

Industrial Baseline Survey in Uganda

Report





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PRELIMINARY NOTE

This report is a synthesis of the main outcomes of the Industrial Baseline Survey (IBS).

Detailed presentations (slideware) illustrate graphically the insights described in this report along the following dimensions:

- Supply and demand for manpower;
- Industrial survey results by industrial sector;
- Recommendations.



INTRODUCTION

Executive Summary

Objectives

Over the last few years there have been a number of significant oil and gas discoveries in East Africa, which are now moving to the development stage. Countries like Uganda are increasingly interested in leveraging these opportunities to stimulate the development of a sustainable and productive local industry.

Oil and gas companies like Total E&P, CNOOC and Tullow Oil have experienced the challenges associated with Local Content (LC) requirements in countries where they operate, such as Nigeria and Angola where pressure from the government has grown significantly but without specific focus or long term vision.

Experience shows that it takes years and sometimes decades before local content programs have a material impact on a country. Governments and public are generally not prepared to wait so long.

CNOOC, Total E&P and Tullow Oil are preparing for large projects in the Lake Albert (LA) region. In this context, the three partners have decided to launch a corporate initiative to define a strategy to support the industrial environment as early as possible.

The objective of the Industrial Base Line Survey in Uganda ('IBS') is to evaluate local capacity to supply the oil industry with skills and goods with a view to identifying strategies to bolster it.

Main insights

The Industrial Baseline Survey (IBS) measured the number of people and the volume of raw material and equipment that will be necessary for the Lake Albert oil and gas projects.

In terms of people, there will be a peak of direct jobs generated at 13,000 in the first years of the project during the construction phase. Later in the production phase, this number will plateau at 3,000 people to operate and maintain the fields.

The vast majority of the competencies required will be related to construction first and then to operations and maintenance. Craftsmen, mechanical technicians and electrical technicians will represent the vast majority of the staff on site (60%). People without any educational background required ('unskilled') will represent 25% of the manpower, while engineers and managers will account for only small proportion of the overall needs (15%).

Consequently, the educational background of the future workers and engineers on site will be mainly around the disciplines of civil and mechanical engineering rather than petroleum engineers or geosciences.

Oil and gas operators strongly control the competencies of the staffs on site in order to avoid quality failure that can turn into damage to people or environment or heavy financial loss. Workers and engineers need to be certified in several disciplines, i.e. they need to receive an accreditation allowing them to work on site. One of the key insights of the IBS is that a substantial peak of certified workers will be required at the beginning of the project. Around 5,500 workers will have to be certified by the end Year 3.

Beyond direct jobs that will be created on site, the oil and gas activity will also generate indirect and induced jobs. Based on SBC's international benchmarking research carried out among oil-rich countries and applied to the Ugandan case, 100,000 up to 150,000 jobs will be generated by the Lake Albert projects.

From an industrial standpoint, the Industrial Baseline Survey studied 25 sectors that will be impacted by oil and gas activity. The survey reveals that a few industries will be able to absorb the peak of demand, like cement or structural steel. Most industries will need to ramp up seriously to be able to benefit from the future growth, like reinforcement steel or flat steel. Finally, some sectors will need a complete transformation to be able to cope with future needs since the gap between future demand and current supply is at the range of the multiplier (e.g. hazardous waste management or road construction).

Main challenges

When companies established in Uganda were being asked what their main barriers for development in the country are, the answers were the following, in the descending order of importance:

- Visibility over demand
- Access to finance
- Infrastructures
- Administration
- Training of skilled people
- Oil and gas certification process
- Capacity of suppliers

These obstacles to development have to do with several types of stakeholders, public and private. Seeking to address these barriers should therefore involve not only the oil and gas operators but also the public stakeholders.



The first main challenges that the country is facing is education. The need to train thousands of technical workers in a short period of time is complex. It requires high upfront investment and speed of execution. The survey reveals that time is of essence: if a massive training program does not start quickly in 2014, the country will not be ready to supply Ugandan qualified workers to the construction phase. In other terms, jobs that could easily be granted to Ugandans will end up in the hands of expatriates workers if nothing serious is done in the education front.

The second main challenge of the Lake Albert oil and gas projects is managing the after peak period. Right from the start of the construction phase it will be important to identify future sectors likely to absorb the future qualified and trained workers and engineers that will not be needed any longer after the construction phase.

The third main challenge is to support and develop the local industry. Future local suppliers have to anticipate the forthcoming demand both in terms of production capacity and in terms of quality to match oil and gas standards. Oil and gas operators have a key role to play in this preparation phase before the construction starts.

Main recommendations

The main recommendations detailed in the Industrial baseline Survey are the following:

- Recommendation 1: Organizing a forum with potential suppliers to communicate on future demand of people and equipment;
- Recommendation 2: Creating an 'Industry Enhancement Center' to prepare future suppliers to LA project demand;
- Recommendation 3: Developing a list of suppliers and a register of talent in Uganda;
- Recommendation 4: Supporting several specific and selected sectors;
- Recommendation 5: Supporting the best existing universities;
- Recommendation 6: Supporting the best existing technical institutes;
- Recommendation 7: Establishing a dialogue between universities and private employers;
- Recommendation 8: Envisage the creation a technical training institute.

Approach

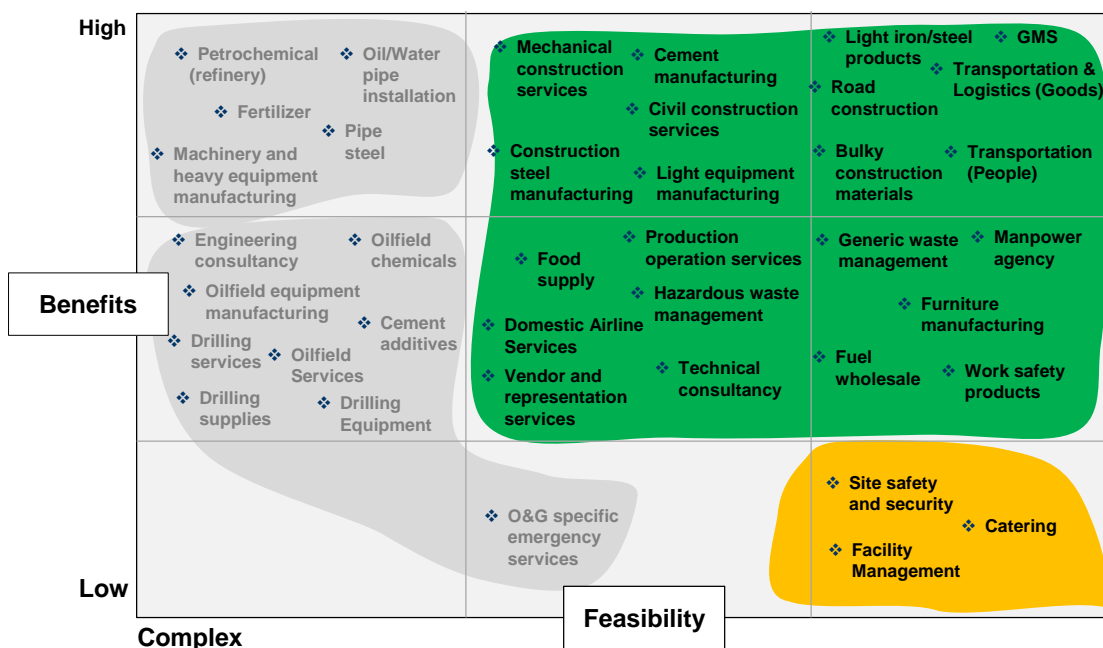
The Industrial Baseline Survey was delivered in three steps over 16 weeks, from early April to mid-July 2013.

Step 1: Scope of the industrial study

The first phase of the study was dedicated to identifying the industrial sectors likely to be directly or indirectly impacted by future oil and gas projects in Uganda. Of the industries identified, 25 revealed a higher potential for local content based on an assessment of both their benefits to the country (i.e. number of jobs created and skill level of jobs) and feasibility (i.e. investment intensity and ramp up time required to reach oil and gas standards), as illustrated in figure 1.

All industries whose feasibility in Uganda would be too complex to develop within a reasonable time (grey area) were excluded from the IBS. However, they are still areas of interest for the oil and gas partners. Measures towards education (investigated in Step 3) typically address the industries which need Ugandan talent. There are no Ugandan companies today that operate in niche industries like oilfield services, chemicals or drilling, and it would take decades before they actually exist.

Figure 1: Mapping of industries on benefits-feasibility matrix
Green and Yellow areas are the scope of the supply survey





Step 2: Supply and Demand analysis

The second step of the study focused on the supply and demand analysis of the 25 selected industries (Figure 1, green and yellow areas) and corresponding gaps. It also included a comparison of future manpower needs that would be generated by the Lake Albert project (demand for manpower), to the number of available candidates in the country (supply of manpower).

Demand information was provided by the operators based on analysis and estimations performed internally by project teams for each phase of the project (drilling, construction, operation, logistics, etc.).

Supply information was assessed through questionnaires distributed to several hundred of Ugandan companies operating in the 25 identified industries, together with data collected from the education system.

This study required high level of activity on the ground. More than 100 interviews were conducted with companies established in Uganda, Ugandan professional associations, actors from the educational sector (universities and technical institutes), international organizations and governmental bodies (UBOS, UIA).

Step 3: Possible actions to reduce the gaps

The third and last step of the study was aimed at identifying possible local content development action that could be taken to reduce the gap between current industrial capabilities in Uganda (including manpower) and future demand generated by the oil and gas projects.

Assumptions and hypothesis

The data, collected through the three partners Total, CNOOC and Tullow, was re-worked and integrated into a large database designed to assess the demand for manpower, raw material and equipment in the next years.

The various assessments developed in this study rely on several assumptions.

- **Timeline:** the planning taken into consideration for Lake Albert Basin Development (LABD) projects is the same as the one shared with the PEPD in May 2013 and LABDC in October 2013. Figure 3 below illustrates the plan in a simplified structure.

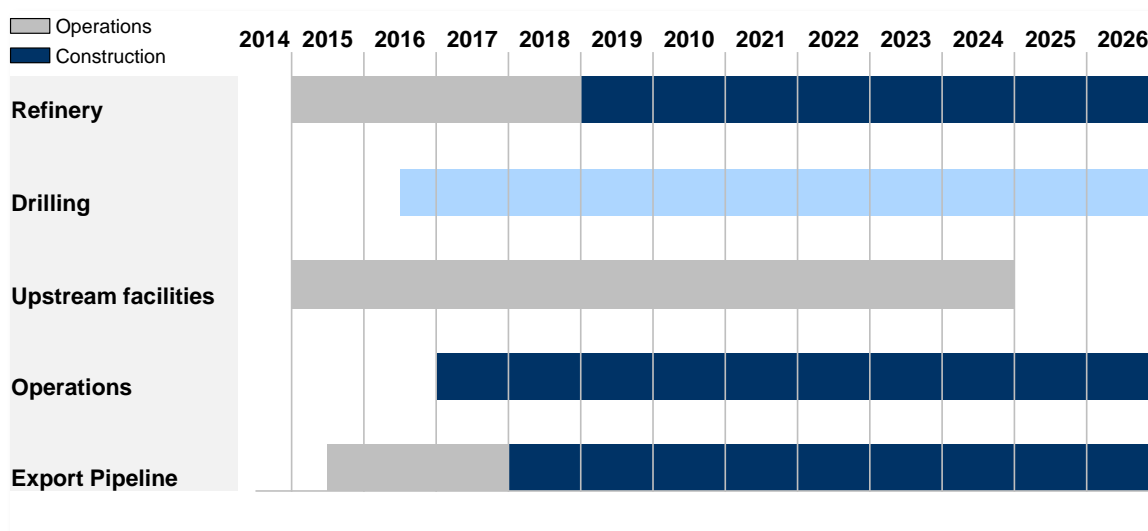


Figure 2: Timeline of future Lake Albert projects (as of May 2013)

- **Refinery construction:** The oil and gas operators are not responsible for construction of the refinery. They have not mobilized internal teams to study this project and therefore have no specific data describing the manpower and equipment needs. In addition, existing studies on the future Ugandan refinery do not mention or allow for any assessment of manpower needs in the construction phase.
 - Faced with this shortage of local studies, CNOOC provided estimates of manpower needs for construction of the refinery based on proxies observed in other similar environments (example of other refineries);
 - The hypothesis taken assumes single phase construction model leading to a refinery with 30,000 barrels of oil per day (bopd) capacity, and not a phased construction resulting in 60,000 bopd in the second phase. The rationale for

choosing the 30 kbopd single phase approach is based on the lack of available data on technical feasibility and timing for the two-phase approach (60 kbopd).

- **Construction (infield activities)**

- Data were provided by the 3 operators;
- This phase includes three Central Processing Facilities (CPF), operational camps, temporary camps, water intake facilities, pumping stations, well pads and above ground installations;
- Construction is assumed to follow a ‘stick-built’ approach (imported equipment small enough to be transported by truck are assembled on- site) as opposed to a ‘modularization’ approach (larger pieces of equipment).

- **Export pipe construction**

- Data were provided by CNOOC and Total E&P;
- It is assumed that the distribution of manpower between Uganda and Kenya is proportional to the length of pipeline in each country (~30% in Uganda and ~70% in Kenya);
- Around 600 meters of pipeline will be installed every day by three crews;
- Mobilization and infrastructure preparation will take 9 months, construction on site will take 18 months, final test and commissioning will take 9 months.

- **Drilling**

- Data were provided by Total;
- ~80 people per rig for 40 positions;
- 9 rigs at peak (2018-2020);
- ~670 wells in total.

- **Transportation:**

- Data were provided by the 3 operators;
- Manpower required for transport is based on the number of trucks, trailers, and buses required;
- 1.2 drivers required per truck/bus;
- 1 traffic coordinator per 10 drivers.

- **Production operation**

- Data were provided by the 3 operators;
- Manpower are required primarily to operate the central processing facilities (CPFs) serving the four distinct areas, conduct well intervention and workovers, monitor reservoir during production operations;
- People are mobilized 6 months before production starts;
- Operations start with Kaiso Tonya followed by Kingfisher then Buliisa South then Buliisa North;
- 2018-2023: 2 workover units and 2 well intervention units required;
- 2023-2030: 4 workover units and 5 well intervention units required.

- **Export pipe operations**

- ~200 people for export pipe operations (indicative estimation).

- **Refinery operations**

- Data were provided by Total;
- Assessment based on the capacity of 30 kbopd due to lack of data on a 60 kbopd refinery.

A manpower database has been designed to facilitate the study, listing approximately 400 positions required to build and operate Lake Albert onshore oilfields (by domain, skill level, and educational background, type of employer and recruitment geography). This database forms the basis of the manpower demand analysis (see Figure 3).

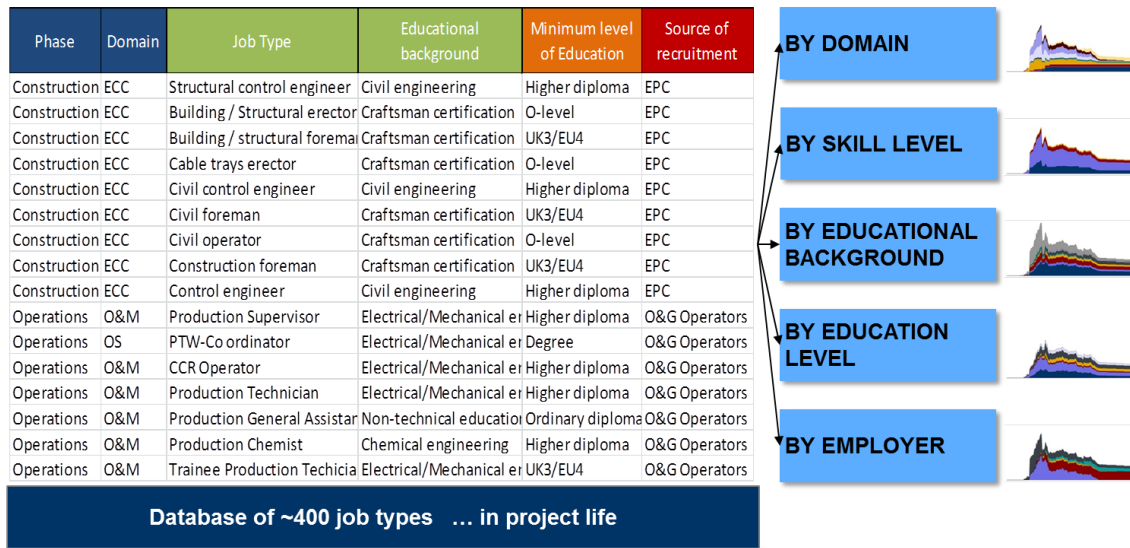


Figure 3: Extract from the database of 400 job positions and derived segmentations

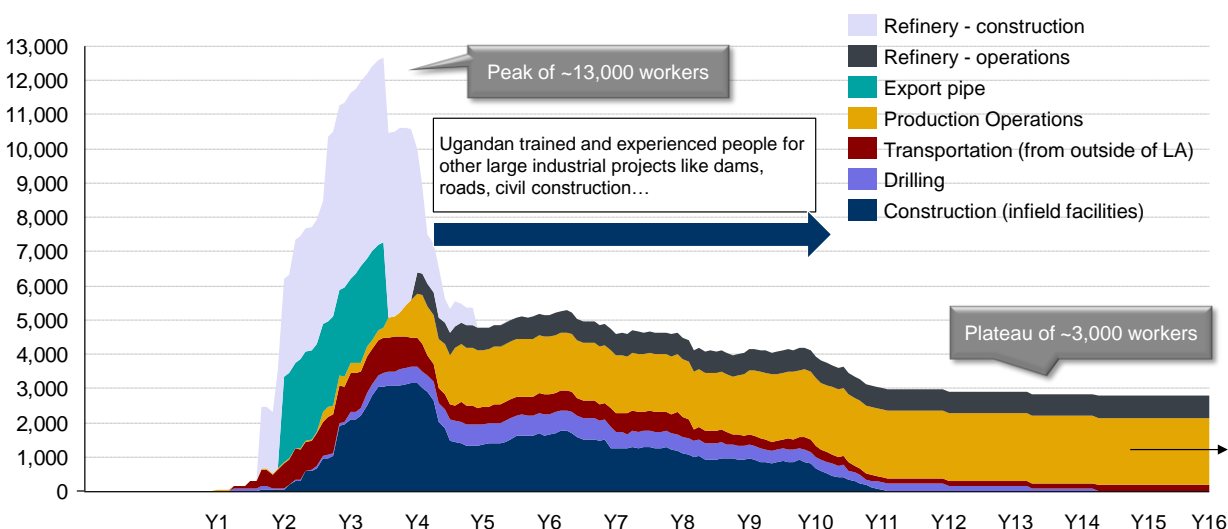
MANPOWER ASSESSMENT

Direct Manpower requirements

View by project phase

The Lake Albert Basin Development projects will require the creation of thousands of direct jobs in Uganda, with a peak of about 13,000 workers including refinery jobs (see figure 4). This assessment of manpower is done by phase of the Lake Albert project.

Figure 4: Manpower split by development phase (refinery included)
Cumulative number of people required to build and operate LA projects on site



Source: SBC analysis; CNOOC; Total; Tullow

Note: Refinery operation manpower for a 30kbpd capacity; Transportation and Export Pipe exclude Kenyans

Year 1 (Y1) represents the actual starting point of the Lake Albert project. At this point the final investment decision (FID) is approved by the Government of Uganda and contracts for engineering, procurement and construction (EPC) will be awarded to start the construction phase.

- **The construction of the Refinery** alone will require around 5,000 workers at peak (Year 3) and 650 workers in operations (based on a 30kbpd refinery);
- **The Construction phase**, which includes all the upstream facilities construction (excludes refinery), will require around 3,000 workers at peak (Year 4) and continue to employ around 1,000 people after Year 5, essentially for well pad construction;

- **The Drilling & Production Operations** phases include the manpower requirements for drilling and CPFs operations, well intervention, workovers and reservoir monitoring during production. The overall demand for these two phases will not exceed 2,300 people and will remain stable overtime. Among the manpower required for these two phases, the geoscientists (geologists and geophysicist) and petroleum engineers (reservoir, drilling, completion, and production engineers) should not exceed 600 jobs maximum, including oilfield services beyond the only oil and gas operators;
- **Transportation** phase includes the manpower required for the transportation of people, equipment, and raw material inside and outside Lake Albert area and excludes manpower required for transportation services from Kenya to Uganda, primarily needed for transport of sophisticated equipment. Transportation phase will require at peak around 900 people (Year 3 & 4) in Uganda;
- **Export pipe** phase includes manpower required for the construction and installation of the export pipe and corresponding facilities (stations). One third of the manpower needed will come from Uganda, whilst the remaining two thirds will be Kenyan (relative split based on pipeline length in each country). This split equates to around 2,500 jobs generated at peak (Year 3). It should be noted that the manpower required for pipeline operations (~200 people) is integrated into the 'export pipe' layer illustrated in figure 4.

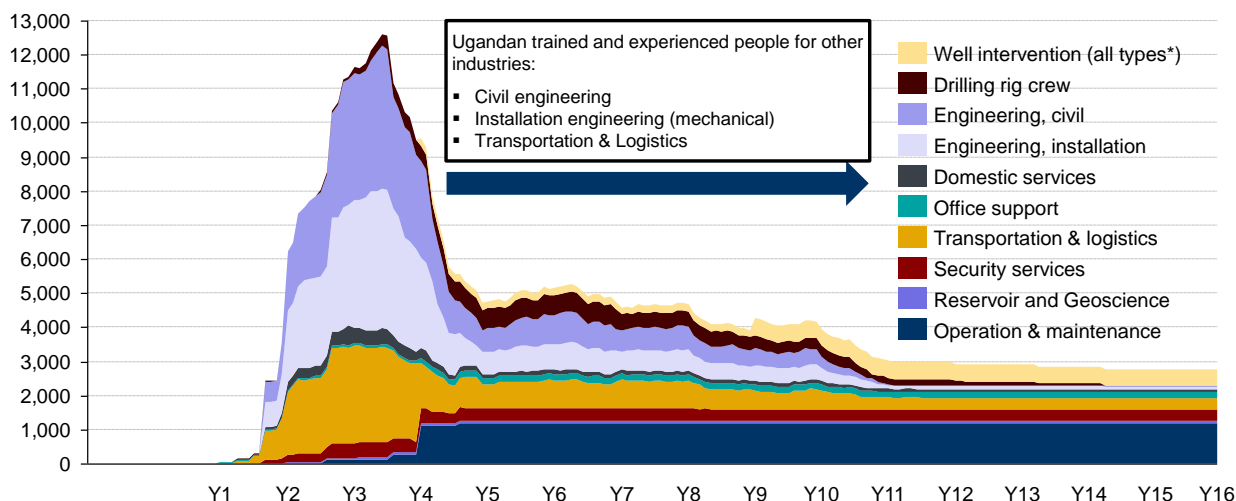
The most striking insight from this manpower assessment is the management dilemma resulting from the contrast between manpower needs at peak (~13,000 direct jobs) and needs in stable operation phase (~ 3,000 jobs). This sharp drop in manpower 'after-peak' is most evident in the refinery where 5,000 people are needed for construction and only 600 to 700 maximum jobs required in operation phase.

In other words, Uganda will have at its disposal a national talent pool (trained, qualified and experienced skilled and semi- skilled resources) that can be leveraged in other industries (Hydro-electric power generation projects like dams construction, roads, plants, buildings, etc. will require civil craftsmen, welders, technicians or drivers) after the construction peak. Thus it is pivotal that all public and private stakeholders plan for this after-peak period right from the beginning of the project.

Similarly, it could also be interesting to think about exporting competent workers with oil and gas facilities construction experience to neighboring countries like Kenya or Tanzania where similar projects are also being developed.

View by domain

A detailed analysis of manpower requirements for the Lake Albert Basin Development projects by domain reveals a high demand for civil engineering, mechanical engineering, and transportation jobs at peak in Year 3 (see figure 5). From Year 4 onwards (after-peak), manpower requirement will be more focused on operations; maintenance and well intervention.



Source: SBC analysis; CNOOC; Total; Tullow

Note: Drilling rig crew includes all personnel required for drilling operations; Engineering, installation includes managers, engineers, technicians, and unskilled people providing mechanical construction services; Domestic services include manpower for catering and facility management; Office support includes support staff in offices like planners and contract managers; Transportation & logistics includes drivers of trucks and buses and traffic coordinators; Reservoir and Geoscience includes geologists, geophysicists, etc.; Operation & maintenance includes production planners, production technicians, inspectors, maintenance supervisors, etc.

Figure 5: Manpower split by Domain (refinery included)

There will be a progressive transfer of manpower from construction of upstream facilities and export pipe and transportation to operations & maintenance. Such a transfer needs to be anticipated because of the conversion time and training required in moving experienced construction workers into operations and maintenance roles.

The definition and content of each domain is detailed in the Appendices.

View by skill level

The study also points out that the majority of jobs generated in Uganda will be for technicians and craftsmen (60%), followed by unskilled workers (25%) and then engineers and managers (15%). Training efforts need to be aligned with this reality given that the biggest pool for jobs generation in Uganda is technicians and craftsmen, not engineers (see Figure 6).

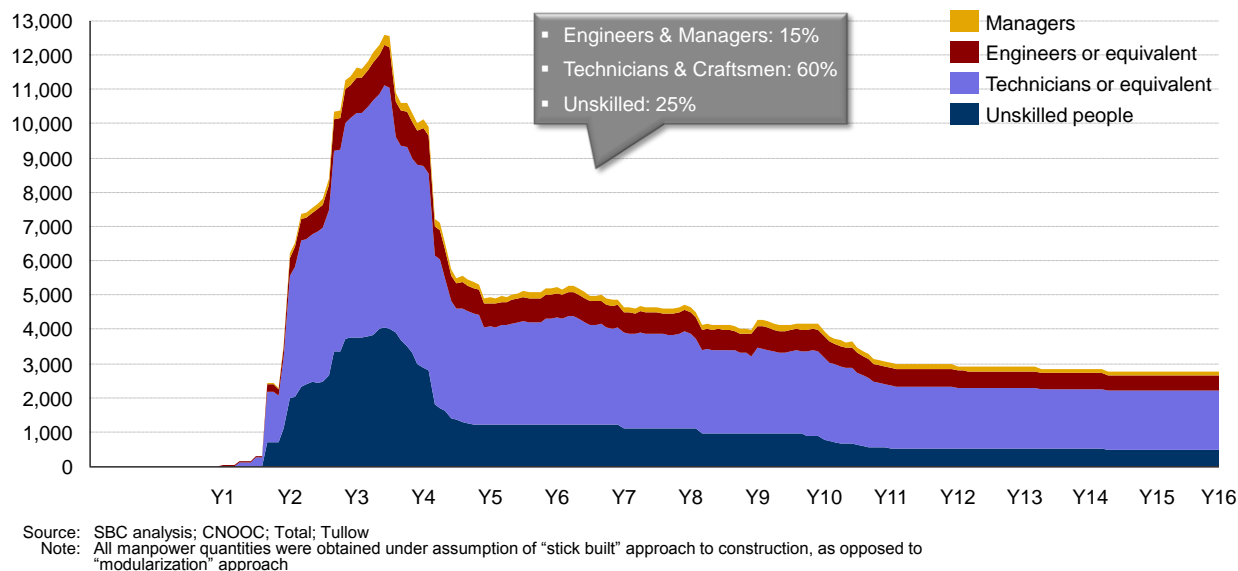


Figure 6: Manpower split by skill level (refinery included)

The definition and content of each skill level is detailed in the Appendices.

Beyond the views by phase, domain and skill level, other views exist in the Appendices (by employer, by degree level, by geography...)

Indirect and induced jobs generated

Beyond the direct jobs generated by the construction and operations phases of the Lake Albert Basin Development projects, oil and gas activities will create demand for other activities outside the strict boundaries of petroleum activities.

Although indirect activities are derived from the oil and gas projects, they are not exclusively dedicated to oil and gas projects. In the case of Uganda, an important number of industries will be boosted by oil and gas projects offsite, like environmental services, manpower agencies, construction materials, etc. Jobs generated by these activities qualify as indirect jobs.

Beyond direct and indirect jobs, many jobs will be 'induced' by oil and gas activities. By 'induced', we refer to wealth generated through the re-distribution of oil revenues in the local

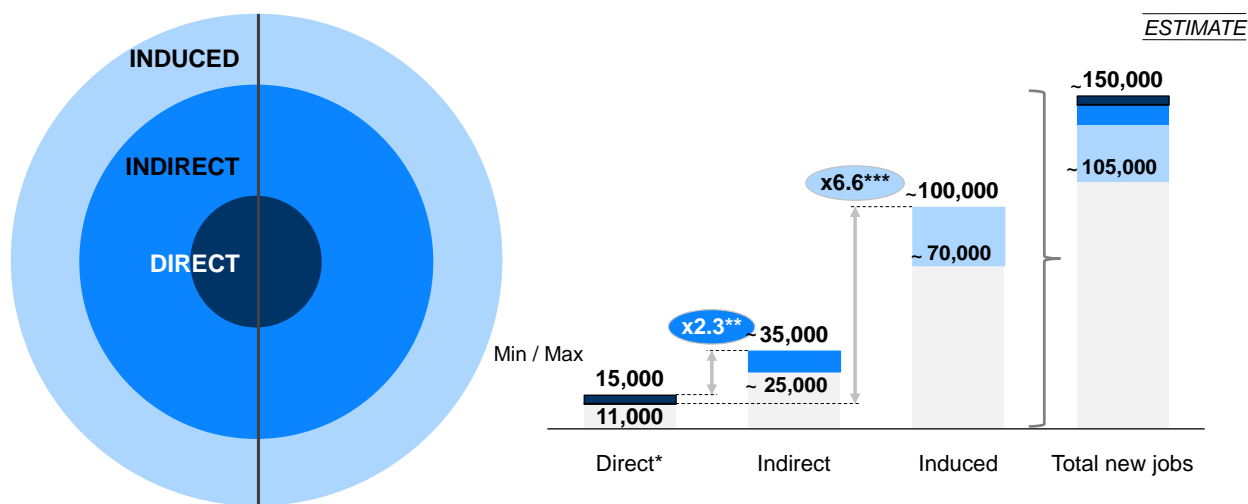
economy. This distribution happens either naturally through individuals spending the money earned through oil and gas projects or deliberately with governments distributing oil revenues in other industrial projects like infrastructures. This re-investment of oil and gas revenues in the economy will induce jobs in sectors like hotels, banks, insurance companies, or new schools.

Direct, indirect and induced jobs created by LA oil and gas projects can be schematically represented in circles of various sizes, as illustrated in figure 7. To estimate the number of indirect and ‘induced’ jobs from direct jobs, the survey 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) or Stavanger (Norway).

This international benchmark of similar developments in the petroleum industry locally revealed a range of coefficients that can be applied to the number of direct jobs created. The range varies from 2.3 to 3.8 when moving from direct to indirect; and 6.6 to 8.4 (depending on the geography) when moving from direct to induced. In the case of Uganda, a conservative approach was taken with the lowest points of each range taken into account.

Finally, the overall benefit for Uganda in terms of jobs generated from Lake Albert oil and gas projects should vary in the range of 100,000 to 150,000 jobs, resulting from the direct, indirect and induced jobs created.

Figure 7: Jobs generated in Uganda by Lake Albert Basin Development projects (refinery included)



Source: SBC research on “stand alone” oil and gas cities (Stavanger - Norway, Aberdeen - UK, Macaé – Brazil, Trinidad & Tobago)

Note: *Number of jobs created was computed as peak of manpower (13,000) for Lake Albert Basin Development projects. ±15% was added to account for uncertainty

**Ratio direct to indirect varies in the range of 2.3 - 3.8 depending on geography

***Ratio direct to induced varies in the range of 6.6 - 8.4 depending on geography

Supply of Manpower in Uganda

The survey details the ‘supply’ side from recognized universities and institutes. An assessment of the number of graduates, technicians, and craftsmen likely to become available by the time of the construction phase has been performed so as to evaluate the future gaps between supply and demand.

Preliminary remarks

1. The pool of existing Ugandan technicians and engineers was not considered in the assessment of ‘Supply’ not only because there was no available data to assess this (in terms of competencies or absolute numbers) but also because these people are required to stay in place where they are employed. It is required that oil and gas projects do not pull human resources already working in other sectors. Therefore in the survey, ‘Supply’ refers to the number of young people graduating every year in the Ugandan education system in any disciplines related to oil and gas projects, construction included;
2. The second remark is that we are talking here in pure quantitative terms (number of students graduating every year), not in qualitative terms (level of skills learned). It is essential to understand that several disciplines in any oil and gas project need to be certified to operate on an oil and gas field in development or in production by autonomous training institutions of third parties. Such certified workers (welders, machine operators ...) hardly exist in Uganda.

Methodology to assess gaps, for all disciplines

To reach a conclusion on possible future quantitative gaps (not qualitative yet), the survey has developed a projection that takes into account several elements, including:

- The need not to ‘dry out’ the Ugandan economy, i.e. maintaining a large proportion of young trainees to feed the demand from other traditional sectors (*example...*).
- A proportion of the population will be young Ugandan trainees. In the case of craftsmen for example, the survey assumes that 60% of demand will be Ugandan trainees; the rest will either be experienced Ugandans or expatriates. This percentage is at 25% for electrical and mechanical technicians.
- A selection process has to take place before training starts, whether it coincides with recruitment or not. This selection process generates a multiplier of at least 2 from the current supply (hypothesis taken in the survey, considered as very low). This means that when 100 workers are needed, the system should supply a minimum of 200 workers.

- The numbers mentioned by the survey are available in appendices in large details. These numbers are based on past studies undertaken by Tullow Oil, data collected from the best BTVETs in the country, and reports received from the Department of Industrial training (DIT).

For certified positions in general

A major effort of certification will be required in the medium term to comply with oil and gas projects standards. These training efforts will be very strong in the first two years of the construction phase, as illustrated in Figure 8.

The survey illustrates the urgency of putting in place adequate facilities to train and certify these workers on time to avoid resorting to expatriates for jobs that could have easily been anticipated and localized.

The majority of these certifications relate to jobs for drivers and craftsmen (civil construction). Other relevant disciplines are welders, machine operators and hoisting & lifting.

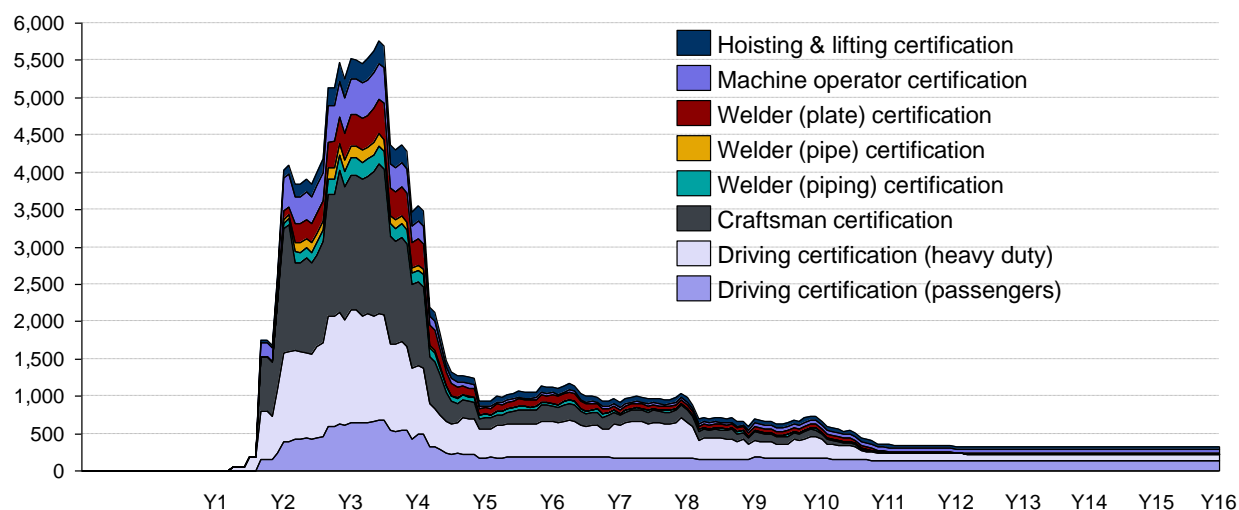


Figure 8: Manpower split per certified disciplines

Craftsmen

Craftsmen refer here to welders, drivers, machine operators, hoisting & lifting operators and civil craftsmen.

The number of craftsmen required during the construction phase will peak dramatically at more than 5,500 workers in Year 3, drop to 1,000 in Year 5 and plateau at 300 level a few years after.

Therefore, more than any other population, the challenge with the craftsman population is first to train them rapidly to ensure a maximum proportion of such jobs go to Ugandans, and second to anticipate and manage well the transfer from oil and gas industry to other markets, i.e. the after-peak period.

- **Civil construction craftsmen:** Within the craftsman disciplines, a shortage in civil craftsmen is of particular concern, not only in the quality needed to meet oil and gas standards, but also in pure quantitative terms. The survey estimates that there will be a gap in civil craftsmen during the construction phase, from year 1 to year 3 in particular.
- **Drivers:** The need for drivers and passengers will be very strong, in the order of 2,000 during the first 2 years of the development phase. Pressure on the market will be intense for these jobs, and instead of teaching new drivers the specificities of oil and gas standards, transportation companies will transfer most of their local senior experienced staff to their oil and gas compliant trucks.
- **Welders:** The survey indicates that there should not be a shortage on the number of available welders, however there will be a quality gap. Oil and gas projects demand strong qualifications in welding to do upstream facilities like CPF and pipelines.

Technicians

The survey refers to mechanical and electrical technicians here, i.e. workers that have followed at least 2 years of technical vocational training after high school. They correspond to a higher level of education than craftsmen and lower than engineers

The survey reveals that there will be a gap in absolute numbers -not only in quality- for the mechanical technicians. Indeed, assuming that the proportion of young trainees among mechanical technicians is only at 25% (the rest being expatriates or experienced Ugandans), then the annual needs in the first two years of construction will exceed 800 technicians. In contrast, the education system can barely supply 300 of such technicians to the labor market every year. Hence, it is important to address the gaps in this discipline.

For electrical technicians, the survey did not highlight any gaps between supply and demand. However in the second year of construction, there is a risk to the Ugandan economy of resources 'dry out' which may occur because of this near equilibrium in demand (around 250 to 300 technicians) and supply from the education system (slightly more than 300). The situation needs to be carefully managed in order to avoid this 'dry-out'.

Engineers

Considering the four best universities in Uganda from an industrial employer's point of view - Makerere, Kyambogo, Ndejje and Busitema, the annual supply of graduate engineers is around 650.

The university system in Uganda is more developed than the vocational technical training institutions. Makerere for example is a well-established university with a strong legacy of quality teaching and regional prestige.

Considering that the demand for young fresh out engineers in the construction phase will be around 400 in the second year of construction, there should not be a gap in absolute values, but tensions will be strong as other sectors also need engineers.

