now, Tanzania's private sector is unprepared to offer many of the services and skills that are demanded in a highly complex and unique project environment like off-shore gas development. The number of domestic companies and workers that could be expected to participate in “core” oil and gas activities will therefore be limited. However, the project should create a sizeable number of service jobs and generate opportunities that will upgrade the quality and size of deliveries in the construction sector. It may also advance the development of certain gas-related industries whose goods and services will be needed over the 25- to 30-year lifespan of the fields.

The lack of an industrial base in the Lindi and Mtwara regions constrains the involvement of local communities and creates project risk. Lindi's economy is largely based on agriculture, and neighboring Mtwara, although benefiting from the presence of a port, also has a small industrial footprint. There is a limited base of worker skills and both regions suffer from high levels of poverty and unemployment. Indeed, many people migrate from these regions to Dar es Salaam in search of work.⁸ So ensuring the participation of these communities in the LNG project will be important not only from the standpoint of promoting economic growth but also as a way to help maintain social stability.

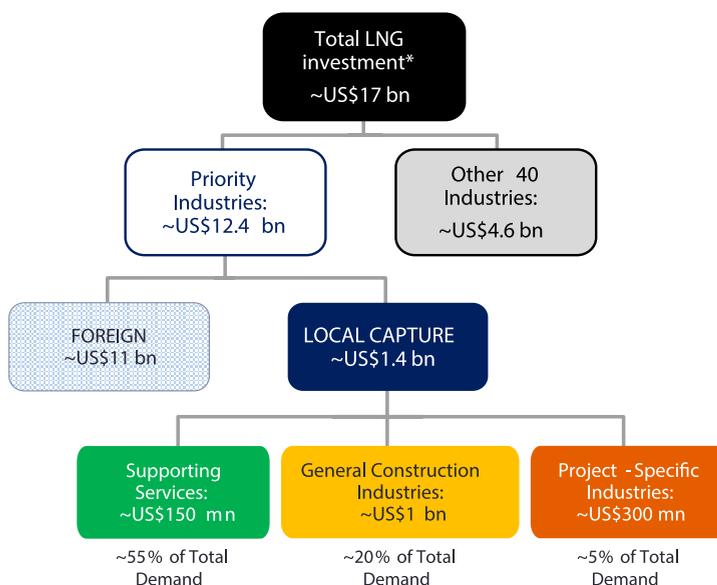
The study examined the impact of the estimated USD 15-20 billion investment into the LNG facility as a source of demand for jobs, goods, and services within a set of “priority industries.” This focus on the “midstream” segment of the gas industry came about largely due to considerations relating to the timing and overall impact of the investments. Demand for goods and services directly connected to the project will be high and concentrated over a relatively short timeframe (5-6 years),⁹ but the industrial capacity and skills developed over that period will add value well after the project finishes. A fairly diverse set of industries will be mobilized during the construction process, some of which are already operating in Tanzania. For purposes of the analysis, they were grouped into three clusters: labor intensive supporting services (including catering and cleaning services, temporary employment agencies, security, landscaping, and passenger transport); general construction activities relating to site preparation and civil infrastructure installation (such as civil works, general electrical and non-specialized instrumentation connections); and certain project-specific industries (mostly related to LNG tank and train production and installation, metal/steel fabrication, and the construction of sea jetties).

The analysis measured “local capture” as a proxy of local value created along the gas value chain and assessed the magnitude of that capture in the priority industries. The level of local capture, expressed as a percentage of total demand, was derived by looking at its three main components: (i) the level of local employment, translated into labor payroll; (ii) the local sourcing of goods; and (iii) the share of profits that comes from local sub-contracting.¹⁰ To determine the size of demand, a top-down assessment of all industries involved in the construction of the LNG facility was performed and a subset of industries displaying the highest potential for local participation were selected for the study. Each industry was then broken down into a set of sub-activities and an effort was made to identify the local content opportunities within each activity. Information was then collected to gauge the level of preparedness of local enterprises to seize those opportunities. Using that information the team was able to identify constraints that might limit local content uptake and propose specific interventions designed to address those gaps.

In the analysis, “base case” estimates of local capture assume minimal intervention before the FID and “success case” projections presuppose early implementation of an integrated set of supplier and workforce development initiatives. In the base case, existing skills development programs¹¹ are augmented by initiatives sponsored by the LNG JV or the engineering, procurement and construction contractor (EPC), steps that are usually launched only after the FID has been reached and that only focus on suppliers and workers that are considered “pre-qualified”. In contrast, the success case scenario assumes an “early start” and a coordinated approach to preparatory interventions, such as the up-skilling of the local labor force to meet international certification standards, the upgrading of product qualities, or the implementation of financing mechanisms to encourage long term investments. These “Supplier and Workforce Development (SWD)” interventions are a central recommendation of the report.

The base case scenario suggests potential for “local capture” in the priority industries of around 11% of the total estimated demand. Figure 1 shows that out of a total LNG investment projected to be around USD 17 billion,¹² roughly USD 12.4 billion will be spent in the priority industries over the seven-year project timeframe, and within that number the “local capture” is expected to be in the range of USD 1.4 billion, split between supporting services (10%), construction (70%), and project-specific industries (20%).

Figure 1: Estimated Local Capture in the Priority Industries (Base Case)



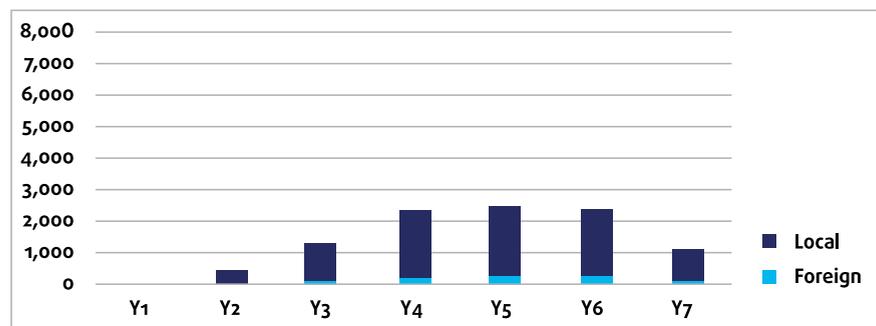
Note: Figures are based on the model: the actual investment will depend on the final design and construction approach.

Source: Team analysis

Demand for labor-intensive “supporting services” is expected to absorb a large share of the locally sourced workforce, and many responsibilities there can be delegated to qualified local providers (see Figure 2). Catering (see page 32) and business support services (see page 34) include occupations such as kitchen helpers, waiters, cleaners, security guards, warehouse assistants, gardeners, drivers, and office assistants. Almost 60% of these workers will be employed at the basic-skilled level – accounting for about half of the total basic-skilled positions generated across all of the priority industries. Local participation could be high in this activity, however, even among semi-skilled workers (see Figure 3). The EPC is likely to rely heavily on a local workforce for these services, or sub-contract out many full-service activities to Tanzanian companies, provided that workers and firms are able to demonstrate compliance with international standards and show the capacity to deliver services to scale. Demand for “supporting services” is also expected to remain relatively stable over the project period, giving local firms willing to invest in upgrades enough time necessary to recover their costs. So despite

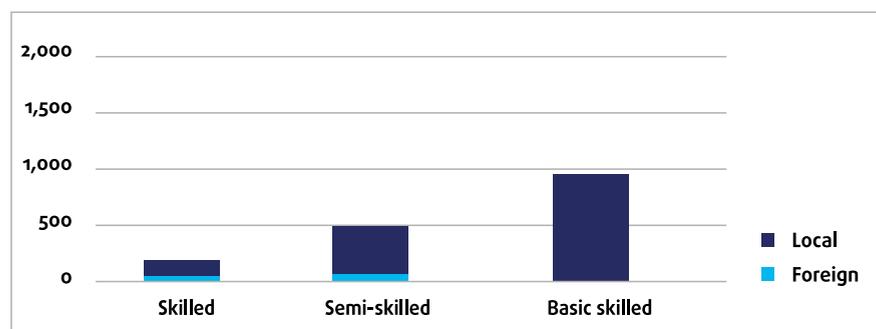
being comparatively small in value, generating less than USD 300 million of total demand (or less than 2% of total LNG spending), the ‘supporting services’ industry cluster could achieve local capture levels of at least 50% in the base case scenario, and up to 80% in the success case.

Figure 2: Supporting services: average full-time employment over the project period



Source: Team analysis

Figure 3: Supporting services: average full-time employment by skill level¹³



Source: Team analysis

The “supporting services” industry offers significant potential for employment and commercial opportunity in the Lindi and Mtwara regions.

While skilled and semi-skilled workers will likely be recruited throughout Tanzania, basic-skilled workers will likely be sourced from the surrounding Mtwara and Lindi communities, potentially through a network of local, temporary-employment agencies. To maximize opportunities in these areas attention will have to be paid to training the local workforce in communication skills and health, safety, security and environment (HSSE) skills.

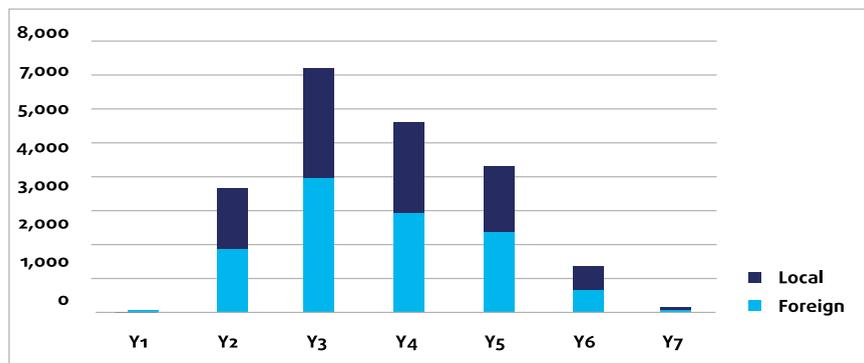
Catering services could generate long-term benefits at the local level by developing agro-processing value chains in the Southern region.

If agribusiness value chains can be strengthened in the region, and food safety standards raised, a range of catering inputs to the project could be locally sourced. Such a development could have a long term impact on the local economy as an improved agricultural sector would be positioned to satisfy demand from within the country and surrounding regions once the LNG facility construction period is over. However, private sector investments (such

as the establishment of a large scale poultry farm in the surroundings of Lindi) would be needed well in advance of the FID date to prepare the food industry for production at the scales that are going to be required.

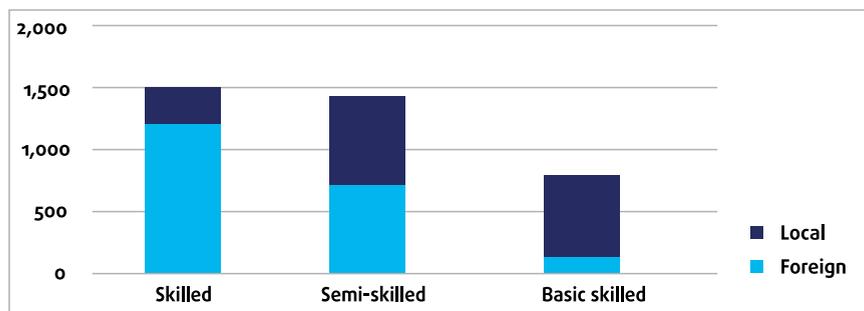
Demand for general construction should mobilize a significant number of local workers and result in the procurement of large quantities of basic goods and increased sub-contracting opportunities for top-tier Tanzanian companies. Since construction activities will be concentrated in the early phases of the project (see Figure 4), local suppliers of labor and goods will have to be well prepared as early as the FID date if they want to participate. Construction (see pages 36-47) is labor intensive and the balance of jobs tends to be skewed towards skilled and semi-skilled workers (see Figure 5). Roughly 40% could be expected to be skilled positions (e.g., project managers, technical supervisors, quality and safety supervisors, engineering team leaders); another 40% semi-skilled (e.g., scaffolding workers and carpenters, industrial electricians and painters); with basic-skilled (e.g., trades assistants) making up the balance. Sourcing of local goods could also be significant for certain categories of bulk materials – such as sand and aggregate for concrete production, or fill material for site preparation. Finally, while local firms are not expected to directly secure the largest contracts,¹⁴ a number of sub-contracting opportunities should emerge in areas such as perimeter fencing, building foundation laying, superstructure assembly, and road construction.

Figure 4: General construction: average full-time employment over the project period



Source: Team analysis

Figure 5: General construction: average full-time employment by skill level

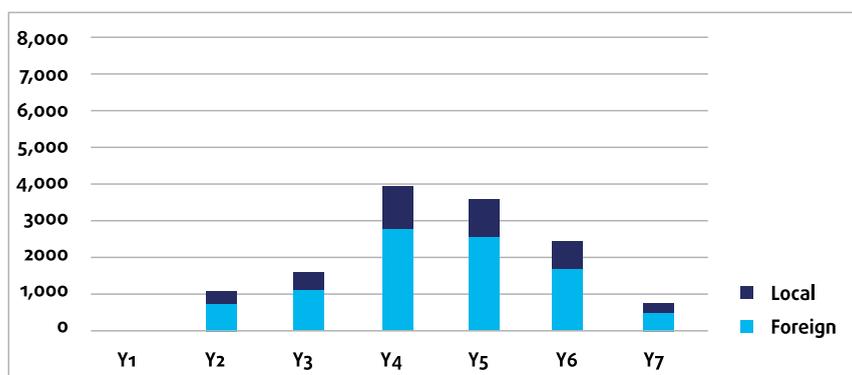


Source: Team analysis

The project offers a one-time opportunity to upscale local firm quality and capacity and improve local skill sets in the construction sector. The construction sector has been growing at a fast pace over the past three years and currently stands at about 11% of Tanzanian GDP. Aside from the size of the contracts that will be awarded there, the greatest opportunities for local firms and workers may lie in the exposure they will get to more efficient and technologically advanced practices. The transferable skills they will acquire in the project should help them be competitive with foreign contractors in the drive to urbanize and strengthen the country's infrastructure, and the impetus for firms to leverage Tanzania's abundant natural resources and improve the quality of primary construction inputs such as sand, aggregates, and cement, will prove to be useful in future projects as well.

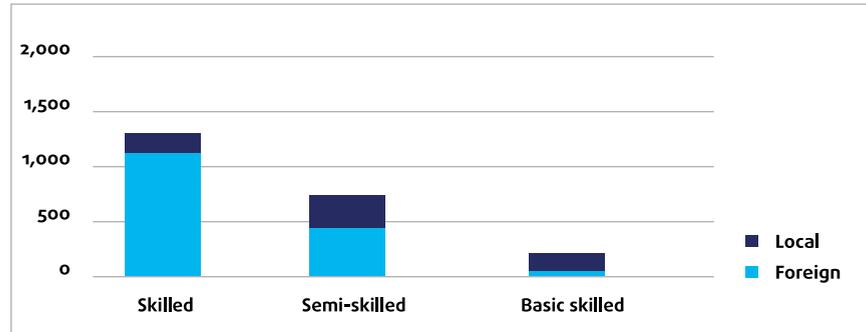
Opportunities in project-specific industries may lead to greater future participation in the oil and gas value chain, but the immediate engagement of local firms and workers will be constrained (see Figure 6). Project-specific industries include the construction and installation of LNG tanks and trains (see page 48), of the docks and jetties for LNG loading (see page 52), as well as the fabrication of specialized metal and steel (see page 50). While there is no real industrial base for these activities right now in Tanzania and the local availability of skills is very limited (see Figure 7) it could be worth developing some capabilities in these areas because they will represent almost USD 6 billion or 35% of the total LNG investment. These high, value-added industries will also be active over a longer period. For example, there will be continuous demand for spare parts and maintenance of LNG trains and tanks during the construction project, in upstream activities, and in plant operations.

Figure 6: Project-specific industries: average full-time employment over the project period



Source: Team analysis

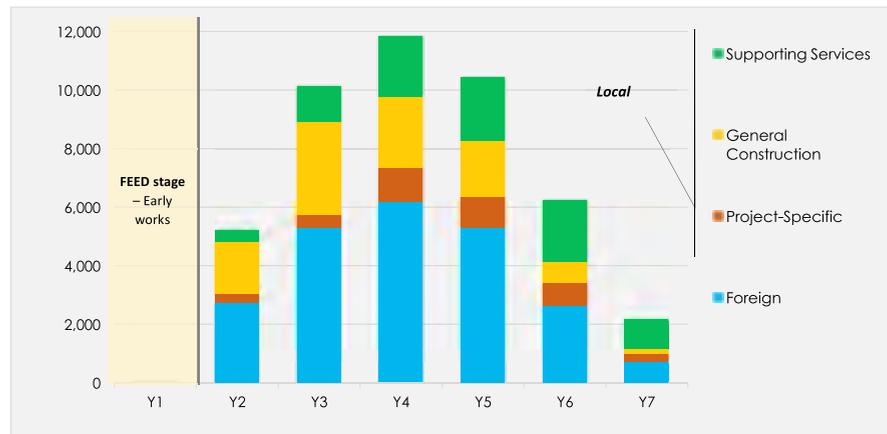
Figure 7: Project-specific industries: average full-time employment by skill level



Source: Team analysis

All in all, close to 4,000 Tanzanian workers – or one out of every two positions – could be employed full-time in the priority industries during the six year construction period, reaching a peak of 5,500 in year 4 (see Figure 8). An average of around ~7,600 full-time jobs could be generated during the life of the project, extending upwards to 12,000 in year 4, about half of which could be filled by locals working on behalf of the EPC, other prime contractors, or Tanzanian sub-contractors.

Figure 8: Estimated trend of Local jobs (by cluster) vs. Foreign jobs, in the Priority Industries

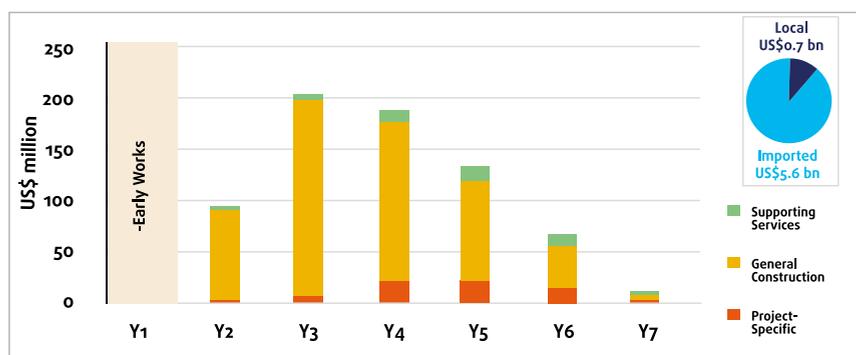


Source: Team analysis

However, local employment will only represent 13% of the total payroll. While local employment is expected to translate into ~USD 450 million in local labor payroll, it may be less than 15% of the total due to the balance of skills that will be needed between the local and the international workforce. The share of that going to local communities may also be limited given the prevalence of low-wage, basic-skilled jobs sourced from those areas.

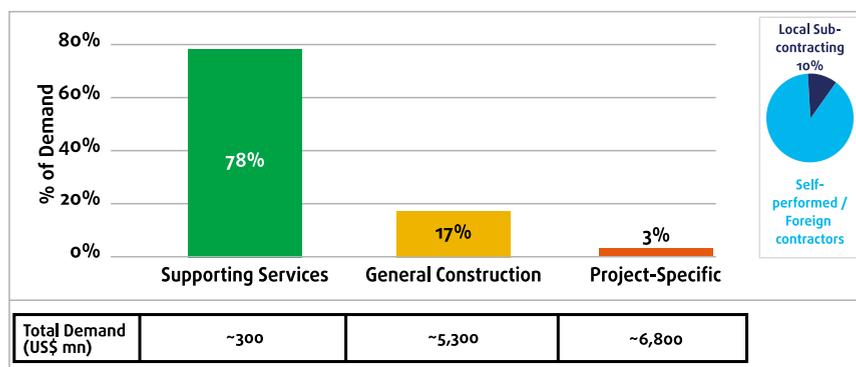
Local companies could capture close to USD 1 billion in goods and sub-contracting opportunities in the priority industries. Local companies are expected to supply goods and services for ~USD 700 million directly to the EPCs or prime contractors (see Figure 9). Goods most likely to be sourced will be sand, aggregates (such as granite for road construction), gravel, engineered-fill, bitumen, and cement; along with consumables (such as wiring, cabling, petrochemical products) and vegetable foodstuffs. Local companies are also expected to earn profits quantified in the range of ~USD 250 million from outsourcing opportunities mostly in the areas of Concrete Works and Building/Camp Construction (see Figure 10).

Figure 9: Estimated Demand for Local vs. Imported Goods in the Priority Industries and Demand for Local Goods by cluster



Source: Team analysis

Figure 10: Estimated Share of Local Sub-contracting in the Priority Industries



Source: Team analysis

Potential for higher local capture is constrained by shortages of workforce skills, the limited capacity of firms to deliver quality goods in the volumes required, and a business environment that hinders private sector competitiveness (see Table 1). The analysis not only confirmed a limited awareness among Tanzanian firms of the gas value chain and the demands of an LNG facility, but it also highlighted three main categories of constraints

that hold back local participation. First, the labor force at all skill levels will have to comply with the highest quality and safety standards expected by the oil and gas industry – a condition that will require workers to be certified for a number of semiskilled and skilled positions. Second, quality requirements will also be binding at the level of the firm. Suppliers will have to prove that they are capable of reaching industry standards under conditions of large-scale production. This translates into large working capital requirements and the need for appropriate investments in state-of-the-art equipment. Third, the business environment must be conducive to the establishment and growth of enterprises. Here it should be noted that local content has proven to be most successful when international companies are able to establish joint ventures (JVs) with local partners on the basis of tangible commercial benefits, rather than on imposed local content requirements. One aspect of the business environment deemed critical for the gas industry is the presence of a National Quality Infrastructure (NQI)¹⁵ system that facilitates the absorption of foreign technology and provides a low-cost testing environment.

Table 1: Key Constraints to Local Capture

Key Constraints to Local Capture		
Shortage of Workforce Skills	Limited Firm Capacity to Scale-up and Comply with Quality Standards	“Unfriendly” Business Environment
<ul style="list-style-type: none"> • “Missing middle” dilemma: shortage of local craftspeople certified to international industry standards (e.g. IVQ level 3) due to low domestic demand • Poor soft skills, including team work, communication, English, punctuality, and basic problem solving 	<ul style="list-style-type: none"> • Limited availability of certified goods, weak enforcement of HSE standards, and increased service costs when they are adopted • Limited availability of internationally recognized and affordable testing and certification services • Absence of bulk fabrication capacity in engineering services which provides economies of scale • Limited access to finance to (i) meet large working capital requirements to scale up capacity and/or (ii) finance investments in state-of-the-art equipment 	<ul style="list-style-type: none"> • High costs of doing business and complying with relevant legislation hinder firm competitiveness

Source: Team analysis

IOCs usually take actions designed to enhance local participation, including Corporate Social Responsibility (CSR) programs, only around the FID date. In this case, however, the LNG JV should be part of joint capacity-building initiatives to be launched by public and private stakeholders well in advance of the FID. In most oil and gas projects, full-scale interventions to upgrade local suppliers sponsored by the IOCs (or the EPC) begin only immediately before the FID, or shortly thereafter, which is usually about 6-12 months before the full-fledged commencement of the project. Furthermore, these interventions tend to focus only on workers and suppliers that have already shown a substantial level of readiness for the industry, the idea being that with minimal training they will be able to make the final upgrades towards full compliance with industry standards within the limited timeframe available.



However, in this scenario, these preferences will mean that many, if not most, Tanzanian firms (especially SMEs) and workers will end up missing out on opportunities considering the gaps that exist in their level of preparedness. This calls for an early start of coordinated interventions by the Government and the local private sector well ahead of the FID, and strong support of the LNG JV will be needed during that effort to help ensure that the programs put in place effectively serve to meet the standards of the project and the industry.

Early launch of integrated Supplier and Workforce Development (SWD) interventions, preferably as dedicated operations within existing institutions, would broaden the pool of potential beneficiaries and improve "local capture" from the project. To maximize opportunities for local stakeholders, a set of coordinated SWD interventions would be designed to comprehensively address identified constraints and give firms and workers enough time to improve their competitiveness vis-à-vis industry requirements. To minimize implementation costs and reduce the potential for overlapping mandates (implied by the creation of new agencies) these efforts would be led as much as possible by existing institutions, that would then have to set up a "window" of operation dedicated to capacity building activities strictly related to oil and gas.¹⁶ The interventions could be sequenced in four main steps (see Table 2):

- **Visibility.** The first step would be to provide up-front visibility of industry demands for skills, goods, and services, including an estimate of the timing in which the demand will materialize.
- **Assessment.** The second step would be to assess the gaps between demand requirements and individual suppliers' skills and capabilities. A matching process could then take place by evaluating at various stages the readiness of workers and firms to meet industry standards and then identifying candidates that are ready to be engaged in the industry as workers, suppliers, or (sub-)contractors.
- **Upgrade.** Support could then be provided to firms and workers to help them: (i) upgrade their skills; (ii) achieve certain quality and certification standards; and (iii) scale-up their operations to meet capacity requirements. In the course of implementing such programs attention should be paid to the need for greater access to financing, which was identified by Tanzanian enterprises as the top constraint to doing business.¹⁷ Finally, improvements in the overall business environment to facilitate the attraction of FDI, angel, and impact investing¹⁸ should be pursued, along with the creation of a strong NQI to reduce the cost of product certifications.
- **Matching.** Finally, initiatives would be made to facilitate the matching of international contractors with local suppliers, as well as labor demand with local supply.

Table 2: Proposed sequencing of Supplier and Workforce Development (SWD) interventions

Step	Intervention	Instrument
1. Visibility	<ul style="list-style-type: none"> Establishment of a Local Content One-Stop Shop (LC-OSS): One-stop information center for all details on LNG and other capital projects' demand and procurement Outreach to enterprises Monitoring and evaluation of local content 	<ul style="list-style-type: none"> PPP
2. Assessment	<ul style="list-style-type: none"> Launch of a screening program of local firms to create a Supplier Database Establishment of an Enterprise Development Center (EDC) to: Advise firms on oil and gas general procurement Assess firms' qualifications and suggest upgrading interventions 	<ul style="list-style-type: none"> Matching grants
3. Upgrade	Enterprise Development <ul style="list-style-type: none"> Certification programs (e.g. ISO 9001, ISO 14001) and advisory on procurement, management and quality through the EDC 	<ul style="list-style-type: none"> Matching grants
	Enterprise Financing <ul style="list-style-type: none"> Partnerships with financial institutions to facilitate access to credit by firms, and advisory on financing for scaling up 	<ul style="list-style-type: none"> Credit line(s) Credit Guarantee(s)
	Workforce Development <ul style="list-style-type: none"> Establishment of Practical Training Facilitation Centers (PTFC) for training of workers (self-employed and firms' employees) 	<ul style="list-style-type: none"> (Matching) grants
	Business Env. & Quality <ul style="list-style-type: none"> Capacity building for NQI institutions and investment in testing infrastructure (e.g., NDT) 	<ul style="list-style-type: none"> Technical Assistance
4. Match	<ul style="list-style-type: none"> LC-OSS: - Matching of supply and demand through the to Supplier and Talent Database; - Facilitation of JV arrangements PTFC: Matching of supply and demand for semi- and basic-skilled workers 	<ul style="list-style-type: none"> PPP

Source: Team analysis

Visibility on the project demand for local suppliers could be provided by centralizing all information relating to procurement and labor needs in a “Local Content One-Stop Shop” (LC-OSS).¹⁹ The LC-OSS would be designed to address generalized problems associated with the imperfect exchange of information between the oil and gas industry and local firms. Furthermore it would help with the coordination of demand and supply. The LC-OSS would have both a physical office and an online platform to serve as a repository of demand requirements for the industry. It could also be set up to perform monitoring, evaluation and learning (MEL) functions, tracking both the “local capture” outcomes and the intermediate indicators measuring the strengthening of the enabling environment. The MEL function should also seek to balance the costs of interventions against the achieved outcomes.

The **assessment** of individual enterprises in terms of their overall suitability as potential suppliers, and the creation of a unique database of pre-qualified firms, could be carried out by an independent provider with the support of an Enterprise Development Center (EDC).²⁰ As part of its outreach function the LC-OSS would direct local firms to enter a supplier assessment program, which would then create a comprehensive database. While the screening process and the supplier database should be managed on a commercial basis by an independent provider,²¹ an EDC would advise the most promising firms on how to enhance their production capacity, product quality and certification, workforce training, and enhance their partnership potential for JVs. The EDC – potentially set up as a Public-Private Partnership (PPP) – could play a coordinating role by directing local enterprises to specific support and advisory services based on their identified gaps. The EDC would most logically

be located in Dar es Salaam because of the concentration of enterprises in that area, but satellite offices could also be set up in other regions like Lindi or Mtwara to support players based there. As local firms upgrade and obtain new certifications their improvements will be reflected in the supplier database, which will be kept constantly up-to-date.

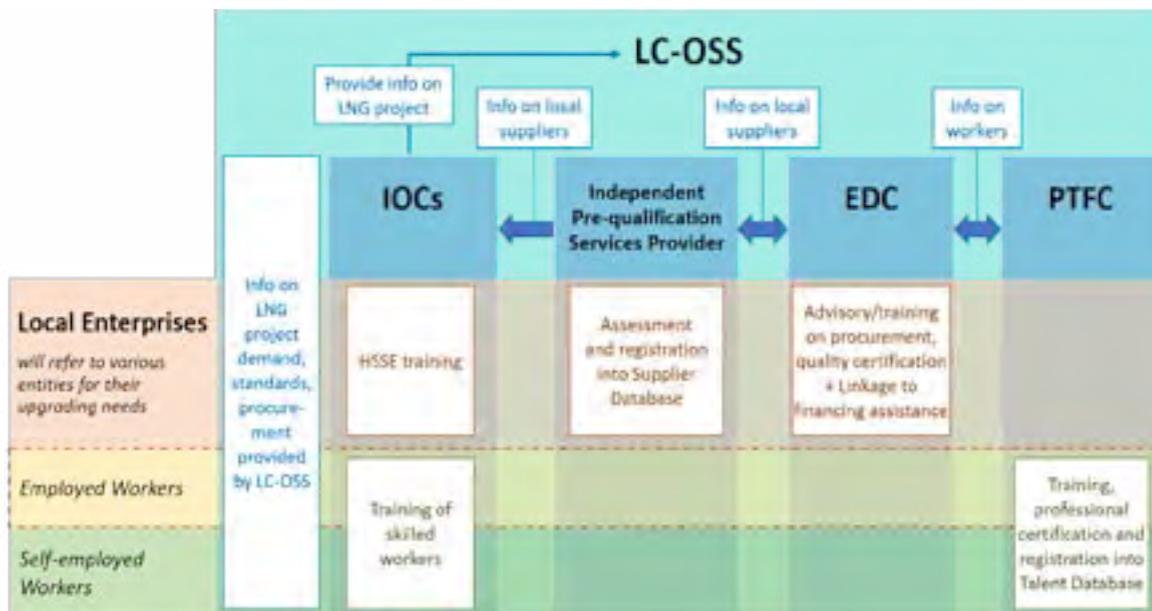
Dedicated upgrade programs would help firms and workers address bottlenecks in four main areas (see Figure 11) that include: (i) compliance with international quality and certification standards, (ii) access to finance to scale-up operations, (iii) availability of skills and professional certifications, and (iv) business environment and testing and certification infrastructure. These are discussed in further detail:

The EDC would provide direct support to firms that want to scale-up their capacity and improve their quality levels in order to qualify as potential suppliers or sub-contractors. These interventions, which would ideally be managed by the EDC, will be expected on one hand to provide consulting services on a matching basis to incentivize SMEs to operate in line with international standards and maintain quality compliance; on the other, they will manage matching grant programs for firms to acquire product or quality certifications. Advisory services will include: (i) consulting and training on procurement, business planning, financial management, and general health, safety, security, and environment (HSSE) standards; (ii) consulting and training on firm and product quality certification; and (iii) specialized industry-specific trainings. In parallel, certification programs will support the effort by selecting local firms to obtain quality certifications (such as ISO 9001) and/or product certifications (such as IEC electrical standards or ISO 10426 standards for cement) considered by the LNG JV and EPC as a minimum requirement for suppliers and sub-contractors. For these programs to be successful, however, it is paramount that the LNG JV/EPC communicates, transparently and in advance of the project launch, which standards will be applied to the required goods and services.²²

- **Enterprise financing interventions will support efforts by local enterprises to access working and investment capital to increase their scaling capacity or quality of operations.** Qualified firms positioned to submit proposals to financial institutions (FIs) to secure working and/or investment capital (to finance improvements or acquire equipment directly connected to their ability to compete as suppliers to the LNG project) could receive practical advice under this area. Technical assistance could also be given to FIs to help them channel financing to selected industries, or to categories of enterprises normally perceived as "high-risk" (and therefore remain un-served or under-served) such as agribusiness entities or SMEs. The advisory to firms and banks could be complemented by access to finance programs. Working capital financing in the form of invoice discounting or factoring should be designed in close coordination with the LNG JV/EPC to conform to their procurement processes. A credit line to financial institutions to extend the maturity of available financing for suppliers would make longer-term investments possible, such as the purchase of industrial machinery or heavy equipment. Finally, a credit guarantee scheme (CGS) to reduce the credit risk for FIs could also be considered, including with some kind of backing from the IOCs.