Lead times for training

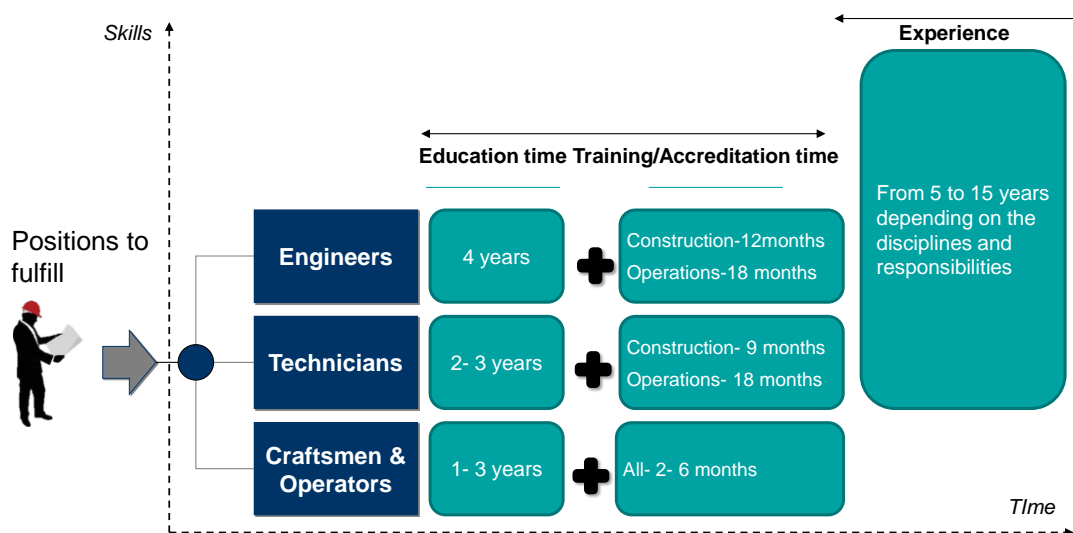
The question of the supply and demand for craftsmen, technicians and engineers has two sides. One is the matching or not of the numbers of graduates available every year versus the demand. The second aspect is quality, i.e. to what extent the education system in Uganda provides students that can be recruited to work on oil and gas projects.

The issue of supply quality from Uganda for oil and gas projects, extends beyond the technical knowledge graduates to include a minimum level of ‘on-the-job’ training to achieve the certification(s) required.

To complete the picture, a number of universities and BTVET were visited and discussions with education system insiders were held. These engagements revealed that Ugandan institutions do not provide adequate practical training to allow for the recruitment of operational staffs.

In a nutshell, it is assumed that additional ‘on-the-job’ training is required for all people in Uganda before he/she can be hired by the operators or its contractors (EPC). Figure 9 displays typical lead times in a Western country for education (university, college...) and then for vocational certification on the job.

Figure 9: Minimum education and certification Lead times by job type





This view can help draw a reserve planning of the training deadlines for each future employer (see appendices for more details on the training and recruitment planning for the refinery, upstream facilities and operations).

Conclusion on the manpower supply and demand for the LA oil and gas projects

- The various assessments of gaps summarized here and detailed in the appendices are largely based on assumptions that will have to be confirmed or corrected overtime.
- The survey reveals that there will be a number of gaps in absolute values for certain jobs: civil craftsmen, drivers and mechanical technicians. For electrical technicians and welders, the main challenge will be to avoid 'dry out'.
- Therefore the main insight highlighted by this assessment is the critical need to focus efforts on vocation technical training in advance to maximize the benefits of the construction phase for Ugandans.
- The time is short for training to happen therefore a massive training initiative needs to take place from early 2014 considering the various lead times required for the disciplines concerned.
- Developing new universities is obviously the right decision for the long term, but as far as the Lake Albert projects are concerned, the priority should be given to training craftsmen and technicians.

All the detailed results and graphical representation are provided in the Appendices.

INDUSTRIAL SURVEY

Survey approach

A first list of industries potentially impacted by oil and gas projects has been established based on the review of an exhaustive list of industries derived from UN Statistics and the international classification used by UBOS. This initial list was shortened from 420 industries to only 39 ‘target industries’.

These ‘target industries’ were then filtered based on their feasibility (ramp up time and Capex), and the benefits they could bring to the country (number and level of jobs created), reducing the number of industries further from 39 to 25.

The industries retained in the scope of the survey were:

- | | |
|--------------------------------|---------------------------------------|
| 1. Bulk material | 14. Manpower consultancy |
| 2. Catering | 15. Mechanical construction |
| 3. Cement | 16. Production operations |
| 4. Civil construction | 17. Reinforcement steel manufacturing |
| 5. Domestic airline services | 18. Road construction |
| 6. Facility management | 19. Site safety and security |
| 7. Food supply | 20. Structural/flat steel |
| 8. Fuel wholesale | 21. Technical consulting |
| 9. Furniture manufacturing | 22. Transport & Logistics (Goods) |
| 10. Generic waste management | 23. Transportation (People) |
| 11. General maintenance | 24. Vendors |
| 12. Hazardous waste management | 25. Work safety products |
| 13. Light equipment | |

These 25 industries were analyzed in detail through a questionnaire sent to companies involved in the sectors concerned. The questionnaire was designed to be short and simple, with questions limited to production capacities of companies, number and profiles of employees.

Questionnaires were sent to hundreds of companies. The 200 largest companies replied, representing the lion share of production capacities in the country. In addition to these data analyses physical meetings were held with the 60 biggest actors in each sector. The objective of these meetings was to get a better view of the realities in Uganda, beyond the information collected through the questionnaires.

Industrial survey results

Analysis of the data collected aimed at identifying gaps between current local industrial supply and incremental demand from oil and gas projects in the future.

Figure 10 summarizes the major insights for the 25 industries with high potential for local content based on the collected questionnaires.

Results include the gap between supply and demand expressed as a percentage of current supply. If a sector analysis reveals a gap of 50%, it means that the incremental demand to be expected in the next years will be equivalent to 50% of the current available supply.

Other insights from the data received are the ownership of companies, expressed in percentage of companies whose equity is owned by Uganda at more than 50%. The percentage of Ugandan staff is also detailed per sector.

Finally companies were also asked about the main barriers for development that they see to get prepared for future growth. The table in Figure 10 reflects only the first barrier mentioned by companies.

View per sector

The survey reveals that certain sectors will face important quantity and/or quality gaps. Sectors like transportation & logistics for goods and equipment will need to multiply their current capacities to meet future demand. In a project that will require the highest level of security standards in the industry, very few trucks drivers are able to provide services today. Road construction is another sector that will need serious development to be ready for the forthcoming oil and gas projects. The same goes for hazardous waste management an industry which is almost nonexistent in the country today at the standard required by oil and gas companies.

On the contrary, some other sectors like cement, structural steel or services like security for example will be able to cope with future demand increase.

Finally, a certain number of sectors that have a real potential for local content development do not exist today, like general maintenance services for oil and gas sites, production operations services or work safety products. Consequently, the gap is not measurable at the moment for these sectors.

Figure 10: Table of Industry supply analysis by sector

INDUSTRIAL SECTORS	Gap between current supply and future demand		Companies with Ugandan ownership >50% (% of total companies of the sample)	Ugandan employees (% Ugandans out of total employees in the sample)	Main support expected to prepare future growth (top 1 item mentioned)
	In %	Qualified			
Transportation & Logistics (Goods)	80% to 660%	Important gap	55%	90%	Visibility over demand
Transportation (People)	40%	Sizeable gap	100%	88%	Improvement of infrastructures
Cement	<10%	No gap	0%	92%	Improvement of infrastructures
Bulk material	70%	Sizeable gap	80%	100%	Access to finance
Reinforcement steel manufacturing	60%	Sizeable gap	75%	93%	Improvement of infrastructures
Light iron/steel products - Structural steel	<10%	No gap	--	--	Improvement of infrastructures
Flat steel	80%	Important gap			
Civil construction Services	See complete report	Small gap	--	--	Visibility over demand
Mechanical construction - Engineers	40%	Sizeable gap	0%	87%	Visibility over demand
Technicians	340%	Important gap			
Road construction	130%	Important gap	63%	89%	Reinforcement of certification process
Domestic waste management	50%	Sizeable gap	100%	99%	Access to finance
Hazardous waste management	170%	Important gap	67%	99%	Visibility over demand
General maintenance	Inexistent today	Important gap	--	--	--



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Production operations services	<i>Inexistent today</i>	Important gap	-	-	-
Security services	<10%	No gap	43%	95%	Administration
Domestic airline	20%	Small gap	75%	69%	Training of skilled people
Fuel wholesale	20%	Small gap	67%	97%	Improvement of infrastructures
Manpower agencies	<i>Variable</i>	Important gap	50%	96%	Visibility over demand
Catering	30%	Sizeable gap	83%	98%	Training of skilled people
Facility management	<10%	Small gap	60%	98%	Improvement of infrastructures
Food supply	--	Important gap	--	100%	Access to finance
Work safety products	<i>All imported today</i>	Important gap	100%	100%	Visibility over demand
Light equipment manufacturing	--	Important gap	--	--	--
Technical consulting	--	--	75%	87%	Training of skilled people
Vendor services	--	--	57%	90%	Visibility over demand
Furniture manufacturing	--	--	83%	95%	Visibility over demand



Industry analysis by sector

Bulk construction material

Industry deals with mining and quarrying of bulk construction material like aggregate, gravel, sand, gypsum. The components are mainly used for concrete mix in the following proportion 24% of sand, 48% of gravel, 10% of gypsum of total aggregated construction material (remainder is cement).

Sand is generally located close to the lakes. In the North, coarse and clay-free sands are available in river courses often associated with gravel. In the East, sands with clay and silt are available in many places. In the West, clean sand is found in stream courses and on lake shores in the rift areas. In the center, little sand is available.

Aggregate is made of stone suitable for crushing and available in most parts of the country. Granite, gneiss, quartzite and sandstone are widely available throughout the areas of Precambrian Basement. In the Center and East, badly weathered dolerite and amphibolite are available. In the East and Southwest, volcanic lavas and agglomerates are extensively available.

Supply for bulk material was estimated at ~35,000 tons per month. The estimation was based on interviews held with companies operating in the proximity of Lake Albert. The incremental demand coming from Lake Albert project will result in a gap to current supply in 2016-2017 as high as 70%. This gap may put certain pressure on availability of supply in the region.

Conclusion: Bulk construction material may face certain stress on supply (10-100% of current levels). The quality of materials is in line with oil and gas standards.

Catering

Industry deals with catering of camp facilities onsite. In the current analysis, only catering for camps was considered (small restaurants and hotels were excluded). Based on a sample size of 6 major companies, the total number of people working in catering industry was estimated at ~1,000 professionals in 2012.

Incremental demand for catering services due to Lake Albert development is expected to cause a gap of ~30% with current supply levels. This gap is not critical and may be overcome by the industry on its own. However, a significant improvement in quality of services should be planned. As of 2012, standards of catering in Uganda are below what it is required by the oil and gas industry.

Conclusion: Catering services will meet a manageable gap in quantity (10-100% of current levels), however the quality of service must be improved to meet oil and gas standards required by operators.

Cement manufacturing

Industry deals with cement for structural constructions and buildings, but not for oil wells requiring high-grade quality cement of Class G which is not available in Uganda.

There are two major cement companies in Uganda taking 100% market share: Tororo Cement and Hima Cement (part of Lafarge Group). The companies reported production levels at the level of 2,550,000 tons (or ~200,000 tons per month) for 2012. The production levels represent actual production figures and not full production capacity. Each player has around 20 to 25% spare production capacity. Full capacity is rarely reached because of frequent power cuts.

Main barriers to future industry growth are expensive imported raw materials and poor road quality. Road transportation impacts production cost and final price (\$200/ton in Uganda compared to \$120/ton in Kenya).

Fluctuation in exchange rate USD-UGX is an issue, because of imported raw materials. Gypsum is imported from Oman and Egypt. Some clinker is produced locally, some is imported. The imported clinker comes from Japan, Korea, India and Dubai. Coal (imported from South Africa) and fuel oil (imported from Kenya) is used to produce local clinker. Limestone comes from local quarries.

There are two industrial mega-projects in Uganda which will require large amounts of cement for development: Karuma Dam and Lake Albert project. Total demand for cement for the both project will reach its peak in 2016-2017, generating a gap of less than 10% with current production levels. This gap is not critical and may be overcome by the industry on its own.

The quality requirement for the cement produced in Uganda will be adjusted by operators, based on available technical specifications.

Conclusion: Cement manufacturing industry has enough capacity to satisfy the demand for both Karuma Dam and Lake Albert projects (<10% of current supply levels). Oil and gas operators may adjust their requirements to the quality based on available cement technical specifications.

Civil construction

Industry deals with civil preparation, earth and building works, erection of prefabricated, electrical installation, plumbing, welding, carpentry works, building completion and finishing.

From a sample size consisting of 41 major companies for the industry analysis, ~1,750 civil engineers and ~3,000 civil technicians were reportedly employed in 2012. Total industry population was estimated at ~8,500 professionals (~3,200 civil engineers and ~5,300 civil technicians), by comparing manpower of the sample companies to manpower for the entire construction industry services (excluding road construction) reported by UBOS in 2012.

The industry expressed a number of concerns on financial side. The availability of working capital is the biggest industry problem. Only 10-20% of the contract is paid in advance. Furthermore, companies do not have enough equity to cover project expenses and find it difficult to get loans from national banks (the most common financing solution), given that borrowing rates are prohibitive (20-25%). Some small companies are getting finance from private and independent money lenders at ~10% interest per month.

Incremental demand for civil engineers required by Lake Albert project will stay within 10% of current supply. A similar situation is observed for civil technicians, where incremental demand will stay within 20% of current supply.

The industry sees the main barrier for future growth to be a lack of visibility on governmental long term demand for civil construction as only short term visions are communicated to the companies.

Quality of civil construction services required by oil and gas operators is of the highest standards for safety and environmental protection. Ugandan companies have not yet attained level required and will need to put in significant effort to reach the demanded standards.

Conclusion: Civil construction industry will face a certain gap due to incremental demand from Lake Albert project, although not of a significant magnitude (10%-100% of current supply levels). However the quality of service is far below oil and gas standards and should be improved to make the local industry competitive.

Domestic airline services

Industry deals with air transportation of personnel working on site.

The sample size for the industry analysis consisted of 4 major aviation companies, with reported to capacity of 1,740 flights per month in 2012. On average one airplane will make one roundtrip per day. Based on known market share for the sample companies, a total supply capacity was inferred at level of ~2,100 flights per month. The industry reports that it is difficult to recruit local pilots and engineers and more information on Oil & Gas demand and standards is required.

Incremental demand coming from Lake Albert project will create a small gap (<10% of current supply levels) in 2016-2019. However, today's capacity of oil and gas compliant flights (Eagle Air & Kampala Aeroclub) is ~1100 flights/ month and incremental demand at peak will be 225 flights/ month, hence a gap of 20%.

Conclusion: Domestic airline services will meet a manageable gap in quantity (10-100% of current levels). The quality of service is compliant with oil and gas standards for the companies already working with the operators as they have been audited in the first place.

Facility management

Industry deals with camp/ facility services including: cleaning, firefighting, facility maintenance, office supply.

Five companies representing 80% of the facility management sector were analyzed. They reported 745 professionals in employment, which when extrapolated give an overall industry population of ~930 professionals.

The industry also expressed a number of concerns on financial side. It is difficult to access credit for local players, whereas there is easier to access to credit for international players who have financial support from their mother company.

Incremental demand from Lake Albert project will create a small gap (<10% of current supply levels) and can be overcome by the industry on its own. However, special attention should be given to the quality of local services provided. It is still below oil and gas standards and would require some efforts to upgrade.

Conclusion: Facility management services will face a small gap (<10% of current supply levels) at the peak of Lake Albert development starting from 2016. The quality of the service is still below oil and gas standards, but efforts will quickly allow catching up with the standards required.

Food supply

Industry deals with food production, processing, preserving and supply in vicinity of Lake Albert area. Based on the assumptions that 2 kg of food per person per day and 2 liters of water per person per day will be required, the demand for food and drinking water will peak at ~1,200 tons per month in 2017.

Even though, this is not material in terms of overall agriculture production in Uganda, it may put a significant strain on local food market in Buliisa area. High prices for food inflated by oil operators may make it difficult for the local population to pay for the food. Hence, if the increase in demand is not properly anticipated, the local food market may have a major negative impact.

Agriculture businesses have been selected as one of the targeted industries for support from oil and gas operators because of the large potential they represent to the entire region. Careful management of demand for the food in Buliisa area and increase in quality of food supply due to oil and gas standards may significantly boost competitive advantage of the industry in the area.

The sample agriculture companies reported that the major barriers to future growth are the difficulties in accessing finance and high capital required for investing in food processing plants.

Conclusion: Food supply industry will face a peak demand in highly localized areas in Buliisa, though the overall increase is non-significant at country level. The quality (defined here as stability of the product over the year in quantity and aspect, hygiene in transportation....) of the food is still below oil and gas standards, however attaining the levels required can be achieved quickly with minimal effort.

Fuel wholesale

Industry deals with bulk sales of fuels, oils, lubricants, liquefied gas for machines and vehicles (land/air/water), and fuel for drilling rigs.

Four companies representing 50% of the wholesale fuels sector were analyzed. It is a very fragmented industry with two major players, Total & Vivo, with 25% market share each.

Some volumes of lubricant and specialty products are illegally smuggled into the country. Bituminous market is not managed by oil companies and the majority of the products are independently sourced by individual companies.

Total industry supply was inferred at the level of ~1,000,000 tons of gasoline in 2012 (or ~85,000 tons per month). Incremental demand from Lake Albert development will reach a peak in 2019-2020, introducing a sizeable gap (10-100% of current supply levels).

The industry reported the following main barriers to future growth: high sensitivity to electricity supply & demand fluctuations, poor road infrastructures leading to higher fuel transport cost, lack of visibility on oil and gas demand and standards required as well as governmental decisions on the construction of refinery and export pipeline.

Conclusion: Fuel wholesale industry will face a manageable gap in quantity (10-100% of current levels). The quality of service is compliant with oil and gas standards.

Furniture manufacturing

Industry deals with manufacturing of chairs and seats for office, sofas, sofa beds and sofa sets, office furniture, etc.

The market is fragmented with more than 5,000 businesses and 18,000 employees (Ugandans and non-Ugandans). Around 90% of the companies in this industry are small in size. The majority of these small companies operate in public markets (on the street). The overall quality of the furniture in Uganda is not up to the standards of Oil & Gas companies.

The main barriers to future growth are uncertainty around future contracts, payment capacity of the clients, difficulties faced by local companies in accessing finance and changes in

specifications. The industry has never worked to oil and gas specifications and as such more information on demand and standards is required.

Conclusion: The quantity of supply available in the country is significant, whereas the quality of produced furniture is far below oil and gas standards. A major effort should be done to catch up. This could be achieved partially through the consolidation of smaller companies into larger groups that are able to implement large scale project. However this is predicated on the availability of strong financial support.

Generic waste management

Industry deals with collection, treatment and disposal of waste water (dark, grey, and water based mud cutting) and non-toxic solid waste (life on the camp).

Six companies representing 80% of the domestic waste management sector were analyzed. This translates to a collective capacity of ~18,000 tons per year. Based on the interviews, it was inferred that overall industry capacity comprises up to ~23,000 tons per year (or ~2,000 per month). Only private companies were analyzed and waste handled by municipalities was not included in the analysis.

The industry expressed a number of concerns on financial side. Among them, the difficulties in accessing credit, high costs for transportation of waste and delays in payments (up to 1 year). Companies developed special “collector” positions to recover accounts payable from the clients. High investment needed to buy new trucks, pumps and tanks if operating in liquid generic waste management.

Main barriers to grow business in the future are prohibitive borrowing rates which penalize companies in the industry.

Local companies reported a lack of proper training in Oil & Gas related waste management and higher skills required to operate in the liquid domestic waste management domain.

Incremental demand coming from Lake Albert project will create a gap up to 50% of current supply levels from 2017. The quality of service provided meets oil and gas standards.

Conclusion: Domestic waste management may face certain stress on supply (10-100% of current levels) starting from 2017.

General maintenance services

Industry deals with repair and general maintenance of equipment, electrical installation, civil facilities, etc.

Future development of Lake Albert project demands general maintenance services (GMS) starting from 2017.

The surveys revealed the absence of pure general maintenance service companies in Uganda. There are companies that provide these services on an *ad-hoc* basis, deviating from their core business (civil engineering, road construction, mechanical construction, etc.). At the same time, an important part of general maintenance services could be outsourced to local companies that would sustain the necessary HSE standards and oil and gas certifications.

Demand will reach a plateau of 40,000 man-hour per month mostly required during the production phase of Lake Albert.

Conclusion: The industry does not yet exist in Uganda but it has a great future. Some contracts are done by non-specialized companies whose core business is in other industrial sectors. The quality is not yet up to the standards required by oil and gas, but it can be ready on time if well anticipated and prepared since it will only be required when production will start.

Hazardous waste management

Industry deals with collection, transportation and storage of hazardous waste (bio-hazardous waste, used oils and batteries, etc.), and collection of oil based mud cuttings from drilling activities.

Six companies representing 70% of the hazardous waste management sector were analyzed. The sample companies accounted for ~7,400 tons of waste treatment in 2012. Based on the interviews held with the companies with known market share, it was estimated that they took ~70% market share waste handled. That brings the total industry supply to ~10,600 tons of waste treated per year (or ~1,000 tons per month).

Oil based mud cuttings constitute the vast majority of total hazardous waste. Oil based mud cuttings per well is around 70% of all cuttings and ~280 tons of cuttings per well.

Incremental demand from Lake Albert project development will start to build up from 2017 and peak in 2018 to 2021, creating a gap of ~170% to the current supply level.

The supply and demand gap takes into consideration only the transportation of hazardous waste. For the disposal of treated waste, the gap is simply the future demand since there is no company able to dispose hazardous waste management in the country today.

NEMA's license and environmental certificate is required to dispose hazardous waste. Authorized dumping sites are also listed by NEMA. Oil operators require compliance with strict standards and certifications on hazardous waste transportation and disposal throughout their worldwide operations.



On the financial side, the local companies interviewed reported the following obstacles: difficulty in accessing credit, high cost of transport of waste, delays in payments (up to one year). Companies developed special “collector” positions to recover accounts payable from the clients.

Hazardous waste management was selected as one of the high-potential industry for local content development in Uganda. By extending their capacity beyond local transportation and waste disposal, Uganda can leverage their first mover advantage and become a regional leader in the sector, retaining key know-how and treatment capacity.

Conclusion: Significant gaps exist between supply and demand in the future (>100% of current supply levels). Quality standards of local hazardous waste management industry, which have never had experience working in petroleum sector, are far below oil and gas requirements.

Light equipment

Industry deals with manufacturing of electric motors, generators, transformers and electricity distribution and control apparatus, fiber optic cables and other electrical equipment.

Currently, Uganda is almost a 100% net importer for all kind of light equipment: high-voltage cables from China and India, generators from Europe, transformers from Tanzania, and electrical motors from China. Uganda does export certain low voltage cables, armored underground cables, flexible cables, house wiring cables, etc.

Development of Lake Albert project create a major peak in demand for all types of light equipment which are at risk to be entirely imported if no actions is taken to support the local industry.

Conclusion: Neither the supply capacity nor quality of light equipment manufacturing industry meets the demand standards of the oil and gas industry.

Manpower consultancy

Industry deals with managing unskilled workforce and placement and temporary employment.

Six companies representing 70% of the manpower agencies sector were analyzed. Total number of people being placed by the six companies was ~400 in 2012. Based on the known market share, a total industry supply can be inferred at the level of ~ 600 placed employments in 2012.



Demand is composed of unskilled people who will be recruited from LA communities. For each position 4 candidates should be considered. Incremental demand for Lake Albert is significantly higher than available supply and it is highly variable.

Manpower agencies mainly source for skilled and semi-skilled people. Unskilled people required for construction can be sourced from the LA community. Main requirement on quality from oil operators is compliance with HSE standards.

Conclusion: Manpower agencies in Uganda are not yet ready to deal with peak demand from Lake Albert development (>100% gap of current supply levels). The quality of service provided can meet oil and gas standards as long as core HSE requirements are taught to the people placed.

Mechanical construction

Industry deals with installation of industrial machinery in industrial plant, manufacture of tanks, reservoirs and containers of metal, and manufacture of structural metal products.

Only two companies operating in the mechanical construction sector in Uganda were analyzed in detail. Other contacted companies were not able to provide usable data for analysis.

These two companies employ 200 mechanical technicians and 50 mechanical engineers in 2012. The survey revealed a substantial gap of supply over future projects' demand for mechanical construction, especially for technicians (>100% of current supply).

Interviewed companies reported lack of visibility on future industrial projects as the main barrier for future growth. Additionally, a shortage of skilled personnel and lack of specialized vocational training for mechanical trades were also cited as obstacles.

Conclusion: Significant gap of qualified manpower for mechanical construction industry (>100% of current supply levels). A certain effort should be given to bring the quality of professionals up to oil and gas standards.

Production operations

Industry deals with wells and well pad maintenance, flow-line and pipeline maintenance, central processing facilities (CPF), support base services, etc. Companies in this industry supply services for the inspection, control and maintenance of oil production facilities including wells, well pads, flow-lines, trunk-lines, CPF, export pipe, etc.

There are currently no companies that provide such services in Uganda. Some international companies that operate in Uganda can leverage their global expertise and source foreign professionals to do the job.

Demand generated by Lake Albert project will take off in 2017, coinciding with ramp-up of the production phase. It will reach a long-term manpower plateau of ~1,000 professionals employed full time during the entire life of the field.

Production operation industry has been selected for further Ugandan development. It will require a long-term demand not only local, but also on a regional level. Uganda can take advantage of Lake Albert to leverage a strong competitive position when promoting its professionals in this industry.

Conclusion: Production operation industry does not exist yet in Uganda but has a bright future if well anticipated and prepared.

Steel (reinforcement) manufacturing

Industry deals with the manufacture, treatment and coating of steel required for concrete reinforcement.

60,000 tons of reinforcement steel was produced in 2012 in Uganda as reported by the companies interviewed. In the same year, actual production capacity was at 130,000 tons for reinforcement steel.

The major barrier to future growth is shortage of power supply that hinders actual production of steel and lowers utilization rate of existing capacity.

It was assumed that 100% of steel required for reinforcement (80 kg per m³ of concrete) by Lake Albert project is produced in Uganda. Incremental demand due to two major industrial mega-projects (LA development and Karuma dam) will quickly ramp-up starting from 2014 and create a gap of ~60% to current supply levels.

From a quality point view, all Ugandan companies comply with national standards for steel products, while only a few comply with international standards.

Conclusion: Reinforcement steel manufacturing industry will meet a manageable increase in demand (10%-100% of current supply level) in the future. Quality of the product meets oil and gas standards.

Steel (structural/flat) manufacturing

Industry deals with the manufacture, treatment and coating of steel required for structural construction, buildings, tanks, containers, etc.

As reported by Roofing Group, one of the Ugandan leaders in structural/flat steel manufacturing, total industry production capacity is ~30,000 tons of flat steel and ~110,000 tons of structural steel. A 70% utilization factor for flat and structural steel production capacity was assumed.

Incremental demand resulted from Lake Albert development will create a gap of <10% for structural steel, and ~80% for plate steel (mainly due to plate steel installation for refinery).

The main barrier to future growth is shortage of power supply that hinders actual production of steel and lowers utilization rate of existing capacity.

Conclusion: Structural and flat steel manufacturing industry will meet a manageable increase in demand (10%-100% of current supply level) in the future. Quality of the product is below oil and gas standards, but some efforts will quickly bring it to the required levels.

Road construction

Companies in this industry build new roads and rehabilitate existing ones.

The market is divided into two groups: large companies (with contracts above USD 50 million) including SBI (Israeli), RCC (Israeli), ICC, Chico, China Communications systems (Chinese) and smaller companies - including Multiplex, Energo, Spenco, Dott Services, etc.

Companies operating in road construction tend to own/ operate bulk material quarries. The national budget for road construction in 2012 was around UGX 1.6 trillion. Around 160 km of new paved roads were constructed in 2012 (or 14 km per months).

Demand for Lake Albert project development will comprise: non-paved roads built along connection pipelines from well pads to CPF, ~90 well pads in LA project; 5km of new non-paved roads per well pad, paved road from Hoima to Buliisa area (230 km) to be built between January 2015 and January 2016.

This construction will create gap of >100% with the current supply levels.

The main financial issues faced by local companies working in the industry are the difficulties in gaining access to credit, prohibitive borrowing rates, and loan conditions lacking flexibility. In addition, contracts often hide unexpected specification changes leading to additional expenses.

Increasing costs of production are mainly due to soaring energy costs, expensive bitumen imported* from Kenya, Iran, South Africa and high capital required to buy earth moving equipment.

Conclusion: Demand from Lake Albert project will create a significant gap of >100% of current supply levels. Quality of the product is below oil and gas HSE standards, some effort will quickly bring it to the required levels.

Site safety and security

Industry deals with onsite security, security of export pipeline and facilities, and private security (armored cars, security guards).

Seven companies representing 80% of the security services sector were analyzed. Collectively, they reported ~17,000 professionals working in the security services in 2012. All companies have the private security operator's license, issued by the Ugandan police. Some companies have firearms license.

Conclusion: Incremental demand from Lake Albert project will stay within <10% margin of current supply levels, thus will not create a major problem for the industry. Quality of the services provided meets oil and gas standards.

Technical consulting

Industry deals with land and boundary surveying activities, hydrologic surveying activities, projects involving civil engineering, hydraulic engineering, traffic engineering, water management projects, etc.

Consulting companies provide technical expertise in infrastructure projects (bridges, roads), water works, electrical transmission, environmental impact assessment, etc.

The market is growing slowly with few consulting projects and fierce competition on bids. The market is fragmented with around 50 local and international companies. Major players are Kagga & Partners, Kom and Gauff. Some small companies work in partnership due to the lack of experts and projects in the market.

Demand for technical consultancy is hard to assess at the conceptual stage of LA project development, since there is no clear work scope. Measurement units for industry are number of engineers and consultants. A project of \$2M dollars will require 30 engineers/ consultants at 100% utilization. Technical consulting will take 2-5% of total CAPEX.

Local companies reported a lack of skilled Ugandans with relevant consulting experience. Also, there is strong competition from foreign independent consultants hired by Oil & Gas companies.

Conclusion: The manpower gap between supply and demand for technical consultancy is preliminary assessed at <10% levels based on our experience. However, refined analysis should be done at later stages of the project, once a detailed scope of engineering work is available. The quality of local engineers will only meet for oil and gas standards after a certain period of on-the-job training.

Transport & Logistics (Goods)

Industry deals with freight transport by road, warehousing and storage, lifting services, and other transportation support activities (clearing, customs, and forwarding).

33 companies representing 55% of the transportation & logistics (goods) sector were analyzed. Collectively, they reported total fleet of ~2,500 trucks operated in 2012.

Main assumptions on demand for heavy trucks by Lake Albert project are trucks for bulky material capacity – 15m³, trailers for equipment capacity – 20 tons, trucks for food – 20 tons, rotation time for MSA - 15 days and for Uganda – 7 days.

Incremental demand for two major industrial projects in Uganda (Lake Albert development and Karuma dam) will create a gap of ~80% to the current supply levels. However, most trucks are not in line with oil and gas standards with only ~200 trucks (~7% of total fleet) meeting required oil and gas standards. This quality factor significantly increases the gap, bringing it up to ~700% to current supply levels.

The main financial concerns of the companies operating in the industry are difficulties in gaining access to credit (a significant obstacle for national players, especially Small and Medium Enterprise -SMEs), long payback period keeping SMEs away and increasing competition from local players reducing the International companies' margins.

The major barriers to future growth are the nature of contracts (short-term, CAPEX-intensive, high standards, low visibility), poor communication from oil industry and local manpower with no experience in Oil & Gas.

Conclusion: Industry will face a major gap during the ramp-up of Lake Albert project in both qualitative and quantitative terms. If no support actions taken, the entire industry can be a subject to import.



Transportation (People)

Industry deals with passenger land transport for professionals working onsite for Lake Albert development.

Eight companies representing 15% of the private transportation of people sector were analyzed. Collectively, they reported a total operated fleet of ~800 passenger vehicles in 2012.

The key assumptions on demand are the capacity of daily bus (30 people), capacity of regional bus (40 people) and that 25% of manpower will require regional rotation via bus.

Incremental demand coming from Lake Albert project will result in a gap of ~40% to current supply levels for the major construction phase between 2017 and 2018. HSE compliance of passenger vehicles provided by local companies was not fully evaluated. However, it is reported to be of far lower quality than required standards based on the interviews.

Conclusion: Medium gap of supply (10%-100%) should be manageable by local companies, however significant measures should be taken to increase HSE standards of the provided service to meet oil and gas requirements.

Vendors

The players in this industry provide machinery, ores, metals and industrial chemicals, including fertilizers, timber and building materials on a wholesale, fixed fee or contract basis.

Companies in this industry sell machinery, metals, industrial chemicals, building materials, etc. The market is fragmented with several businesses. The majority of the traded products are imported. Many foreign companies are present in this sector. Oil & Gas projects will have a significant impact (induced) on this sector by generating new jobs and more activity.

The major barriers to future growth are the uncertainty of future contracts and required inventories, long delays from order of goods to delivery to the warehouse, time-consuming clearing and forwarding of good.

Conclusion: Vendors service being a highly scalable industry is able to meet demand for oil and gas development. However, it should implement lots of initiatives to ensure compliance with quality standards of oil and gas.



Work safety products

Industry deals with manufacturing of protective clothes, boots, glasses, etc.

Most Personal Protective Equipment (PPE) is imported and only a minor quantity is manufactured locally and not at the required standards.

The market is expanding with an ever increasing presence of international companies focused solely on HSE. The major players include Frenah Safety & Security, Safield, Heights, Safety & Business Center and Sujuzu. Some other small companies are emerging in the market with low quality and fake products.

Overall, PPE in Uganda are not up to the Oil & Gas standards.

Demand for coveralls, to be used by operators and their suppliers, for Lake Albert project is estimated to peak at ~170,000 items. Other items (safety glasses, gloves, safety boots and helmets) will reach a mark of more than 86,000.

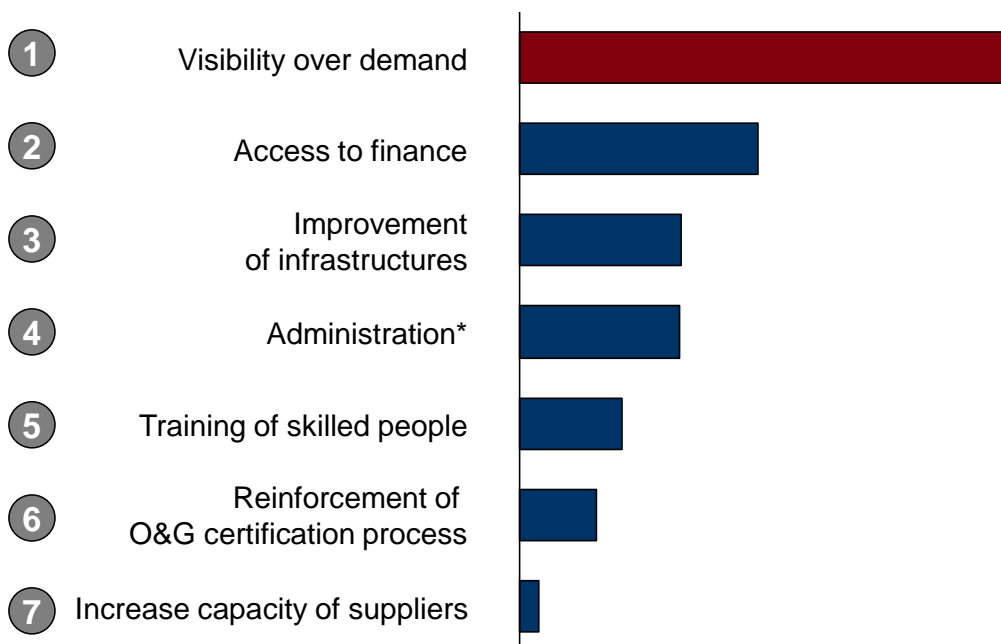
Work safety products manufacturing is one of the selected industries for future development in Uganda. A significant demand from Lake Albert project may be a good starting point to help the industry ramp-up quickly and create of basis for regional expansion.

Conclusion: Work safety products manufacturing is almost absent industry in Uganda today with very little production and low quality of material.

Companies' expectations

The data collected provides a better understanding of what companies settled in Uganda actually expect from large private stakeholder like the oil and gas operators and from the Government. The questionnaire included a question on that topic, and the answers revealed that companies need to better prepare themselves for future oil and gas projects. Expectations are high but not so difficult to address.

Figure 11: Main barriers reported by suppliers in Uganda
(In descending order as per suppliers' answers)



The first barrier to development mentioned by suppliers in Uganda is the lack of visibility on future oil and gas projects. When will the needs start? What type of products and services will be required? At which standards? Timeline? Quantities...?

The second barrier is the difficulty in gaining access to the capital required to invest and develop activities. Rates for loans in Uganda are usually in the range of 17% to 22%, making it nearly impossible for interested parties to develop any business.

Other improvements expected to develop the economy relate to the quality of infrastructures (roads), a more efficient administration, and higher level of skills among workers... Figure 11 illustrates these expectations.

RECOMMENDATIONS

Based on the results of the Industrial Baseline Survey (IBS), eight initiatives are suggested for implementation; they are detailed in the complete presentation and summarized here.

These recommendations relate to three main objectives:

1. Bridging the communication gap between oil & gas companies and Ugandan industrials by initiating a regular and supervised dialogue;
2. Providing assistance to Ugandan companies by creating an 'Industry Enhancement Center' and offering appropriate support to specific sectors;
3. Supporting the educational system by reinforcing the best academic institutions already in place and by founding a training center to develop qualified technicians.

Objective 1: Bridging the gap between oil and gas companies and Ugandan suppliers

Recommendation 1: Organizing a forum with potential suppliers

The aim is to bring together local suppliers and present them the schedule of upcoming projects and the results of the study: future manpower needs, equipment and raw materials demand. Such a communication is highly expected and addresses the first pitfall reported by local businesses as hindering their development: the lack of visibility of future demand.

This event would lay the foundation for the 'preparatory period of time' during which operators will communicate with local companies in view of the start of the construction phase, the objectives of which are two-fold. Firstly, the forum would provide some visibility over the future demand of possible suppliers. The second objective would be to support the exchange of national content development measures that operators are willing to push.

Following the forum, regular updates on the survey results should be made available (e.g. changes in projects' timeline, changes in assumptions taken for measuring demand...). There are many options available to share these updates such as organizing smaller meetings with targeted participants. Operators could also consider developing a website to share up to date information.

Objective 2: Providing assistance to local companies

Recommendation 2: Creating an ‘Industry Enhancement Center’

The center based in Kampala would have two main objectives. The first would be to raise the management standards of Ugandan companies that could be involved in future projects. The second objective would be to take charge of managing the after peak period (i.e. transfer of people to other companies, industries or regions).

It is essential for local businesses to raise their current management standards, not only to access and win tenders from international oil and gas operators, but also to gain access to lower interest rates. Such a center would provide trainings on topics such as how to fill in a pre-qualification application, how to understand the general terms and conditions of an international contract or how to integrate the required HSE standards for instance.

This center would also be seen as a pool of viable and profitable projects for investors and donors.

Following the peak period, the center will focus on its outplacement activity by facilitating the transfer of the workers (mechanical technicians, electricians ...) involved in that peak, from oil and gas infrastructures to other existing ones in the country (dams for instance).

In terms of governance, the center should be led by a combination of different industrials, including oil and gas companies and also non petroleum players such as cement or transportation players that are already well-established in Uganda. This center should also include in its governance some local investors, professional associations (e.g. PFSU, AUOGS), lawyers and auditors and certification companies or banks. Representatives from the GoU, coming from the UIA (Uganda Investment Authority) should also be part of such a project.

In more practical terms, the key rule is that the members of this center (oil and gas and other industrials) should deliver most of the assistance services previously described by themselves, through training sessions, meetings or briefings directly provided by representatives of the participating industrial groups. It is important that the content delivered by this business center remains controlled by the operations and other industrial members.

Recommendation 3: Developing a list of suppliers and a register of talent in Uganda

The *Industrial Baseline Survey* is a first draft but yet a unique list of suppliers available in the country to date, including the real size of players and their production. It was initially based on an existing list of suppliers identified by oil and gas companies and amended with lists provided by professional associations. Finally, the completed questionnaires received from companies enabled generation of a good view on current suppliers in the country, at least for the industrial sectors considered in the survey.

Suppliers data collected can also be useful for all sorts of activities in Uganda, inside and outside of the oil and gas sector. For example, this data would be highly valuable for future Engineering, Procurement and Construction (EPC) contractors upon their arrival.

The objective of the *Talent register* is to list all the engineers, technicians and skilled workers who will be trained over the different phases of oil and gas projects. These trainees, some of whom will be certified (e.g. welders), would constitute a highly valuable set of asset and should be reused on other industrial projects within Uganda or on other oil and gas projects in the region. With few precautions taken in terms of confidentiality and based on neutrality and thoroughness, this register is an easy initiative to implement and will provide tangible evidence to allay the concern of operators that the reuse of trained staff can be ensured after the construction phase.

These two tools, a list of suppliers and a register of talents, could be integrated into the 'Industry Enhancement Center' once it has been established.

Recommendation 4: Supporting several specific and selected sectors

The objective is to foster the emergence of real Ugandan industrial players, which would supply equipment and services to oil and gas projects. This initiative strives to limit the import of goods that could easily be produced in the country, provided that some efforts are done. It is directly derived from the analysis of sectors for which the gap of current supply versus future demand is large, and therefore needs to be fixed to avoid massive imports. This is illustrated in Figure 12.

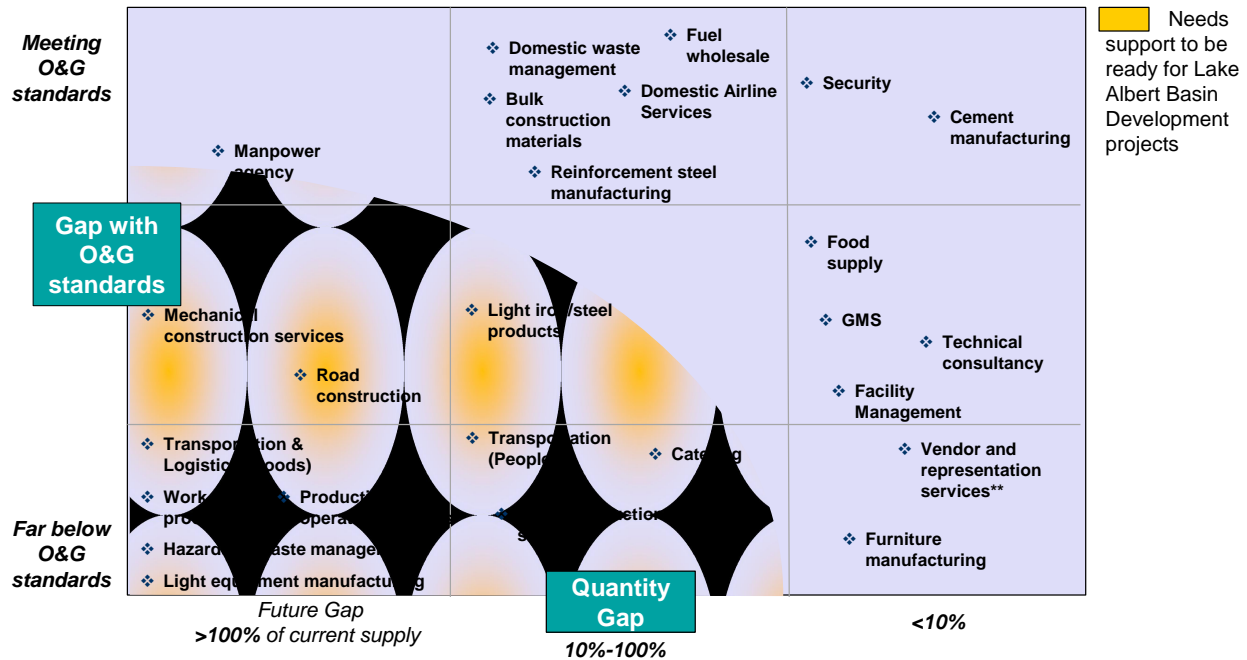


Figure 12: Mapping of industries requiring future support

Examples of possible sectors are detailed in the report and illustrated by 'business cases' when possible. The list contains only suggestions of potential sectors to support and therefore should be reviewed with the knowledge that:

- Maintenance operations (machines, production facilities, oil and gas equipment...) are likely to create many permanent jobs for pre-existing Ugandan companies, starting from the commissioning phase;
- Some Ugandan companies are ready to diversify their business into the safety equipment (PPE) sector so they can supply safety helmets, gloves, glasses, coveralls etc. but do not know what to start up with and how to move forward. On the contrary, some international companies want to establish partnerships with them but do not know how to do so;
- Metal scaffolding has barely been produced in Uganda thus far, but Roofing or Tembo would be likely to invest and become regional players;
- Uganda, the 'Pearl of Africa' should have advanced and modern facilities to ensure the treatment of hazardous fluids (e.g. drilling muds and other refining products) especially as it is being requested that such activities should be transferred to local businesses and not managed by the oil and gas companies themselves.



- Operators cannot be inactive in the agricultural sector which is the primary sector of the Ugandan economy that is likely to be impacted by oil and gas projects (e.g. through price changes). However, operators will not be able to bring any added value as this sector is too distant from the oil and gas business. Therefore, catering companies should be pressurized with high requirements (e.g. consuming a high percentage of local products) and turn to operators for help;

In terms of support, the role of operators would be to 'coach' the most advanced companies from identified sectors. For example, operators would be in charge of explaining the standards to be achieved, providing support from technical experts, and detailing the future contractors demand in the equipment involved. They would also be in charge of gathering potential investors together (Ugandan individual investors, banks, donors), and potentially connecting international companies willing to build joint ventures and are consequently looking for partners in Uganda.

Additionally, support from operators should vary according to the sectors. For small businesses, international oil and gas companies could for instance provide the total quantities required and standards; they could also finance a helmet mold, or they could introduce potential investors to the companies involved... For non-existent sectors such as industrial maintenance, oil and gas operators can bring together individual investors, local firms specializing in related activities, and European small and medium enterprises ready to provide expertise.

If the 'Industry Enhancement Center' is created at some point, the coaching activity could also be integrated in it.

Businesses considered may seem modest or anecdotal. It is true that the business of safety equipment or scaffolding will not make Uganda a leading industrial player. Nevertheless, if in the next 3 to 5 years, Ugandan authorities together with international companies can claim to have developed viable industries in a country with no industrial tradition like Uganda, it will be a great achievement.

Objective 3: Supporting the educational system

In Uganda, oil and gas companies have already implemented several actions to support education such as scholarships for high school students (including communities) or for engineers and technicians. For existing staff, actions are oriented towards sending young Ugandan engineers to other foreign E&P subsidiaries... If these actions are very useful, they focus on a limited amount of people and are insufficient in comparison with the expected need for technicians.

The following recommendations are the result of on-site visits, readings of internal and public reports and input from our partner on this survey, Dr. Jackson Mwakali, professor at Makerere University. According to what has been gathered, operators need to do significantly more than they currently do, to develop the educational system. Most institutions are too far from international standards to achieve the right level of enhancement by the start of the commissioning phase. Hence, the proposal is to help only the best existing institutions in order to have real and visible impact. Finally, an additional training center may be required to train specific technicians that are not well covered in the existing institutions.

It is critical that all the stakeholders (i.e. GoU, oil and gas companies) understand the substantial needs of technicians, workers and drivers, as described in the reports of the study, and act on the basis of these facts and figures reported to avoid a massive influx of workers from other emerging countries (China, Philippines...).

It is also important to mention that only a limited number of future workers will work for the oil and gas operators. Most of them will be recruited by the EPC companies or outsourced to companies based in Uganda.

In that context, spending in education is a must-have investment. The Government of Uganda should consider it an instrument as is the case in any country developing oil and gas projects. The responsibility of operators on education is to leverage their know-how quickly and on a large scale concerning vocational education, so as to offer maximum opportunities for Ugandans. In similar cases, the Government usually takes the lead on large national educational programs.

Recommendation 5: Supporting the best existing universities

This is mainly about supporting the universities of Makerere and Kyambogo. They are recognized, long-established and have a truly regional reputation. Kyambogo is a university training engineers, even if oil and gas operators and service companies are mainly recruiting technicians there. Makerere launched a chair in Geosciences recently and is about to train petroleum engineers. Both institutions offer solid teaching in general disciplines such as

mechanics, electricity and civil engineering. However, they suffer from a lack of equipment, and consequently, learning is still mostly theoretical.

Operators could support these universities by financing equipment for practical lessons, by providing data sets for geological studies and by training professors in accordance with the principle of 'train the trainer'. It is also important to keep on hiring from these two universities, and send more young engineers, freshly hired, in other subsidiaries, so that they can benefit from on-the-job training.

However, operators may not specifically want to bring their support to 'Oil and Gas universities' initiatives that emerge on a regular basis and without any coordination in Uganda. The study shows that the need for engineers will represent less than 15% of total needs, and that the existing capacity is already sufficient.

Nevertheless, quality of trainings should be strengthened.

Recommendation 6: Supporting the best existing technical institutes

Here the recommendations are particularly focused on Nakawa and UPIK.

After several years of subsidies by Japan, Nakawa is better equipped than any other training center. Nakawa trains skilled workers, especially welders. It might be a good candidate for receiving international certification in welding. The problem is that Nakawa has limited capacity.

UPIK is the second institute that has been investigated during the survey. The track record of UPIK is poor for the moment, indeed, since its inception, no UPIK graduates have been hired by oil and gas companies. Additionally, in 2013, no new students have been enrolled in that institute. The concept of UPIK in itself is excellent, as long as it is clearly targeted for low-level technicians and future workers from the communities of Lake Albert. Considering the current difficulties of this institute, operators should keep a close eye on what is happening in that training center and agree on a common approach rather than a separated strategy as is currently done.

Recommendation 7: Establishing a dialogue between universities and private employers

Statistics show that the percentage of unemployed college graduates is higher than graduates from technical and vocational education (17% vs. 10%). In addition, more than 60% of university graduates have a curriculum in social sciences whereas only 24% are taking scientific disciplines such as engineering or medicine. And finally, earlier in the educational curriculum, there seems to be a real contempt towards vocational courses, as classes are mainly populated with students

who have failed to reach the university or standard high school. In other words, the Ugandan system does not value enough technical and scientific disciplines, leaving generations of students to embark on paths without any job opportunities at the end.

It is necessary to strengthen the dialogue between universities and employers. This may be achieved by organizing one or two career fairs every year, or by opening an office a few hours a week during which operators would explain to students what their jobs of the future could be and which sectors will actually be hiring. It would also be an efficient way for sourcing future recruits and for engaging a discussion with those who will become executives in the long run, in other words, a dialogue that should not be overlooked.

Recommendation 8: Creating a technical training institute

This recommendation comes from the analysis of supply and demand for labor during the construction and operations phase, considerably detailed in the reports of the study. The needs for construction phase will be massive and fast (up to 13,000 people). They will last for about three years, followed by the operations phase that will create fewer but more sustainable jobs.

The study outlines the requirements for each discipline based on assumptions on both the number of skilled workers existing in the country and a percentage of expatriates. For many disciplines, it is very likely that EPC contractors will be able to implement accelerated trainings on site for jobs (welders, machine operators or drivers) that are needed to start the construction. This is an area of expertise that can be expected from global EPCs that will easily absorb the full need of previously described jobs. For other disciplines, it is mandatory for international oil and gas companies to anticipate before the implication of EPC contractors, otherwise it will be too late. This is the case, for example, with mechanical technicians, who may not be ready on time if operators do not anticipate their training before the Final Investment Date.



ANNEX 1 – INDUSTRIAL BASE LINE SURVEY PRESENTATION OF THE 20TH November 2013



Industrial Baseline Survey in Uganda (IBS)

Presentation to the Government of Uganda

Entebbe, November 20th 2013



Objectives of the workshop

- Present the results of the Industrial Baseline Survey (IBS) to the PEPD and the invited Ministry representatives:
 - Objectives, methodology and approach, assumptions & hypotheses
 - Main results of the manpower supply and demand assessment
 - Main insights of the industrial sectors' supply and demand analysis
- To exchange with government on possible way forward / recommendations

Agenda

- | | |
|--|---------------|
| ▪ Introduction <ul style="list-style-type: none">• Survey's objective, scope of work, approach, methodology and general assumptions | 9:30 – 10:00 |
| ▪ Manpower supply & demand analysis <ul style="list-style-type: none">• Future manpower requirements• Summary of education system analysis | 10:00 – 11:30 |
| ▪ Manpower supply & demand analysis – Q&A | 11:30 – 12:00 |
| ▪ Lunch | 12:00 – 13:00 |
| ▪ Industry analysis – supply & demand analysis | 13:00 – 15:00 |
| ▪ Industry analysis – Q&A | 15:00 – 15:30 |
| ▪ Recommendations | 15:30 – 16:30 |
| ▪ Way forward | 16:30 – 17:00 |

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Objective of the Industrial Baseline Survey

OBJECTIVE

- To assess the demand of LAB project for goods (equipment, bulk materials) and services (workforce, consultancies, etc)
- To assess the local **capacity** to supply the oil industry with skills and goods and identify strategies to **bolster it**
- Understand the business environment to **capture barriers to participation** of local small and medium enterprises into the supply chain
- Meet with external stakeholders to **build stronger communication** channels and understand local concerns
- **Select the key local content development opportunities** for CNOOC, TOTAL E&P and Tullow

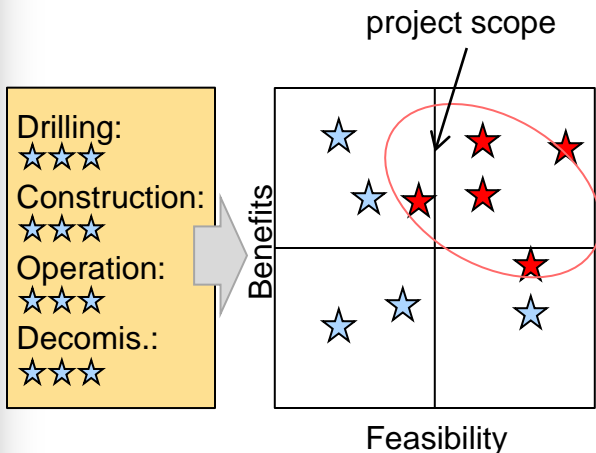
SCOPE OF WORK

- Assessment of **future needs** across several segments:
 - Drilling, Construction, Operations
 - Equipment, Raw Materials, Manpower
 - Upstream and Downstream
 - Direct jobs, Indirect, Induced
 - Buliisa, Kingfisher, Kaiso Tonya
- Analysis of supply sectors through a survey of companies to identify segments with the highest impact on LC in terms of ease of implementation and job creation
- Assessment of **manpower supply from Universities and technical and vocational institutions**

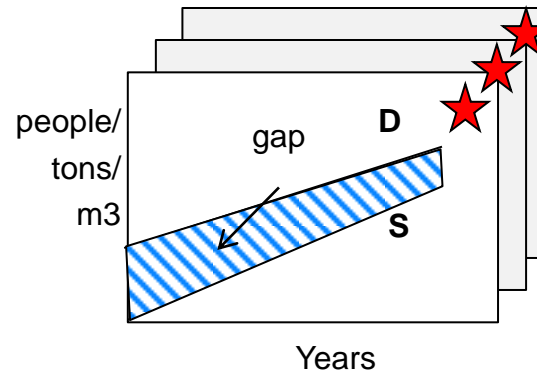
Overall methodology

THREE STEPS APPROACH TO INDUSTRIAL BASE LINE SURVEY IN UGANDA

1 Framing 2 Data gathering and alignment 3 Strategy



- Build an exhaustive segment list for entire value chain (in terms of Services, Goods, Raw materials)
- Define segment with the highest impact on Local Content (LC)



- Perform demand and supply forecast for chosen segments
- Conduct gap analysis

Strategy Road map

- ★ Initiative programs
- ★ People development
- ★ Service industry support programs
- ★ ...

- Develop strategy roadmap to close the gap

Assumptions – Phases

ASSUMPTIONS BY PHASES

Refinery

- Hypotheses of a 30kbpd production: data from proxy (CNOOC and Total)
- Second phase until 60kbpd: no data from operators, no indication of timeline

Upstream Facilities

Construction

- 3 CPFs, operational camps, temporary camps, water intake facilities, pumping stations, well pads, above ground installations, feeder pipe
- construction manpower
- “Stick built” approach

Export pipe

Construction

- ~600m of pipeline installation per day
- 3 crews required for construction
- ~1/3 Ugandan and ~2/3 Kenyan based on the length of export pipe

Drilling

- ~80 people per rig for 40 positions
- 9 rigs at peak
- ~ 700 wells in total

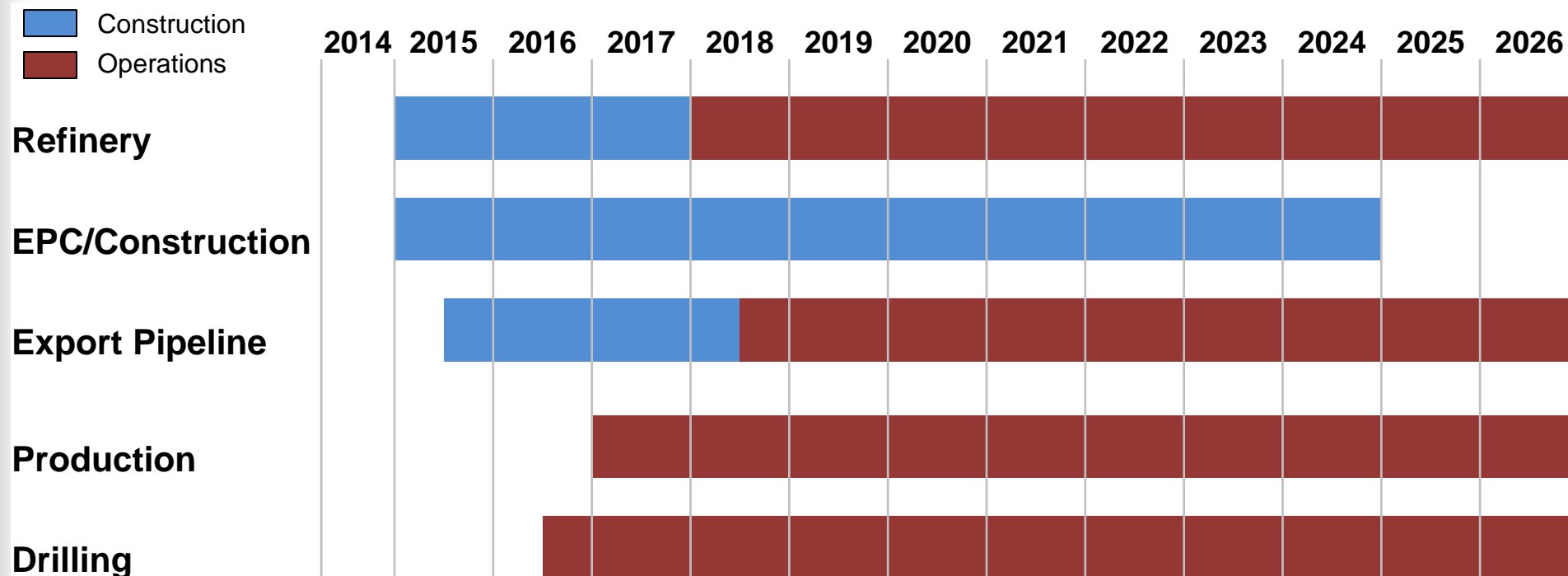
Operations

- 6 months of mobilization before production
- Manpower required primarily to:
 - Operate CPFs
 - Conduct well intervention and workover
 - Monitor reservoir during production operations

Export pipe Operations

- ~200 people for export pipe operation (indicative estimation)

Assumption on Lake Albert Basin Development General planning

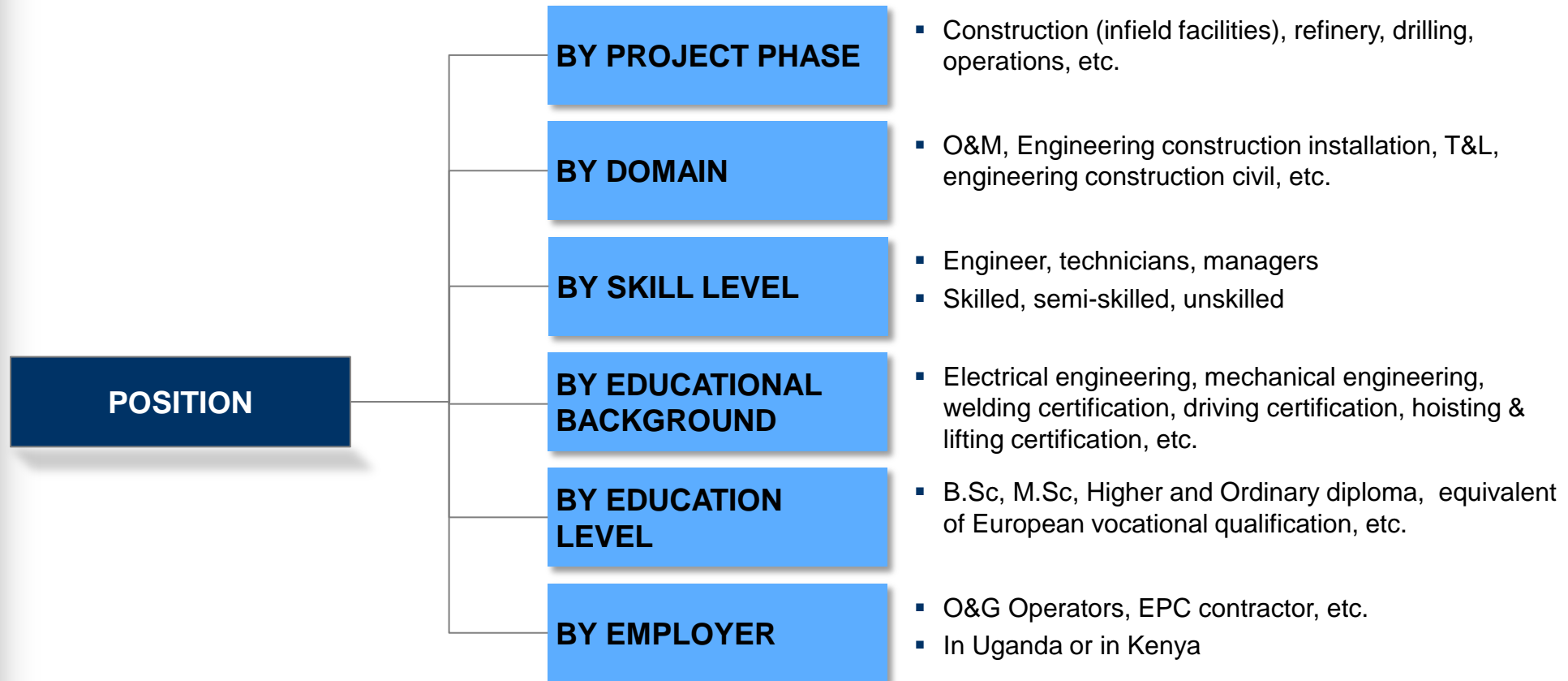


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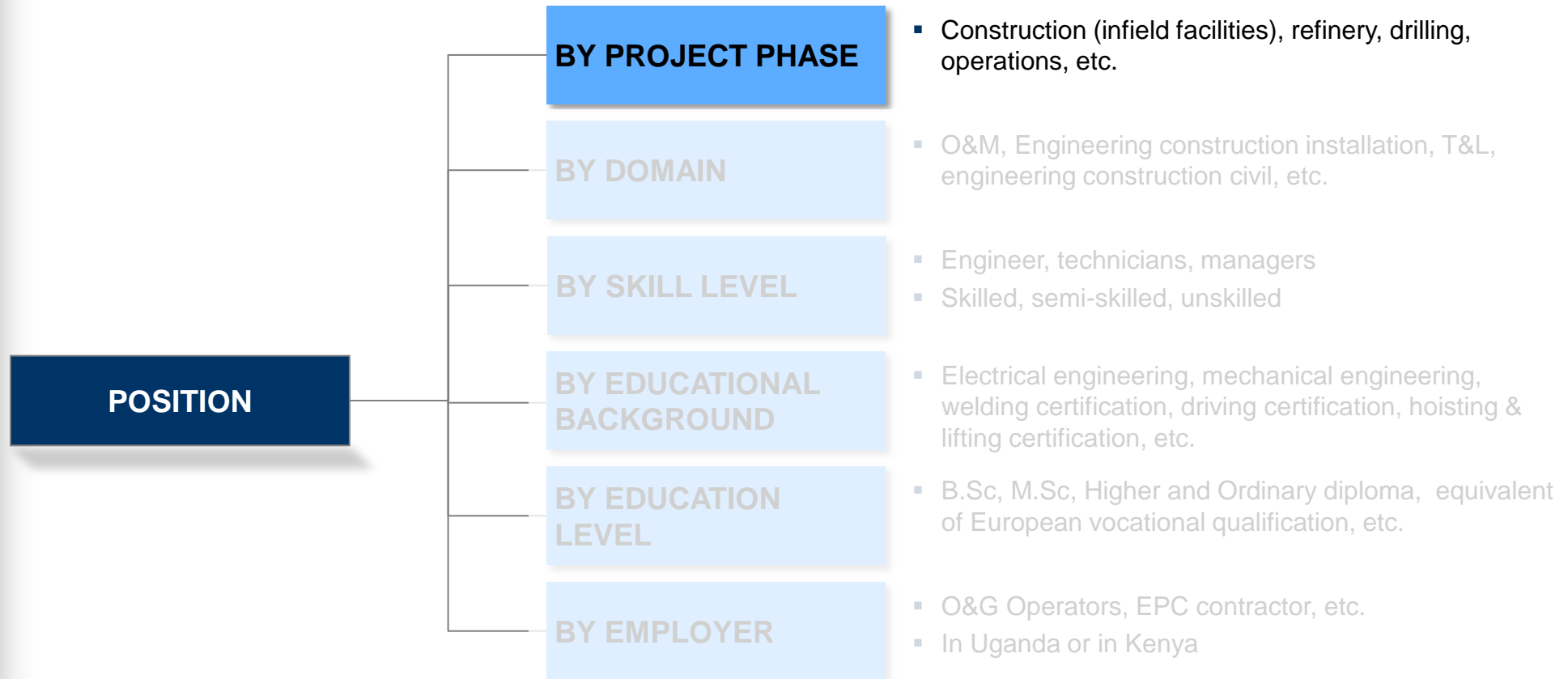
Manpower demand over the entire period of Lake Albert project was analyzed along several segments

ASSUMPTIONS ON MANPOWER SEGMENTATION



Manpower demand over the entire period of Lake Albert project was analyzed along several segments

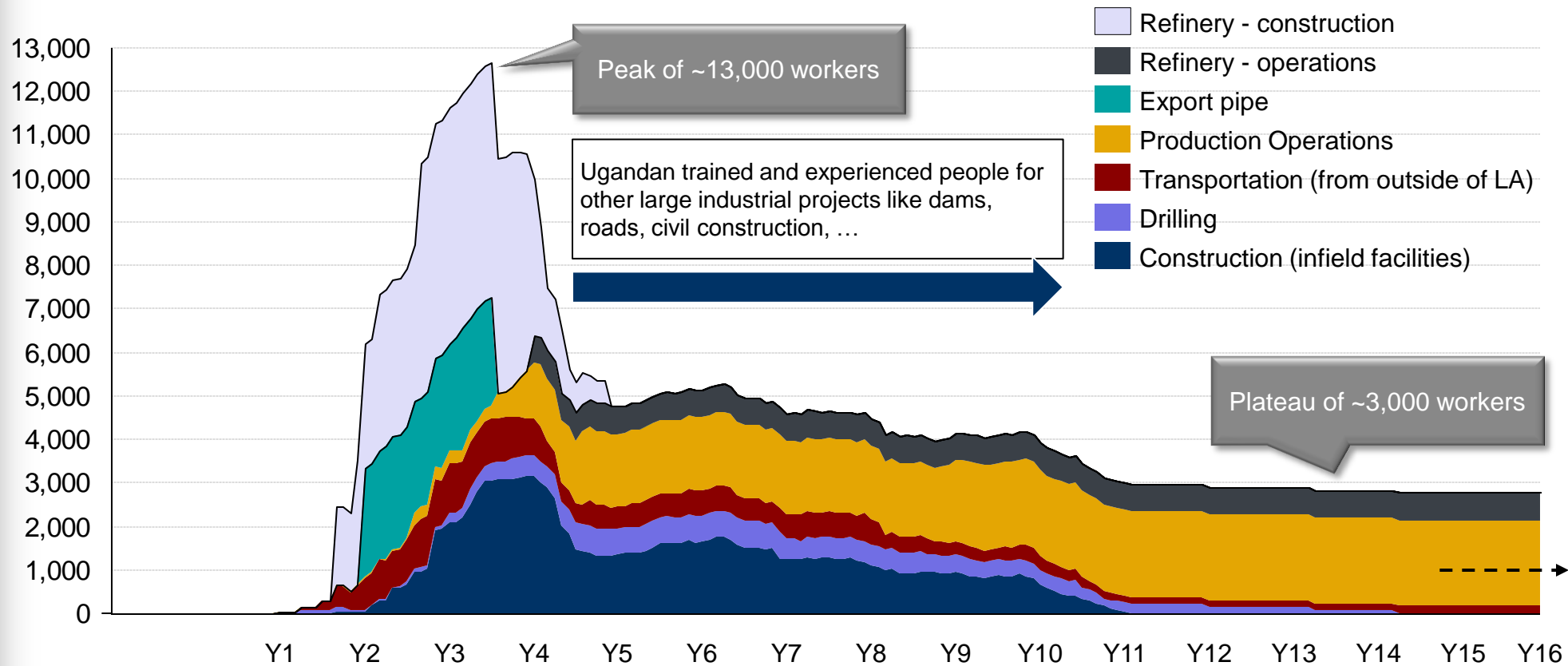
ASSUMPTIONS ON MANPOWER SEGMENTATION



Lake Albert Basin Development projects will create thousands of direct jobs

MANPOWER SPLIT BY DEVELOPMENT PHASE, REFINERY INCLUDED

Cumulative number of people required to build and operate LA projects on site

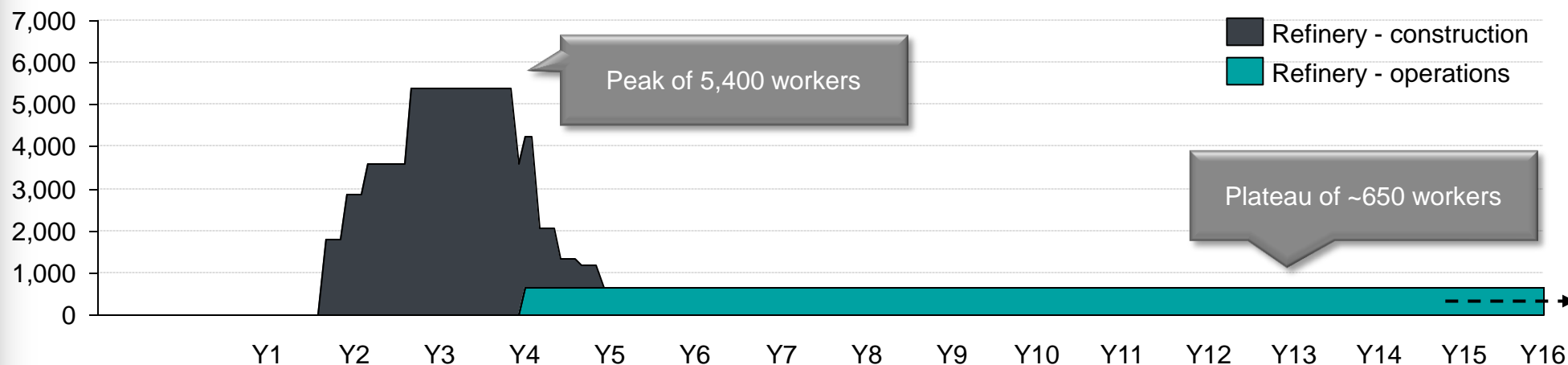


Source: SBC analysis; CNOOC; Total; Tullow
Note: See detailed assumptions and hypotheses in appendix

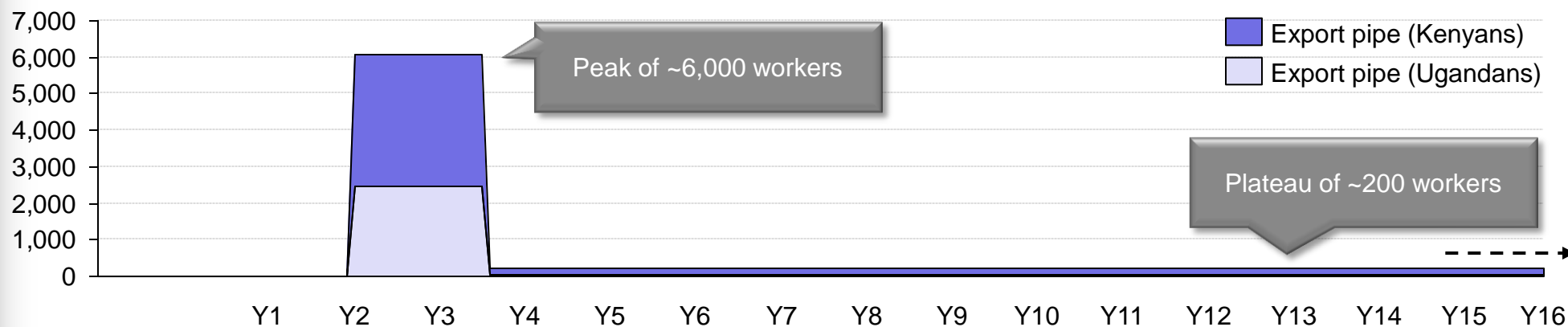
The construction of the refinery and export pipe will require around 5,000 workers each

MANPOWER REQUIRED FOR THE REFINERY

Cumulative number of people (Full time employee - FTE)



MANPOWER REQUIRED FOR THE EXPORT PIPE*



Source: SBC analysis; CNOOC; Total; Tullow

Note: See detailed assumptions and hypotheses in appendix

(*) Manpower to operate Export pipeline is based on assumption of ~200 people. No data was provided by Operators, hence, it is only an indicative estimation



Upstream facilities construction will require 3,000 workers at peak

MANPOWER REQUIRED FOR THE UPSTREAM FACILITIES CONSTRUCTION PHASE

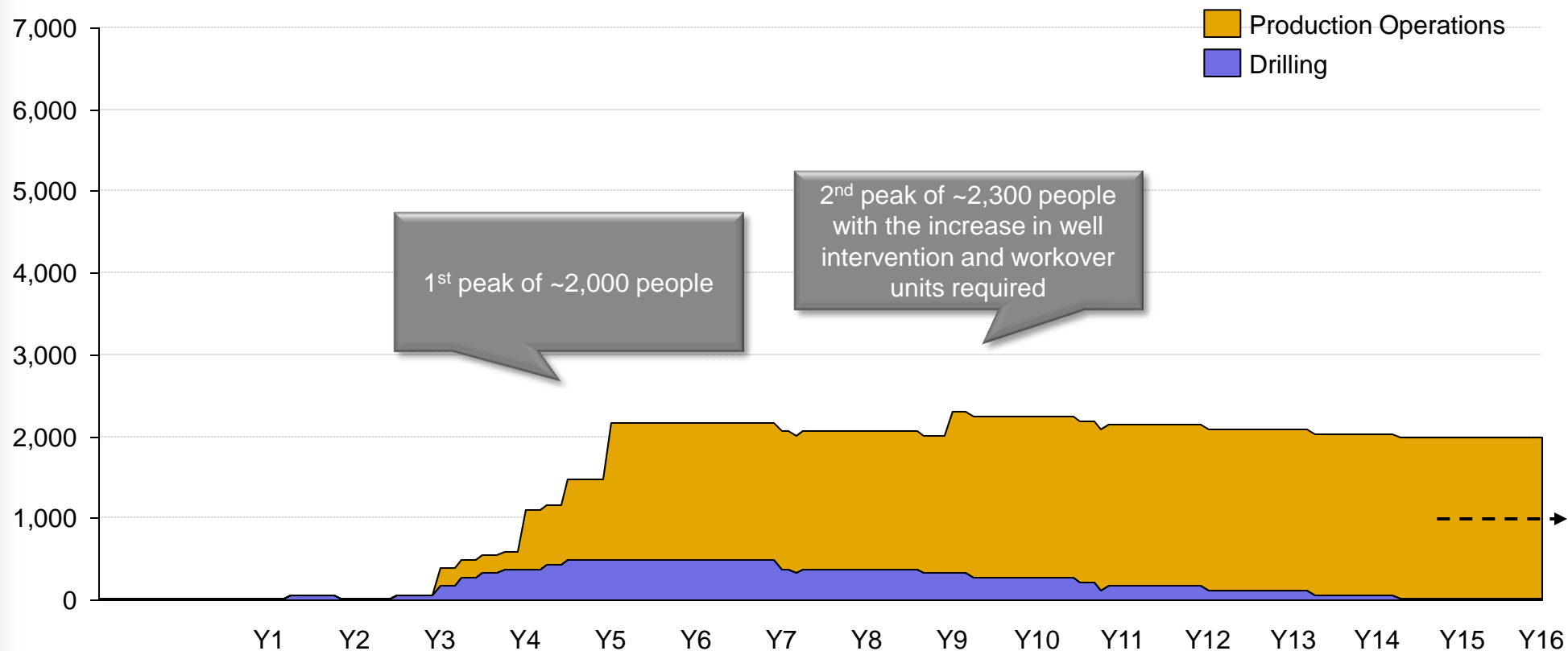
Cumulative number of people (Full time employee - FTE)



Manpower demand for Production Operations and Drilling will be about 2,000 people at peak

MANPOWER SPLIT BY DEVELOPMENT PHASE (OPERATIONS & DRILLING)

Cumulative number of people (Full time employee - FTE)