- **Workforce Development interventions will address the shortages of qualified (and certified) local labor at the skilled and semi-skilled levels (the “missing middle”) and maximize the employment of community workers for basic-skilled tasks.** The overall objective of these interventions is to enlarge the local pool of potential workers and match them with future demand. To this end, a **Practical Training Facilitation Center (PTFC)**²³ will develop and support a comprehensive labor force (or “talent”) database, and deploy up-skilling programs targeting workers in different locations at various skill levels. Through the database, the PTFC will be able to match the demand and supply of local labor by providing worker information to the LNG JV/EPC, prime contractors and local firms. Training for basic-skilled workers will be focused on “soft skills”,²⁴ like communication skills, English language skills, or knowledge of HSSE standards. These would be low-intensity, flexible programs designed to address the quality of relationships in a working environment and to improve the chances for locals to be hired for basic-skilled tasks in the future. Programs could be offered in Lindi and Mtwara that are tailored to the specific needs of workers already employed, particularly women, with classes scheduled on a part-time basis or in the evening so as to not disrupt their incomes or family obligations. Another effect of the part-time and supplemental nature of the programs would be to properly reduce expectations of assured employment.
- **Business Environment and Quality Improvement interventions will focus on policy level support to reduce the cost of doing business and to improve the country’s national quality infrastructure (NQI).** In order to improve the competitiveness of local enterprises, a number of cross-cutting interventions to reduce the cost of doing business and administrative costs need to be put in place. In addition, quality-related improvements will affect the ability of local firms to expand their businesses and increase the desirability of their products: interventions under this category will be closely linked to the Enterprise Development objectives. Support will be provided in the form of financing and technical assistance to national quality institutions (such as the Tanzania Bureau of Standards and the Food and Drugs Authority) and to professional registration boards (in particular, the Construction Registration Board) to improve their testing infrastructure and increase their capacity to issue certifications required by the LNG project in-country and at affordable rates. As part of this process, support could also be provided for a nondestructive testing (NDT) laboratory to be established in Tanzania. This type of facility would reduce the time and cost for local firms to test and certify simple goods needed in large quantities for the project (such as cement, electrical wires, and steel products) as well as for other planned, construction projects (such as the Hoima-Tanga oil pipeline).

Figure 11: Where will local enterprises and workers get support from?



Source: Team analysis

The LC-OSS could also match labor demand with supply and facilitate the process of attracting JV partners. The LC-OSS would manage the database of pre-screened suppliers²⁵ and supervise access to it by the LNG JV, potential buyers, and financial institutions. The LC-OSS would also be a reference point for foreign companies willing to establish partnerships with local enterprises in relation to the project. It could play a role in facilitating the creation of JVs, help streamline administrative procedures for local players to obtain permits and licenses, and support match-making efforts through the organization of trade fairs and other business-to-business (B2B) events²⁶ (e.g., through the Tanzania Investment Center).

Financial institutions – the banking sector in particular – will benefit from a close collaboration with the EDC and the LNG JV to design and implement financing programs tailored to the working capital and investment financing needs of suppliers. The EDC could help in this regard by improving the ability of banks to select well-performing enterprises participating in the program that are qualified to access finance through technical assistance programs. Financial institutions could also benefit from using the supplier database as a source of credit information. Once the FID approaches, the LNG JV should also play a catalytic role in supporting access to finance by developing suppliers' financing mechanisms, including backing banks' efforts to extend financing with risk-sharing mechanisms and guarantees.

The PTFC could leverage the existing network and infrastructure of the Vocational Education and Training Authority (VETA) by reviewing the curricula based on the needs of the project and by complementing it with additional practical training sessions. Given the extensive network of training centers already operated by VETA throughout the country, the PTFC could leverage that infrastructure and help shape the existing curricula to

include activities targeted to the oil and gas sector. The detailed design of interventions under this area should be informed by, and coordinated with, the existing skills development initiatives sponsored by DPs, such as the “Employment and Skills for Eastern Africa” (SOGA) program by GIZ and DfID, and the “Education and Skills for Productive Jobs” (ESPJ) program for results (P4R) by the WBG. Finally, the PTFC would link up selected, skilled workers with the LNG JV and the EPC so that they might receive specialized, on-the-job training, mentoring, and experience in the field.

Support for upgrading will require a partnership between the project sponsors, the local private sector, and the Government, to maximize the benefits to the economy and to leverage existing institutions and programs that already have a mandate to develop transferable skills and technical competencies that advance other sectors of the economy.

Active involvement will be needed from the Government at the policy level, and from the private sector, to help entrepreneurs cope with risks associated with the uncertainty of the FID. The IOCs must be explicit and transparent when communicating project standards applied to the project and supporting capacity-building initiatives. In particular, the final choice of standards should be made public as soon as possible so that local firms can start preparing themselves to ensure compliance. To be effective, the interventions should, to the furthest extent possible, build upon existing institutions and infrastructure and complement active programs. For instance, partnerships with Government agencies such as the National Economic Empowerment Council (NEEC) and the Small Industries Development Organization (SIDO) could be explored to leverage their know-how and their network to help establish the LC-OSS and support enterprise development. This kind of approach would help guarantee both the sustainability of those interventions and the development of skills and technical competencies that could be transferable to other sectors of the economy.

The proposed “public good” interventions led by the Government will need to be matched by a tailored approach to procurement by the LNG JV and the EPC that supports pre-selected suppliers and attracts local investors into the industry.

The proposed SWD interventions pursue “public good” objectives in that they would bridge the gap between individual business interests to achieve a specific improvement in quality or production capacity and expand the number of firms and workers that could compete for contracts. However, the final outcome of these interventions will depend on the procurement choices by the LNG JV. Conventional procurement in the oil and gas sector gravitates towards large, single-sourced contracts after the FID, which can only be fulfilled through targeted procurements tailored to large global suppliers that can mobilize at very short notice. This disadvantages local suppliers in sectors that could lend themselves to more innovative approaches to procurement by the LNG JV. Examples of such approaches are split contracting (e.g. in catering, general services), asset financing of equipment (e.g. concrete batch supply), pre-selection and conditional contract awarding in non-technically specific areas (e.g. in site clearing, office blocks construction). These should be explored and selectively pursued as part of the local content development initiatives.

Finding ways to facilitate JVs between international contractors and local partners will allow qualified Tanzanian enterprises to acquire experience and technical know-how relating to large scale projects. Such arrangements will be effective, however, only if local players are able to show that they can provide some commercial benefits. JVs can help local companies overcome the challenges in delivering on large scale commitments. They can be encouraged by the Government (by creating a business environment that is friendly to foreign investors) and furthered by the project sponsors and the EPC (by "unbundling" some of the large contracts to allow for local enterprises to capture some of the tasks in which they are qualified, such as concrete production or catering services). However, JVs will only be effective if local players can prove that they are up to performing under international standards and are able to bring tangible advantages to their international partners (such as knowledge of the local market, a reliable supplier network, in-country production facilities, improved access to inputs, or greater availability of local skills at a lower cost). International experience has shown that imposed JV arrangements not backed by a competitive local industry may generate sentiments of mistrust, particularly with respect to the appropriation of technology and patent issues.²⁷

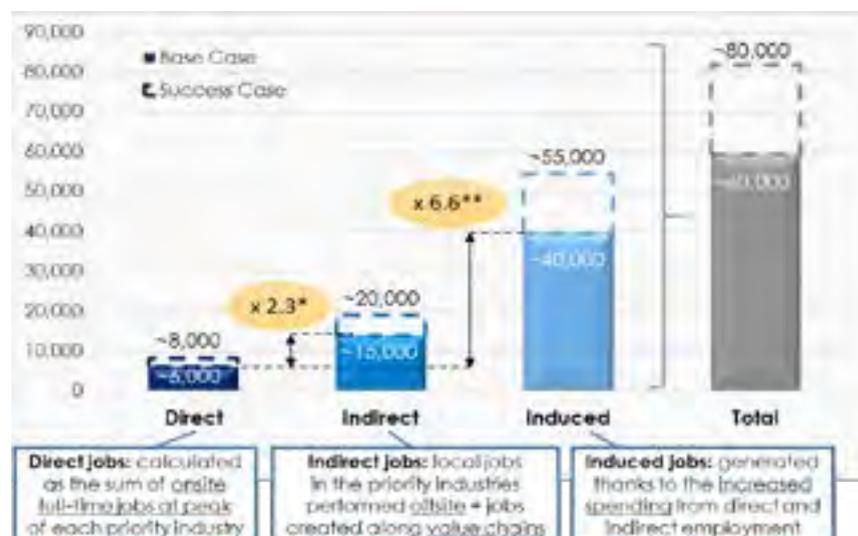
Policies also play a role in driving local content; however, their main objective should be the development of a competitive local private sector and labor force to achieve sustainability. The experiences of other countries (which were discussed in Tanzania as part of the local content PPD events in 2014/15)²⁸ have shown that mandated "unrealistic requirements or targets" that protect the local private sector may not necessarily produce the desired results. Sustainable local content is only possible through the development of a truly competitive local private sector and labor force. Local content policies should therefore focus on achieving sustainability in the long run. Any special privileges granted to "infant industries" should be "time bound," calibrated on actual project requirements, and complemented by programs to develop the technical skills, managerial competence, and financial acumen of the local private sector.

SWD interventions could be instrumental in boosting local capture in the priority industries up to an estimated USD 2 billion. It is estimated that through these interventions local capture in the priority industries could increase up to USD 2 billion, which would be an increase of over 40% from the base case. Tanzanians could participate in more value-adding, semi-skilled and skilled jobs, resulting in an increase in local employment to over 5,000 jobs on average during the life of the project (and up to ~7,500 at peak), which would translate into almost USD 700 million in local labor payroll. Local supply of goods would benefit from the enhanced certification of inputs and equipment, as well as from strengthened business management competencies of local firms, increasing to ~USD 1 billion, part of which will be delivered through local sub-contracting (up to 13% of the total investment), resulting in turn in USD 300 million of profits for local firms.

Upgrading local industries also has the potential to open new markets and enhance economic diversification, which could lead to additional indirect and induced benefits. The development of Tanzania’s agro-processing value chain would be a good example of this. During the LNG project the concentrated, mid-term demand for meals could provide a trigger to scale up the production and processing of many food inputs demanded by the catering industry on the spot, including poultry and red meat at higher quality standards. This could have a significant impact on indirect employment in the local communities of Southern Tanzania and generate induced economic effects from increased spending. There is also the real possibility that production in these areas could be sustained in the future thanks to the rising demand for agriculture goods coming from other East and Southern African countries.

In particular, improvements in key value chains could have a significant impact on local employment, resulting in additional 15,000-20,000 indirect jobs and 40,000-55,000 induced jobs.²⁹ The demand for direct jobs in the priority industries could spur an additional 15,000-20,000 indirect jobs – local jobs in the priority industries performed off-site, as well as jobs created along the value chains (e.g., agricultural and input manufacturing jobs) – and another 40,000-55,000 induced jobs (see Figure 12). However, these positive spillovers will not happen automatically. Broad skills development efforts will be needed before Tanzanians can capture all the opportunities emerging along the value chains related to the gas industry.

Figure 12: Direct, Indirect, and Induced Local Jobs in relation to the Priority Industries



* The ratio of direct to indirect varies in the range of 2.3 - 3.8.

** The ratio of direct to induced varies in the range of 6.6 - 8.4.

Source: Team analysis using multipliers from the study "Uganda Industrial Baseline Survey" (Schlumberger Business Consulting 2013).

Since building local capacity takes time, preparatory interventions must start early enough for local suppliers and workers to internalize the newly acquired capacity and skills. The proposed interventions need time to be properly implemented and absorbed into their operations by local players. Some will need to be sequenced so that, for example, incentivizing policy measures on business environment can be in place before enterprises start investing in significant up-scaling. Intervening early in the process is therefore critical to having an impact on the selected priority industries.

While SWD interventions will have to be led by the Government in partnership with the private sector, DPs can help facilitate the dialogue, and provide conduits for networking, as well as technical and financial backing to help ensure that Tanzanians gain from the LNG investment. The enabling policy conditions and overall design of the proposed interventions will have to be provided by the Government after close consultations with local businesses and the IOCs. Funding for the interventions could include public-private partnerships (PPPs) to limit the risk to private investors, complemented with targeted support from DPs.

The results of this work are aligned with the Second Five-Year Development Plan (FYDP II) and can be used to help the Government shape its local content development strategy. The priority industries and gaps identified by the study are broadly in line with those targeted by the FYDP II, which sets the promotion of local content and the development of productive capacity in sectors like building and construction, iron and steel, and agro-processing, among its key interventions. With access to better information on industry demand, supplier gaps, and investment opportunities provided in this report, the Government should be able to implement a regulatory framework that reflects greater levels of consensus across public and private sectors on where local content emphasis should be placed.

ENDNOTES

- 1 *There are 11 industry case studies, summarizing the findings for 15 priority industries: the analyses of five smaller industries (Security Services; Cleaning Services; Landscaping Services; Temporary Employment Agencies; and Passenger Transport Services) have been grouped together into one single industry profile titled “Business Support Services”.*
- 2 *Proven reserves are ~1 tcf.*
- 3 *Namely BG Group, Ophir and Pavilion on one side and Statoil and ExxonMobil on the other.*
- 4 *This figure includes total estimates of on-shore gas in place in Songo Songo and Mnazi Bay, worth an estimated 8-10 tcf.*
- 5 *According to information available at the timing of writing this report.*
- 6 *The “resource curse” refers to a paradoxical situation in which countries with an abundance of non-renewable resources (like fuels) experience stagnant growth or even economic contraction. In fact, when a country starts focusing on a single industry, such as oil and gas, and neglects other major sectors, the economy becomes overly dependent on the price of commodities, and overall gross domestic product becomes extremely volatile.*
- 7 *Value added, in economics, refers to the difference between the total sales revenue of an industry and the total cost of components, materials, and services purchased from other firms within a reporting period, and the cost of labour. Value added generally represents the industry’s contribution to the gross domestic product (GDP).*
- 8 *VSO Tanzania and UK DfID (2016).*
- 9 *The “upstream” segment (exploration and extraction) offers longer-term opportunities in the Mtwara region, but the technological and capital intensity of the industry implicitly limits the local participation in the short term. Similarly, opportunities in the downstream segment (use of gas) will only materialize once the gas starts flowing.*
- 10 *See the methodological note for a detailed explanation.*
- 11 *Currently, in Tanzania, a number of programs are active. The main ones include the joint GIZ-DfID’s “Employment and Skills for Eastern Africa” (SOGA), a regional program for East Africa and already active in Tanzania, and VSO’s “Regional Enterprise Development” (RED) program, focused on the Lindi Region. In addition, the WBG is preparing an “Education and Skills for Productive Jobs” (ESPI) program for results (P4R).*
- 12 *The USD 17 billion figure represents the midpoint of the USD 15-20 range used for calculation purposes.*
- 13 *Skill levels are defined as follows: (i) Skilled jobs require the ability to perform specialized work independently, and normally demand specific educational or professional qualifications; (ii) Semi-skilled jobs require technical skills for the performance of routine operations, monitoring and quality checking, and the ability to work under limited supervision; (iii) Basic-skilled jobs involve simple tasks and do not usually require one to exercise judgment.*
- 14 *Most of the contracts for each sub-activity in these industries are above USD 50 million value, therefore local firms may not reach the scale required to deliver on these orders.*
- 15 *NQI refers to the set of services and related regulatory framework available at the national level in the fields of metrology, standardization and testing, quality management and conformity assessment, including certification and accreditation.*