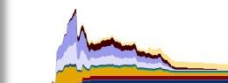


Assumptions – Job type

Phase	Domain	Job Type	Educational background	Minimum level of Education	Source of recruitment
Construction	ECC	Structural control engineer	Civil engineering	Higher diploma	EPC
Construction	ECC	Building / Structural erector	Craftsman certification	O-level	EPC
Construction	ECC	Building / structural foreman	Craftsman certification	UK3/EU4	EPC
Construction	ECC	Cable trays erector	Craftsman certification	O-level	EPC
Construction	ECC	Civil control engineer	Civil engineering	Higher diploma	EPC
Construction	ECC	Civil foreman	Craftsman certification	UK3/EU4	EPC
Construction	ECC	Civil operator	Craftsman certification	O-level	EPC
Construction	ECC	Construction foreman	Craftsman certification	UK3/EU4	EPC
Construction	ECC	Control engineer	Civil engineering	Higher diploma	EPC
Operations	O&M	Production Supervisor	Electrical/Mechanical er	Higher diploma	O&G Operators
Operations	OS	PTW-Co ordinator	Electrical/Mechanical er	Degree	O&G Operators
Operations	O&M	CCR Operator	Electrical/Mechanical er	Higher diploma	O&G Operators
Operations	O&M	Production Technician	Electrical/Mechanical er	Higher diploma	O&G Operators
Operations	O&M	Production General Assistan	Non-technical education	Ordinary diploma	O&G Operators
Operations	O&M	Production Chemist	Chemical engineering	Higher diploma	O&G Operators
Operations	O&M	Trainee Production Techicia	Electrical/Mechanical er	UK3/EU4	O&G Operators

Database of ~400 job types ... in project life

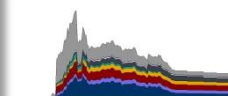
BY DOMAIN



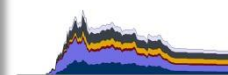
BY SKILL LEVEL



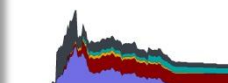
BY EDUCATIONAL BACKGROUND



BY EDUCATION LEVEL



BY EMPLOYER

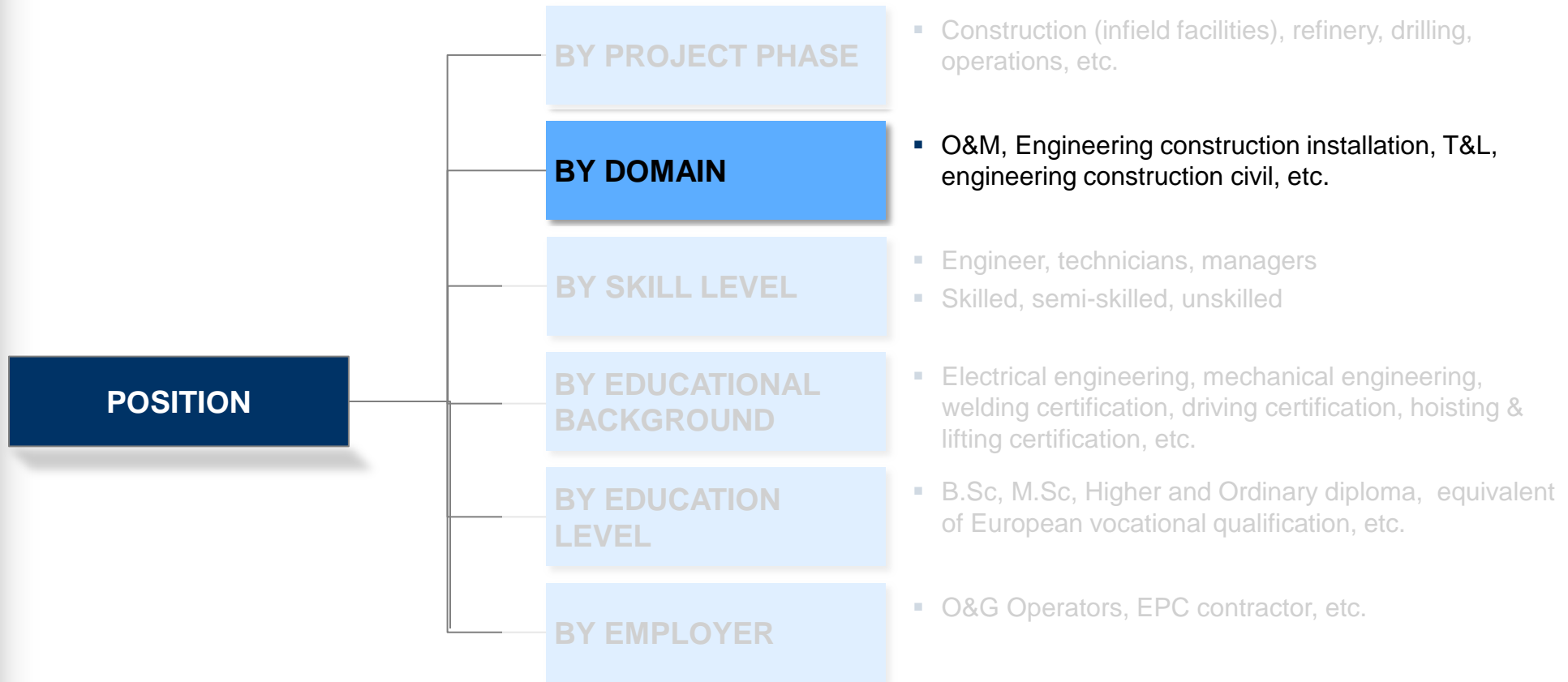


Source: Discussion with Partners; data on demand provided by CNOOC, Total and Tullow
 Note: Higher Diploma corresponds to 4 years to technical education; UK3/EU4 corresponds to 3 years of technical education in UK or EU



Manpower demand segmentation

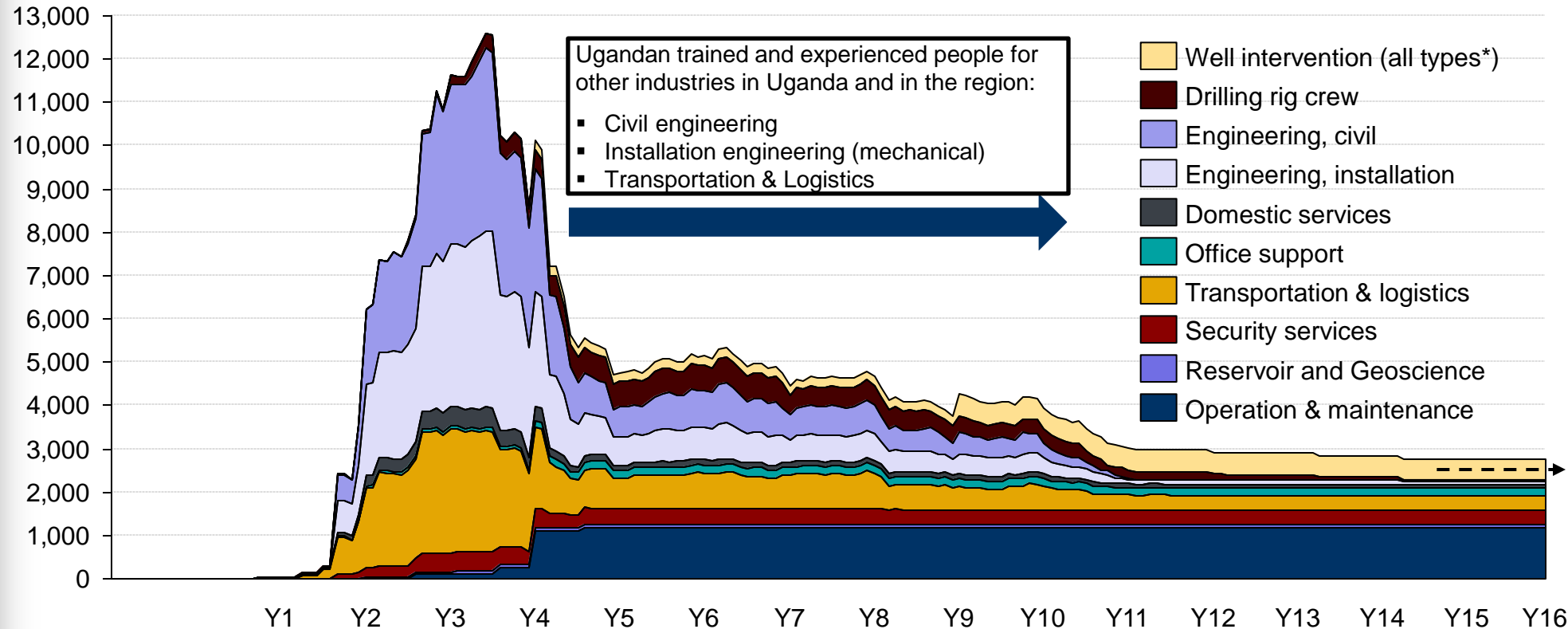
ASSUMPTIONS ON MANPOWER SEGMENTATION



There will be a progressive transfer of needs from Construction & Transportation to Operations & Maintenance

MANPOWER SPLIT BY DOMAIN

Cumulative number of people (FTE)

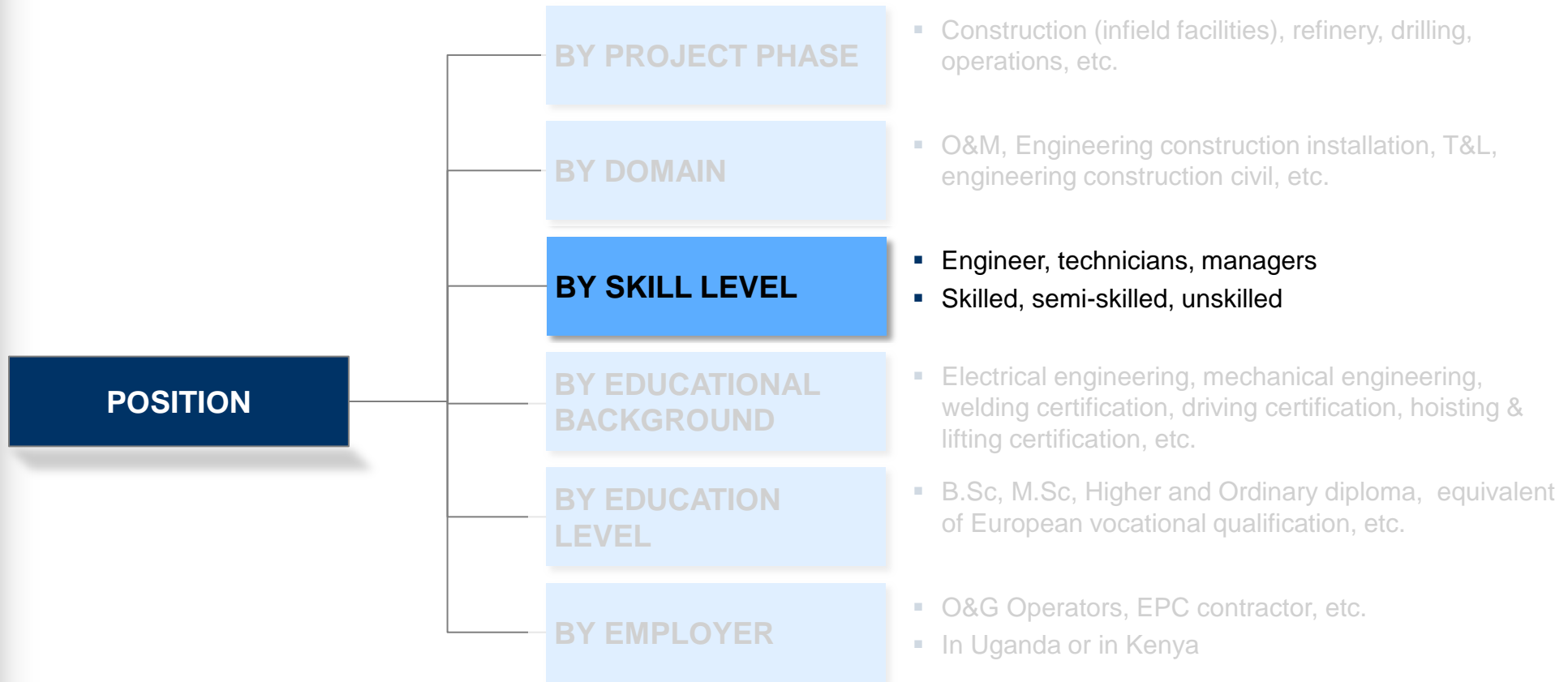


Source: SBC analysis; CNOOC; Total; Tullow

Note: *Well intervention includes work over unit, slick line unit, coiled tubing unit, snubbing unit

Manpower demand segmentation

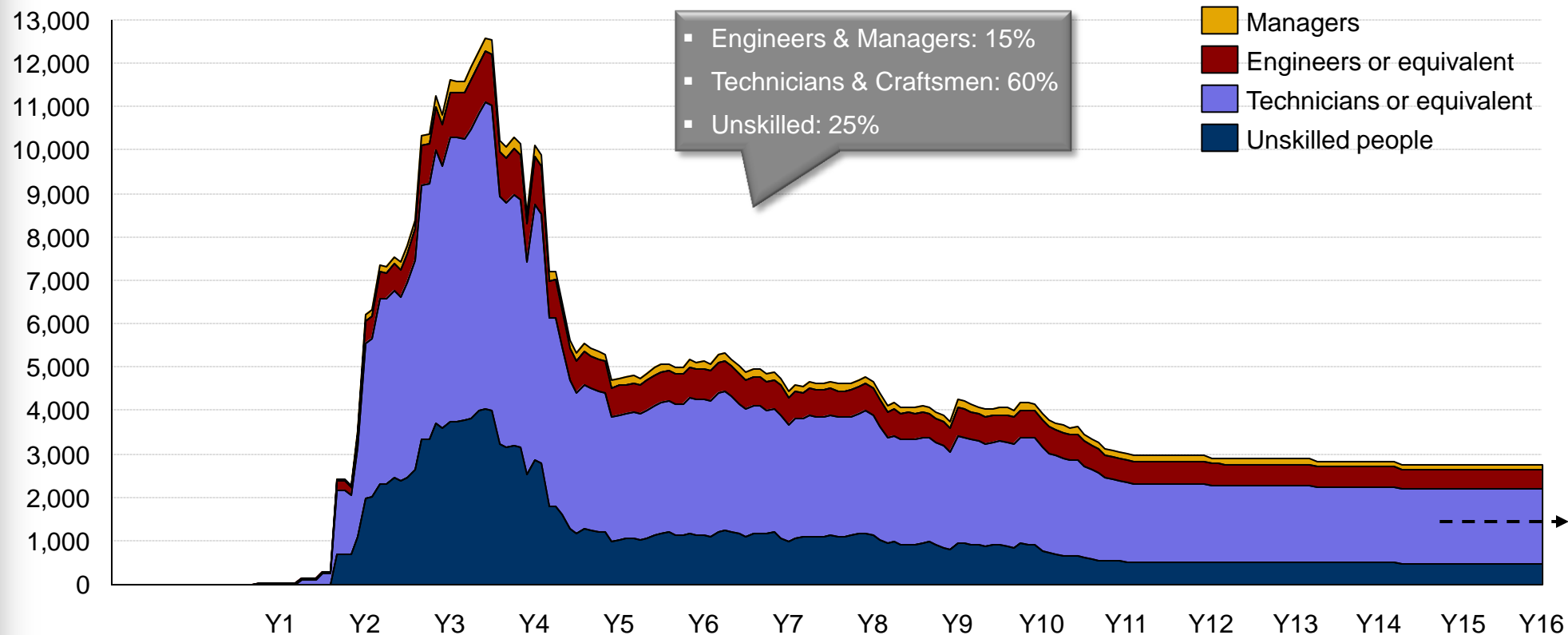
ASSUMPTIONS ON MANPOWER SEGMENTATION



Out of total manpower required, only 15% are engineers and managers, the rest being technicians (60%) and unskilled (25%)

MANPOWER SPLIT BY SKILL LEVEL

Cumulative number of people (FTE)



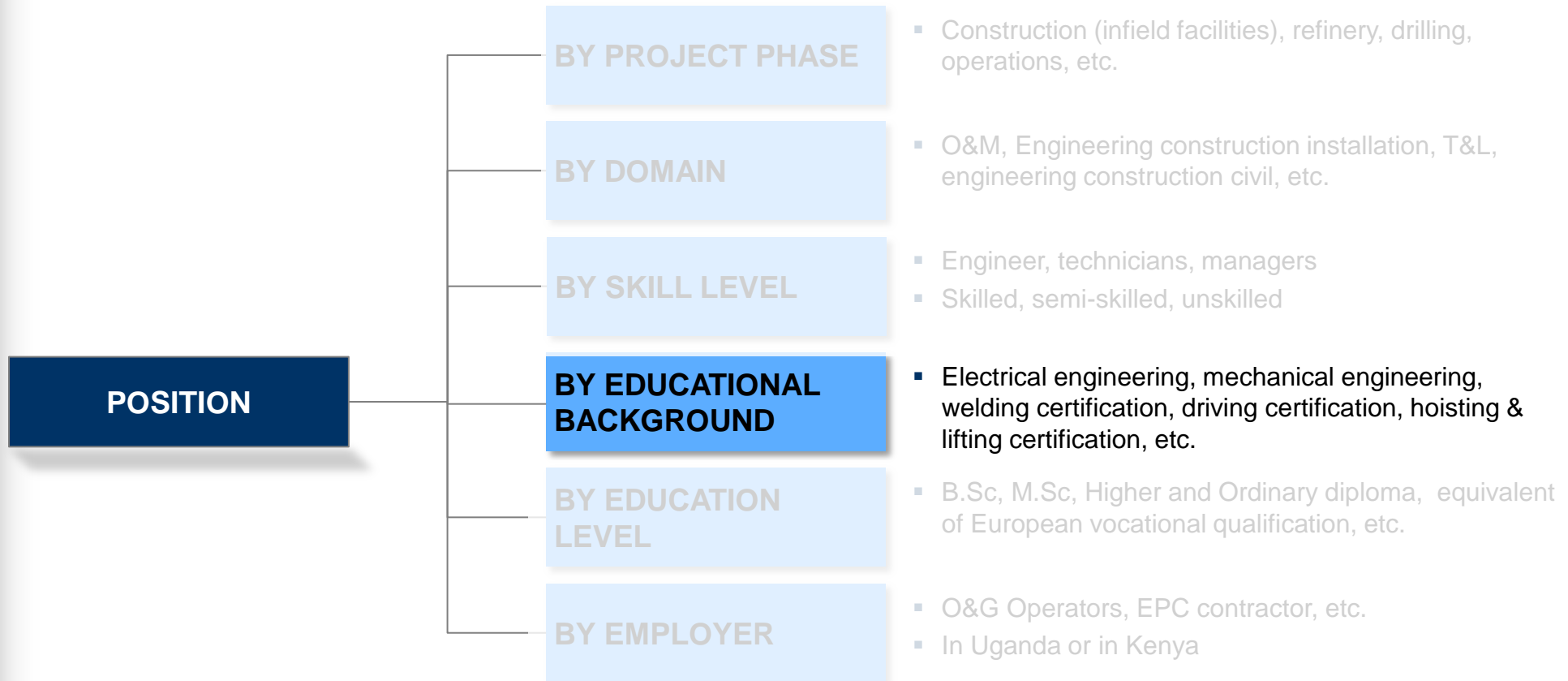
Source: SBC analysis; CNOOC; Total; Tullow

Note: All manpower quantities were obtained under assumption of "stick built" approach to construction, as opposed to "modularization" approach



Manpower demand segmentation

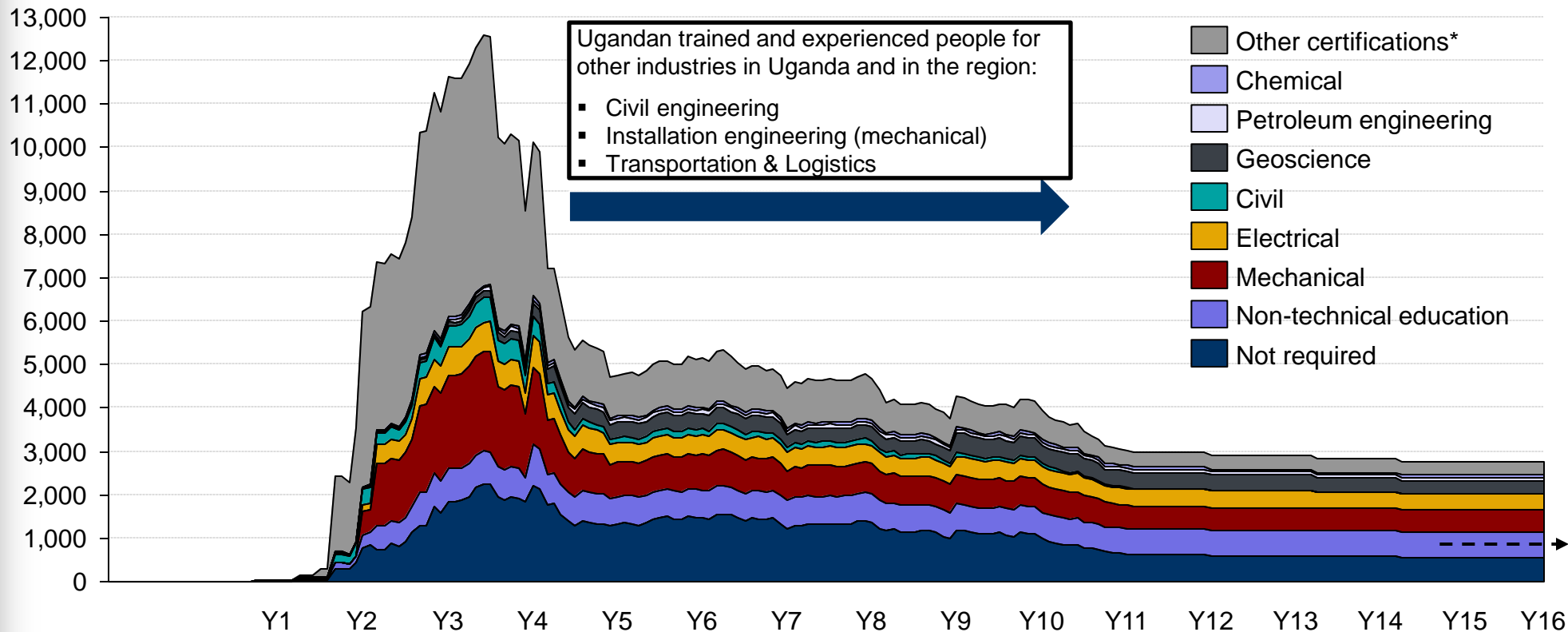
ASSUMPTIONS ON MANPOWER SEGMENTATION



Education focus will have to be on civil construction, electrical and mechanical fields

MANPOWER SPLIT BY BROAD EDUCATION BACKGROUND

Cumulative number of people (FTE)



Source: SBC analysis; CNOOC; Total; Tullow

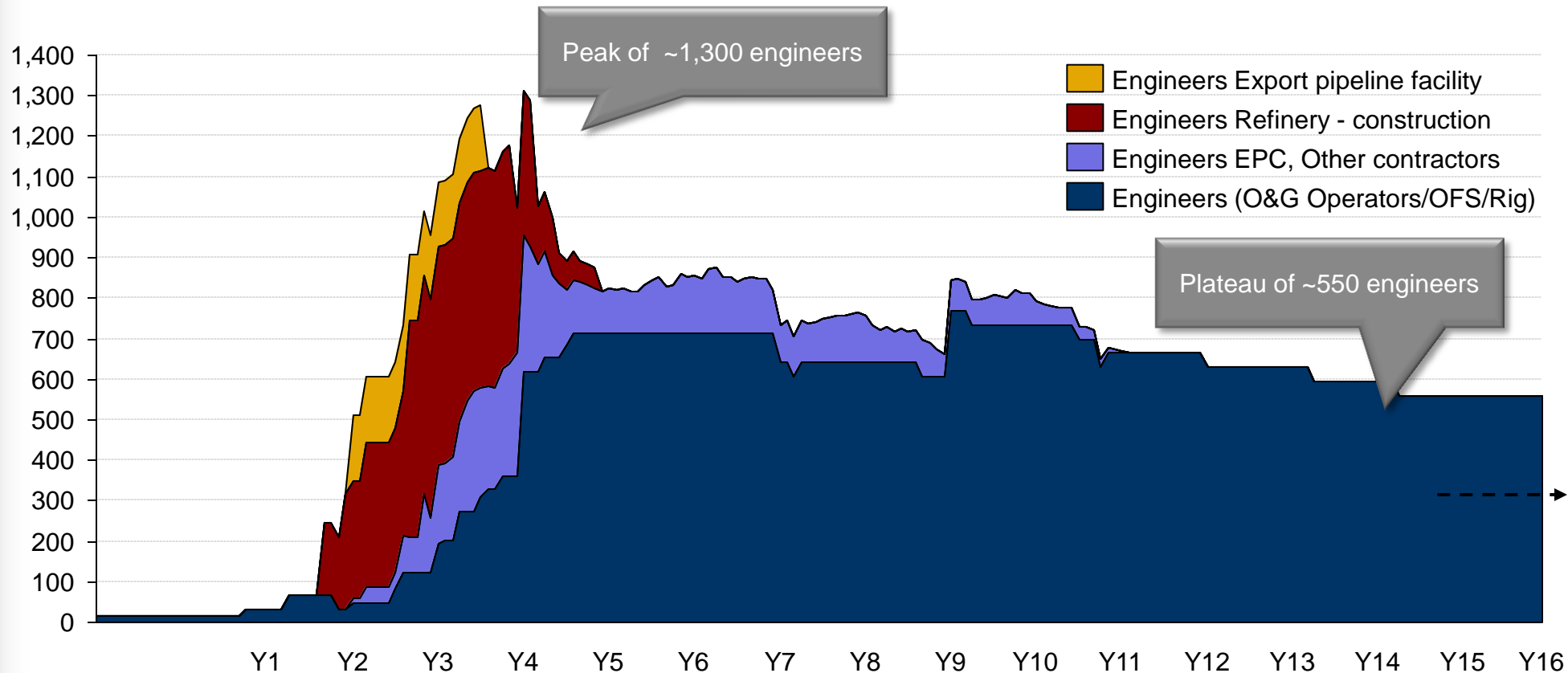
Notes: (*) Other certification includes driving (heavy duty and passengers trucks), welding (pipes), welding (plate), hoisting and lifting, machine operators.



Demand for engineers will be almost 1,300 at peak

MANPOWER REQUIREMENTS FOR ENGINEERS (ALL TYPES OF ENGINEERS)

Cumulative number of people (FTE)



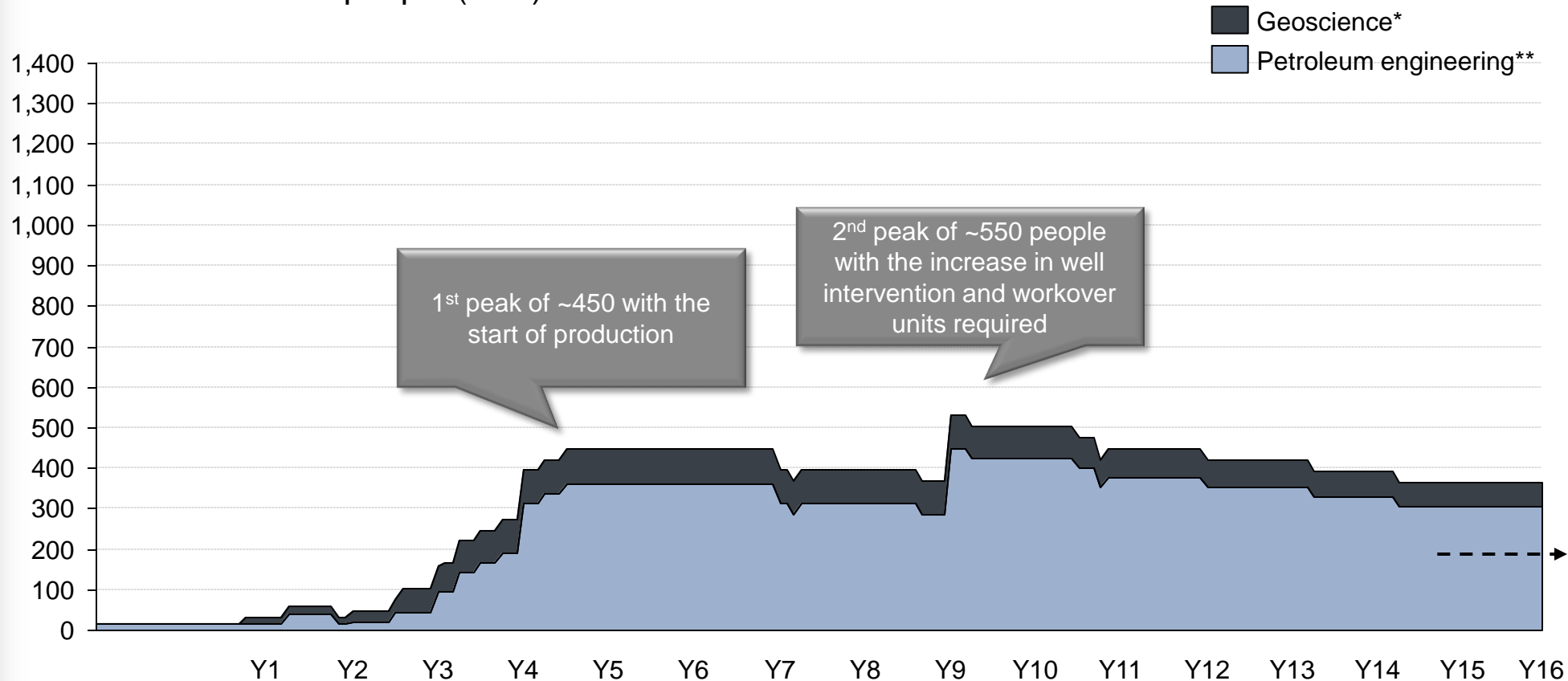
Source: SBC analysis; CNOOC; Total; Tullow

Note: Engineers are made up of Civil, Mechanical, Electrical, Chemical, Petroleum and Geoscience

Demand for petroleum engineers and geoscience professionals will not exceed 500 people

MANPOWER REQUIREMENTS FOR PETROLEUM ENGINEERING AND GEOSCIENCE

Cumulative number of people (FTE)



Source: SBC analysis; CNOOC; Total; Tullow

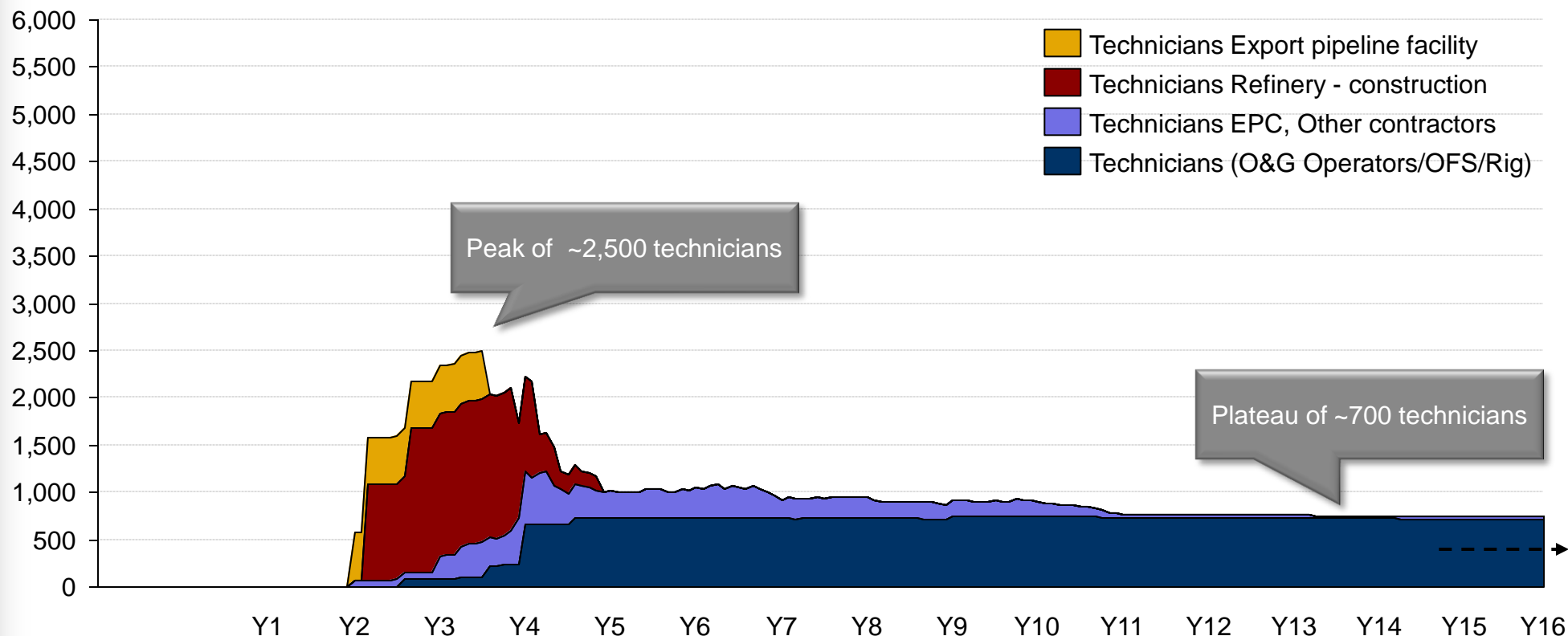
Note: Manpower includes OFS companies. *Geoscience includes geologists and geophysicists. **Petroleum engineering includes reservoir engineers, drilling engineers, completion engineers, and production engineers



Demand for technicians during construction will peak at 2,500

MANPOWER REQUIREMENTS FOR TECHNICIANS (MECHANICAL AND ELECTRICAL)

Cumulative number of people (FTE)



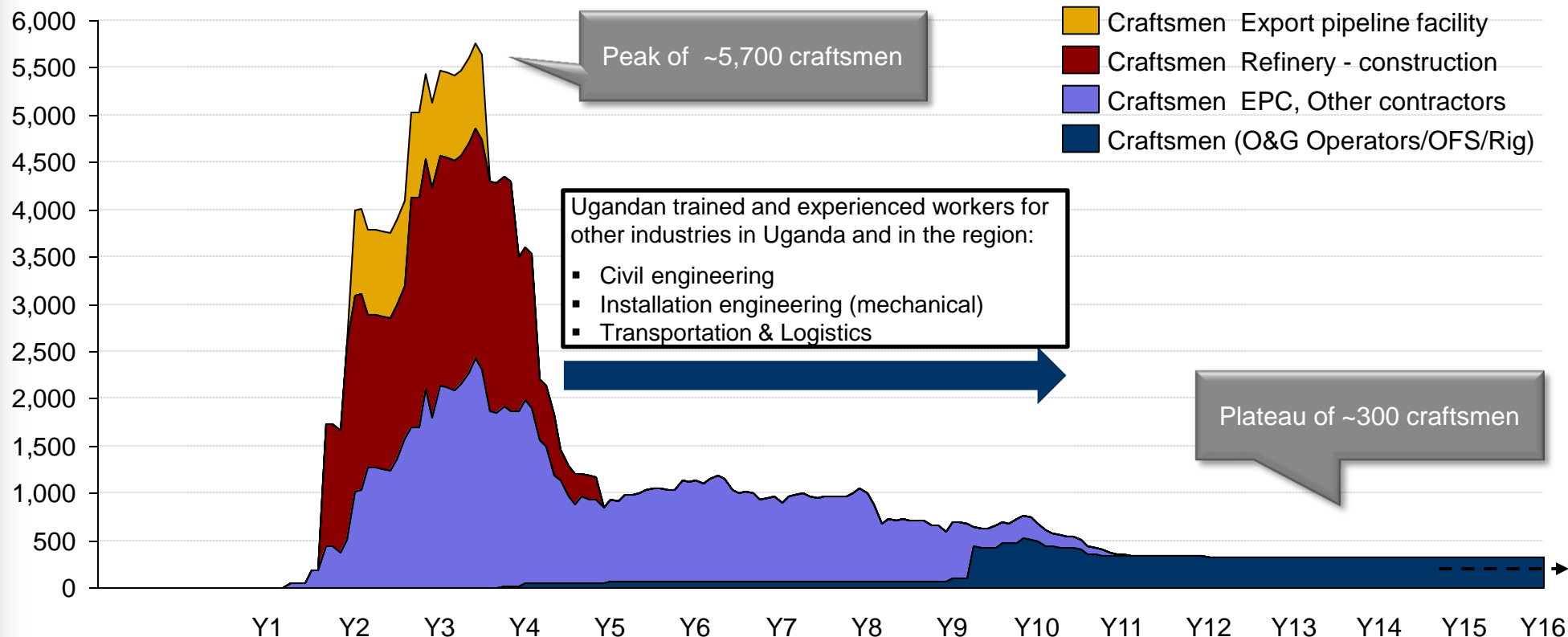
Source: SBC analysis; CNOOC; Total; Tullow

Note: Technicians are made up of Mechanical and Electrical Technicians

Demand for craftsmen will peak at 5,500 workers and then strongly reduce, leaving resources available for other projects

MANPOWER REQUIREMENTS FOR CRAFTSMEN (WELDERS, DRIVERS, MACHINE OPERATORS, H&L OPERATORS AND CIVIL CRAFTSMEN)

Cumulative number of people (FTE)



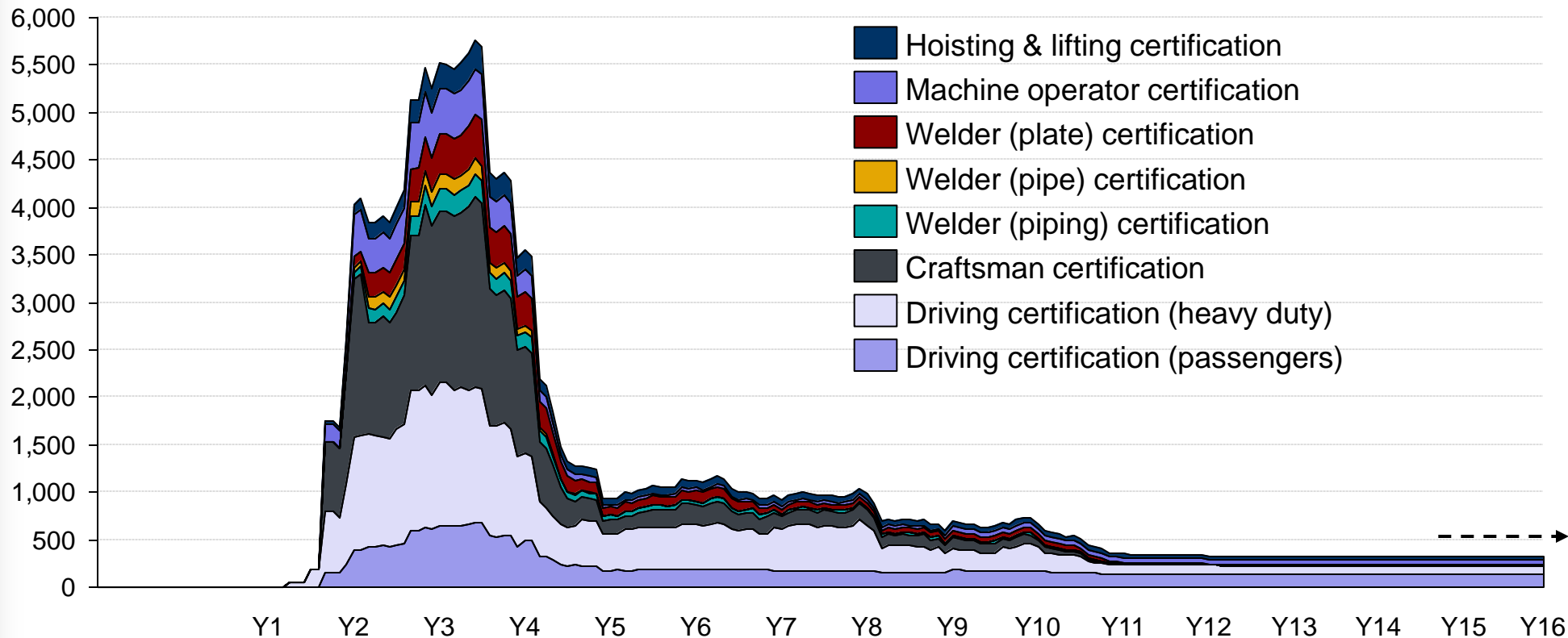
Source: SBC analysis; CNOOC; Total; Tullow