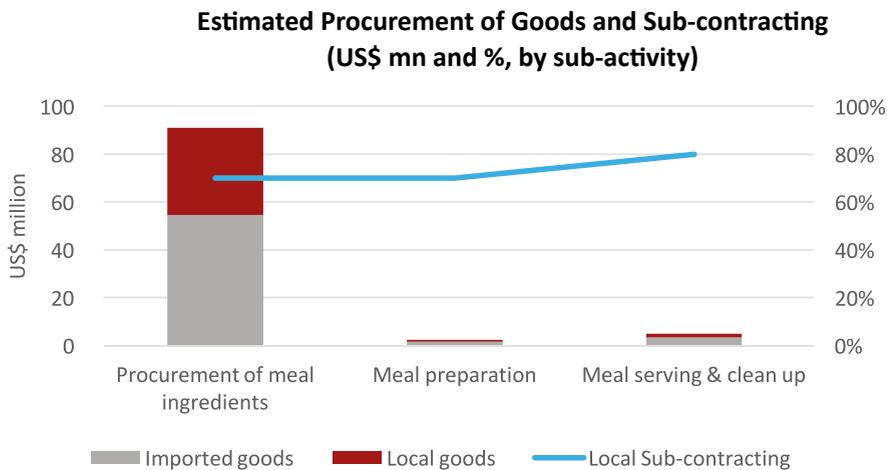
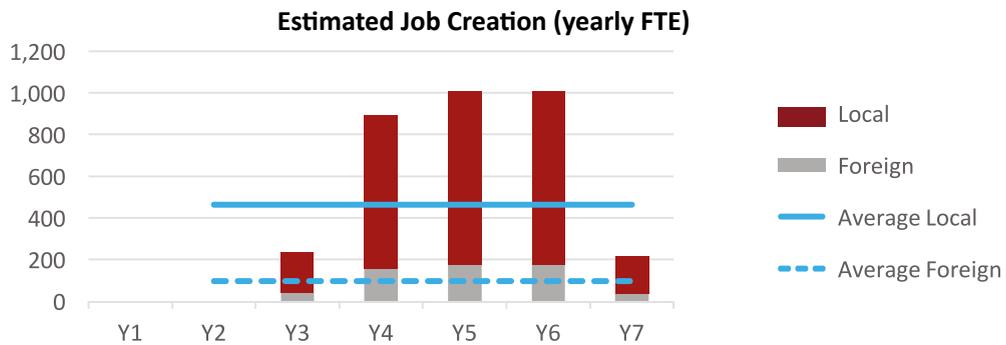
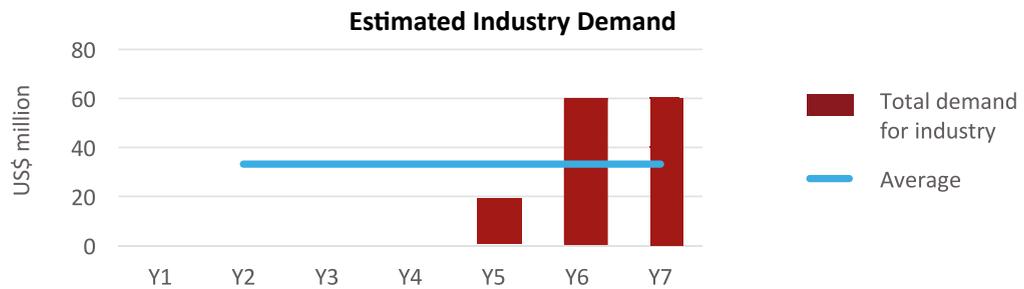
- 16 *This type of approach should be tested through a feasibility study, which would also assess the capacity of existing institutions.*
- 17 *Firms seeking credit to finance both working capital and investment needs face prohibitive collateral requirements and high interest rates, which in turn reflect heightened levels of risk and asymmetric information faced by the banks. (World Bank Group 2013).*
- 18 *Dalberg and GIIN Advisory (2015). "The Landscape for Impact Investing in West Africa – Understanding the current status, trends, opportunities, and challenges".*
- 19 *The LC-OSS could be established within the existing Local Content Unit under the National Economic Empowerment Council (NEEC). Note: no commitment has been expressed on this point, which will need to be discussed with the relevant counterparts.*
- 20 *The EDC could be established under the Small Industries Development Organization (SIDO) or another public institution with an already established network of local enterprises, and collaborate closely with the Tanzania Private Sector Foundation (TPSF). Note: no commitment has been expressed on this point, which will need to be discussed with the relevant counterparts.*
- 21 *In 2015 the LNG JV has launched in 2015 a privately managed supplier database – "Achilles". Consultations between the LNG JV and the Government are ongoing, to see what the best structure for such a platform would be going forward.*
- 22 *For example, there is substantial uncertainty as to whether the LNG project will require British or American standards to general electrical services. Tanzania has adopted U.K. standards so it would be unviable to retrain and recertify technicians to U.S. standards without certainty that local firms would be successful in being awarded some contracts.*
- 23 *The PTC could be managed through the Vocational Education and Training Authority (VETA), and be funded as a public-private partnership (PPP). Note: no commitment has been expressed on this point, which will need to be discussed with the relevant counterparts.*
- 24 *"Soft skills" refer to character traits and interpersonal skills that characterize a person's relationships with other people in the workplace, such as team building, communication, conflict management, human relations, etc.*
- 25 *While the database would be maintained by an independent service provider, the LC-OSS could be responsible for managing its access policy.*
- 26 *Events to facilitate the establishment of commercial relationships between businesses.*
- 27 *Studies have found that technology employed in mandatory JVs was on average 3 to 10 years out of date, and that technical training provided by international companies to local affiliate staff was a fraction of that provided in wholly-owned subsidiaries.*
- 28 *World Bank Group (2016). "Maximizing Domestic Value Added in the Oil and Gas Industry – Sharing lessons learned through public private dialogues in Tanzania".*
- 29 *In order to estimate the indirect and induced effects, the team relied on multipliers extracted from the study "Uganda Industrial Baseline Survey", Schlumberger Business Consulting (November 2013): the study used coefficients observed through research in other countries or cities that have gone through similar oil and gas activities, like Macaé (Brazil), Trinidad & Tobago, Aberdeen (UK) and Stavanger (Norway).*

III. Summary of Industry Profiles

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Industry: 01

Catering Services



Summary

With total catering needs estimated at around USD 200 million, the LNG construction project represents a major opportunity to generate jobs and demand for local industry. Catering services include three main activities, all of which offer high potential for local capture: (a) procurement of meal ingredients; (b) meal preparation; and (c) meal serving and clean up, including cleaning and laundry services.

Local firms could improve their prospects to win catering contracts in the project by scaling up their activities and ensuring compliance with international standards for both food products and labor. While the mining and tourism industries have already fostered the emergence of a well-developed, catering industry in Tanzania, the LNG project is going to demand an even higher level of performance. When it comes to handing out contracts, the international oil and gas companies (IOCs) and the engineering, procurement, and construction contractor (EPC) will be seeking evidence of compliance with global health and safety standards, of access to reliable supplies of foodstuffs, and sufficient operational capacity to serve what may be up to 40,000 meals per day. Leading catering companies in the local market have demonstrated the necessary financial and technical wherewithal to be able to deliver services to large, international, corporate clients. They have also established supply chains, provide in-house training programs, and are generally in compliance with health and safety standards. However, even the larger firms lack staff trained in both national and international standards and may have difficulty purchasing equipment compliant with health, safety, security, and environmental (HSSE) requirements. The chances of winning contracts will depend on the ability of providers to significantly scale up their activities and fully comply with very strict HSSE standards. Unless the local industry is able to make the necessary improvements then a single contract will most likely be awarded to a full-service, international firm.

Unbundling the contract would generate more opportunities for both local firms and local supply chains. EPCs usually prefer to rely on a single, full-service contractor to provide catering, cleaning, and laundry services on-site, and this type of integrated arrangement tends to favor larger, foreign-owned companies. Unbundling the contracts would provide more opportunities for local companies that currently lack the scale and ability to deliver high volume services in all these areas. It also would give local contractors higher incentives (than there would be for a vertically integrated international contractor) to invest in developing local supply chains to increase their access to sufficient quantities of high-quality food inputs.

The potential for local employment in catering will be high and independent of whether the services are provided by several local contractors or one international firm. The expected impact of the LNG project on local employment will be significant in the catering industry no matter who is providing the services, because both local and foreign firms will be tapping into the same labor pool. Overall, this industry is expected to generate 450-550 full-time local jobs across the project in the first four years, rising to 850-1,000 jobs in years 5 and 6.

Appropriate training programs should be in place to ensure that people from the Lindi and Mtwara regions are able to capture the majority of the local positions and that Tanzanians in general are eligible to be employed in the most skilled positions. Catering typically relies on large numbers of basic-skilled and semi-skilled jobs, positions that could be filled by Tanzanians living in the vicinity of the project site. However, given the low skill base in the Lindi and Mtwara regions, workers from those areas will have to be trained not only in technical skills (such as cooking) but also in more basic skills such as English communication, hygiene and sanitation, and other soft skills. In addition, for local workers to be hired in higher-skilled positions - such as chefs, nutritionists, or kitchen supervisors - they will have to undergo targeted training to ensure that their work meets international standards for quality and health safety.

The opportunity for local sourcing of food items is significant, but it remains below the potential for an economy with a large, agricultural base like Tanzania's. In the base case scenario, roughly 40% of food items (totaling USD 40-70 million) are expected to be sourced for the catering services industry locally. Opportunities for additional local capture will be limited by the challenge of accessing high-quality local food inputs, in particular for the protein portion of meals. If the quality of key inputs - such as red meat, poultry, and fish (which is mostly imported at present) - were raised to meet international standards, the share of locally produced goods could, in the success case, increase to up to 75% and generate many more indirect benefits for local communities.

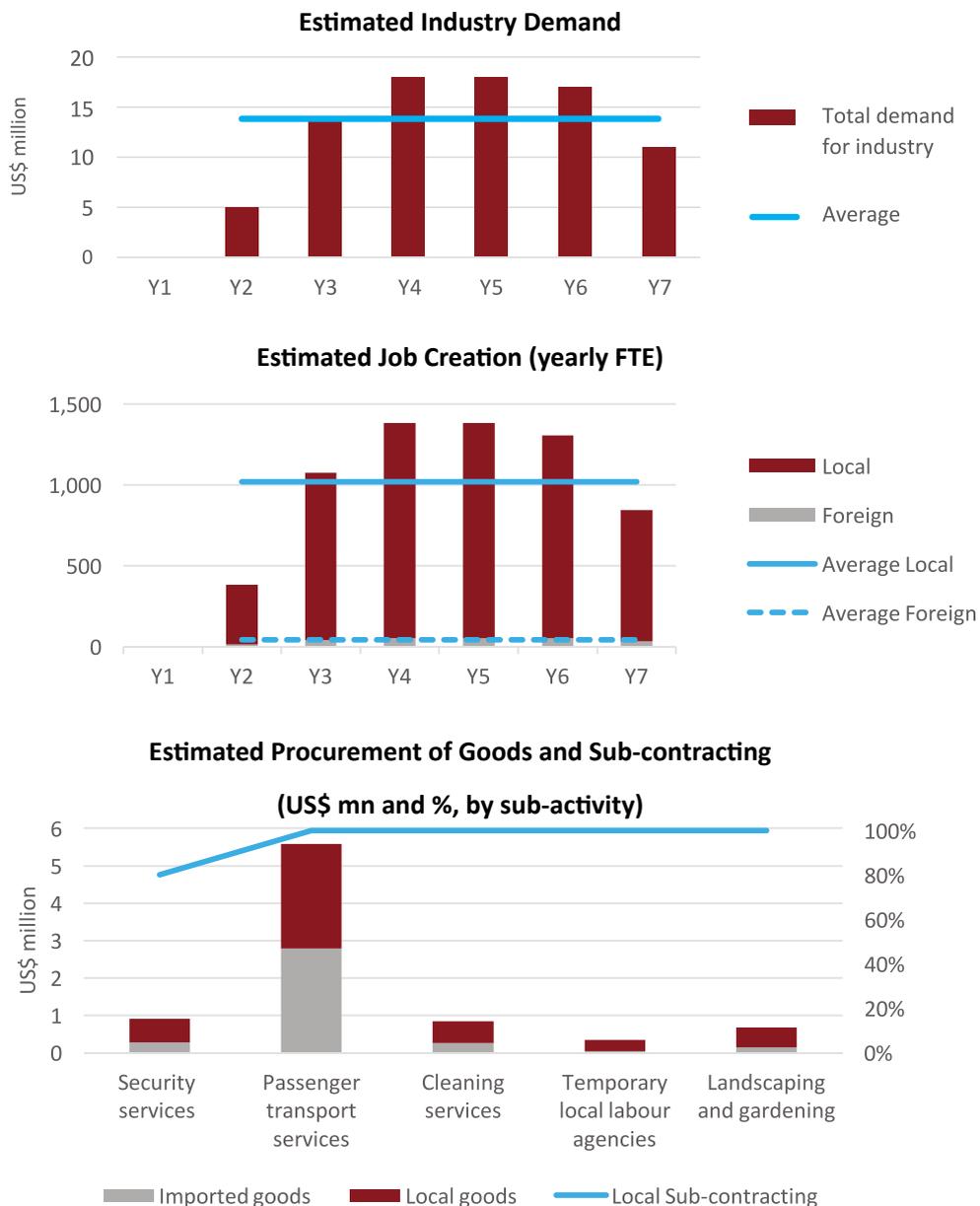
Strengthening the value chains of key inputs will require significant investments by the private sector and enactment of a number of enabling policies. Awarding catering contracts to local firms will encourage them to make important investments. For instance, substantial and concentrated demand for meat generated by the LNG construction project could justify an investment in a large-scale, state-of-the-art, poultry farm, which could rapidly reach a breakeven point and leverage the project timeframe to find new customers in the local market. This would require, however, action on the part of the LNG JV or EPC to tender out the provision of poultry meat well in advance of the inception of the project activities. In parallel, enabling policies would have to be adopted by the government to address food collection, transport and storage infrastructure, and health and safety-related issues, such as animal vaccines and crop pesticides.

Overall, the catering industry serving the construction phase of the LNG facility could result in local capture of between USD 90 and 140 million. The final outcome will be a function of the private sector response to the overall opportunity, of enabling policies, and of the effective implementation of capacity building interventions and investments in value chains.

Note: All upside figures in the ranges represent a success case and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

Industry: 02

Business Support Services



Summary

Within the Business Support Services industry cluster are prime opportunities to enlist large numbers of Tanzanian suppliers and basic-skilled laborers.

The LNG joint venture (JV) or lead engineering, procurement, and construction contractor (EPC) will require supporting services during the construction phase (and, to a lesser extent, during the operational phase) of the LNG facility. These services can easily be procured from local enterprises given the existing base of skills and firm capabilities and, despite the relatively modest level of demand, investments in these industries can help to ensure that the local community captures maximum benefits, especially in terms of job creation. The cluster is comprised of five industries and represents an estimated total demand of about USD 85 million in the LNG project:

- Security services – USD 25 million
- Passenger transport services – USD 25 million
- Cleaning services – USD 20 million
- Temporary labor brokering services – USD 8million
- Landscaping services – USD 8 million.

To fully benefit from these opportunities, local businesses will need to obtain the required quality certifications and ensure compliance with health, safety, security, and environmental (HSSE) standards and other industry requirements. Several local companies have the capacity to become contractors for business support services, but they will need to provide reliable proof of compliance with quality demands and HSSE standards. Some of them will have to enroll into quality certification programs (to obtain a ISO 9001 designation, for example) and to provide HSSE training to their staff.

Demand for labor in this cluster will be relatively constant throughout the construction phase, generating an average of 1,000 local jobs – mostly basic- and semi-skilled. However, many jobs will also have the potential to be sustained through the operational phase of the LNG facility. Given their dependency on labor-intensive, and largely manual, tasks, support services could generate an average of 1,000 full-time, local jobs across the LNG construction phase, reaching up to 1,300 at their peak in years 4 and 5. While all of the basic-skilled and semi-skilled jobs in this industry – which together account for over 90% of the labor demand – are expected to be fully captured by Tanzanians, the remaining 10% of skilled positions (such as project managers, quality supervisors, or personal bodyguards) will be split between local and foreign workers. The magnitude

of labor demanded during the operations phase will depend on whether the LNG JV chooses to follow a rotational vs. a community-based staffing model; however, there is potential that a large share of these jobs could be sustained for up to 20-25 years.

The key challenge is to ensure that employment is maximized at the community level, in particular among women, so that it can spur additional indirect and induced benefits. To this end, training on English, communication, and other soft skills - including HSSE - should be delivered to workers in Lindi and Mtwara. Business support services offer an important opportunity to employ a large number of basic-skilled workers, particularly women (especially with regards to cleaning services and office positions in temporary employment agencies) in the Lindi and Mtwara regions of Southern Tanzania. The opportunity, however, requires that workers from these communities (e.g. cleaners, gardeners, security guards) be trained on essential, light skills (e.g. English language and communication, health and safety, waste management) to be able to operate and interact effectively with an international workforce.