Note: Craftsmen are made up of Welders, Drivers, Machine Operators, H&L Operators and Civil Craftsmen

The majority of manpower will need to be certified before or during the construction phase

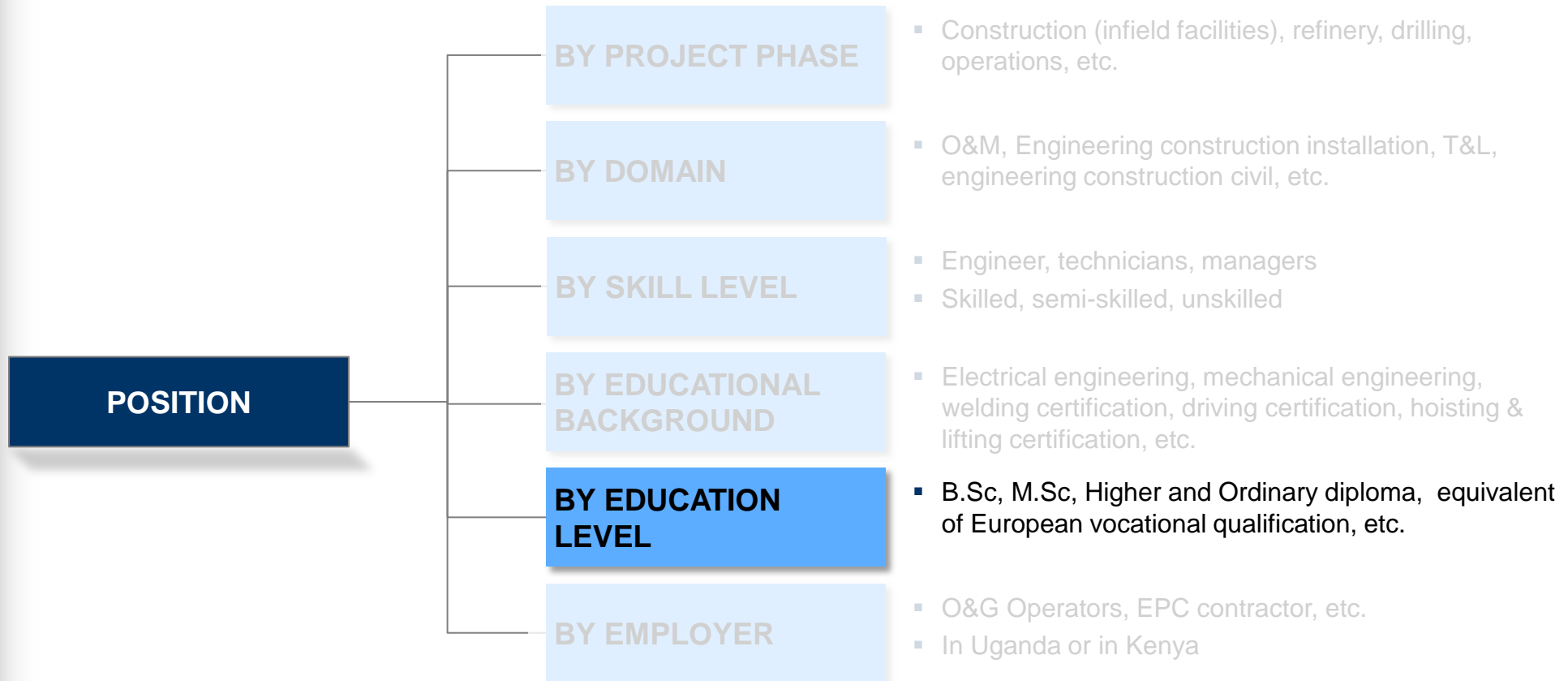
MANPOWER SPLIT FOR KEY CERTIFICATIONS

cumulative number of people (FTE)



Manpower demand segmentation

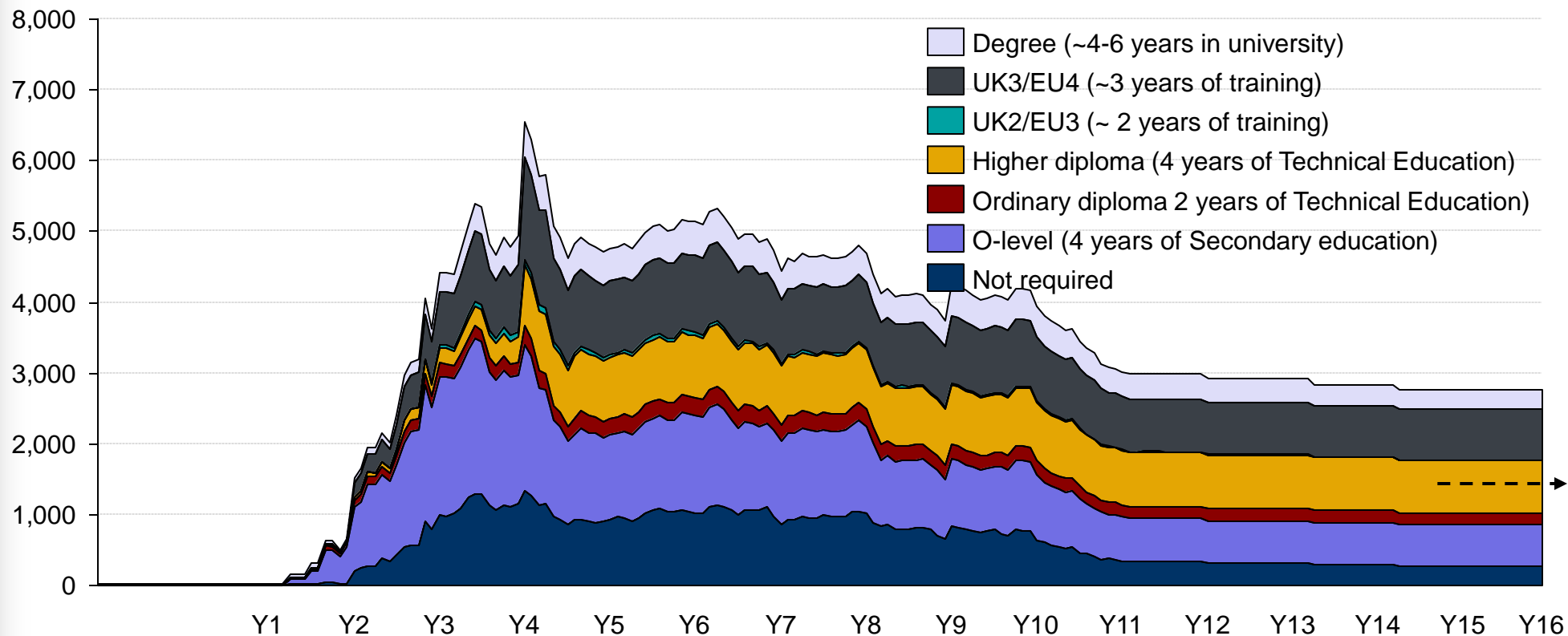
ASSUMPTIONS ON MANPOWER SEGMENTATION



All levels of education will be required for development

MANPOWER SPLIT BY LEVEL OF EDUCATION (EXCL. REFINERY)

Cumulative number of people (Full time employee - FTE)



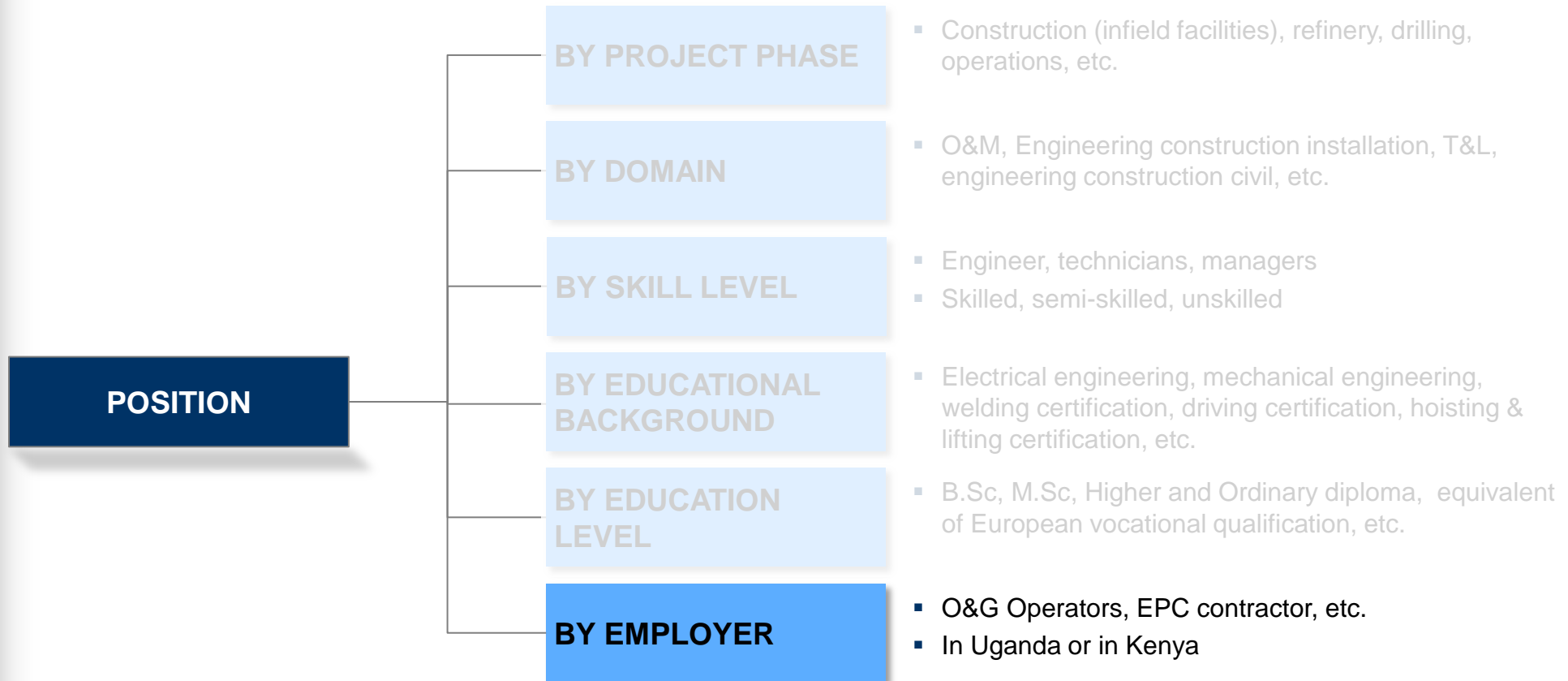
Source: SBC analysis; CNOOC; Total; Tullow

Note: Refinery is excluded. 60% of drivers of trailers for equipment coming from Mombasa port are Kenyan. 70% of workforce for export pipe construction are Kenyan



Manpower demand segmentation

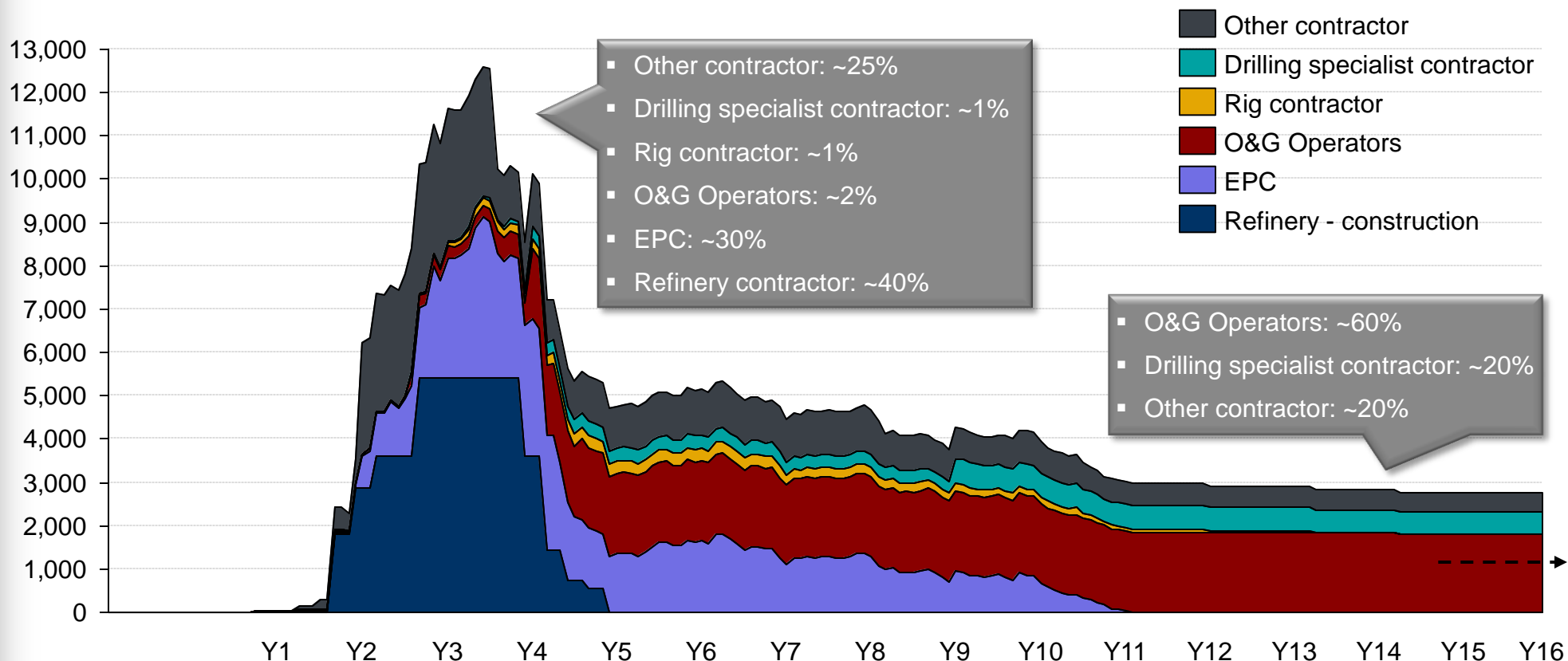
ASSUMPTIONS ON MANPOWER SEGMENTATION



The majority of manpower will be recruited by contractors especially during construction

MANPOWER SPLIT BY EMPLOYER

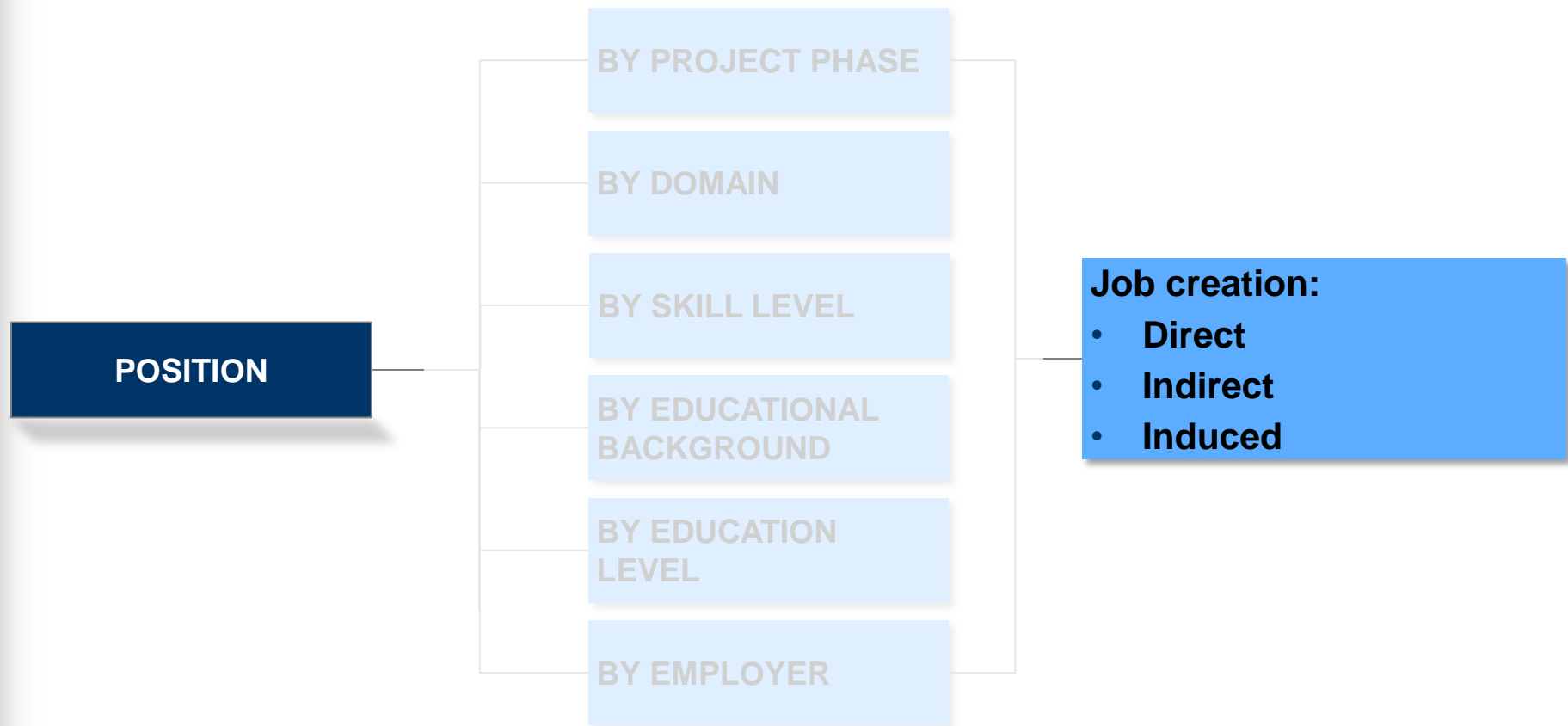
Cumulative number of people (Full time employee - FTE)



Source: SBC analysis; CNOOC; Total; Tullow. Refinery is excluded. 60% of drivers of trailers for equipment coming from Mombasa port are Kenyan. 70% of workforce for export pipe construction are Kenyan

Extrapolation from direct to indirect and induced jobs created

ASSUMPTIONS ON MANPOWER SEGMENTATION (CONTRACTORS AND OPERATORS)



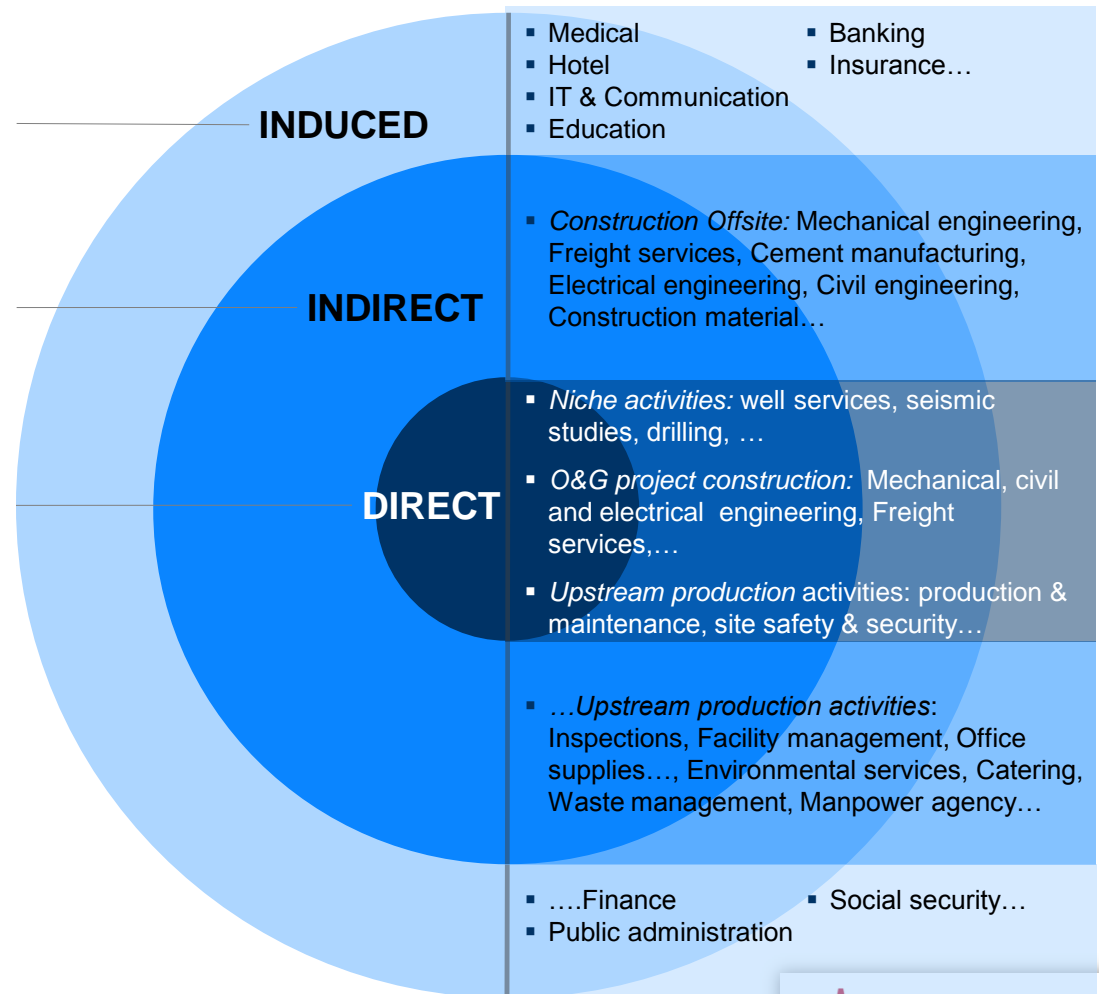
Oil & Gas activity generates jobs beyond the boundaries of projects

CONCEPTS OF DIRECT, INDIRECT AND INDUCED JOBS GENERATED BY OIL & GAS PROJECTS

Direct and indirect jobs generated by the oil and gas industry revenues once **re-invested in the economy**

Jobs generated by companies supporting oil and gas projects **offsite**

Jobs generated by companies developing and supporting oil and gas projects development **on site***

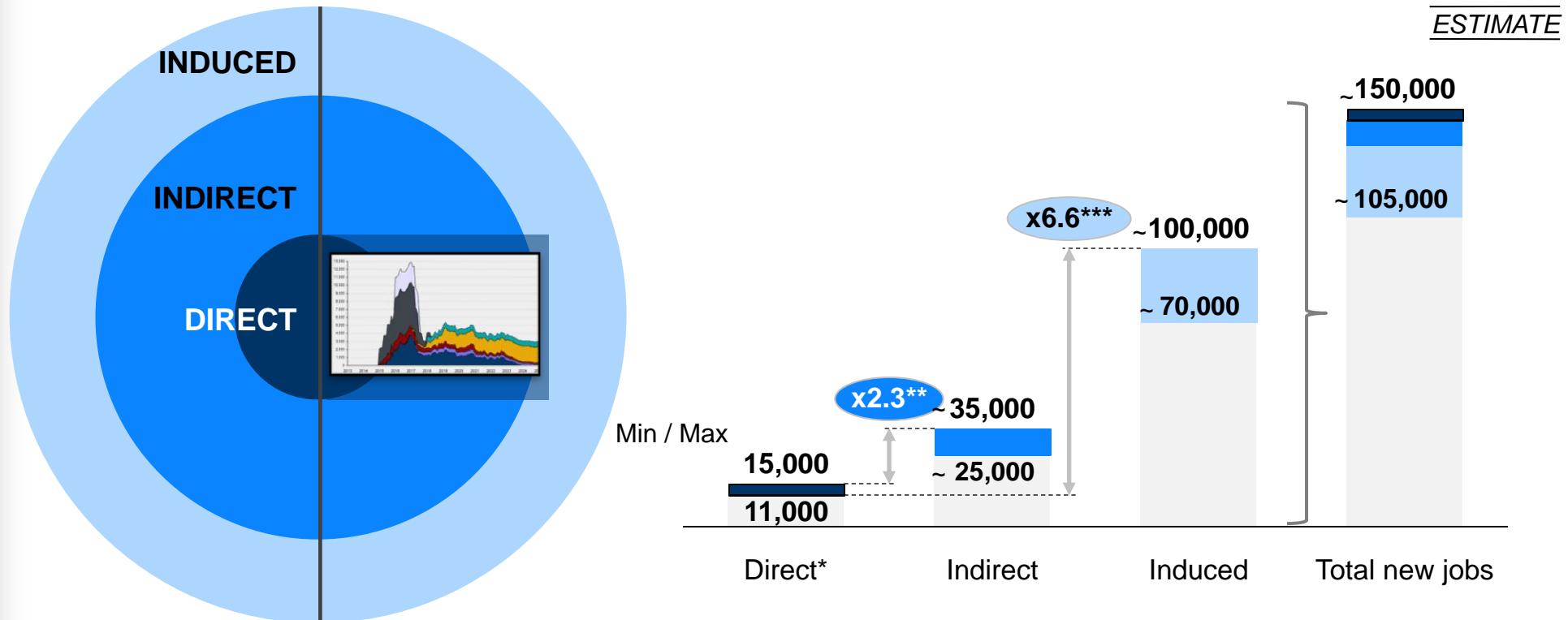


Source: SBC analysis

Note: On Site means on the field and in the oil & gas companies' offices

Total new jobs generated in Uganda by oil development projects may be in the range of 100,000 to 150,000

CONCEPTS OF DIRECT, INDIRECT AND INDUCED JOBS GENERATED BY OIL & GAS PROJECTS, REGARDLESS OF THE NATIONALITY OF THE PEOPLE



Source: SBC research on “stand alone” oil and gas cities (Stavanger - Norway, Aberdeen - UK, Macaé – Brazil, Trinidad & Tobago)

Note: *Number of jobs created was computed as peak of manpower (13,000) for LA projects. $\pm 15\%$ was added to account for uncertainty

**Ratio direct to indirect varies in the range of 2.3 - 3.8 depending on geography

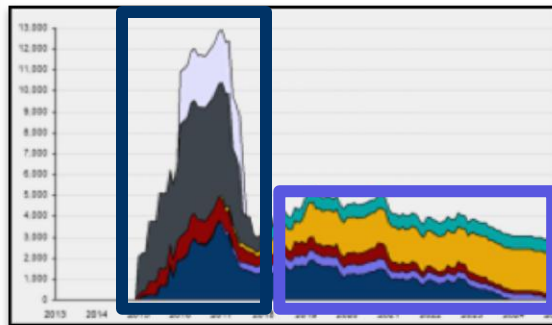
***Ratio direct to induced varies in the range of 6.6 - 8.4 depending on geography

Out of total newly created jobs, 80% will be short-term for the peak of construction and will have to be transferred

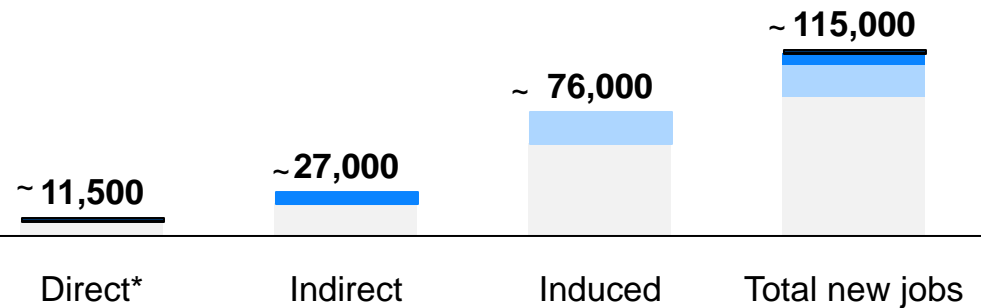
SHORT-TERM AND LONG-TERM JOB CREATION, REGARDLESS OF NATIONALITY

ESTIMATE

Short-term job creation
(Construction phase)

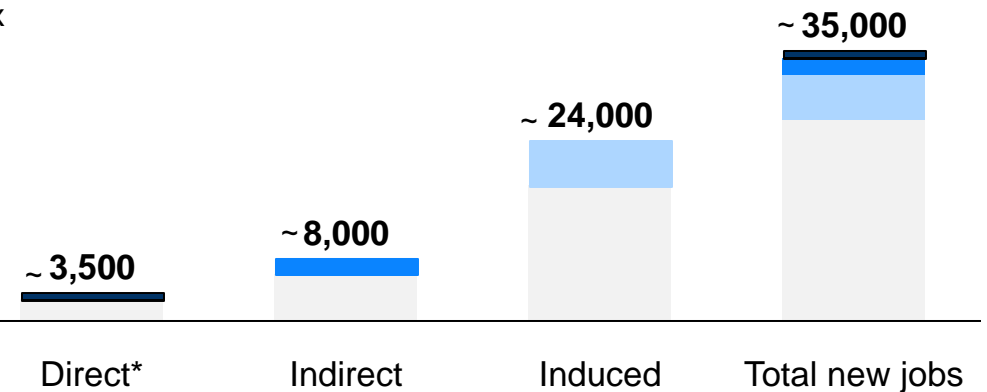


Max



Long-term job creation
(Production Operations phase)

Max



Source: SBC research on “stand alone” oil and gas cities (Stavanger - Norway, Aberdeen - UK, Macaé – Brazil, Trinidad & Tobago)

Note: *Number of job created was computed as peak of manpower (13,000) for LA projects. +/-15% was added to account for uncertainty

**Ratio direct to indirect varies in the range of 2.3 - 3.8 depending on geography

***Ratio direct to induced varies in the range of 6.6 - 8.4 depending on geography

Agenda

- | | |
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| ▪ Introduction | 9:30 – 10:00 |
| • Survey's objective, scope of work, approach, methodology and general assumptions | |
| ▪ Manpower supply & demand analysis | 10:00 – 11:30 |
| • Future manpower requirements | |
| • Summary of education system analysis | |
| ▪ Manpower supply & demand analysis – Q&A | 11:30 – 12:00 |
| ▪ Lunch | 12:00 – 13:00 |
| ▪ Industry analysis – supply & demand analysis | 13:00 – 15:00 |
| ▪ Industry analysis – Q&A | 15:00 – 15:30 |
| ▪ Recommendations | 15:30 – 16:30 |
| ▪ Way forward | 16:30 – 17:00 |

Supply and Demand for the Lake Albert projects

- Supply & Demand for Craftsmen
- Supply & Demand for Technicians
- Supply & Demand for Engineers
- Lead times and corresponding training planning

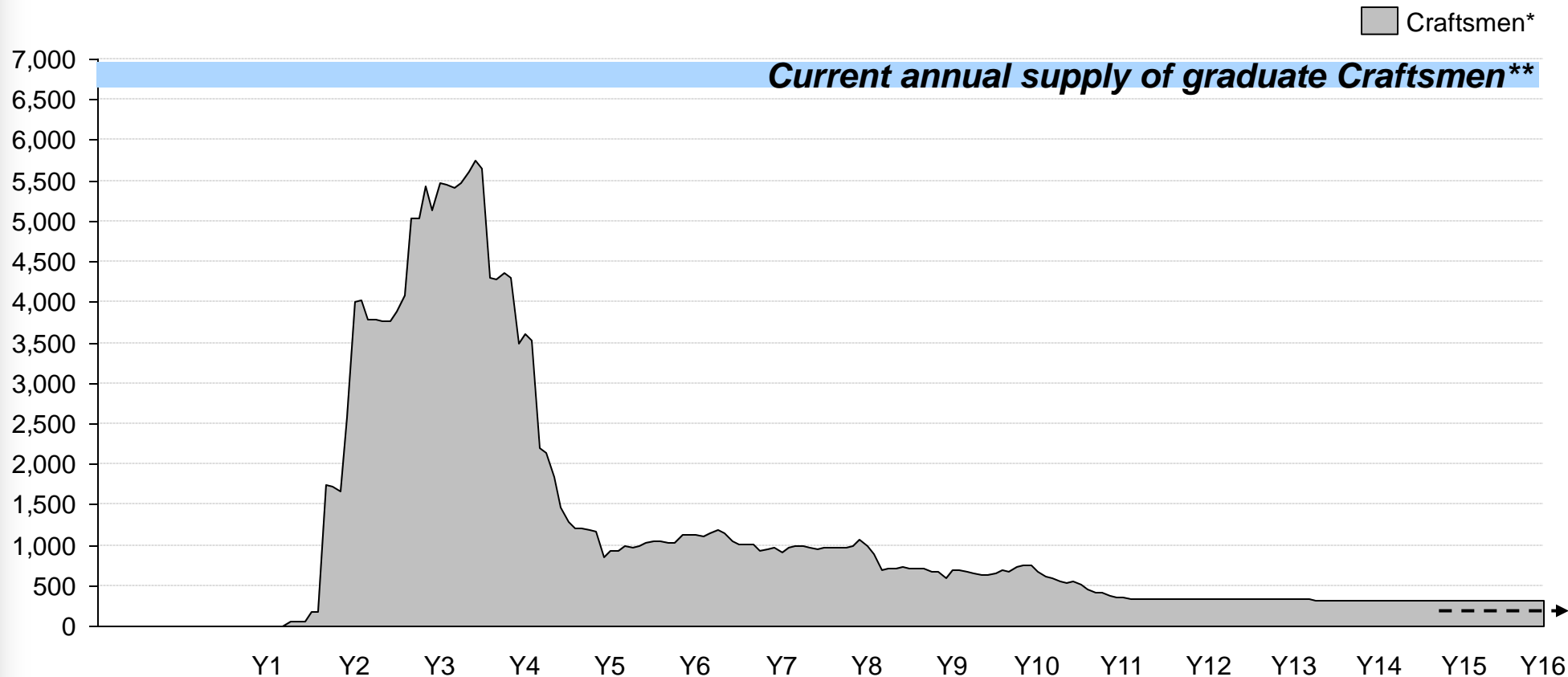
Supply and Demand for the Lake Albert projects

- **Supply & Demand for Craftsmen**
- Supply & Demand for Technicians
- Supply & Demand for Engineers
- Lead time and corresponding training planning

Annual overall supply of craftsmen is over 7,000 people

SUPPLY/DEMAND FOR CRAFTSMEN

Cumulative number of people (FTE)



Source: SBC analysis; CNOOC; Total; Tullow

Note: (*) Includes civil craftsmen, machine, hoisting & lifting operators and drivers

(**) Supply figures are from best BTVETs in the country determined by Tullow and Department of Industrial Training (DIT)

This overall supply/demand analysis is not representative of individual disciplines

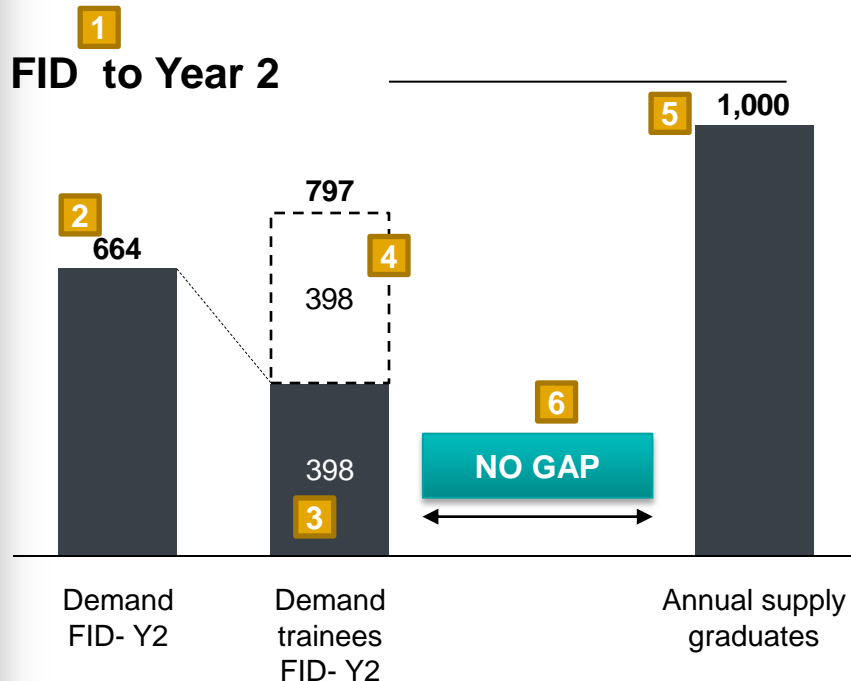


How to conduct a gap analysis for *manpower*

How to read 'gap analysis' charts?

PEOPLE REQUIRED FOR A GIVEN DISCIPLINE

number of people



- **Step 1:** Select the duration of manpower gap analysis
- **Step 2:** Establish demand (# of people) for the selected duration
- **Step 3:** Remove population of the experienced professionals keeping only newly hired trainees
- **Step 4:** Infer actual demand for fresh graduates based on selection success rate
- **Step 5:** Establish supply of fresh graduates by education system
- **Step 6:** Compare demand and supply for fresh graduates

Note: The gap deals only with education. It doesn't take into account the additional O&G certification required for a newly hired trainee

SUPPLY & DEMAND GAP ASSUMPTIONS

- 60% of demand will be trainees, the rest will be either experienced Ugandan or expatriates
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)

Source: Supply from Ugandan Vocational Colleges; SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.