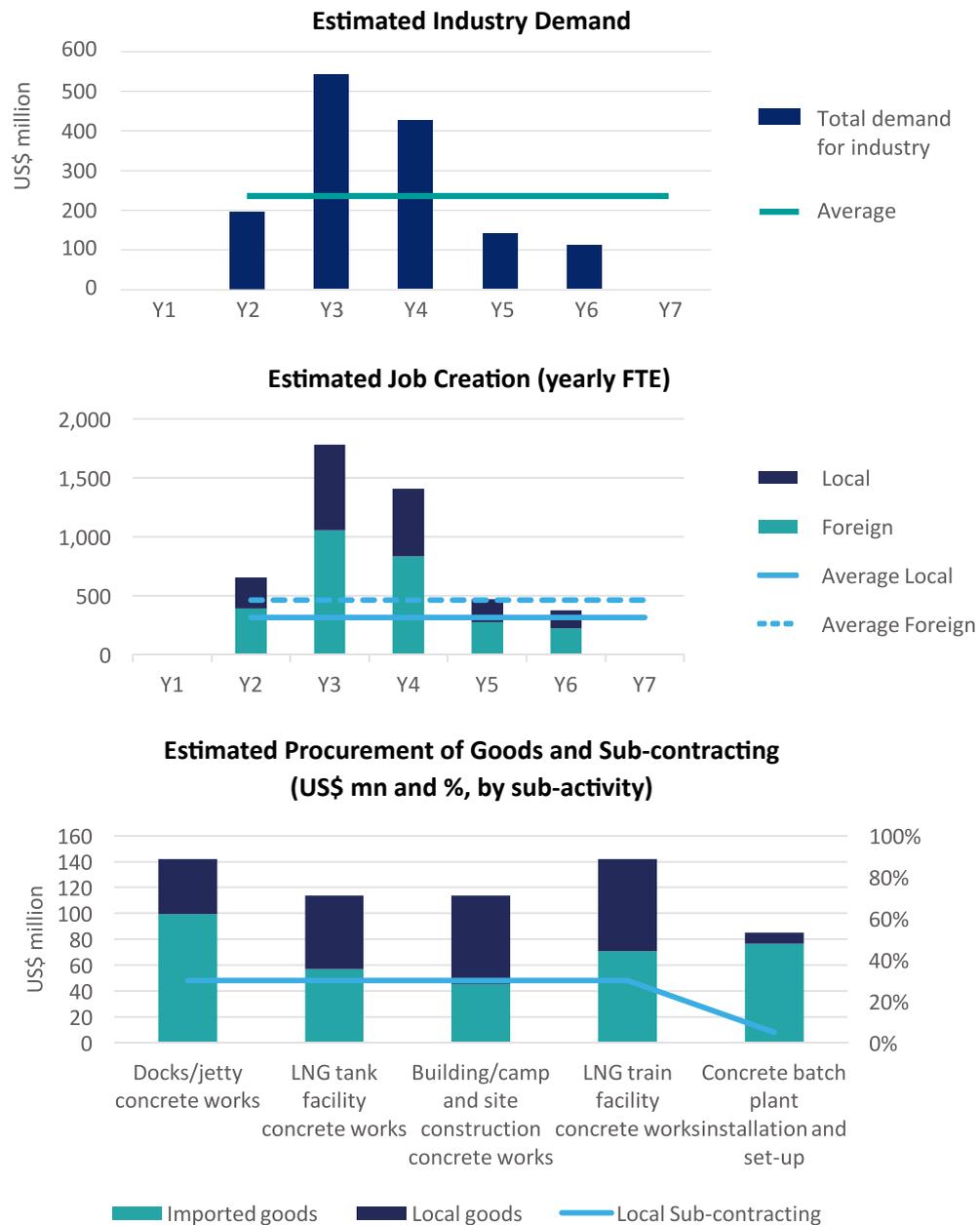
Local communities would clearly benefit if more jobs were captured at the community level and overall project risk would be reduced. If efforts are made to train basic-skilled workers in Lindi and Mtwara, employment at the community level could be maximized. The direct jobs and business created by these industries could then lead to additional indirect and induced benefits, such as increased spending on food items, stimulated agriculture supply chains, or higher demand for transport. All of these potential outcomes could contribute to alleviate poverty and social tensions.

Local capture is expected to be high. Baseline estimates are at 75% of total demand (USD 65 million), although that number could perhaps surpass 80% (USD 70 million) if targeted interventions were to be put in place. Overall, it is estimated that business support industries could result in “local capture” (i.e., the sum of local labor payroll, local procurement of goods, and profits for domestic enterprises) of about USD 65 million, and reach USD 70 million if efforts were to be made to support companies’ certification and worker training. 70 million if efforts were to be made to support companies’ certification and worker training.

Note: All upside figures in the ranges represent a success case and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

Industry: 03

Concrete Works



Summary

Projected demand for concrete works in the LNG project is large, but the supply side will struggle to satisfy it in terms of quality and size. Total demand is projected at USD 1.4 billion, which includes both pre-cast (or pre-fabricated) concrete and the material and services that will be needed to support other construction activities. However, while the concrete industry in Tanzania is fairly well developed in the areas of building and civil works, local firms are not prepared to produce concrete to the scale and specifications that will be required by the project. The sub-activities that make up the industry include concrete works for: 1) the docks and jetty; 2) the LNG tank facility; 3) the building/camp and site construction; 4) the LNG train facility; and 5) concrete batch plant installation and set-up.

The lead engineering, procurement, and construction contractor (EPC) appointed by the project sponsors is likely to self-perform the most critical tasks to retain quality and quantity control. The specifications of LNG projects require maximum adherence to standards both in terms of input quality and task execution, as well as significant levels of concrete production. To properly fulfill its contract obligations, the EPC is likely to retain a batch production plant on-site where it can self-perform many activities and verify the quality and quantities of the final product.

Opportunities for local firms to be integrated into the value chain could be enhanced if joint ventures (JVs) with international firms were established. Decisions about what can or cannot be outsourced will depend largely on the contracting strategy of the EPC; however, a certain amount of pre-cast production and select activities could potentially be sub-contracted. Opportunities for local firms could be maximized through formal arrangements with foreign companies that allow them to become sub-contractors for certain activities, or supply concrete inputs, such as sand or aggregate, to support foundation works. One strategy might be for a local player in the construction sector to co-finance the on-site, batch plant in partnership with a large international concrete supplier with the expectation of taking it over at a depreciated cost upon project completion to then use it for other large-scale, national or regional assignments. It is estimated that local companies may compete for sub-contracting opportunities in the range of 28-33% of total concrete industry demand, provided they show they can meet stringent ISO specifications (such as ISO 10426 or EN standards).

Opportunities for local employment are significant, but local capture of skilled positions will be constrained by the scarcity of experienced and certified workers. This industry could generate an average of 800 jobs across the project, of which over 300 could be local. Indeed, at the peak of construction activity (year 3) up to 750 local workers could potentially be employed. However, the shortage of certified and experienced labor will limit the number of workers employed in skilled positions to less than 10%, while the other jobs will be almost equally split between semi- and basic-skilled workers. It may be possible to raise the average number of local positions to up to 450 (and up to 1,000 at peak) and, more importantly, increase the share of local skilled and semi-skilled positions if intensive professional training and certification programs are put in place.

One challenge with respect to employment will be to localize at the community level as many basic-skilled, local jobs as possible. It is expected that the Concrete Works industry will generate up to 350-400 local, basic-skilled jobs at the peak of activity. While it is not difficult to find workers to fill basic-skilled jobs in the concrete industry in Tanzania, the main challenge will be to localize these jobs at the community level. Providing workers in the Lindi and Mtwara the right training on health, safety, security, and environmental (HSSE) standards, and on English, communication, and other soft skills, will be critical to ensure that they capture as many of these jobs as possible. Again, this will help bring economic benefits to those communities and avoid social tensions.

The local supply of concrete inputs could be significant – within the range of USD 245-315 million – but, to maximize opportunities for local sourcing, the quality of those inputs should be increased and guaranteed. The bulk supply of concrete inputs such as sand, aggregate, and cement should be upgraded to the required specifications. For example, producers of aggregate may be compelled to use granite or volcanic rock in their products, instead of limestone, to increase the tensile strength. Furthermore, while concrete sample testing will most likely be performed on-site by the manufacturer, steps could be taken to establish a Non-Destructive Testing (NDT) facility in Tanzania to reduce the costs of testing concrete at the forming and pouring stage (e.g. radar measurement) and facilitate compliance with the stringent oil and gas standards.

Investments to upgrade human capital and industry capabilities could bring benefits in the long term; however, they should be focused on those local players that have a sustainable incentive to scale up and improve their operations in view of long term business opportunities. Efforts to raise local performance in the concrete industry should be focused on improving compliance with HSSE standards, obtaining ISO certification, and improving labor force skills through dedicated technical workshops. Industry demand is high across the economy due to rapid urbanization, so investment in this industry is justified and could bring benefits over the long term; however, the emphasis should be placed on upgrading firms that already have substantial capacity and that may win business contracts for other large scale projects in the longer term. Additional demand could also be created by the planned relocation of the Government to Dodoma.

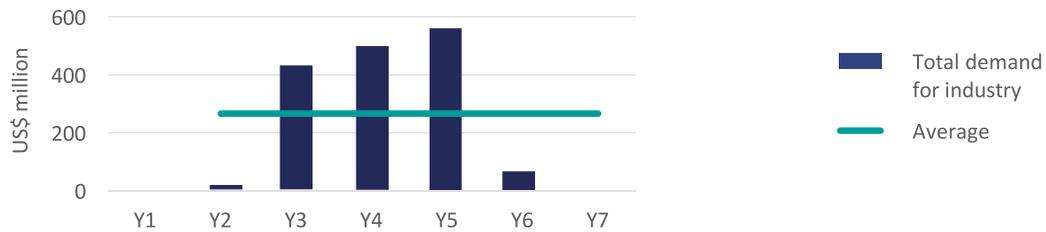
The local capture of this industry would be significant, ranging from 26 to 34% of total demand. Overall, the sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of USD 370 million, with the potential of increasing up to USD 480 million if improvements in goods certification and labor skills are achieved.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

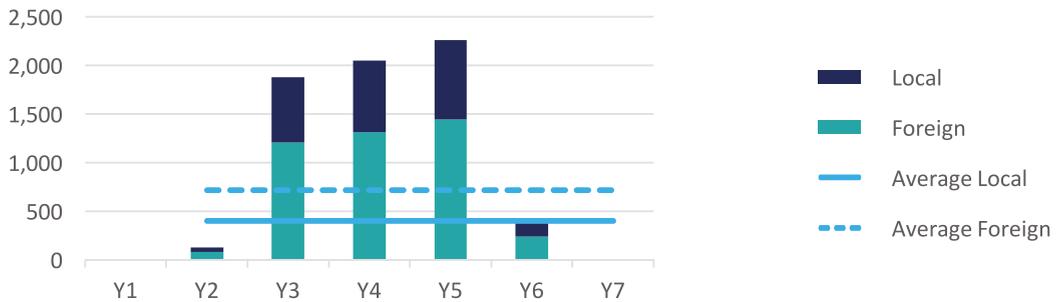
Industry: 04

Building and Camp Construction

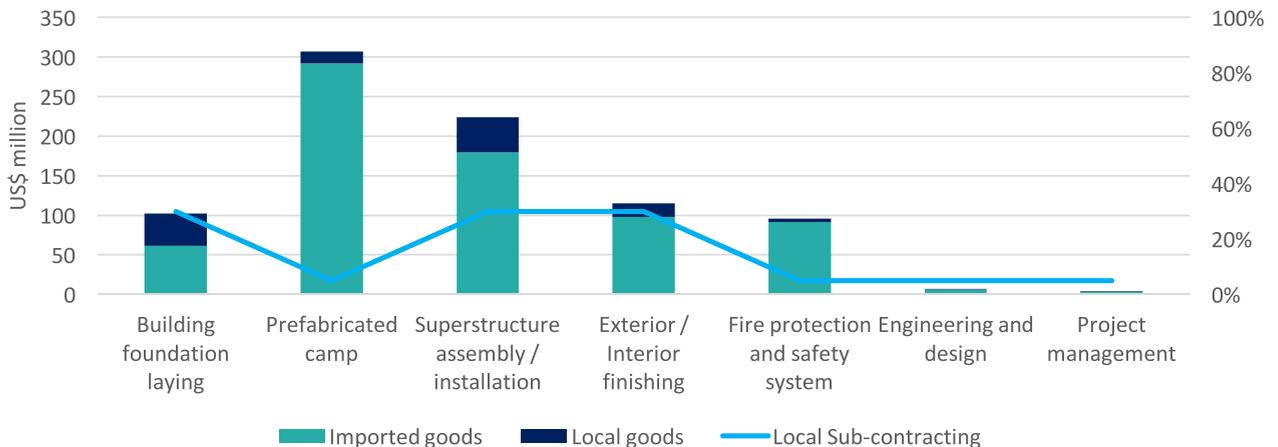
Estimated Industry Demand



Estimated Job Creation (yearly FTE)



Estimated Procurement of Goods and Sub-contracting (US\$ mn and %, by sub-activity)



Summary

The construction of permanent and temporary structures on the LNG site is a sizeable undertaking that offers good opportunities to create local value added. Overall demand for buildings and camps is projected to be about USD 1.6 billion, allocated to activities that range from highly technical installations to less specialized and largely manual tasks. The bulk of the work is concentrated between years 3 and 5 of the LNG facility construction period and largely consists of the following sub-activities: 1) building foundation laying and setting; 2) prefabricated housing and worker accommodation procurement, assembly, and installation; 3) superstructure assembly, installation, and carpentry; 4) exterior and interior finishing; 5) fire protection and safety system installation; 6) engineering and design; and 7) project management.

In large, complex infrastructure projects of this nature, major engineering, procurement and construction contractors (EPCs) are brought in by investors to build the facility, and they typically self-perform many building construction tasks in order to manage costs, schedules, and other risks in-house. However, a number of responsibilities are sub-contracted throughout the project, especially those related to masonry and carpentry. International prime contractors win procurements by showing an ability to deliver goods and services on large projects in sufficient quantity and under a firm schedule, while also warranting adherence to strict quality standards. Therefore, promising local players, including those in partnership with foreign firms, are more likely to be able to compete for smaller, but still sizeable, assignments, mostly in areas such as building foundations laying, superstructure assembly, and finishing works. Local sub-contracting is estimated to range between 18-21% of total demand.

Local sub-contracting potential may be constrained by challenges relating to standards compliance, quality assurance, and by difficult finance conditions that prevent local firms from scaling up. To be eligible as sub-contractors, local suppliers must show an ability to maintain schedule for large scale projects, strict adherence to oil and gas contracting procedures, and full compliance with health, safety, security, and environmental (HSSE) standards. Their capacity to scale activities to the level required in a project of this size will also be affected by the scarcity and high cost of long term financing. To overcome these constraints, local firms may consider partnering with international companies through joint ventures (JVs) or other sharing agreements to build capacity, secure better credit terms, and improve project management and other quality assurance systems. The LNG JV and EPC have critical roles to

play when it comes to communicating the standards that will be applied to the project and explaining how compliance can be ensured.

There will be many opportunities for local employment but the final size of the local workforce, especially for higher-level positions, will depend on the ability of local workers to obtain formal recognition of their competencies and raise the level of their industry-specific skills. The building construction industry is labor-intensive, so international EPCs and prime contractors typically hire a significant number of local workers, even for their self-performed activities. Some 2,200 people could be employed in the sub-activities at peak of construction, of which over 800 could be local. Furthermore, if training and certification programs for workers are implemented - especially for positions such as experienced artisans, technical supervisors, quality inspectors, and managers - local jobs could reach as high as 1,200 at peak, and perhaps average 600 across the entire project.

The local supply of goods offers similar significant potential, but much depends on whether or not the products that can be offered are certified according to international standards and can be supplied on time and in sufficient quantity. Local sourcing of goods - from bulk construction materials for foundation laying (e.g. cement and cement blocks) to forming equipment and consumables (e.g. wood and paint) - could increase from USD 125 million to up to USD 185 million if local suppliers obtain internationally recognized product certifications and are able to invest in scaling up production. As an example, given the low quality of finishing products (e.g. specialized coatings, tiles, etc.) available in the domestic market, most local suppliers in the industry have to rely on imported materials that are subject to high import duties. Efforts to improve the quality of the locally available products, or to avail the main imported items to local firms at a better price point, could boost the local supply of goods and local sub-contracting.

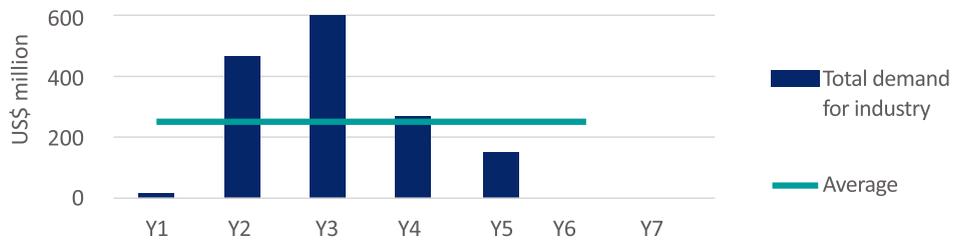
Overall, local capture in the construction industry could range between 15%-20% of the total demand. The sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of between USD 245-325 million depending on the effective implementation of upgrading interventions.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

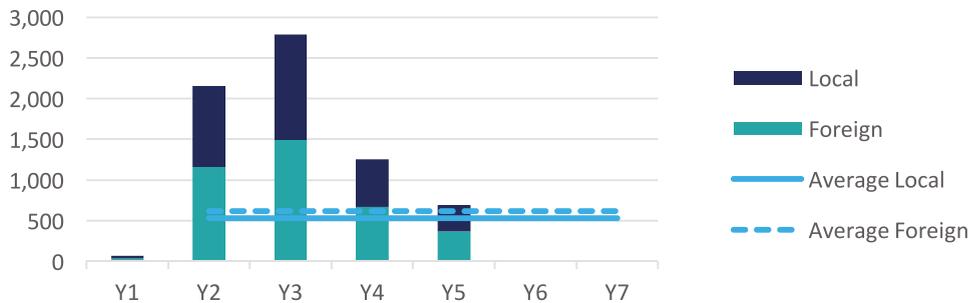
Industry: 05

Site Preparation

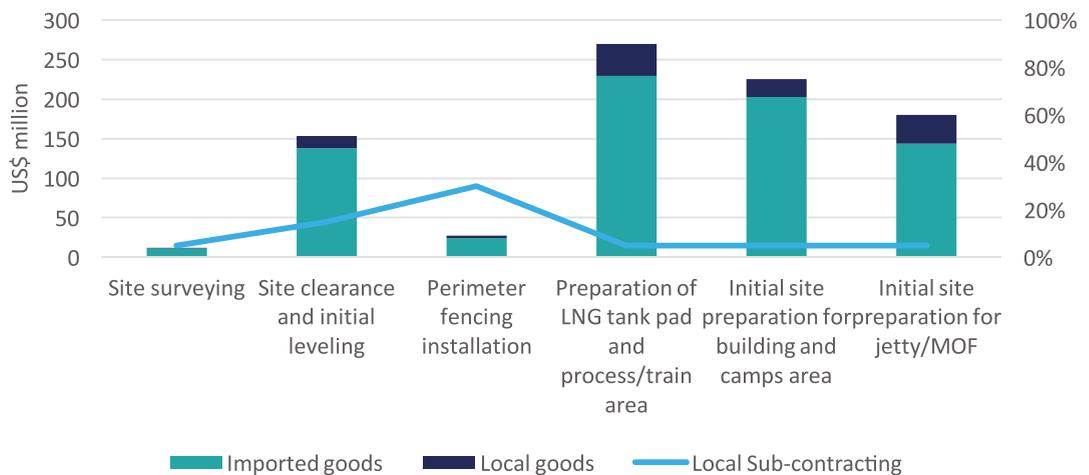
Estimated Industry Demand



Estimated Job Creation (yearly FTE)



Estimated Procurement of Goods and Sub-contracting (US\$ mn and %, by sub-activity)



Summary

Site preparation includes a series of labor-intensive activities that take place prior to the launch of construction and that are valued at close to 10% of the overall project cost. Site preparation involves clearing an area of about 5-6 square km and then making that area suitable for the development of the LNG facility. The total demand for this industry is projected to be USD 1.5 billion, which can be broken down into the following sub-activities: 1) site surveying; 2) site clearance and initial leveling; 3) perimeter fencing installation; 4) preparation of the LNG tank pad and process/train area; 5) initial site preparation for building and camps areas; and 6) initial site preparation for the jetty and Marine Offloading Facility (MOF).

Site preparation can commence ahead of the final investment decision date and concentrates in the first two years of the project. Site preparation activities always precede the development of any infrastructure, so foundation-related work (such as formation of concrete pads) may be undertaken slightly before the final investment decision (FID) is reached.

Sponsors of LNG projects typically outsource site preparation responsibilities to a company with international qualifications, but a number of tasks will be sub-contracted. Site preparation activities can start before an engineering, procurement and construction contractor (EPC) is appointed, thus in most cases activities are launched directly by the investors under a single contract awarded to a firm with international qualifications. The appointed contractor can then be expected to sub-contract a number of tasks to local firms.

Local firms should seek to improve their quality certification systems in parallel with equipment upgrades and improved maintenance services in order to maximize sub-contracting opportunities. Currently, close to 3,000 civil works firms are registered in Tanzania; however, probably less than 40 of them would qualify as potential suppliers for the LNG project based on their size, business systems, workers' certifications, and track records serving large, international companies and government agencies. Shortages of reliable and certified equipment and the absence of a developed maintenance sector often undermine the ability of many companies to deliver on what is required in large projects of this type (see the Equipment Rental Industry profile).

Local contractors should be able to win contracts for significant tasks, representing between 7-10% of the total industry investment, and the local supply of goods could amount up to USD 120-160 million. Local suppliers will have to be positioned to improve their ability to compete in the short term given that site preparation will be launched at an early stage. This will be particularly challenging if they want to compete for activities

requiring large capital investments in machinery. The Government and international oil and gas companies (IOCs) could support the efforts of local firms to access financing for capital equipment by extending guarantees or providing a collection mechanism for the repayment of capital. If financing is made available, quick wins could be expected in the perimeter fencing sub-activity (by upgrading equipment and increasing capacity) and supplies of local goods (such as backfill and gravel) could be increased.

Opportunities for local employment are high given the labor intensity of the tasks, offering the potential of almost 1,300 local jobs at the peak of activity. Site preparation is expected to employ close to 3,000 workers at peak, almost half of which could be local labor. In addition to the jobs created by sub-contractors, the prime contractor will also be looking to recruit local workers in basic- and semi-skilled positions (such as site clearing assistants, basic machine operators, and vector control technicians). Taken together, these lower level assignments should account for almost 90% of local jobs. Demand for this kind of labor will be greatest at the inception of the project during early works and then progressively decline as construction activities take over. However, workers trained up to international standards for certain activities should easily be able to find employment in other constructions projects that demand site clearing and preparation services.

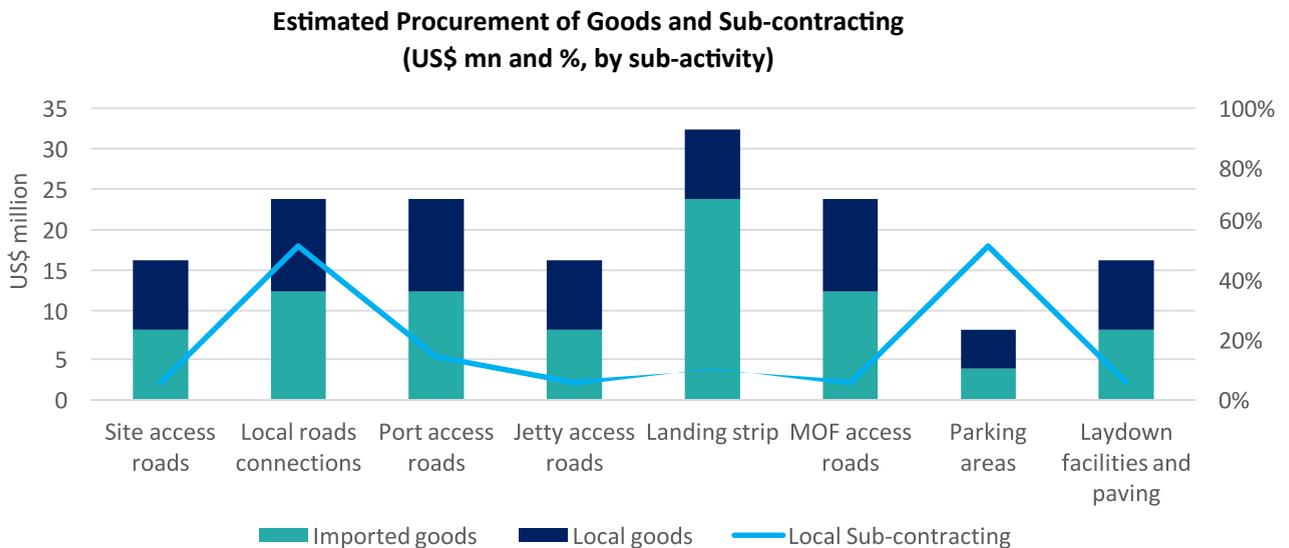
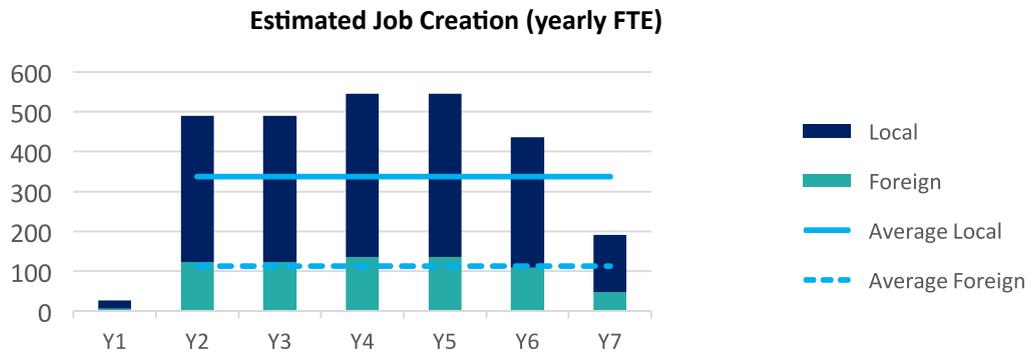
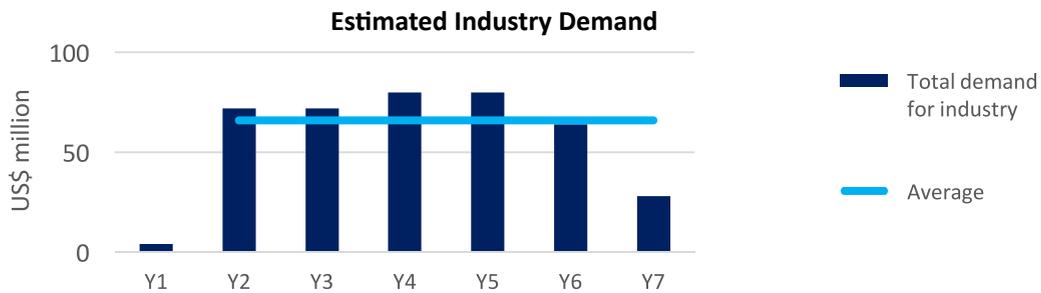
Local employment opportunities for semi-skilled and skilled workers, and for equipment operators in particular, could be greatly enhanced if individuals or companies obtain international certification and are able to demonstrate practical experience in complex operations. The most serious constraint to local employment is the limited presence of experienced and certified machine operators, as well as technicians for supervisory and quality control roles. If training and certification programs were successfully implemented to address this constraint, with direct support from the LNG JV and the EPC, local jobs could reach up to 1,900 at peak, with semi-skilled positions registering an increase of almost 65%.

Local capture could range between 13% and 18% of total demand. Overall, the sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of USD 195 million, and potentially increase up to USD 270 million if interventions designed to improve access to heavy machinery and certify local workers are implemented effectively

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

Industry: 06

Roads and Landing Strips



Summary

The development of a modern LNG facility will require substantial upgrading of access infrastructure and new construction of internal roads, curbs, and parking lots. These services will commence during early works and continue throughout the construction phase as maintenance services will be required. Total demand for roadwork is projected to be about USD 400 million, spread homogeneously across the project timeline, and it includes the following sub-activities: 1) site access/maintenance roads development; 2) creation of local road connections and improvements; 3) port access road upgrades; 4) jetty access road development; 5) formation of landing strips (if necessary); 6) construction of the Marine Offloading Facility (MOF) access road with onshore parking and a storage area; 7) creation of worker housing and accommodations parking areas; and 8) development of laydown facilities and area paving.

The construction of a landing strip will depend on the requirements of the investors or the appointed engineering, procurement and construction contractor (EPC) and therefore may eventually not materialize.

While road connections within and around the site are crucial for other construction work to be implemented and for staff to be able to easily move around, the final scope of work for improving access is at the discretion of the primary contractor, as is the decision to build a landing strip or upgrade capabilities at the Mtwara or Lindi airports.

Road construction service firms are well established in Tanzania; however, most local firms do not have the capacity to manage a single contract of this size. Most of the identified 30 local, road-building contractors that operate in Tanzania are smaller-sized companies that do not have the capacity or scale to manage a single contract of the size required in this project. There are a few large, foreign companies active in the market that reportedly win the overwhelming majority of large projects, and facilitating joint ventures (JVs) between local and foreign/regional firms could be instrumental in overcoming the capacity gap.

Efforts to upgrade the skills and capacity of local suppliers should be focused on improving the availability of certified, leased equipment, and facilitating access to finance to help promising companies scale-up their operations. Local companies looking to participate in civil works projects face significant challenges when it comes to leasing state-of-the-art, heavy equipment, or accessing working capital or investment finance to either buy assets or upgrade equipment already owned. By addressing these gaps local sub-contracting opportunities are expected to increase from 17% to 22%.

The industry is heavily reliant on expensive capital equipment, but a number of key inputs – such as gravel and backfill – can be sourced locally. Road and landing strip projects share many of the characteristics of the site preparation and concrete works industries in terms

of the activities and labor required (see the relevant industry profiles). Many of the goods used (such as gravel and backfill) can be sourced locally and firms have easy access to these consumables from local distributors. The local supply of goods is estimated to be around USD 70 million, mostly consisting of bulk inputs, but that number could rise to USD 120 million if required product quality certifications were obtained (e.g. for aggregates).

The road construction industry provides local employment opportunities for basic- and semi-skilled workers, and for skilled labor such as specialized equipment operators or supervisors.

The industry is labor-intensive, so there will be constant demand for mostly semi- and basic-skilled workers that can be coordinated by a smaller number of highly experienced project managers to ensure that work is completed on schedule, within budget, and according to specifications. Between 75-85% of the jobs in this industry could be captured by local workers, provided they manage to demonstrate the required experience and certifications (e.g. for equipment operators), and this could translate into an average of 340-380 local jobs across the project. While the potential for improving these numbers is limited, it can be noted that the additional positions would be skilled and semi-skilled, which should lead to a significant increase (~USD 10 million or 23%) in local labor payroll. One challenge in this industry will be to localize as many basic-skilled jobs as possible at the community level in Mtwara and Lindi.

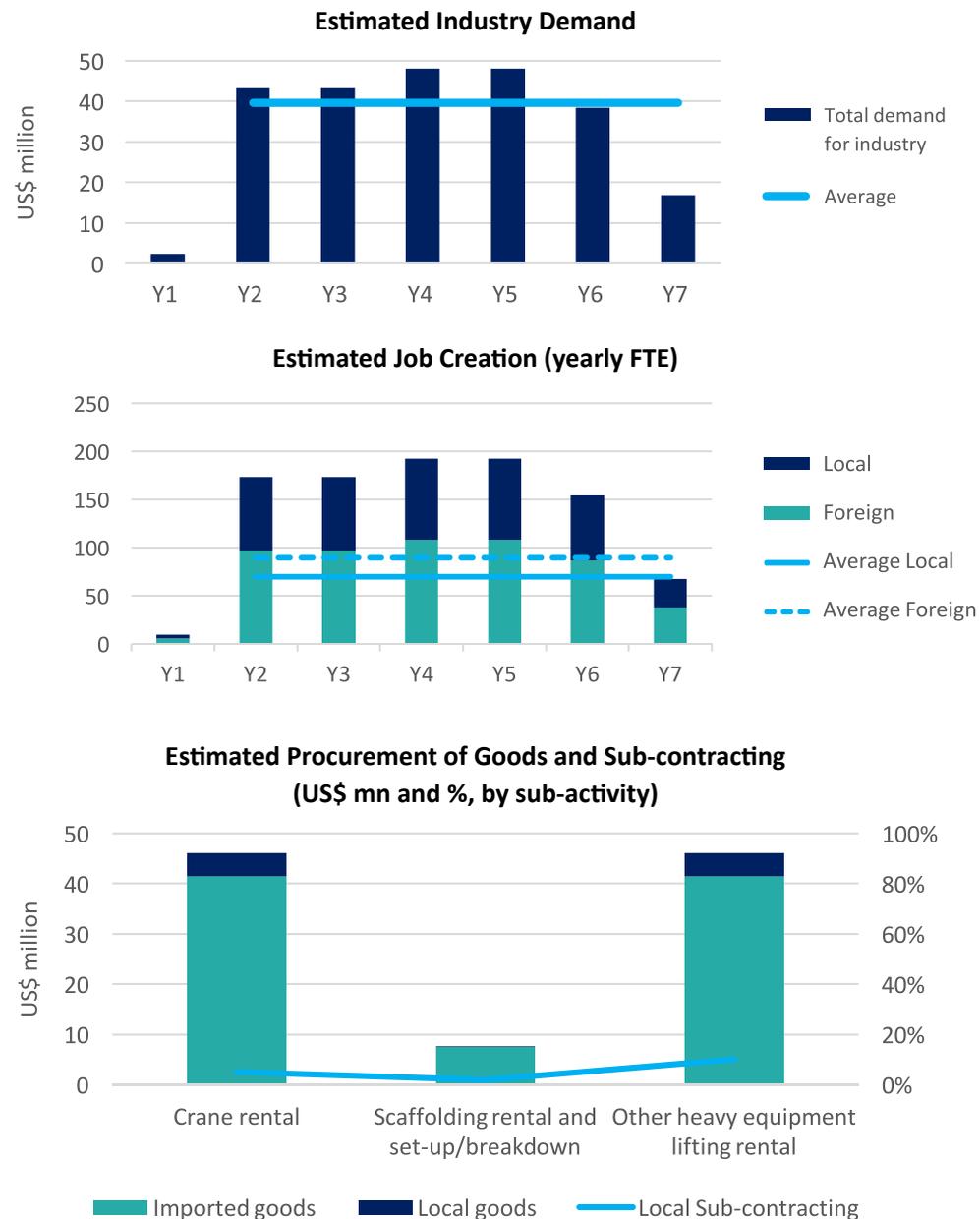
All in all, the involvement of local firms and workers in the LNG project might have a catalytic effect in developing a base of highly transferable skills that could be mobilized in other infrastructure-related projects. Developing the right set of local industrial and labor capacity in this domain could support the broader infrastructural development of the country, including domestic road paving, regional transportation infrastructure construction, and large scale maintenance and repair works. To this end, it is critical that local firms be able to demonstrate their ability to consistently comply with international standards as part of their operations (e.g. use of high quality inputs, accurate traffic and weight levels estimation) to ensure the high resistance and longevity of roads and other transportation network elements

The local capture of this industry will range from 35% to 50% of total demand. Overall, the sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of around USD 120 million, or 35% of the total demand for this industry. If the upgrading interventions mentioned above are implemented effectively, local capture could potentially go up to USD 200 million, or 50% of demand.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

Industry: 07

Equipment Rental and Scaffolding



Summary

Close to a quarter of a million USD will be spent to procure scaffolding and equipment for transporting and lifting goods. Equipment rental and scaffolding works will be needed throughout the LNG construction phase as their contributions are critical to the activity of other industries. The industry includes the following sub-activities: 1) crane rental; 2) scaffolding rental, set-up, and breakdown; and 3) other heavy-lifting equipment rental, including trucking and heavy-lifting machinery.