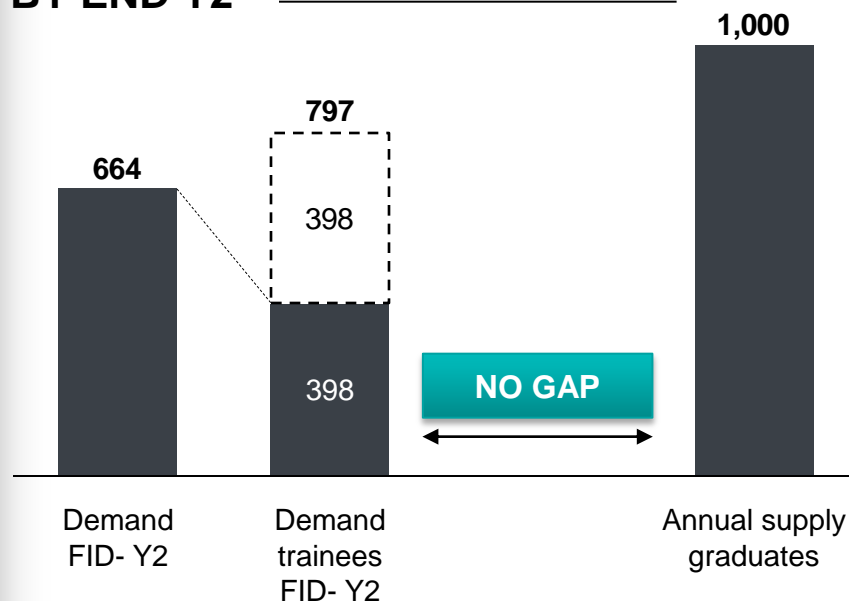


Supply of new welders will be tense by the end of Year 2

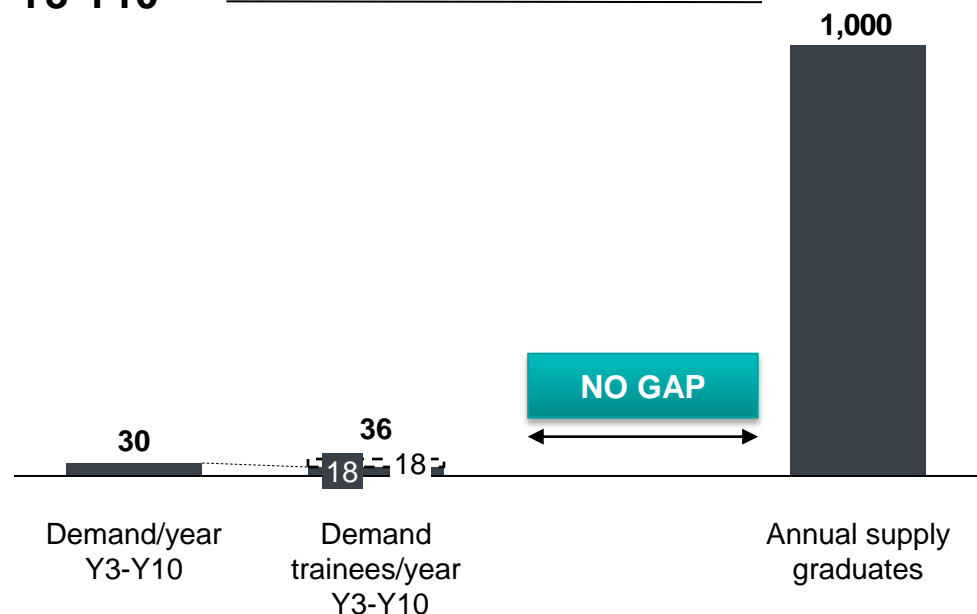
WELDERS REQUIRED number of people

 Recruitment demand required
 O&G Operators/OFS (negligible demand)
 EPC and other contractors*

BY END Y2



Y3-Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 60% of demand will be trainees, the rest will be either experienced Ugandan or expatriates
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)
- Annual supply of welders is selection from best vocational colleges

Source: Supply from Ugandan Vocational Colleges; SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.

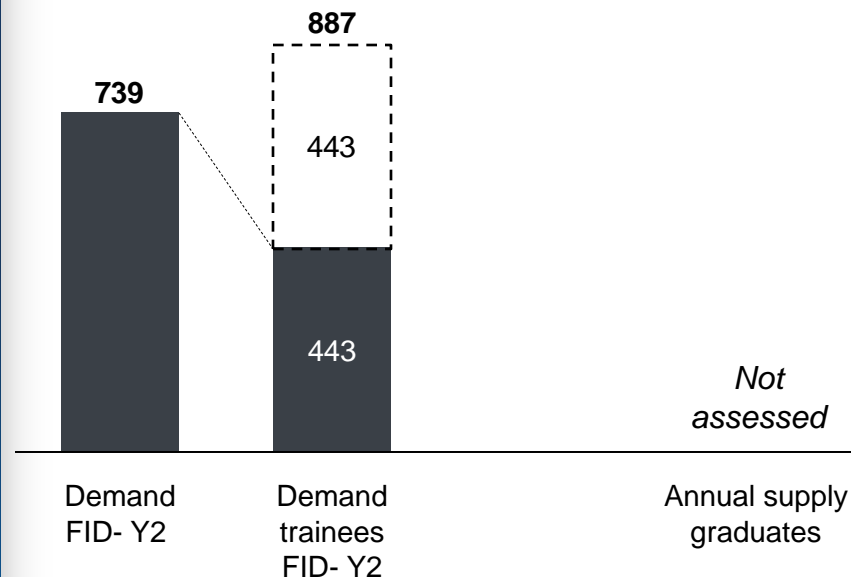


Demand for trainee machine, hoisting & lifting operators is above 500 by Year 2 and reduces from Year 3

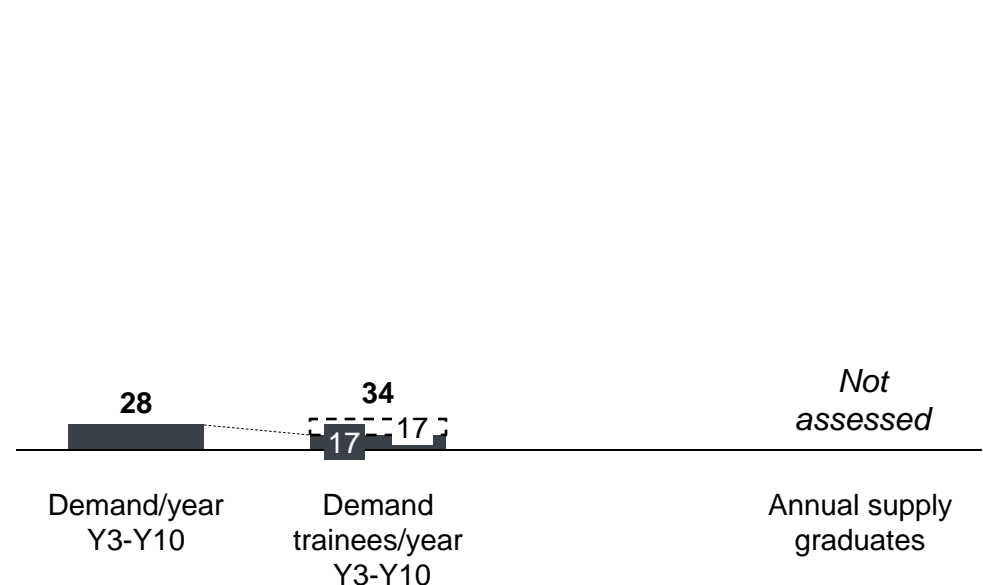
MACHINE, HOISTING AND LIFTING OPERATORS REQUIRED number of people

- Recruitment demand required
- O&G Operators/OFS (negligible demand)
- EPC and other contractors*

BY END Y2



Y3-Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 60% of demand will be trainees, the rest will be either experienced Ugandan or expatriates
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)
- Supply has not been assessed as there is no direct machine or H&L operators program

Source: SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.



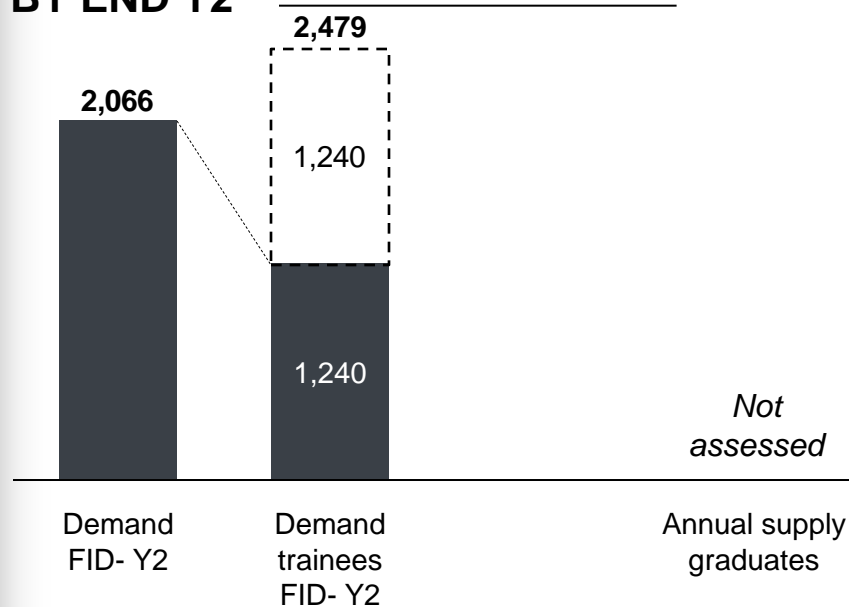
Demand for trainee passengers and heavy duty drivers will be very high in the first 2 years of the project

PASSENGER AND HEAVY DUTY DRIVERS REQUIRED

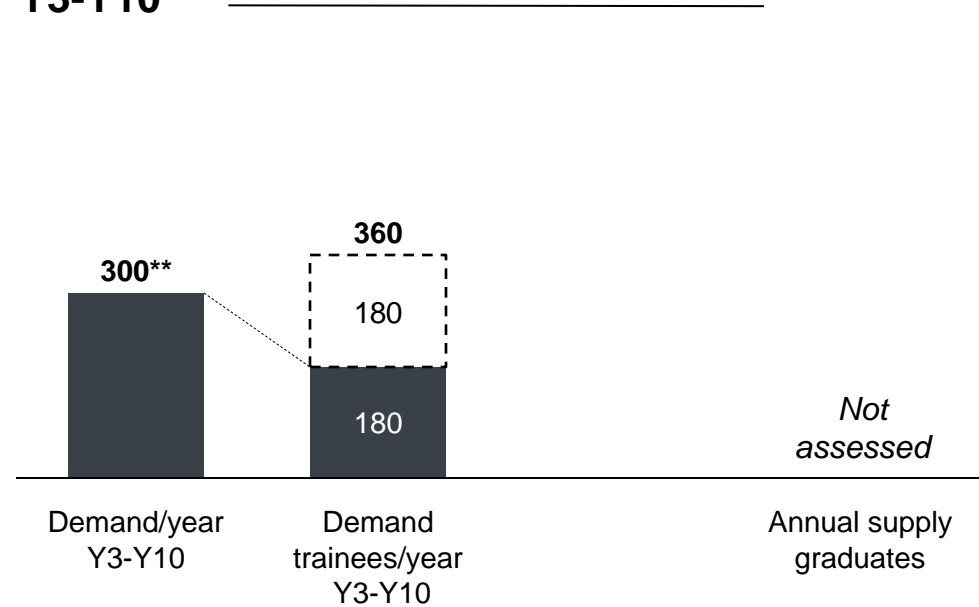
number of people

 Recruitment demand required
 O&G Operators/OFS (negligible demand)
 EPC and other contractors*

BY END Y2



Y3-Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 60% of demand have to be certified, the rest will be experienced and certified Ugandan or expatriates
- Recruitment demand required = 2 x Demand (Selection success rate is 1 out of 2 applicants)
- Supply has not been assessed as there is no drivers training program

Source: SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc. (**) 1000 of these drivers are required in 2017 alone

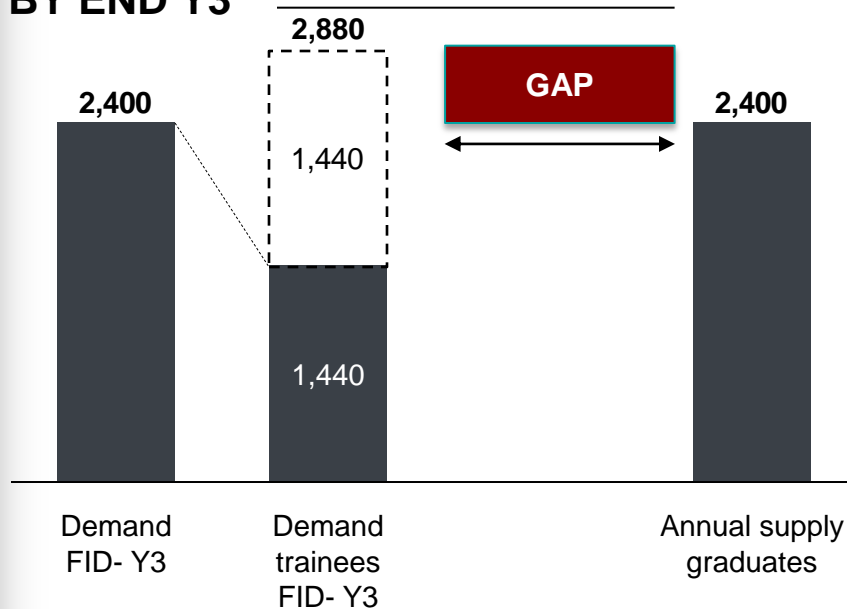


Supply of civil craftsmen may not meet demand by Year 3

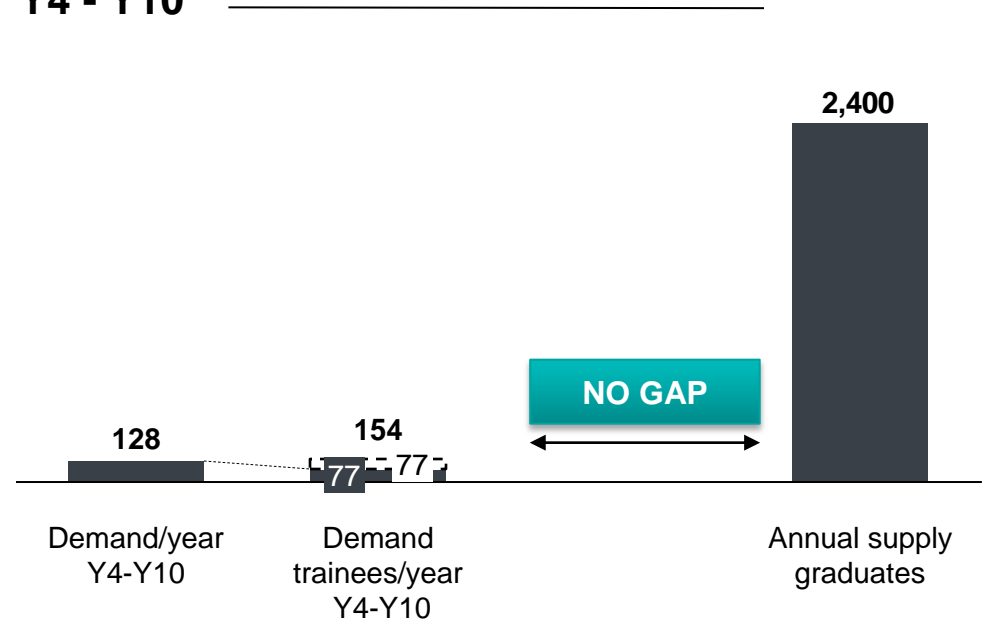
CIVIL CRAFTSMEN REQUIRED number of people

 Recruitment demand required
 O&G Operators/OFS (negligible demand)
 EPC and other contractors*

BY END Y3



Y4 - Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 60% of demand will be trainees, the rest will be either experienced Ugandan or expatriates
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)
- Annual supply of civil craftsmen includes Civil diploma holders, Bricklayers and Carpenters (selected sample)

Source: Supply from Ugandan Vocational Colleges; SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.



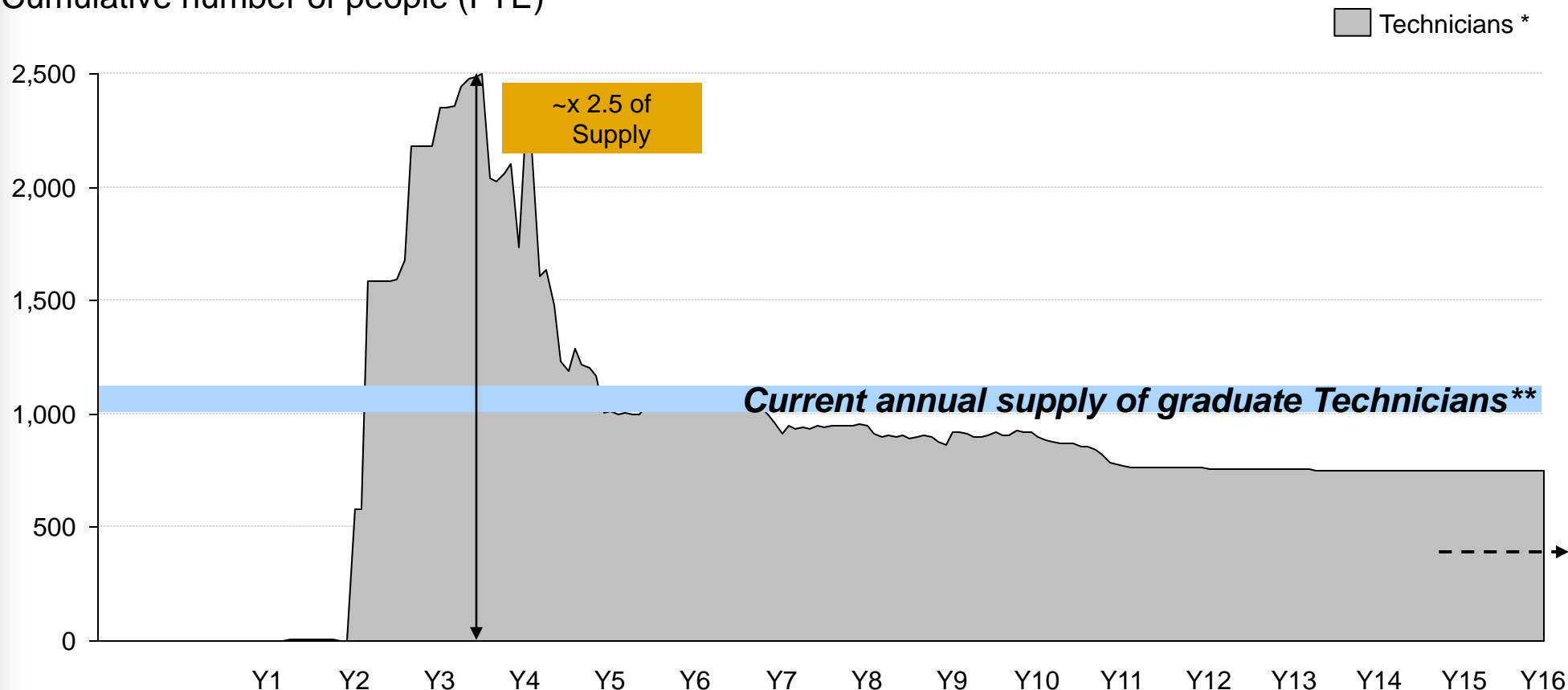
Supply and Demand for the Lake Albert projects

- Supply & Demand for Craftsmen
- **Supply & Demand for Technicians**
- Supply & Demand for Engineers
- Lead time and corresponding training planning

Annual supply overall of new technicians is over 1,000 people

SUPPLY/DEMAND FOR TECHNICIANS

Cumulative number of people (FTE)



Source: SBC analysis; CNOOC; Total; Tullow

Note: (*) Technicians are mechanical and electrical only




(**) Supply is from Kyambogo and 5 Ugandan technical colleges (UTC Bushenyi, UTC Lira, UTC Kichwamba, UTC Elgon, UTC Kyema)

This overall supply/demand analysis is not representative of individual disciplines

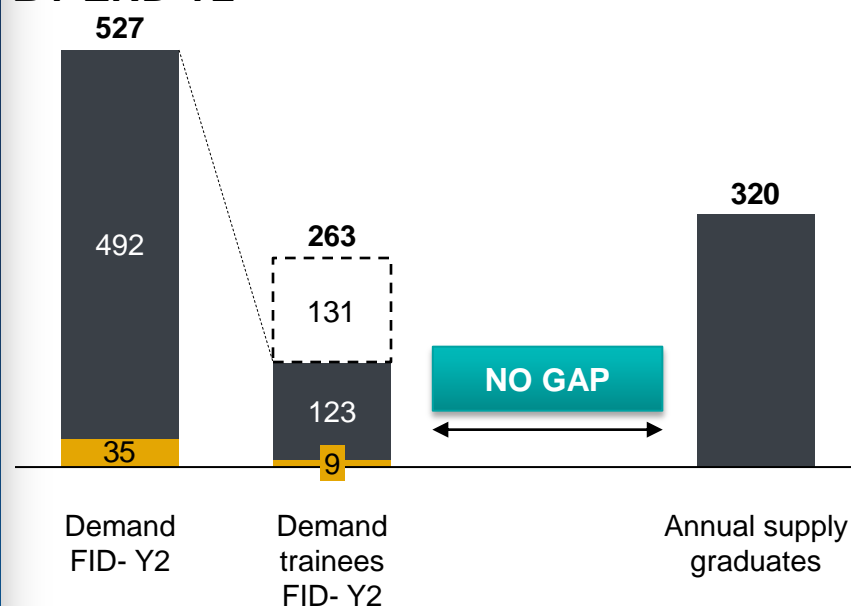


Supply of new electrical technicians will hardly meet demand by Year 2

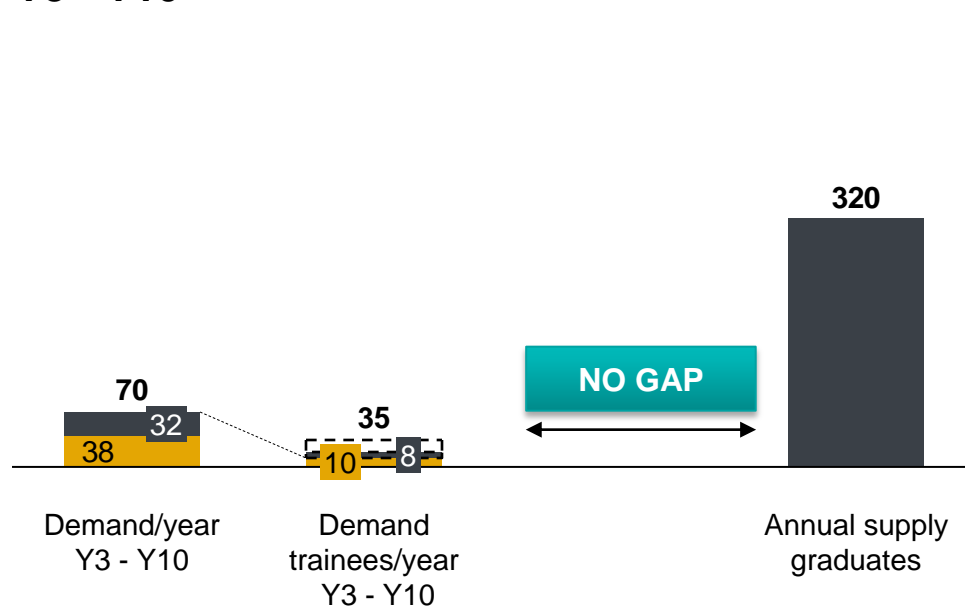
ELECTRICAL TECHNICIANS REQUIRED number of people

 Recruitment demand required
 EPC and other contractors*
 O&G Operators/OFS

BY END Y2



Y3 - Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 25 % of demand will be trainees, the rest will be either experienced Ugandan or expatriates
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)
- Supply is from Kyambogo and Uganda technical college

Source: Uganda Technical Colleges; SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.

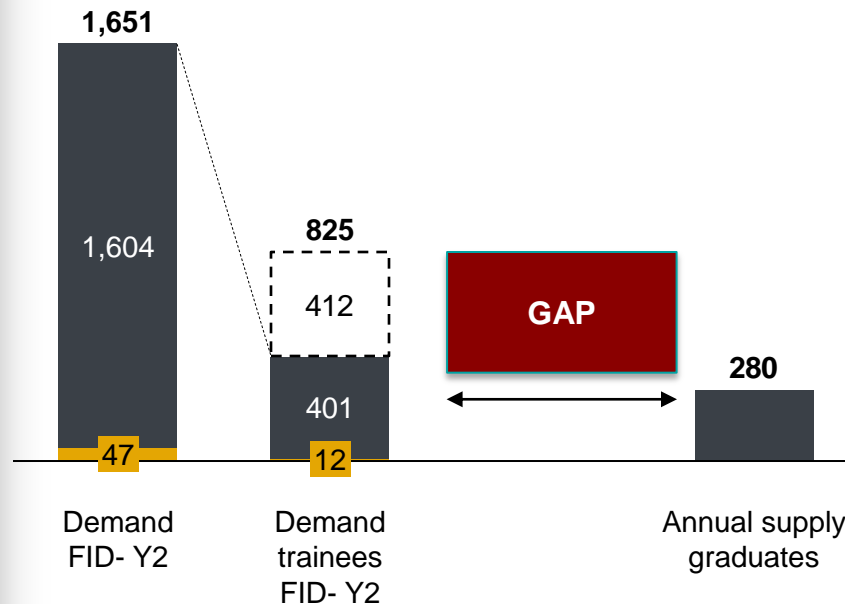


Supply of new mechanical technicians may not meet demand by year 2

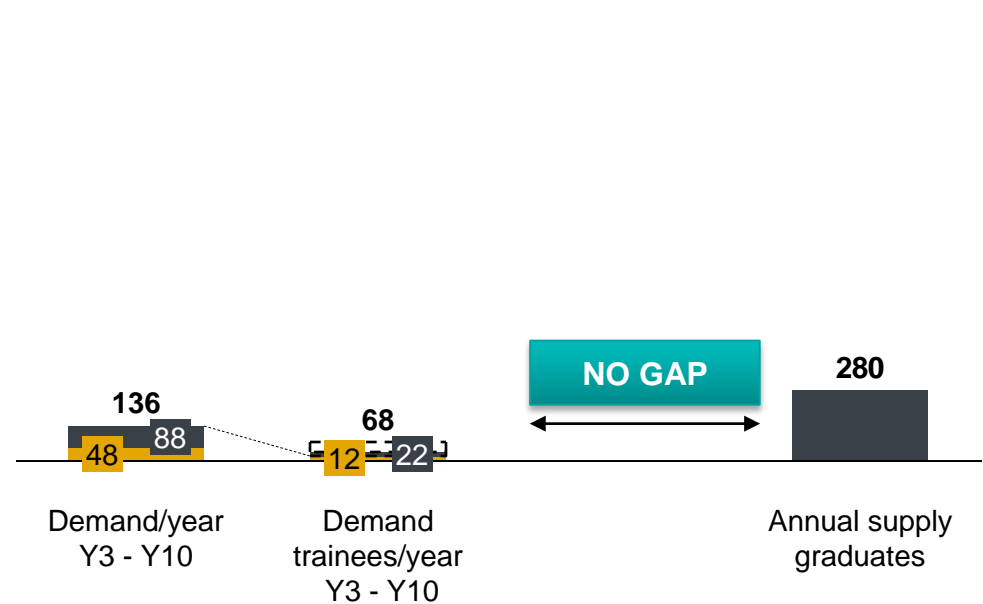
MECHANICAL TECHNICIANS REQUIRED number of people

 Recruitment demand required
 EPC and other contractors*
 O&G Operators/OFS

BY END Y2



Y3 - Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 25 % of demand will be trainees, the rest will be either experienced Ugandan or expatriates (see appendix)
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)
- Supply is from Kyambogo and Uganda technical college

Source: Uganda Technical Colleges; SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.



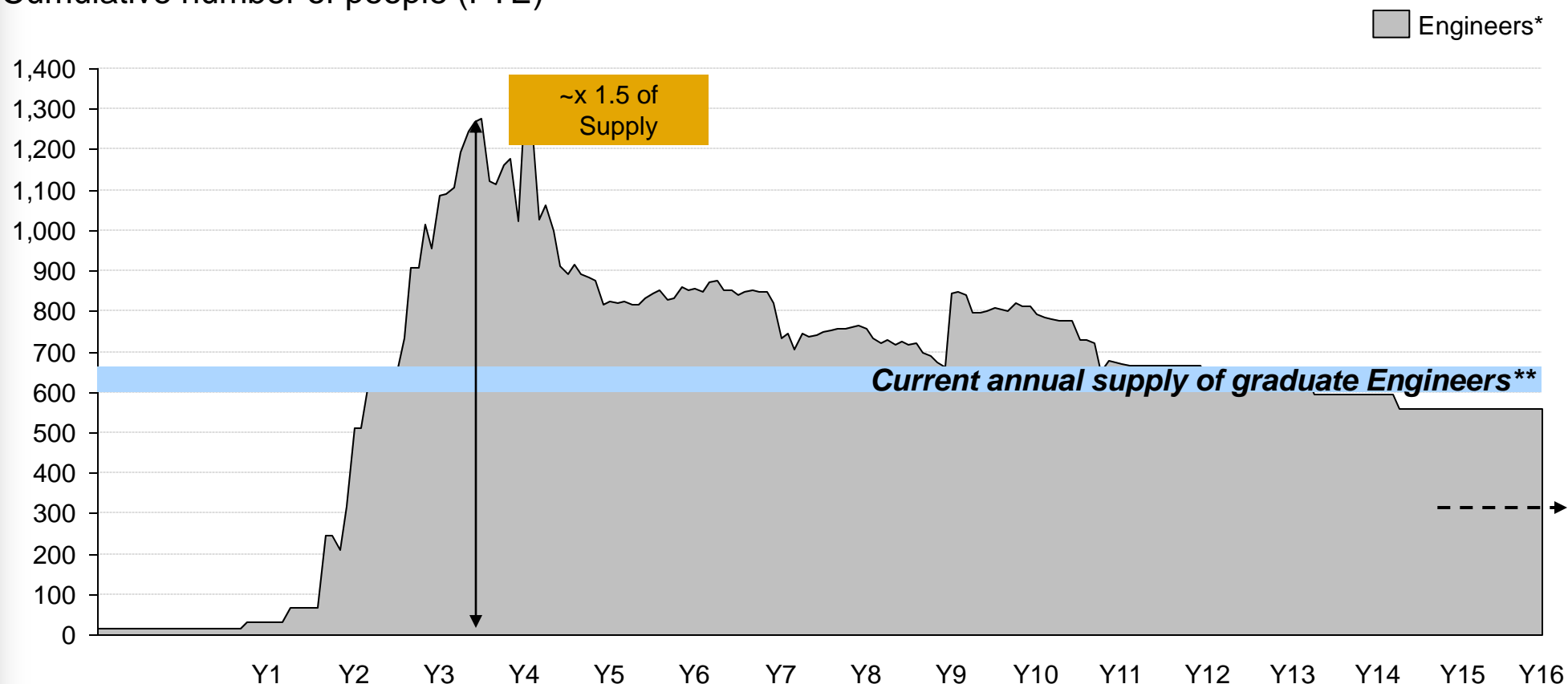
Supply and Demand for the Lake Albert projects

- Supply & Demand for Craftsmen
- Supply & Demand for Technicians
- **Supply & Demand for Engineers**
- Lead time and corresponding training planning

Annual supply overall of fresh engineers is more than 650 people

SUPPLY/DEMAND FOR ENGINEERS

Cumulative number of people (FTE)



Source: SBC analysis; CNOOC; Total; Tullow.

Note: (*) Engineers include Civil, Electrical, Mechanical, Chemical, Petroleum and Geosciences

(**) Supply is from 4 Engineering Universities in Uganda: Makerere, Kyambogo, Ndejje, Busitema.
This overall supply/demand analysis is not representative of individual disciplines

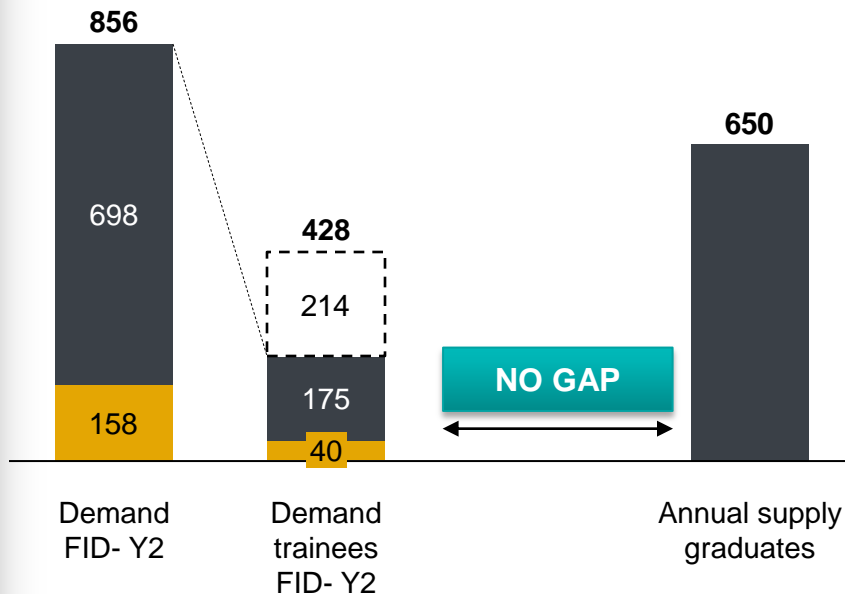


Supply of new engineers should meet demand

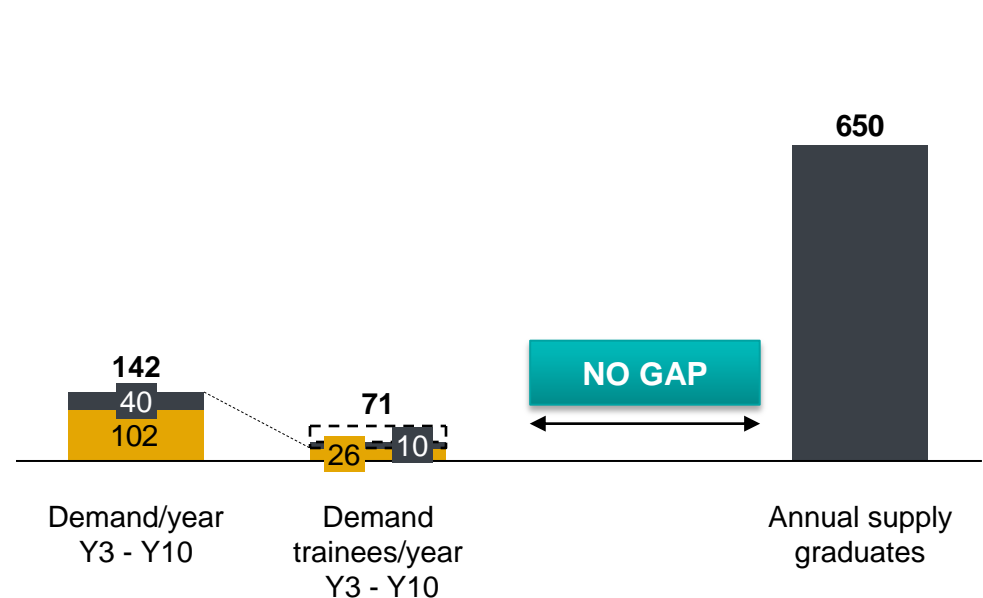
ENGINEERS REQUIRED number of people

 Recruitment demand required
 EPC and other contractors*
 O&G Operators/OFS

BY END Y2



Y3 - Y10



SUPPLY & DEMAND GAP ASSUMPTIONS

- 25 % of demand will be trainees, the rest will be either experienced Ugandan or expatriates (see appendix)
- Recruitment demand required = 2 x Demand for trainees (Selection success rate is 1 out of 2 applicants)
- Demand includes petroleum geoscientists, petroleum, civil, mechanical, chemical and electrical engineers

Source: Ugandan Engineering Universities; SBC analysis

Note: (*) "EPC contractors" include construction of infield facilities, transportation and logistics, construction of refinery and export pipeline, catering, office facility management, etc.

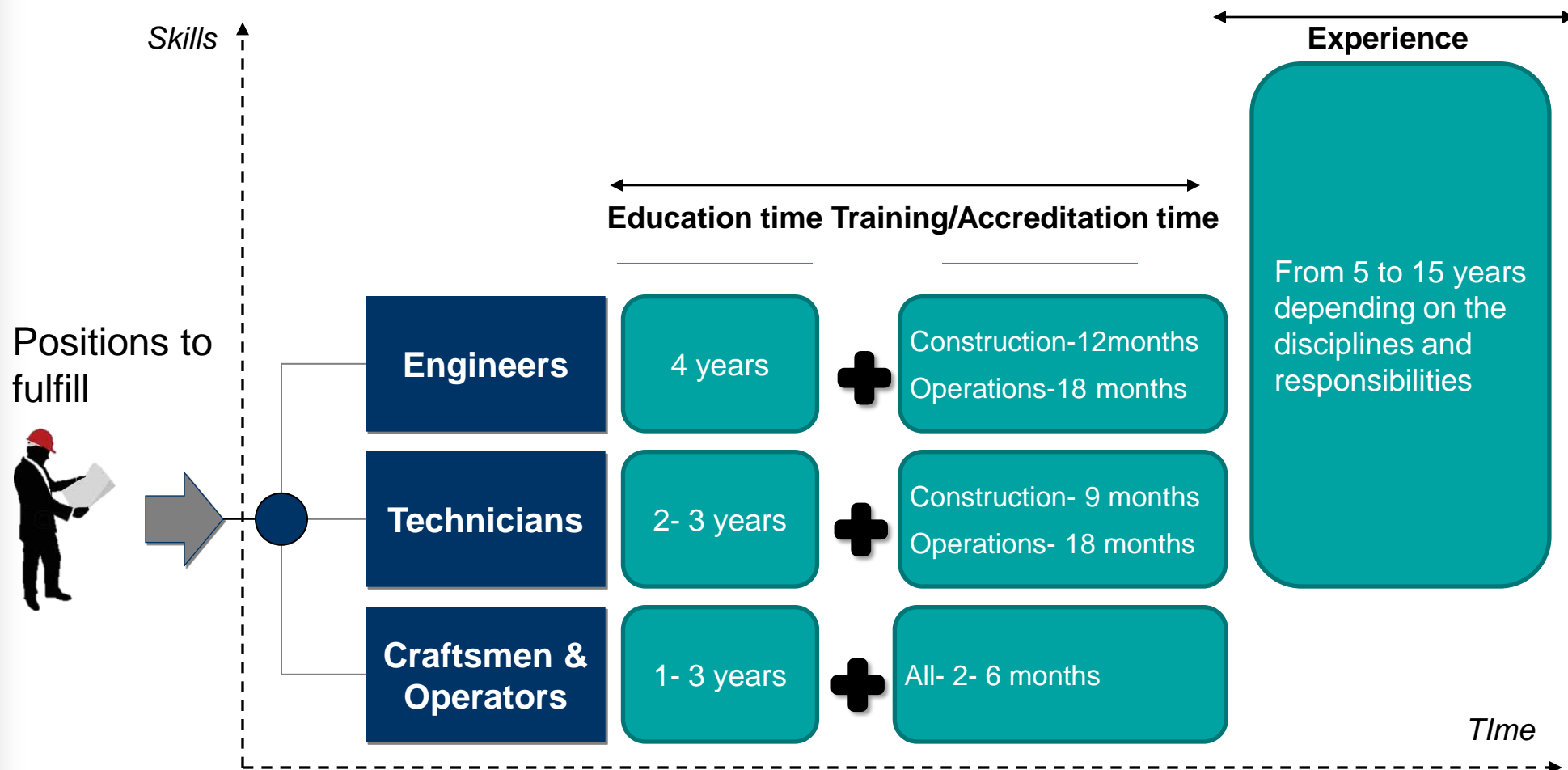


Supply and Demand for the Lake Albert projects

- Supply & Demand for Craftsmen
- Supply & Demand for Technicians
- Supply & Demand for Engineers
- **Lead times and corresponding training planning**

The lead time after recruitment takes into account the time to certify and train to attain the minimum skill level

MINIMUM EDUCATION AND CERTIFICATION LEAD TIMES BY JOB TYPE



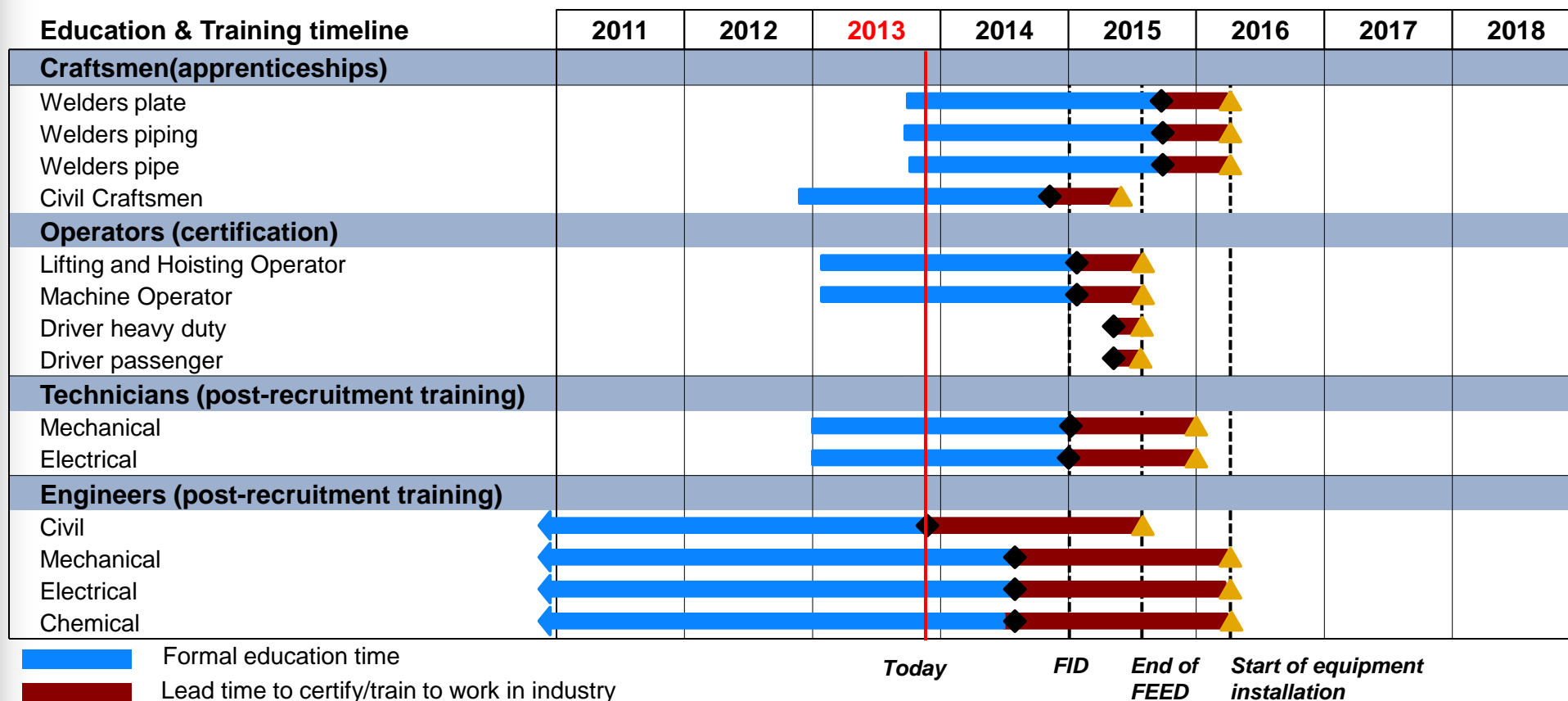
Supply and Demand for the Lake Albert projects

- Supply & Demand for Craftsmen
- Supply & Demand for Technicians
- Supply & Demand for Engineers
- **Lead times and corresponding training planning**
 - For the Refinery contractor
 - For the EPC and other contractors
 - For the O&G, Rig operator and OFS

Refinery Contractor

EDUCATION AND TRAINING LEAD TIMES

TRAINING LEAD TIMES AFTER RECRUITMENT



Source: SBC analysis; KT- Kaiso Tonya, KF- KingFisher

Note: Peak demand is the highest manpower demand in that category over entire duration of the project.



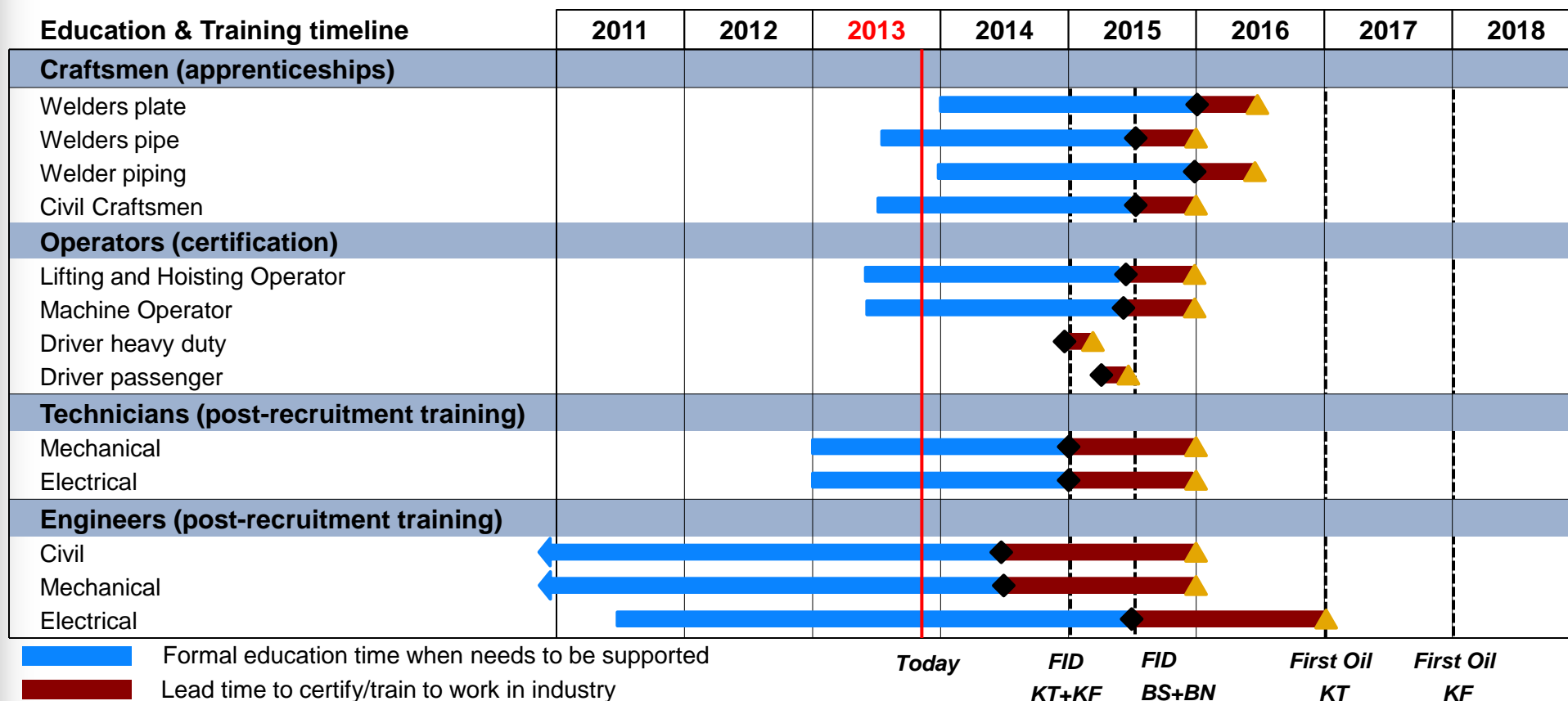
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EPC contractors/Other contractors

EDUCATION AND TRAINING LEAD TIMES

TRAINING LEAD TIMES AFTER RECRUITMENT



Source: SBC analysis; KT- Kaiso Tonya, KF- KingFisher

Note: Peak demand is the highest manpower demand in that category over entire duration of the project.



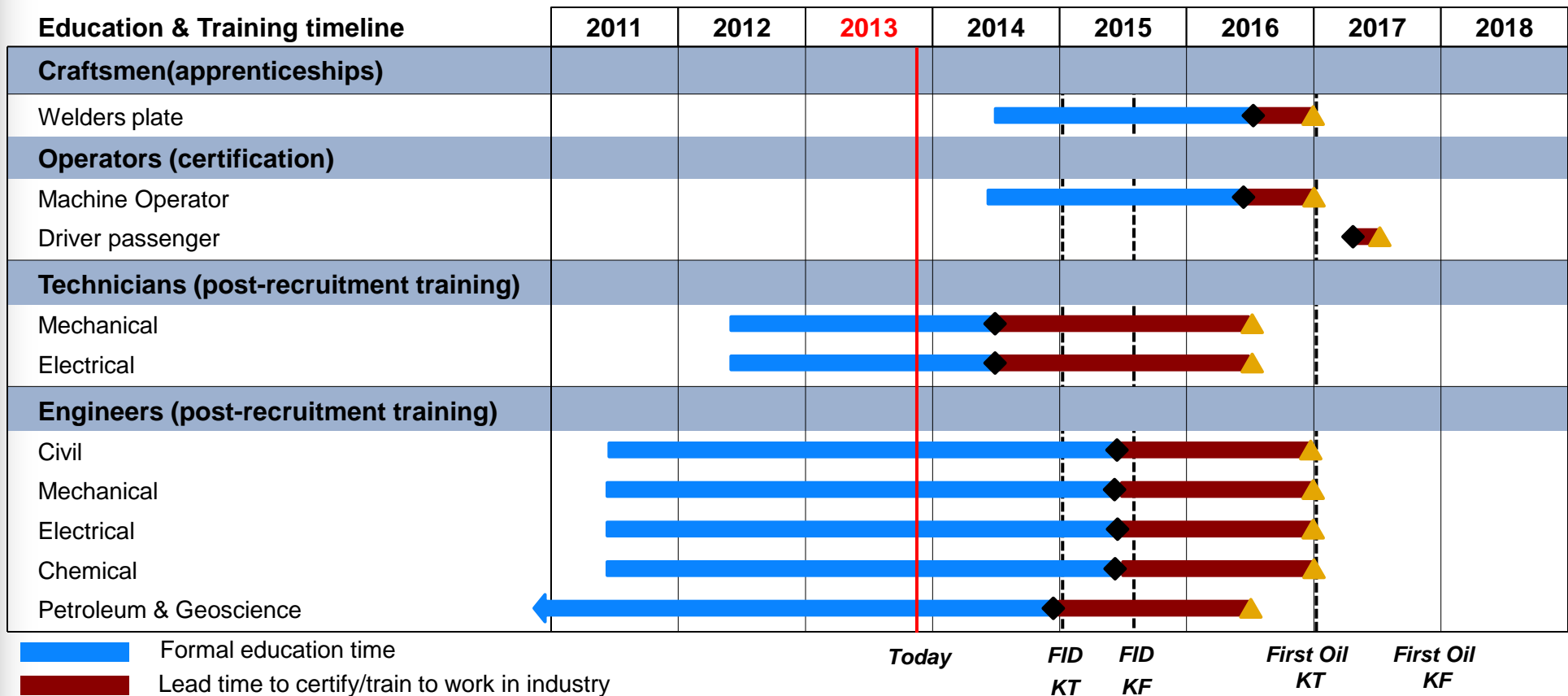
Supply and Demand for the Lake Albert projects

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 - For the O&G, Rig Operators and OFS

O&G operators, Rig Operator and OFS

EDUCATION AND TRAINING LEAD TIMES

TRAINING LEAD TIMES AFTER RECRUITMENT



Source: SBC analysis; KT- Kaiso Tonya, KF- KingFisher

Note: Peak demand is the highest manpower demand in that category over entire duration of the project.



Summary of main insights on future manpower requirements

- The peak of direct jobs will be around 13,000 people and will plateau at 3,000 in operations
- Need to certify several thousands of craftsmen, welders, machine operators and drivers for the construction phase
- Need to train hundreds of mechanical and electrical technicians
- Strong tensions on technicians (especially mechanical)
- Insufficient education system in Uganda in terms of compliance to oil and gas certification requirements and on-the-job practical training
- Most training efforts for the construction phase will lie on EPC contractors, though they may not have the time required to train them in advance
- There is an obvious need for massive training efforts of public and private stakeholders from early 2014 to maximize benefits for Ugandans

Agenda

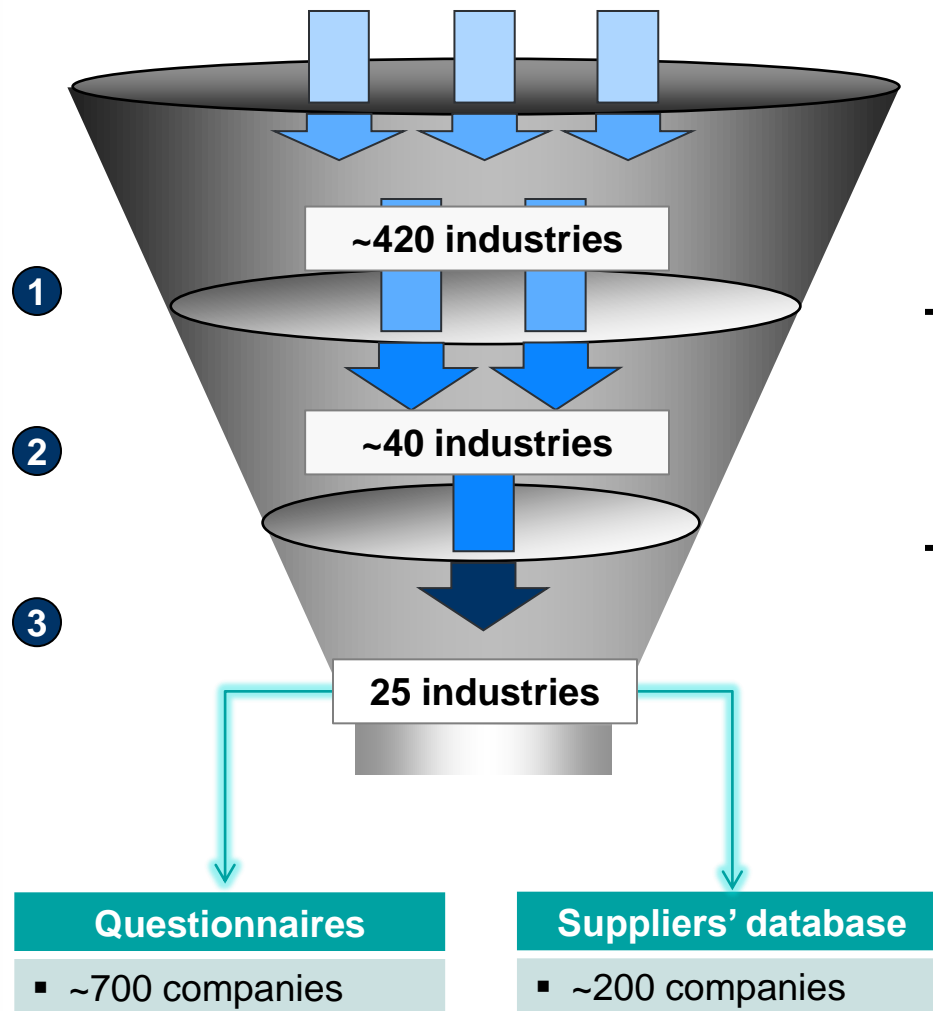
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| ▪ Way forward | 16:30 – 17:00 |

Local companies with high potential for National Content industries were surveyed in details



Initial list of industries

- Exhaustive list of industries (UN stats)
- International classification used by UBOS

Target list of industries

- O&G direct and indirect industries*
- Industries widely recommended for National Content

Industries with high potential for National Content

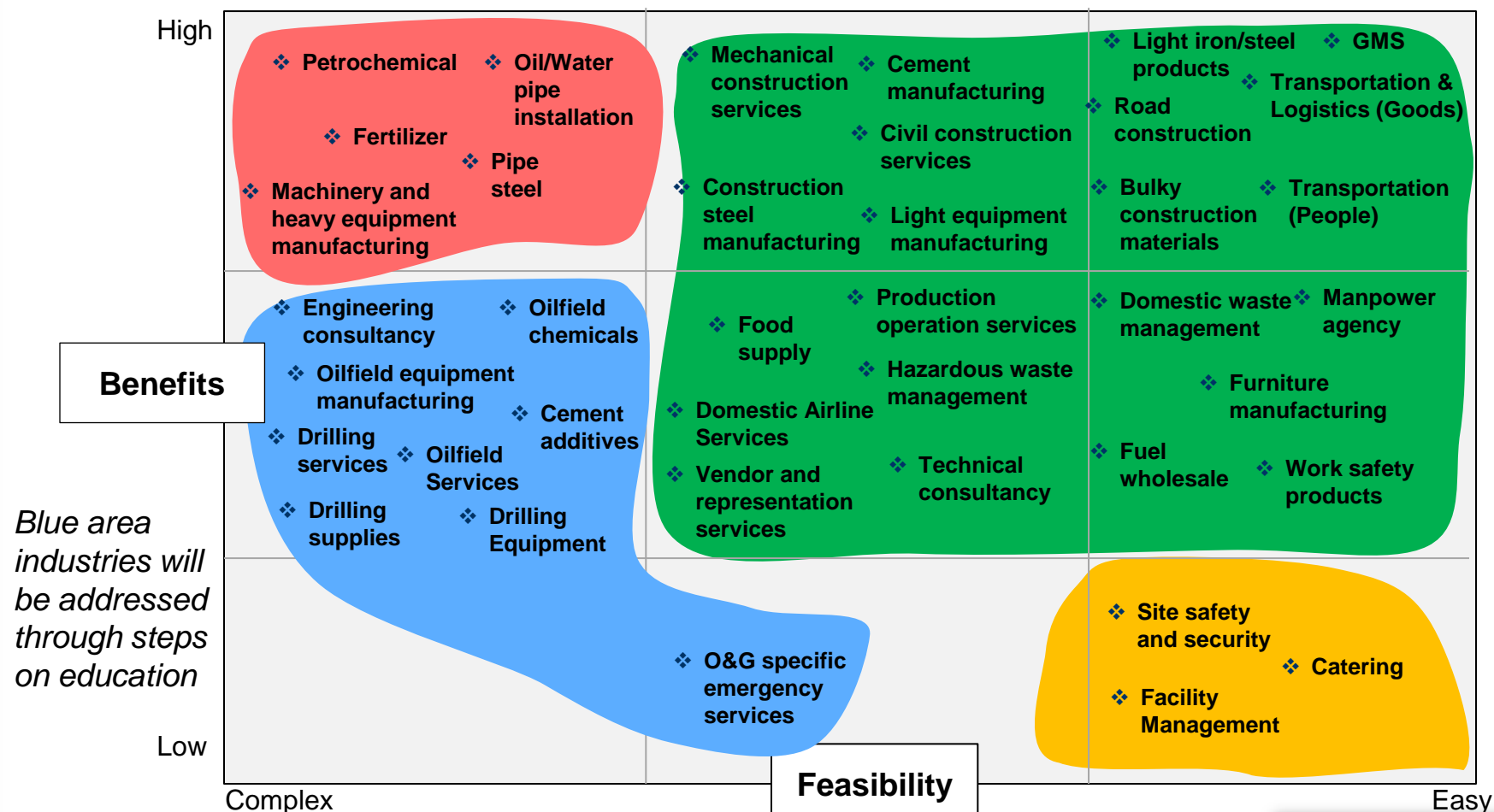
- Industry evaluated along Feasibility and Benefits
- Only highly beneficial and feasible industries passed further

Note: Initial list of industries was sources from UN Statistics Division, ISIC Revision 4
* based on the detailed value chain of O&G activities

Industries related to oil & gas projects in Uganda have been classified in terms of potential for National content development

MAPPING OF SELECTED INDUSTRIES ON BENEFITS-FEASIBILITY MATRIX

Green and Yellow areas are the scope of the supply survey



Source: SBC analysis
 Note: Industries within quadrants are not evaluated relatively to each other

List of industries analyzed

1. **Transportation & Logistics (Goods)**
2. **Transportation (People)**
3. **Cement**
4. **Bulk construction material**
5. **Reinforcement steel manufacturing**
6. **Light iron/steel products (structural and flat steel)**
7. **Civil construction services**
8. **Mechanical construction services**
9. **Road construction**
10. **Generic waste management**
11. **Hazardous waste management**
12. General maintenance services
13. Production operations services
14. Security services
15. Domestic airline services
16. Fuel wholesale
17. Manpower agencies
18. **Catering**
19. Facility management services
20. **Food supply**
21. **Work safety products**
22. Light equipment manufacturing
23. Technical consulting services
24. Vendors
25. Furniture manufacturing

Transportation & Logistics (Goods) industry

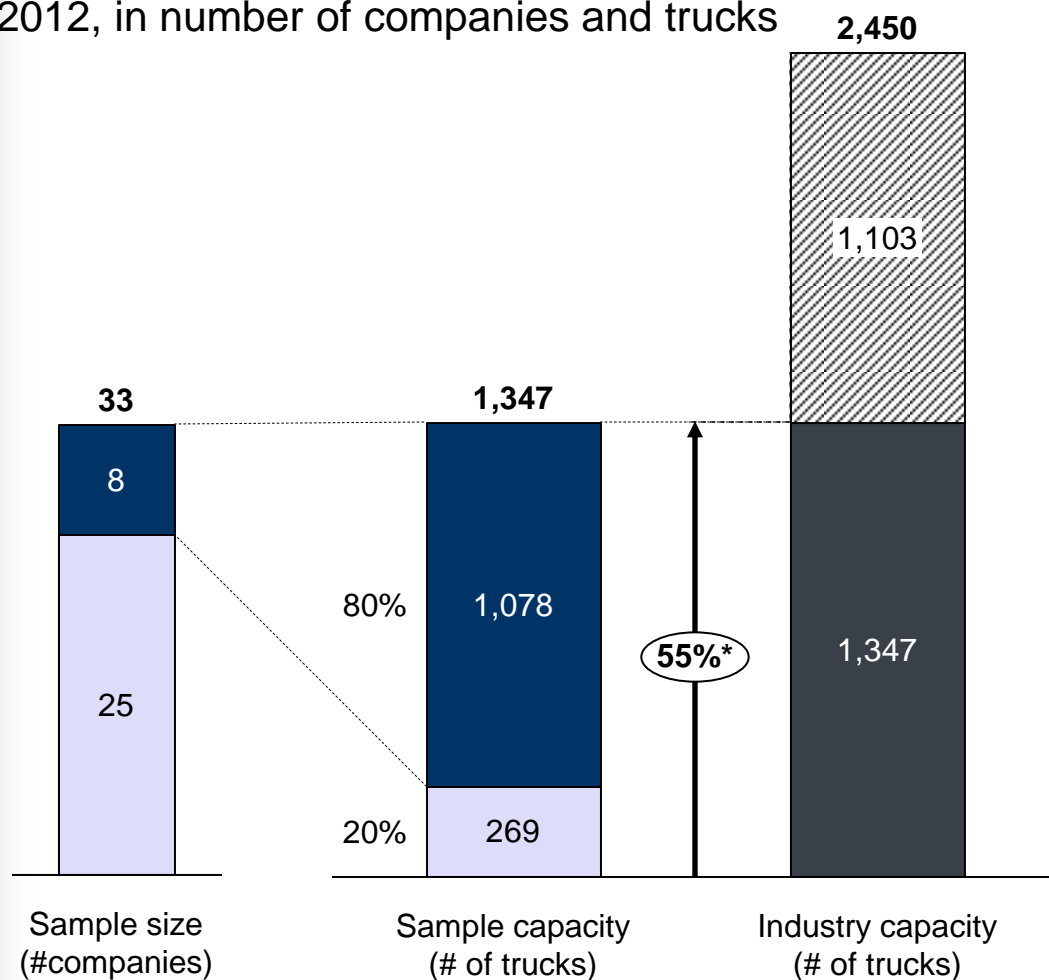
Freight transport by road, warehousing and storage, lifting services, and other transportation support activities (clearing, customs, forwarding)



33 companies representing 55% of the transportation & logistics (goods) sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – TRANSPORTATION & LOGISTICS (GOODS)

2012, in number of companies and trucks



Companies Surveyed	
AGS Frasers	Jaffer Freighters
Agility	Kampala Executive Aviation
Aramex	Kenfreight
Ataco Freight	Mansons
Bemuga Forwarders**	Multilines East Africa
Bollore Africa Logistics**	Multilines International
Bwik Petroleum	Multiplex**
CETS Optimus Logistics	Nalugom
Damco Logistics	Pax
DB Schenker	Primefuels
DHL	Procure Services
Eagle Logistics	Pro Ride
East African Cranes**	Semliki Rift Trading
East African Petroleum Services**	Spedag Interfreight
Globe Trotters	Threeways Shipping**
Integrated Logistics Services	

Source: SBC analysis, company data

Note: *55% market share was estimated based on number of trucks of the interviewed companies with known market share

. **Companies interviewed

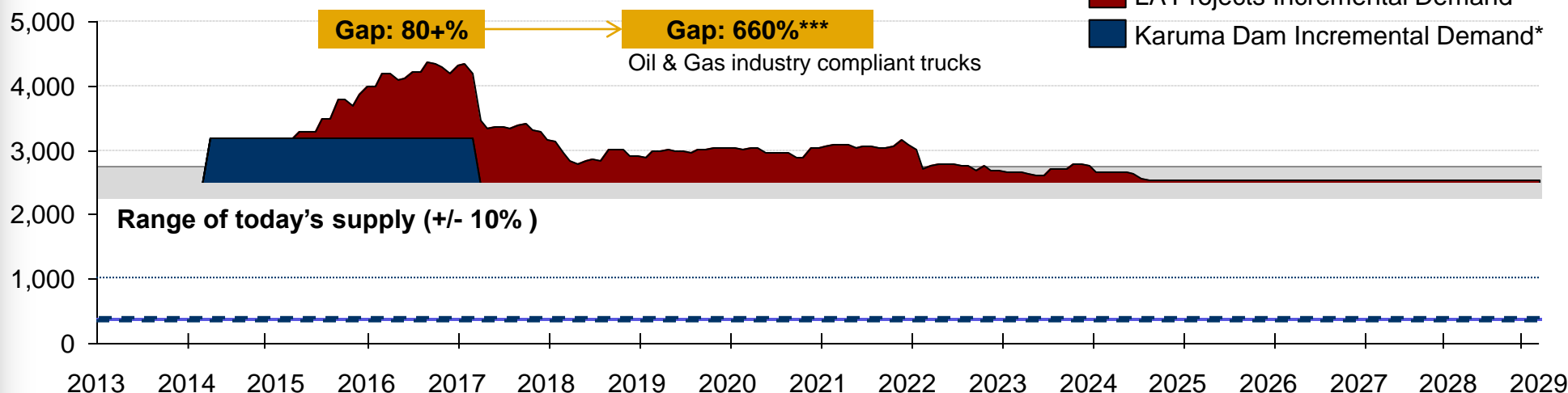


The survey reveals a substantial gap of supply over future projects' demand for transport & logistics of goods

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of trucks *

of trucks per month



QUALITY

DEMAND

- O&G Producers Land transportation safety recommended practice: n° 365, revision 1.1+Guidance Note 6
- At least ISO 9001

SUPPLY

- Most trucks not in line with O&G standards
- Around only 200 trucks (~7% of total fleet) in line with O&G standards

Source: SBC analysis

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation. *Trucks include heavy duty vehicles required for transportation of equipment, raw bulky material and food&water. ** 740 trucks per month for 3 years are required for cement transportation based on an interview with Tororo cement. ***Today's capacity of oil and gas compliant trucks is ~180 and LA Projects demand at peak is 1180, hence gap is 660%

ASSUMPTIONS ON DEMAND

- Trucks for bulky material capacity – 15m3
- Trailer for equipment capacity – 20 tons
- Truck for food – 20 tons
- Rotation time for MSA - 15 days , for Uganda – 7 days

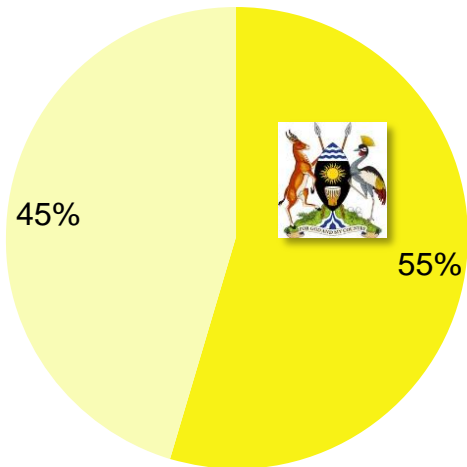


In terms of local content, shareholders are mixed and companies employ essentially Ugandan workers

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

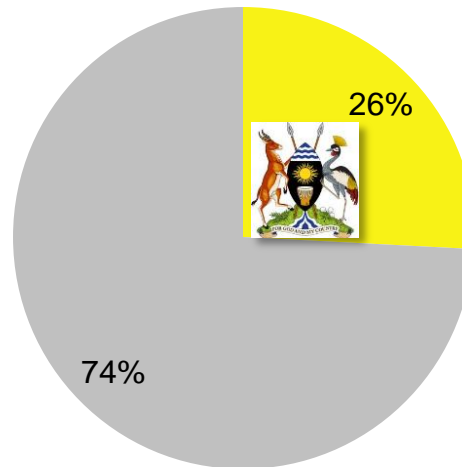
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



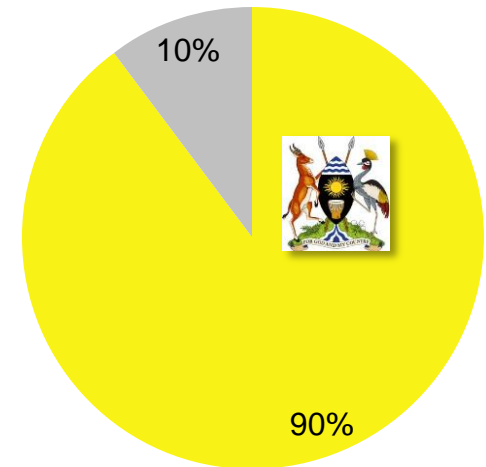
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

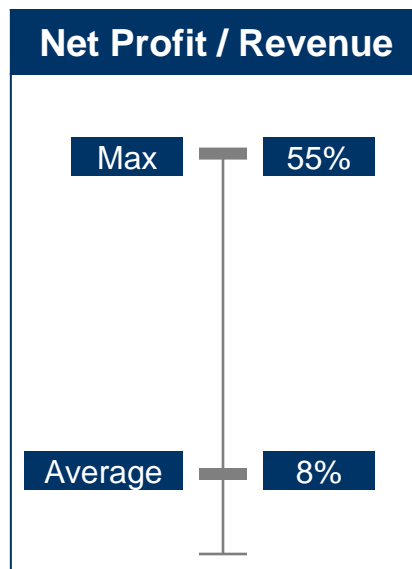
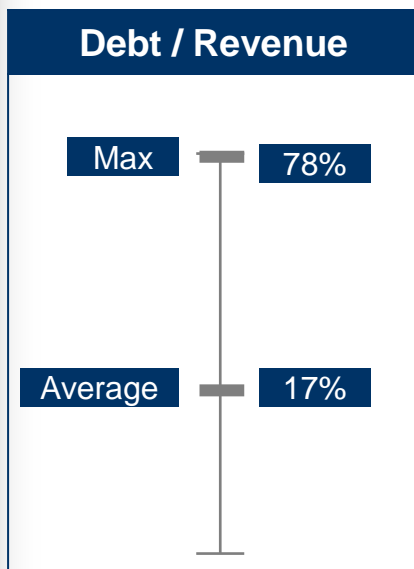
Overview of financial performances

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 1,000,000 million
~ USD 390 million

2012, based on sample companies data



FINDINGS

- Access to credit is a significant obstacle for national players, especially SMEs
- Long payback period keeps SMEs away
- Increasing competition from local players is reducing the International companies' margins

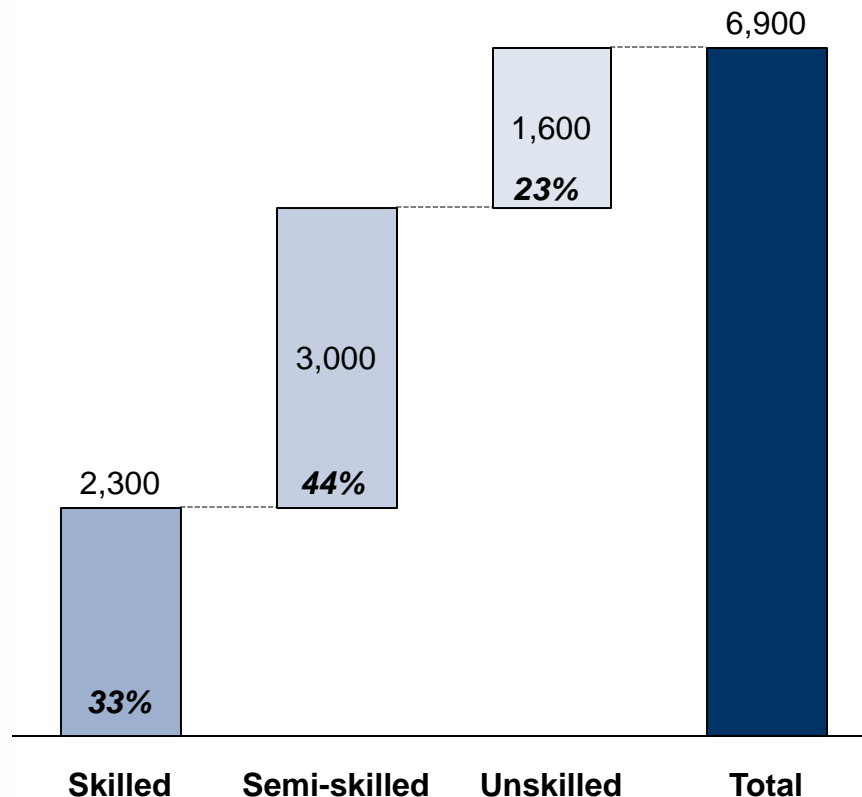
Source: SBC analysis, company data

Note: * The sample revenue was extrapolated to the industry revenue via defined market share (55%) of the sample.

Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: managers
- Semi-skilled: administrative staff, forklift operators, crane operators, drivers
- Unskilled: security officers

Source: SBC analysis, company data

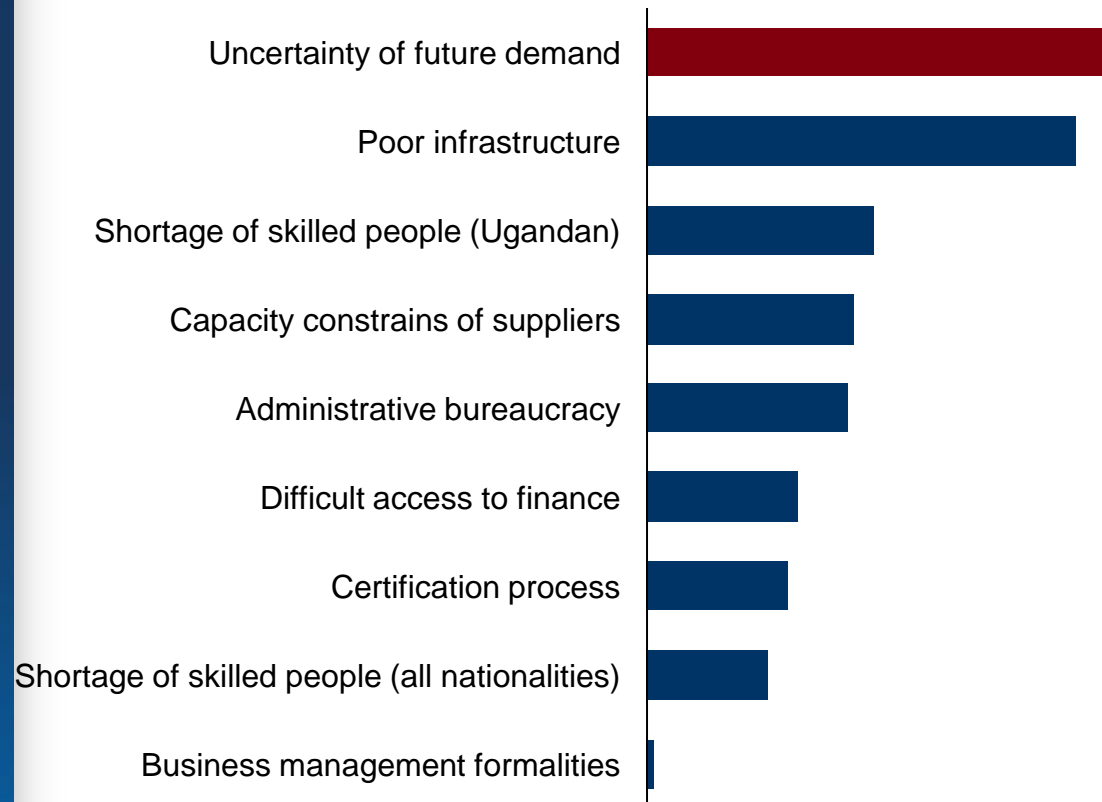
Note: * The sample manpower was extrapolated to the industry manpower via defined market share (55%) of the sample.



The main barrier for growth within the transportation & logistics industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Short-term CAPEX-intensive contracts with high standards require visibility which is absent
- **Oil & Gas specific:**
 - Poor communication from oil industry
 - Local manpower has no experience in Oil & Gas
- **Other barriers:**
 - No support for financial loan
 - Poor quality of roads: 15 days needed to forward freight from Mombasa to Kampala*
 - Difficulties to find skilled personnel (lifting, heavy transportation)
 - Banks lack flexibility to serve the industry needs (few leasing offers, etc.)

Source: SBC analysis, company data
Note: *Including clearance.