Although a well-developed equipment rental market exists in Tanzania much of the machinery that is offered is not certified, or, when it is, it is very expensive. This leads many potential customers to buy or lease specialized equipment from foreign companies. Furthermore, scaffolding rental services are virtually non-existent. Only an estimated 5% of all local civil and building works firms own their equipment. Due to high demand, locally leased equipment tends to be moved from one construction project to another without any time to undergo proper maintenance and certification renewal. This results in frequent break-downs of machinery that cause significant project delays. There is also noticeable lack of certified machinery on the market (such as cranes), and what few pieces are available are priced very high. For these reasons, specialized equipment is mostly foreign sourced, either purchased or leased. When it comes to scaffolding, most construction companies usually keep their own material in inventory (which, however, is often made of wood instead of steel as required by international standards), so there is currently no market in Tanzania for scaffolding rental. This industry is therefore expected to generate only USD 10-15 million in local procurement of goods, against a total demand for goods of about USD 100 million.

Equipment rental is likely to be sub-contracted to a large, international company, while the engineering, procurement and construction contractor (EPC) and prime contractors are expected to perform their own scaffolding. For these reasons, opportunities for local sub-contracting will be limited mostly to maintenance services. The equipment rental contract will likely be awarded to a company that already owns all the required specialized and certified machinery. Furthermore, scaffolding will probably be autonomously installed by the EPC or prime contractors that are already engaged in other on-site construction activities, such as Building and Camp Construction, and that are relying on their own equipment to support those activities. The overall potential for local sub-contracting for this industry will therefore be limited to maintenance services and rental of some mobile cranes (provided they are modern and certified), and is expected to range between 6-10% of total demand.

Efforts to raise the performance of local suppliers in this industry should be focused on easing access to finance, on improving the maintenance of leased equipment, and on upgrading scaffolding activities to meet international industry standards. Facilitating access to finance, particularly investment capital, would help position local businesses to buy or lease heavy equipment that is needed to become a

sub-contractor in this industry. However, the leasing market needs, in turn, to increase compliance with international standards of machinery maintenance and certification. This process can be incentivized through greater enforcement of project deadlines in the market, which would penalize delays related to equipment failure. Efforts aimed at upgrading the scaffolding sub-activity could also lead to sustainable benefits because it is a labor intensive activity and there are currently no local scaffolding rental companies on the market despite evidence of demand well beyond oil and gas.

Shortages of qualified and experienced technicians and equipment operators on the local market will limit the potential for local employment in this industry unless quality practical training and certification programs are put in place well ahead of the LNG project. The oil and gas sector adheres to stringent global standards with respect to certification of both equipment and operators. Employment in this industry is expected to be around 200 people at peak of construction activities. Up to 80 positions could be local provided workers are able to demonstrate professional experience and certification. However, if interventions aimed at providing quality practical training and certification services to a larger pool of equipment operators and scaffolding workers are put in place, local full-time positions could increase by almost 60% up to 130 at peak, with the greatest improvement in the number of semi-skilled positions.

The LNG project offers an opportunity to build capacity and skills in this important construction-related industry, which could then be deployed in other capital investment projects. Interventions to increase the preparedness of Tanzanian companies and workers in view of the LNG project could spur development of high-value, local, employment and contracting opportunities that are sustainable beyond the LNG construction phase. For instance, the equipment rental and scaffolding industry could benefit from business opportunities generated in the short-to-medium term by the planned relocation of the Government headquarters to Dodoma, which will require large scale residential and commercial building and construction works. This could also provide incentives to the leasing market to expand the range of equipment offerings and increase the number of machines available to local contractors, thereby reducing utilization rates and allowing for improved maintenance. will require large scale residential and commercial building and construction works.

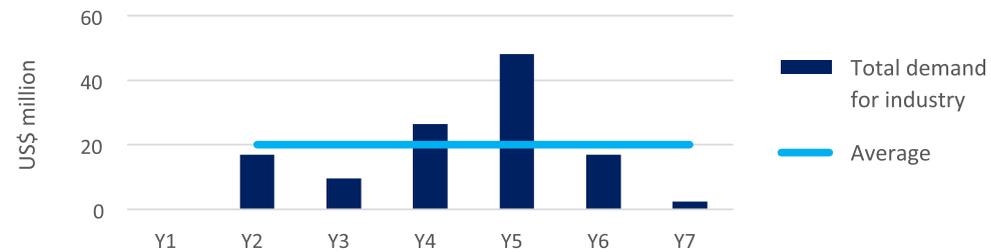
The overall local capture in this industry is expected to be in the range of 10%-16%. The sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of between USD 25-40 million, depending on the effective implementation of upgrading interventions.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

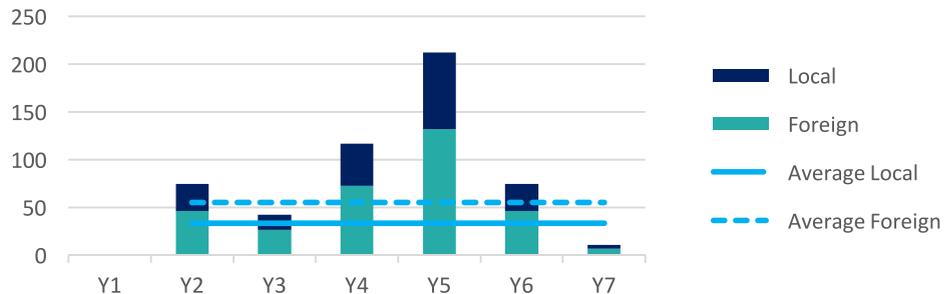
Industry: 08

Basic Electrical Works

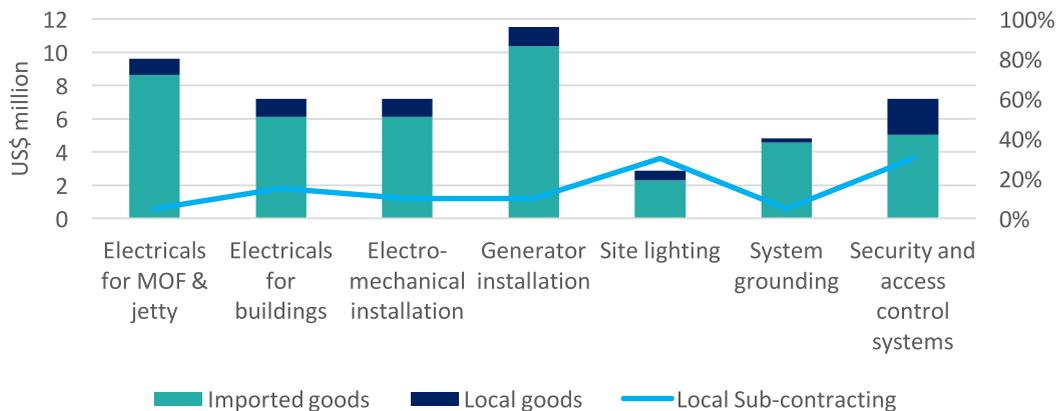
Estimated Industry Demand



Estimated Job Creation (yearly FTE)



Estimated Procurement of Goods and Sub-contracting (US\$ mn and %, by sub-activity)



Summary

Basic electrical works is considered a medium-sized activity in LNG projects that encompasses both the installation of generic electrical systems in buildings – such as control rooms, offices, camps, and accommodation facilities – as well as the work involved in wiring the marine offloading facility (MOF) and LNG jetty. The total demand for power-related tasks is projected to be USD 120 million, broken down into the following sub-activities: 1) the MOF and jetty electrical works; 2) building systems; 3) electromechanical installations; 4) generator/substation installations; 5) site lighting; 6) system grounding; and 7) security and access control systems.

Duties in this industry are commonly self-performed by the appointed engineering, procurement and construction contractor (EPC), but a number of tasks can be sub-contracted. The EPC or an international prime contractor will most likely self-perform the core activities, especially those related to the LNG jetty, but what they will do can be complemented by sub-contracted work depending on procurement arrangements, schedules, and local capacity.

Most local firms currently do not have recognized certifications that meet the standards of the oil and gas industry and would struggle to find experienced electricians that are credentialed to work on oil and gas sites. Most of the firms operating in Tanzania's basic electrical services industry are SMEs. There are a few large companies that manage to secure large civil and corporate works projects in the country, but even those firms typically do not have the internationally recognized certifications for goods and labor that would qualify them to participate in a LNG project.

Urgent clarity is needed on which standards – British or American – will be applied to electrical services for the LNG project. Qualification for contracts is largely dependent on the LNG JV or EPC's choice of standards. Tanzanian firms in this industry normally comply with U.K. standards, which presents a barrier to entry in the event the LNG project ends up using U.S. standards. In fact, it would be unviable to retrain and recertify workers to U.S. standards without certainty that local firms would be successful in being awarded general electrical work.

Despite these constraints and uncertainties, the best opportunities for local firms exist in the areas of site lighting, building electrical works, and security and access control systems. These activities offer the highest potential for local sub-contracting because they do not require highly-specialized knowledge of LNG technology or previous experience in similar projects.

Efforts to raise performance of local industries should be concentrated on obtaining internationally recognized certifications (such as ISO 9001 for firms, or IEC standards for electrical products and for wiring) to demonstrate compliance with quality standards. Regardless of the ultimate standards environment chosen by the LNG JV or EPC, local companies aiming at becoming sub-contractors will have to acquire ISO certifications to demonstrate compliance with international quality management systems, and they will have to employ experienced, certified electricians. Manufacturers will also need to adopt International Electrotechnical Commission (IEC) standards for electrical products and for wiring.

The EPC or prime contractors will employ local workers either directly or through sub-contracted firms, but the search and hiring process will largely be executed through local recruitment agencies. Basic electrical works will be performed throughout the whole project timeframe, but the peak is expected in year 5 when over 200 people will be employed in electrical activities, of which about 80 will be local hires. These local jobs will be generated either by Tanzanian contractors or by the EPC (or prime contractors), and workers will be sourced by local recruitment agencies.

Employment opportunities could be maximized if the local workforce could be certified. If programs to certify electricians are put in place the number of local jobs could double to up to 160 at peak. The benefits from such programs are expected to be sustainable since domestic demand for electrical services in other markets is expected to expand and these types of jobs could be transferrable.

The potential for local supply of goods is limited, as most specialized equipment is imported. It is expected that most of the goods needed for electrical works will have to be brought in from outside the country, especially specialized equipment; however, some basic goods, such as wiring, cabling, and consumables, could be sourced locally, generating around USD 7-9 million in sales.

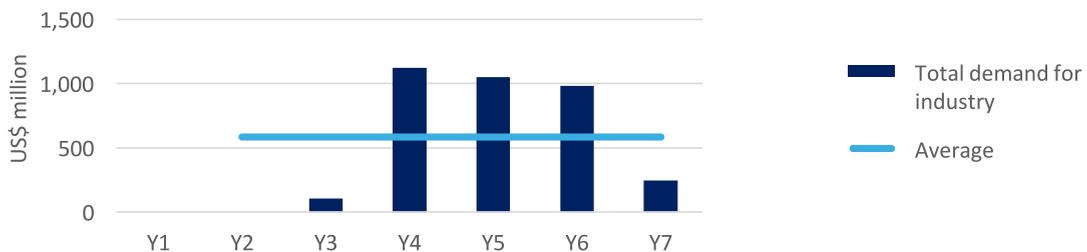
Local capture in this industry could range between 12% -20%. Overall, the sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of USD 15-25 million depending on the effective implementation of upgrading interventions, especially in the area of skill development.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

Industry: 09

LNG Tanks and Trains

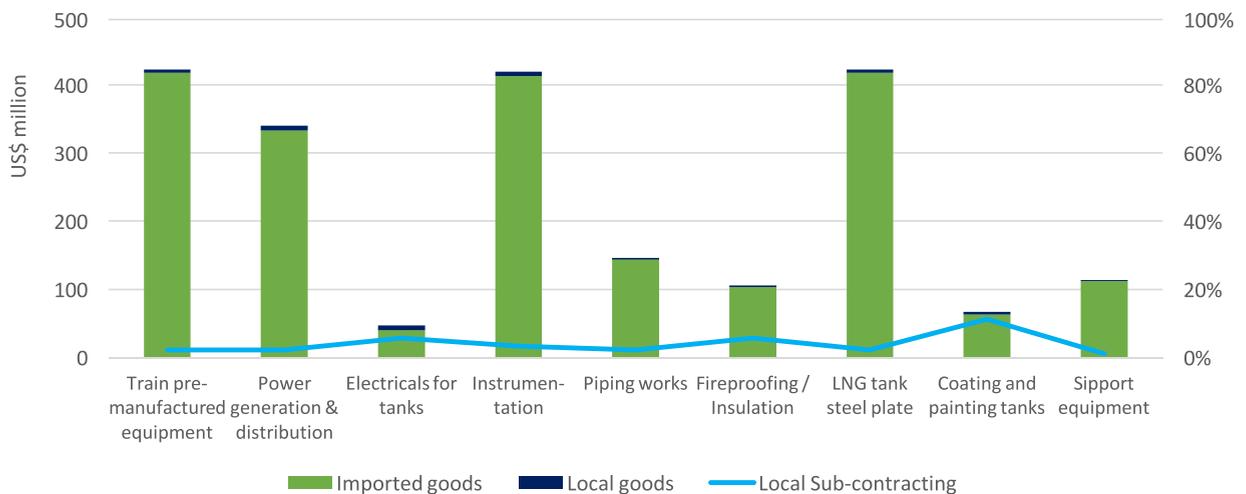
Estimated Industry Demand



Estimated Job Creation (yearly FTE)



Estimated Procurement of Goods and Sub-contracting (US\$ mn and %, by sub-activity)



Summary

The Liquefied Natural Gas (LNG) tanks and trains industry includes the fabrication, assembly, and installation of processing units for gas liquefaction. Total demand for this activity in the Tanzanian LNG project is projected to be USD 3.5 billion to be spent predominantly between years 4 and 6 of the facility construction period. The industry can be segmented into the following sub-activities: 1) process/train premanufactured equipment and installation; 2) power generation and distribution utility; 3) electrical works for tanks; 4) piping works; 5) instrumentation; 6) fireproofing/insulation works; 7) LNG storage tank steel plate erection and assembly; 8) coating and painting tanks; and 9) support equipment.

The high sophistication levels of the industry dictate that most of the activities will be self-performed by an engineering, procurement, and construction (EPC) contractor. Certain tasks may also be sub-contracted to an international prime contractor. In some cases, a EPC that specializes in LNG trains and a EPC that specializes in LNG tanks may form a Joint Venture (JV) for the project to best meet the demands of the client.*

The potential for local sub-contracting and supply of goods will therefore be limited, except for some minor works on tanks coating and painting and the supply of a few consumable goods. Currently, Tanzanian firms involved in related activities are general, electromechanical engineering companies that serve basic industries, so their ability to participate in the highly specialized tasks of LNG train/tank construction will be extremely limited. There may be opportunities for firms that can source certain goods (e.g. basic steel plates for tanks), provided those items meet the stringent specifications of the IOCs or the EPC; however, most of the fabricated steel items used in the industry are imported. In terms of labor and sub-contracting, any local company looking to play a role would have to provide evidence that they are internationally certified to perform certain tasks during implementation of a sophisticated electromechanical engineering project. For these reasons the main opportunities for local companies will likely be concentrated in the 'Tanks coating and painting' sub-activity and in the supply of basic consumable goods, such as electronics, tubing, piping, and paint. Overall, sub-contracting in this industry is expected to range between 3-4% of total demand and local supply of goods could amount to USD 40-50 million, a level that is fairly significant in absolute terms given the very large size of the industry.

Local capture will largely be in the form of labor. The LNG tank and train industry is labor intensive. At peak activity between years 4-6 over 1,600 people may be employed, and of that about 550 could be local workers. If up-skilling and certification programs are put in place that number could go up to almost 900 at peak with significant improvement in the number of semi-skilled and technical positions. Those programs would emphasize development of transferable skills, such as supervisory roles, that could then be applied in a wide range of construction environments.

Efforts to improve local performance in the LNG tanks and trains industry should be focused on improving quality standards and labor skills, and on facilitating the identification of suppliers. Key constraints that must be addressed include the limited availability of certified equipment, goods, and artisans/technicians, and general deficiencies in the country's economic infrastructure. Certification programs for companies and goods to increase their quality and compliance with LNG project standards are recommended, as are professional certification and skills training programs for workers. Establishing an effective and up-to-date supplier database would also help EPCs and prime contractors identify local firms with potential. This is already a work-in-progress as IOCs are setting up their own supplier database for Tanzania with the support of an international service provider.

The sum of local labor payroll and procurement of goods in the LNG tank and trains industry could result in local capture of USD 125-180 million (or 4%-5% of total demand). To maximize their potential for success, local firms should try to progressively build a confidence relationship with the EPC by first accessing smaller tasks in this industry, demonstrating strict compliance with quality requirements and performance deadlines, and then expanding their work to additional areas. The goal is to become the EPC's preferred supplier of certain goods or services for a broad range of construction activities.

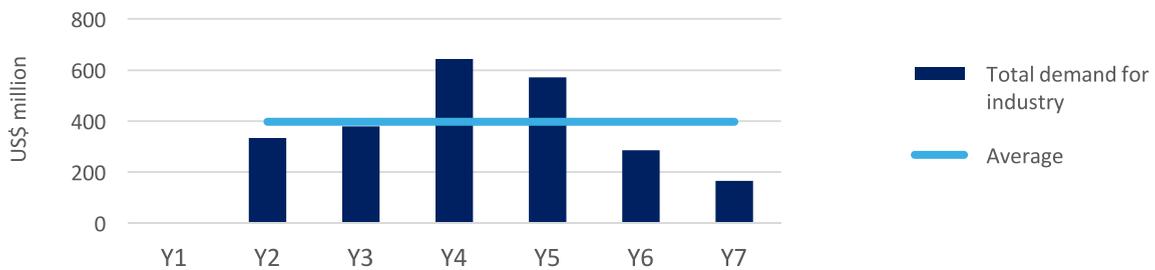
Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

* The Papua New Guinea (PNG) LNG project is an integrated development that includes gas production and processing facilities in the Southern Highlands, Hela, Western, Gulf, and Central Provinces. Chiyoda and JGC formed a JV for this project to install the main LNG plant facilities. Total investment for the initial phase of the project, excluding shipping costs, is estimated at USD 19 billion.

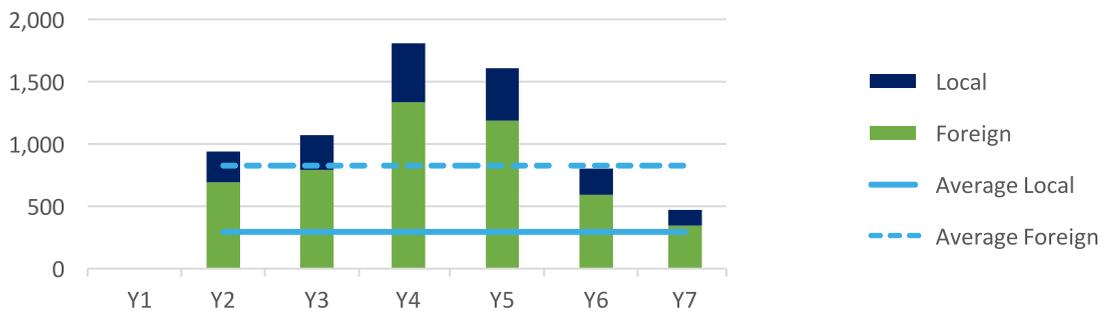
Industry: 10

Metal and Steel Fabrication

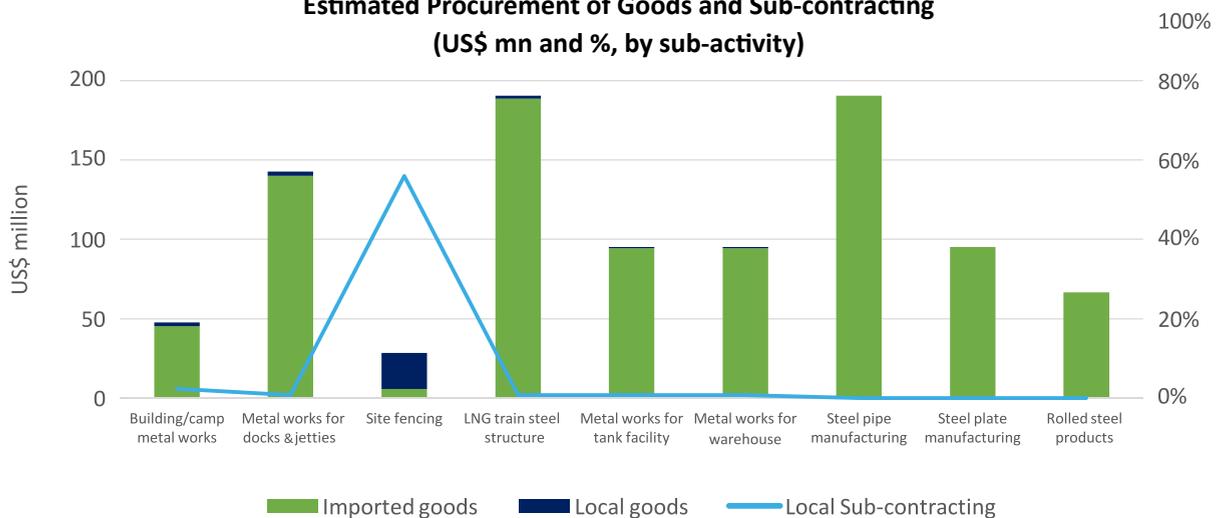
Estimated Industry Demand



Estimated Job Creation (yearly FTE)



Estimated Procurement of Goods and Sub-contracting (US\$ mn and %, by sub-activity)



Summary

Metal and steel product fabrication makes up a large share of total demand in the LNG project because it underlies many activities that relate to the construction of the facility.

Expenditures on metal and steel products totaling up to USD 2.4 billion will be made throughout much of the construction period (from years 2 to 7) and center around the following sub-activities: 1) building/camp metal works; 2) metal works for docks/jetties; 3) site fencing; 4) LNG train facility steel structure work; 5) metal works for the tank facility; 6) metal works for the off-site port, container, and warehouse depots; 7) steel pipe manufacturing; 8) steel plate manufacturing; and 9) rolled steel products.

Activities in this industry are traditionally performed by an engineering, procurement and construction contractor (EPC) or large international contractor; however, there will be opportunities for Tanzanian firms to supply goods and labor on a sub-contracted basis.

Most of the metal/steel fabrication sub-activities will be performed in yards outside of Tanzania due to the limited availability of inputs and equipment. Product standards (such as metallurgical composition, galvanization, and external coating) and fabrication methods (welding techniques) must meet the highest-quality testing and certification thresholds. Currently, the industry in Tanzania is made up of a mix of small and medium-sized companies and larger firms, most of which are non-specialized mechanical engineering companies that provide a broad range of products and services and rely heavily on imported inputs. It can therefore be expected that few items will be purchased locally, but there may be some sub-contracting opportunities for firms that can source goods globally that meet the stringent specifications of the international oil and gas companies (IOCs) and the EPC. Business for local firms may also arise from situations where the EPC may be facing downtimes related to, for instance, delayed supplies, and may need to quickly mobilize support in less technically challenging areas of fabrication, such as assembly of prefabricated units (e.g. walkways, stairways, roofing and other low risk tasks). This would allow local players to provide first hand evidence of their capability, which in turn could qualify them for further work as the construction progresses. It is expected that the share of local

sub-contracting will range between 3% and 5% of the industry demand, while local supply of goods will amount to USD 30-50 million.

The greatest potential for local capture lies in the sub-activities for site fencing and building/camp metal works; however, most opportunities will be conditional upon certification of equipment and goods.

Building and camp metalwork and site fencing involve fewer technical elements and that makes the participation of local firms more feasible; however, potential sub-contractors will have to provide evidence of access to certified equipment for forming products prior to fabrication. Efforts to improve local performance should therefore be focused on upgrading quality standards and business capacity in selected markets, such as steel works for buildings and perimeter fencing, where there is sustainable demand and opportunity beyond the LNG project in other sectors (e.g. the building of power stations or industrial zones).

There is significant potential for local employment concentrated on-site.

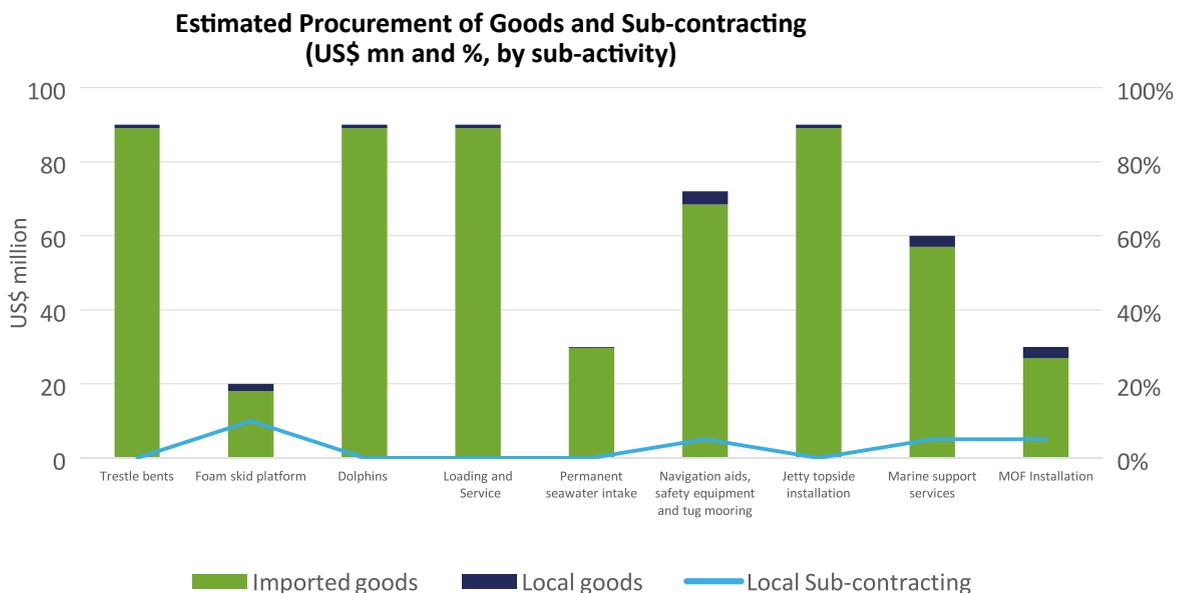
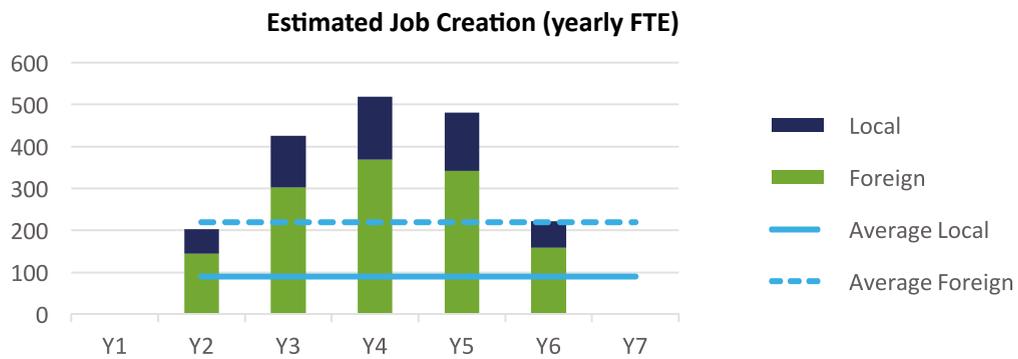
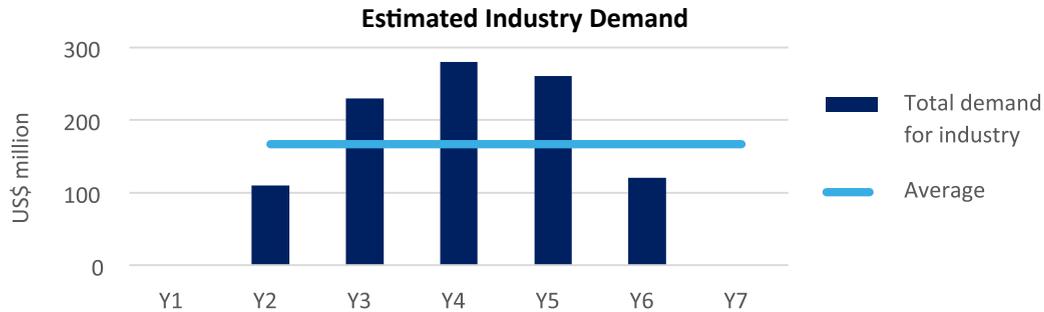
This industry is labor intensive and could generate an average of 1,100 total jobs across the project, of which about 300 could be local. More than half of the jobs will be filled by foreign nationals (fabricating pipes, steel plates, etc.) performing in factories outside of Tanzania, whereas almost 80% of local jobs will be located on-site, supporting goods offloading and assembly. Local labor will be hired by both local sub-contractors and the EPC or prime contractors (where tasks are self-performed) and services like welding, shaping and cutting, and assembly of components are core activities that can be upgraded locally to increase the participation of Tanzanians, up to an average of 500 jobs at peak.

The sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of up to USD 120-195 million, or 5% to 9% of the industry demand, depending on the effective implementation of upgrading interventions.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

Industry: 11

Docks and Jetties



Summary

The Docks and Jetties industry – consisting in the construction of docking, shore-based offloading facilities to support the construction of the LNG plant, and an LNG loading jetty – presents a large market potential. The total activity demand level for this industry is projected to be USD 1 billion, spread quite homogeneously across the project and broken down into the following sub-activities: 1) trestle construction onshore and over water; 2) foam skid platform; 3) dolphins (breasting and mooring); 4) loadings and service platforms; 5) permanent seawater intake and superstructure; 6) navigation aids, safety equipment and tug mooring; 7) jetty topside installation; 8) marine support services; and 9) marine offloading facility (MOF) installation.

However, no local firms registered in Tanzania currently have the technical capacity and requisite scale to be competitive for a contract to build the docks and jetty associated with this project. The engineering, procurement, and construction contractor (EPC) or prime contractors are expected to self-perform most of the activities, while only very small scopes of work will be sub-contracted locally. The pioneer and MOF docks will likely be bonded in a single contract performed by the EPC. The LNG jetty contract, on the other hand, is usually awarded to a primary contractor that is able to self-perform all the highly specialized cryogenic and related topside work. Given the high level of quality and civil and marine specifications required, the EPC and prime contractors are unlikely to sub-contract docks and jetties projects. They could however draw on existing labor skills and locally registered firms for a few small tasks that do not demand much in terms of technical sophistication and do not require capital-intensive equipment (provided those workers and firms can demonstrate previous experience in other related civil works projects or fabrication projects). This is the case, for example, for the construction of a foam skid platform – a piping structure above the jetty where safety foam (to be used in case of overheating or fire) is stored. Local sub-contracting is expected to be in the range of only 2%-3% of industry demand.

Similarly, local supply of goods is expected to be constrained by the lack of specialized, certified equipment for lease in the local market, and by the limited availability or inadequacy of financing for business growth. Overall, it is expected that local supply of goods could amount to around USD 15 million. However, measures aimed at providing affordable and longer term capital to firms to upgrade and/or upscale their activities, and improving the availability of certified equipment in the leasing market, could help increase local supply of goods up to USD 20 million. Efforts should be concentrated in improving capacity for those goods and services that are expected to benefit from sustained demand beyond the life of the LNG project; otherwise, local suppliers will have no incentives to invest resources and time into unsustainable upgrading efforts.

While local sub-contracting and goods supply opportunities are limited, most of the local capture will be in the form of labor hired for self-performed activities by the EPC/prime contractors. This industry is expected to generate an average of 300 jobs throughout the project, of which about 90 could be local (reaching a peak of 150 in year 3). However, there is a critical need to start upskilling and certifying experienced technicians to qualify them for supervisory and specialized roles and to develop their high value, transferable skills. Interventions to structurally improve skill levels in the industry could have sustained impacts on both the employability of the local workforce and the ability for firms to provide certified labor and therefore win future contracts. Thanks to these interventions, local jobs could almost double to 180 on average (with a peak of 300).

Overall, local capture in this industry could amount to USD 35-65 million. The sum of local labor payroll, procurement of goods, and profits for domestic enterprises could result in local capture of between 4%-7% of total demand, depending on the effective implementation of upgrading interventions.

Note: All upside figures in the ranges represent a success case scenario and are subject to the successful implementation and uptake of the recommended interventions by the target markets/sectors/entities.

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