2 Transportation (People) industry

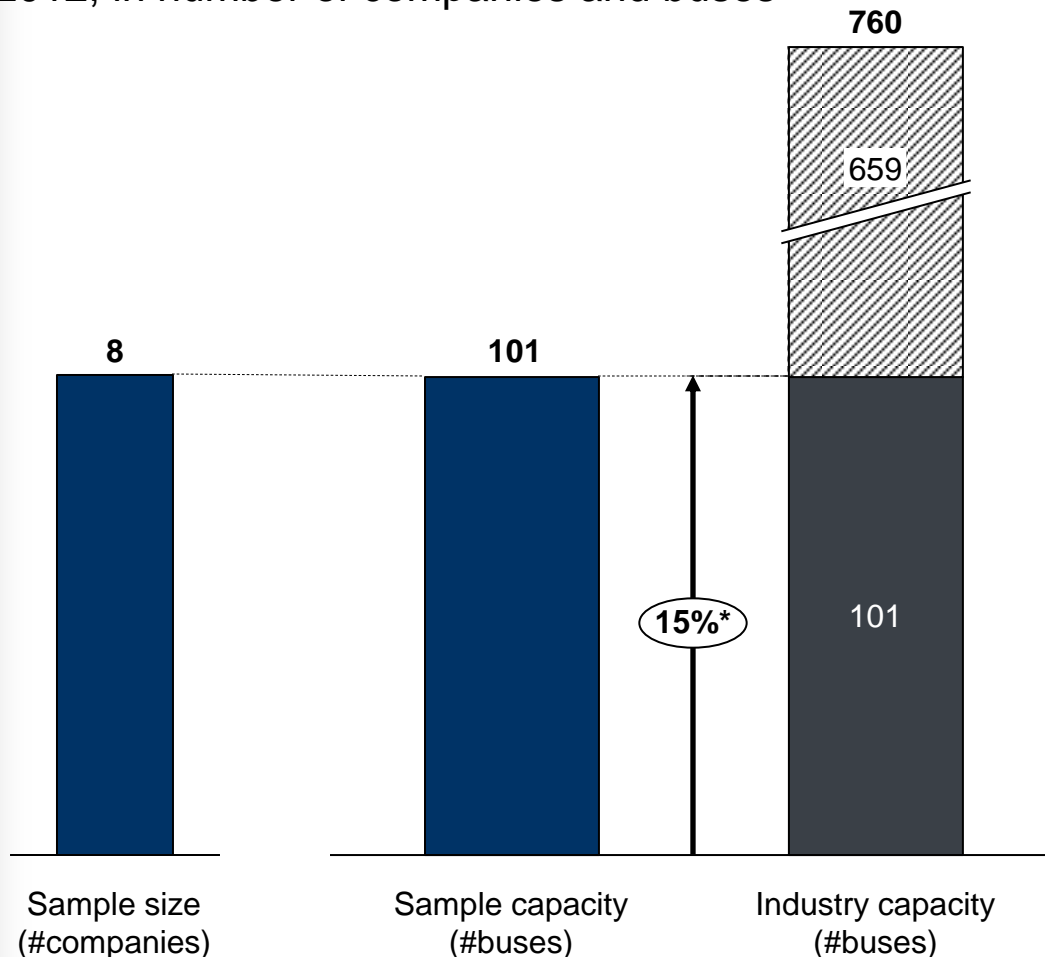
Passenger land transport



Eight companies representing 15% of the private transportation of people sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – TRANSPORTATION (PEOPLE)

2012, in number of companies and buses



Companies Surveyed
24-7 cars
Inter-car
Jakobu enterprises
Klean services
Pro Ride
Silver Tours and Logistics
Taho Enterprises
Whitelines**

Source: SBC analysis, company data

Note: *15% market share was estimated based on the newly registered buses in the private sector for the last 10 years reported by UBOS and the number of buses of surveyed companies. 10 years was used as the useful life of a bus in Uganda compared to ~12 years useful life of a bus in USA. **Companies interviewed

Transportation of people - Hypothesis

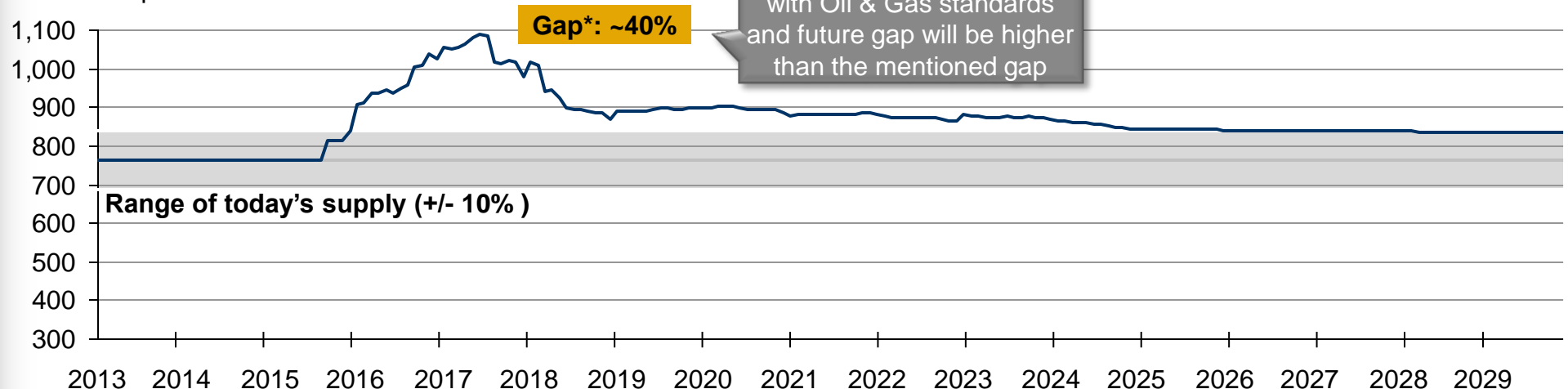
- Assumptions as no company was able to give a hint regarding the market shares:
 - **Useful life:**
 - Useful life of a bus in USA is ~12 years
 - Roads in Uganda are of lower quality than USA
 - Took 10 years useful life of bus in Uganda
 - **Available buses:**
 - Newly registered buses (not mini-buses) for last 5 years (UBOS 2012)
 - Average newly registered buses for 10 years useful life
 - 40% of buses in the private sector
 - Compared figure with figures from the sample

The survey reveals a substantial quality gap of supply over future projects' demand for transport of people

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of private buses

of buses per month



QUALITY

DEMAND

- O&G Producers Land transportation safety recommended practice – n° 365, revision 1.1 + Guidance Note 6.
- At least ISO 9001 certification.

SUPPLY

- PMO license required to operate buses
- Quality of supply was not fully investigate, however interviews reveal very low quality

ASSUMPTIONS ON DEMAND

- Capacity of daily bus - 30 people, Capacity of regional bus - 40 people
- 25% of manpower will require regional rotation via bus

Source: SBC analysis

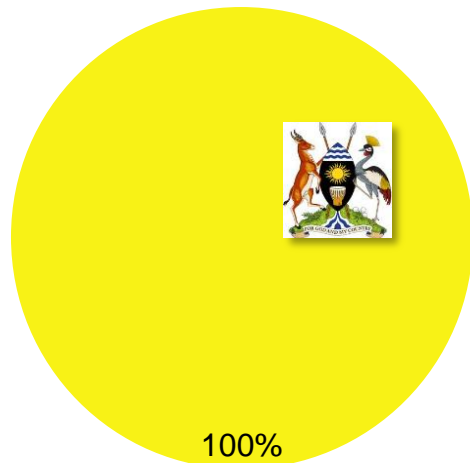
Note: *Current supply is not at the O&G standards and therefore the future gap will be higher than the mentioned gap. To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation



Local content proportion by industry

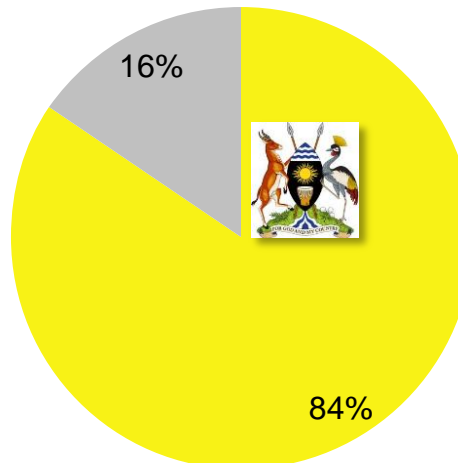
INDICATORS OF UGANDAN CONTENT IN THE SECTOR 2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



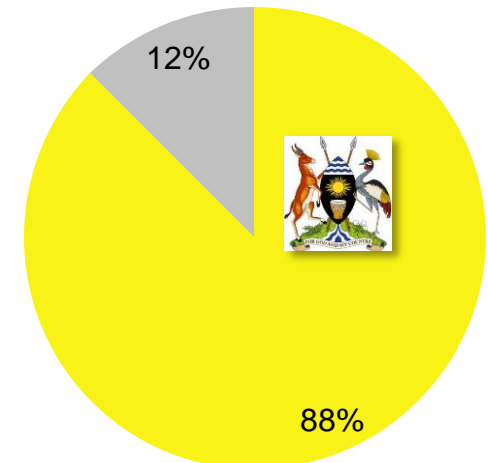
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

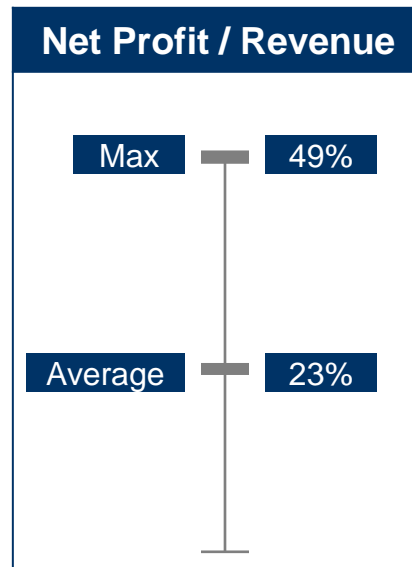
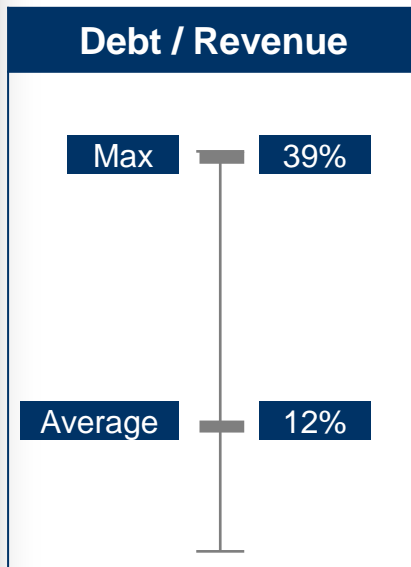
Overview of financial performances

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 73,000 million
~ USD 30 million

2012, based on sample companies data



FINDINGS

- High capital required to buy additional buses
- Difficult access to credit
- Banks require a 15% asset contribution to secure a loan

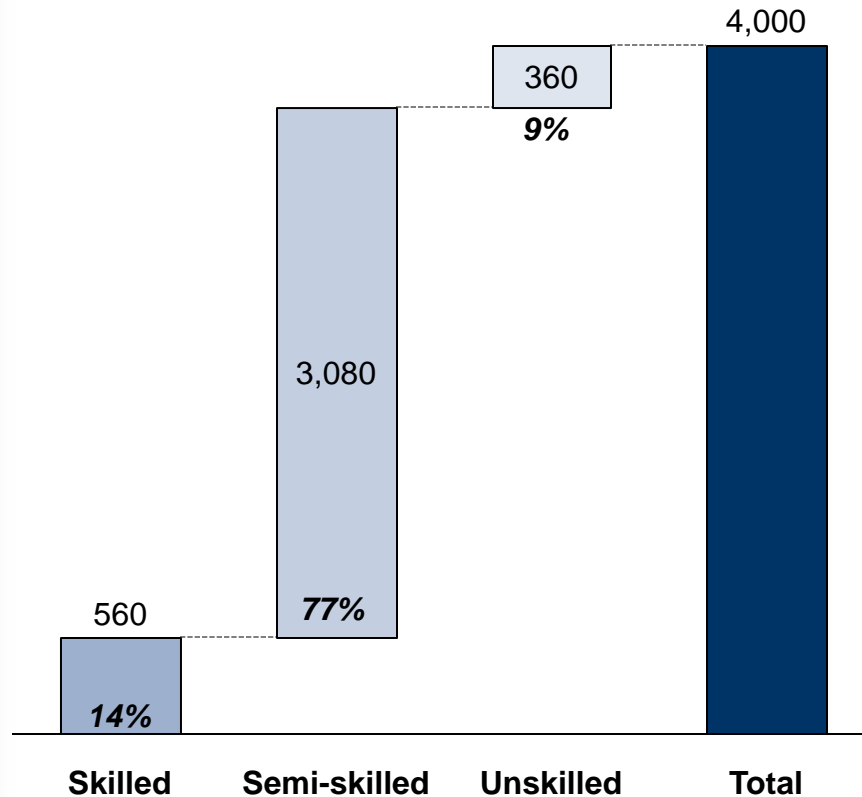
Source: SBC analysis, company data

Note: *The sample revenue was extrapolated to the industry revenue via defined market share of the sample (15%)

Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: mechanical engineer, managers, logistics coordinator
- Semi-skilled: mechanics, drivers, administrative assistants
- Unskilled: cleaners

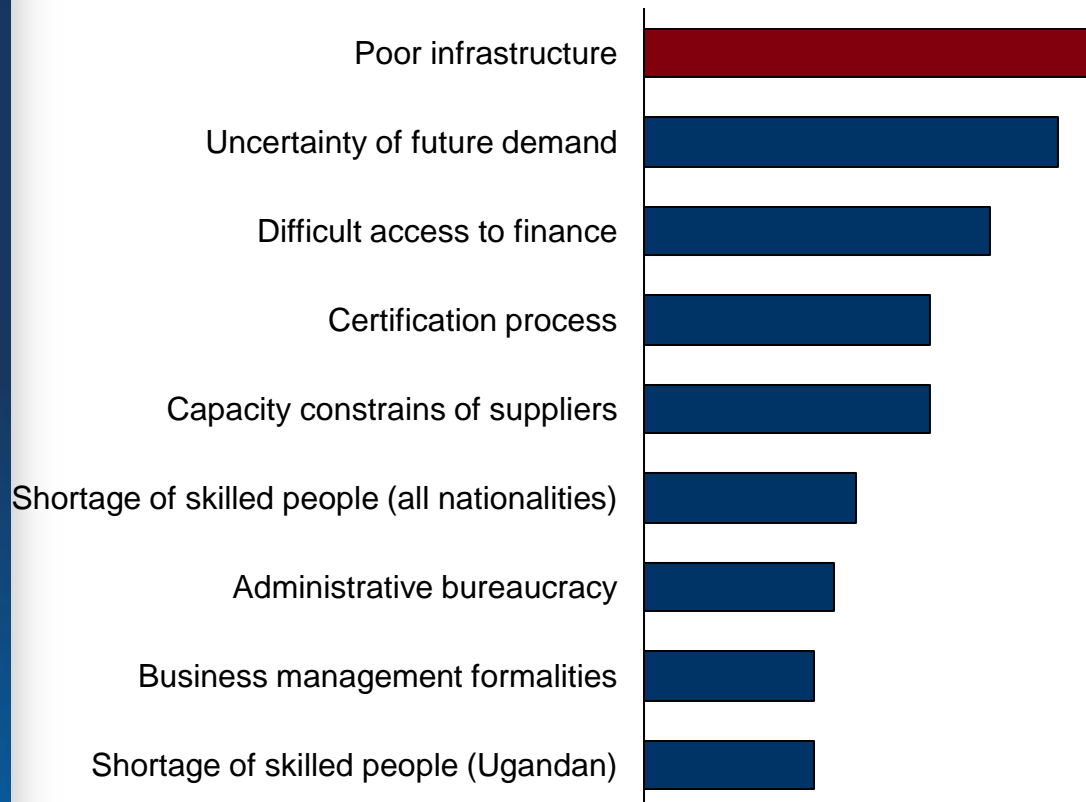
Source: SBC analysis, company data

Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (15%)

The main barrier for growth within the transportation of people industry is poor infrastructures

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Poor road infrastructure leading to higher transport and maintenance costs
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Lack of appropriate logistics and HSE culture in the country
 - High capital required to buy additional buses, high interest rates

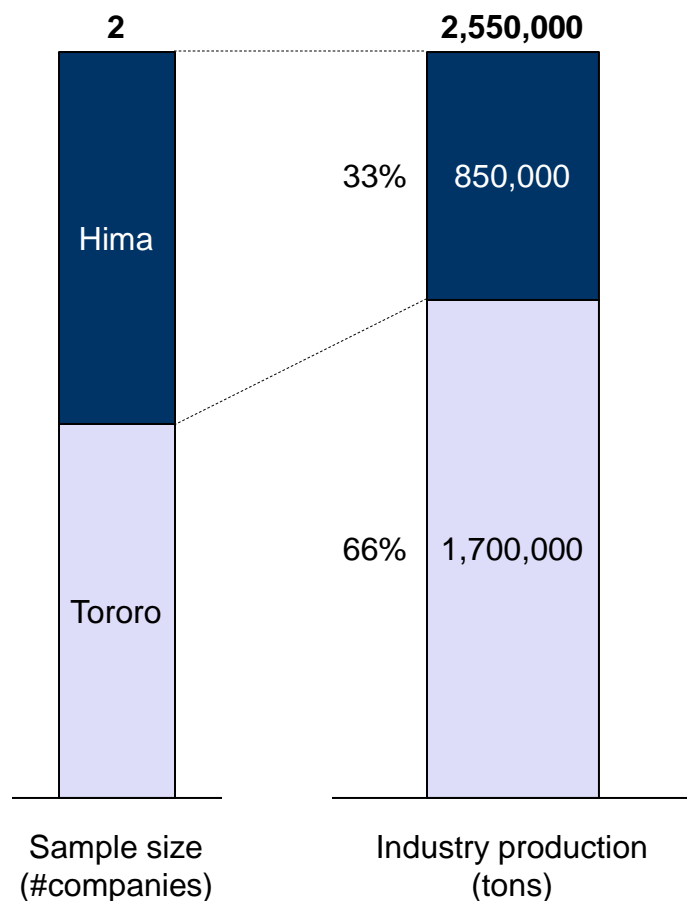
Cement for structural constructions, buildings, but not for wells



Hima and Tororo represents 100% of the cement sector in Uganda

DETAILS OF THE SURVEYED SAMPLE* – CEMENT MANUFACTURING

2012, in number of companies and tons



Companies Surveyed

Hima**

Tororo**

Cement Capacity

- The production numbers displayed in this analysis are actual production figures and not full production capacity
- Each player has around 20 to 25% spare production capacity
- Full capacity is rarely reached because of frequent power cuts

Source: SBC analysis

Note: *The sample surveyed represents the total market of cement in Uganda

**Companies interviewed

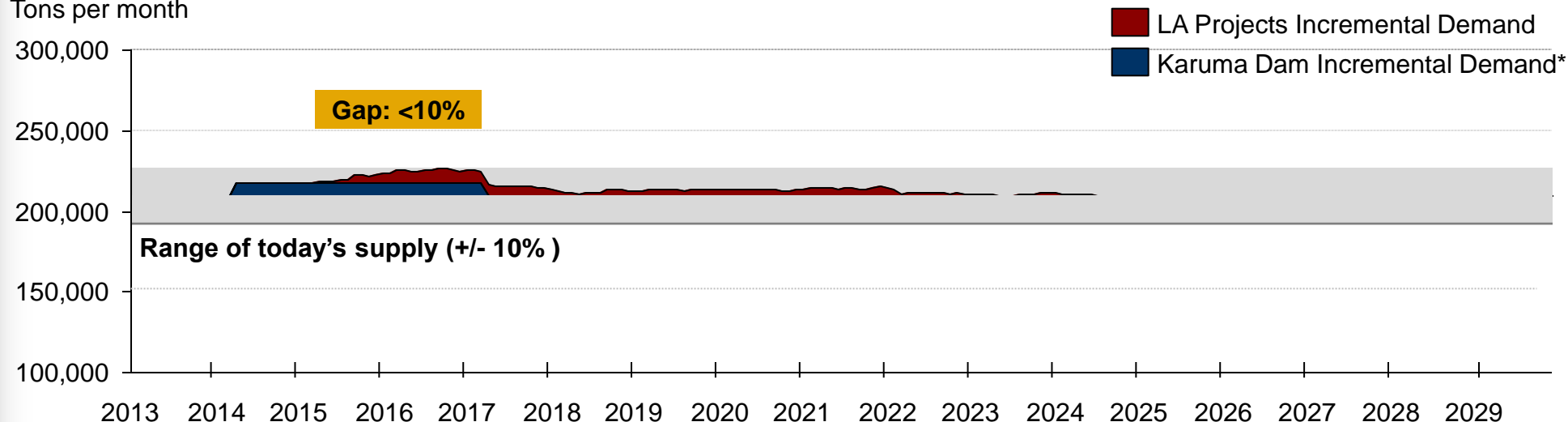


The survey reveals a small gap of supply over future projects' demand for cement

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & Supply of cement per month

Tons per month



QUALITY

DEMAND

- To be defined and communicated by oil and gas operators

SUPPLY

- Ordinary Portland and Portland Pozzolana cement
- Both certified under national and international standards
- Production of cement type I & II of US 310 standard

ASSUMPTIONS ON DEMAND

- Cement is 18% of total weight of bulky materials
- Cement density is 3000 kg/m³

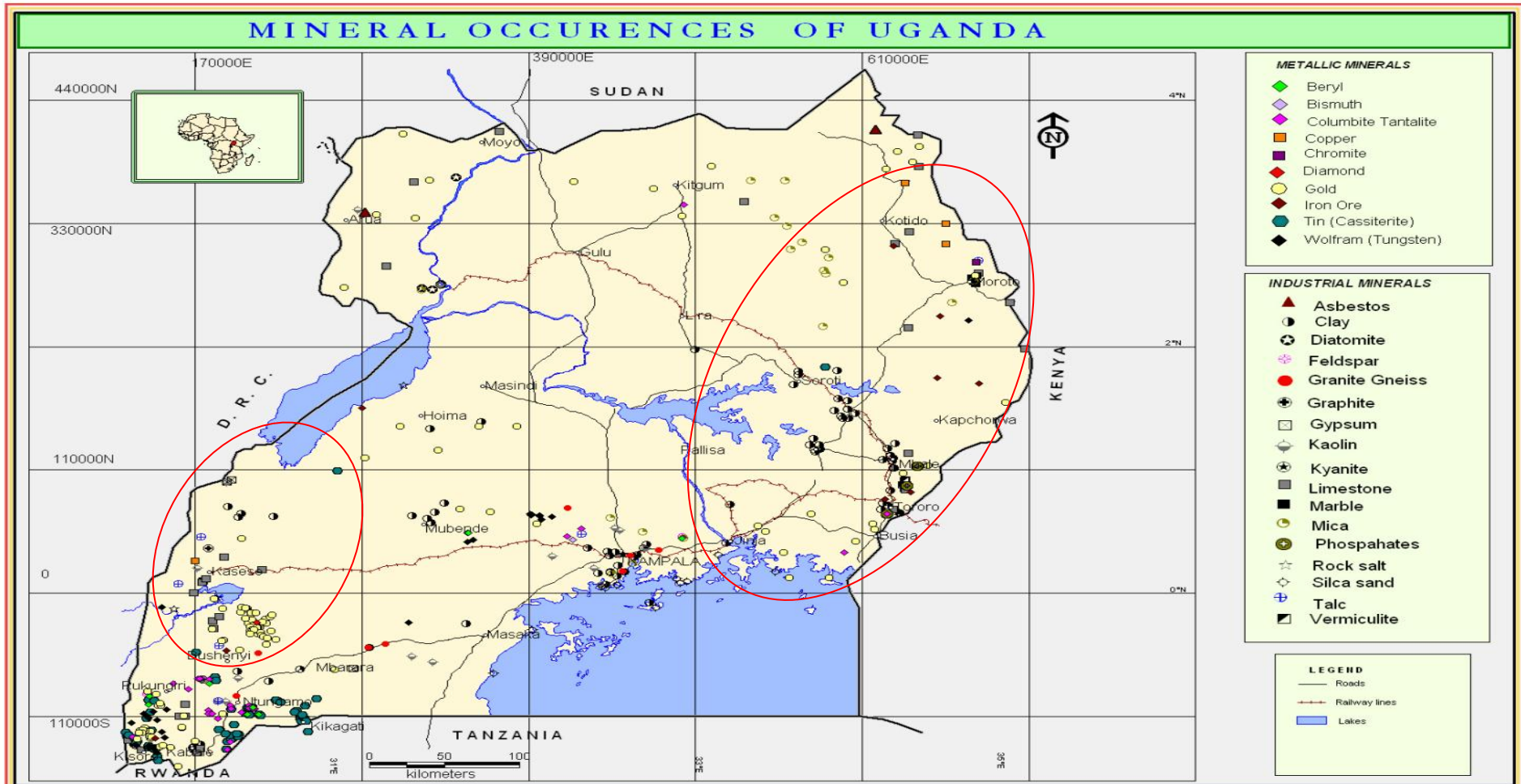
Source: SBC analysis

Note: Today's supply capacity (including 30% of exported cement). To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation. *Karuma hydropower project demand estimated based on an interview with Tororo cement



Lots of clays and limestone deposits are available for cement production in Uganda, while gypsum is mainly imported

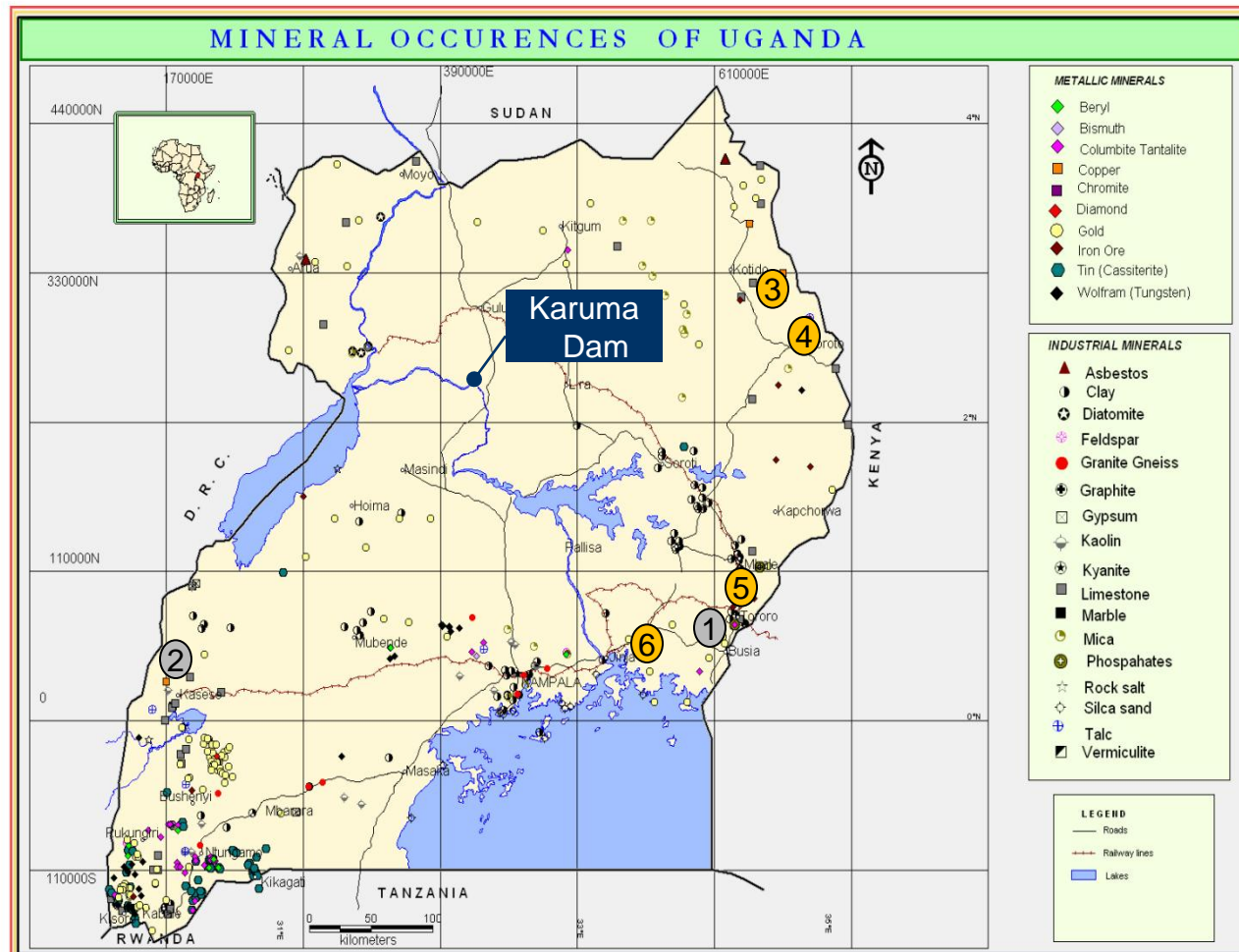
MINERAL OCCURRENCES IN UGANDA



Source: Ugandan Geological Survey and Mines department (<http://www.uganda-mining.go.ug/magnoliaPublic/en/GeologyMining/MineralOccurrences.html>)

Two players are currently present in the industry in Uganda and four other players are expected to enter the market in 2016

CEMENT PLAYERS IN UGANDA



Current Players

1. Tororo cement in Tororo (1,700,000 tons)
2. Hima in Kasese (850,000 tons)

Future Players

3. China National Machinery Import & Export Corporation in Moroto (800,000 tons)
4. Kiboko in Moroto (500,000 tons)
5. Raiply in Tororo (500,000 tons)
6. Dao Group on Tirinyi road (500,000 tons)

Note: Supply capacity will double if all future players start operate in 2016

Tororo produces cement type I & II of US 310 standard

TEST CERTIFICATE FOR TORORO'S CEMENT

TORORO CEMENT LIMITED

(Formerly Tororo Cement Industries Limited)

KAMPALA OFFICE:

P.O. Box 22753 Kampala
Tel: +256 (414) 250065 / 71
+256 (312) 260183 / 184
Fax: +256 (414) 344564
GODOWN 6th Street
Tel: +256 (772) 987836
NAMANYE GODOWN
Tel: +256 (772) 555447



TORORO FACTORY:

P.O. Box 74, Tororo, Uganda
Tel: +256 (454) 448025 / 75
+256 (352) 512500 (PBX)
Fax: +256 (352) 512517
Email: tcl@tororocement.com
MALABA:
Tel: +256 (454) 442481
Fax: +256 (454) 442278

Our Ref:

Your Ref:

Date: 04.05.2013

TEST CERTIFICATE FOR CEM II (PORTLAND POZZOLANA CEMENT) - TEST AND COMPLIANCE

S.R. NO.	PARTICULARS	REQUIREMENT AS PER US 310-1:2001 CEM II / B-P / 32.5N	RESULTS ACHIEVED
A	Chemical Requirements		
1	Sulphuric Anhydride (SO ₃) %	MAX : 3.50	1.88
2	Chloride (%)	MAX : 0.10	0.009
B	Physical Requirements		
1	Fineness (Blain) M ² / Kg.	NR	456.7
2	Setting Time (Minutes)		
	(a) Initial	MIN : 75	180
	(b) Final	MAX : 600	265
3	Soundness by Lechatelier (mm)	MAX 10.0	0
4	Compressive strength (Mpa)		
	(a) 48 +/- 1 hour	NR	15.77
	(b) 168 +/- 2 hours	MIN : 16.0	26.23
	(c) 672 +/- 4 hours	MIN : 32.5	35.92

Nandu
Shadresh Bhatt
Manager (QC & QA)

TORORO CEMENT LTD.
P.O. BOX 74
TORORO - UGANDA



PRODUCER & MANUFACTURERS OF:
Portland Cement, galvanised corrugated Iron Sheets,
Ridges & Gutters, Wire nails & Wire Products



- Adopt US 310 standard
- ~95% of Tororo cement production is cement type II with ~32.5% pozzolanic for buildings and regular construction
- ~5% of Tororo cement production is cement type I for dams, bridges and high rise buildings
- Tororo is ISO9001-2000 certified
- Hima and Tororo have similar specifications*

Source: Tororo cement

Note: *Based on the interview with Tororo cement

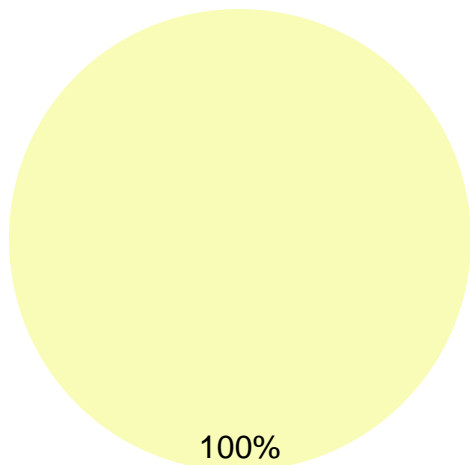


Cement industry is owned by foreigner shareholders and operated by local employees

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

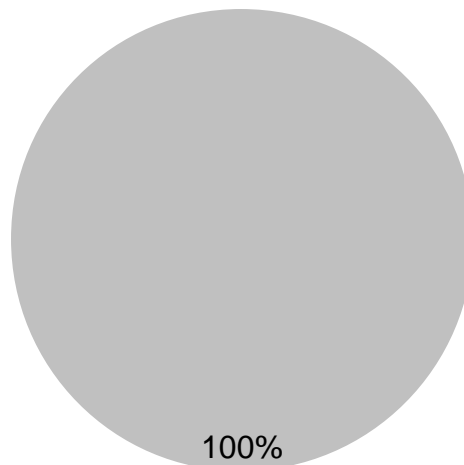
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



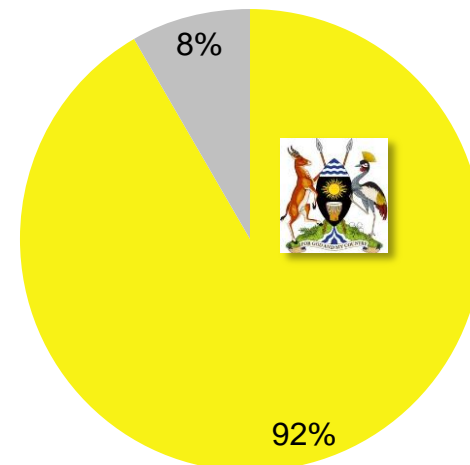
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

Source: SBC analysis, company data

Note: Hima is a subsidiary (100%) of the Kenyan company Bamburi Cement which is 100% owned by the French company Lafarge. Tororo is a Kenyan family-owned business



Overview of financial performances

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 1,500,000 million
~ USD 585 million

FINDINGS

- Annual growth is around 6%
- Fluctuation in exchange rate USD-UGX is an issue, because of imported raw materials
 - Gypsum is imported from Oman and Egypt,
 - Some clinker is produced locally, some is imported
 - The imported clinker comes from Japan, Korea, India and Dubai
 - Coal (imported from South Africa) and fuel oil (imported from Kenya) is used to produce local clinker
 - Limestone comes from local quarries

Source: SBC analysis, company data

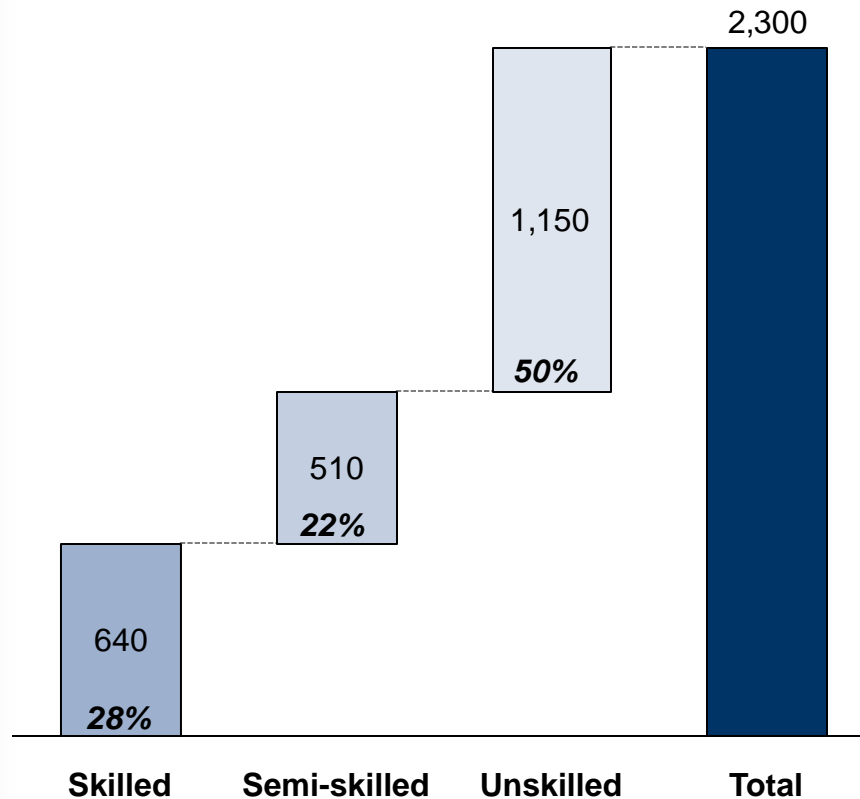
Note: *The sample revenue is equal the industry revenue, since the two companies represent 100% of the market



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: engineers, cement technicians
- Semi-skilled: machine operators, loaders, packers
- Unskilled: helpers, cleaners

Source: SBC analysis, company data

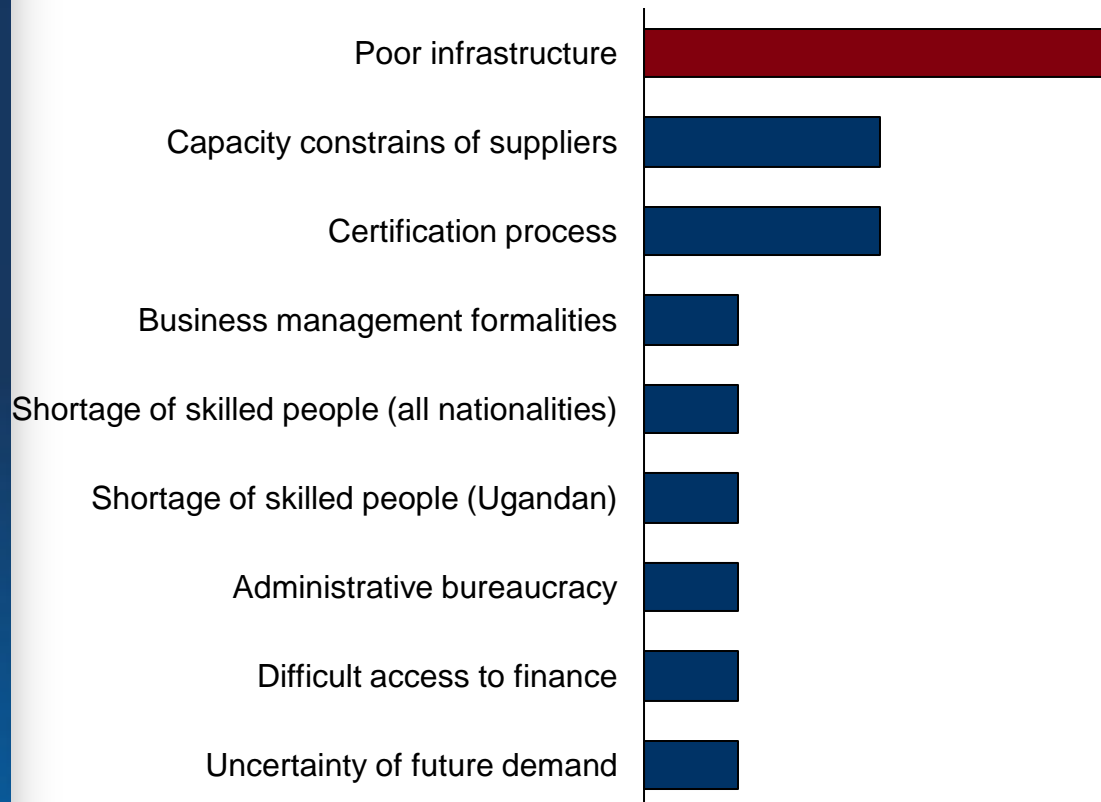
Note: * The sample manpower is equal the industry manpower, since the two companies represent 100% of the market



The main barrier for growth within the cement industry is poor infrastructure

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Expensive imported raw materials
 - Poor road quality
 - Road transportation impacts production cost and final price: \$200/ton in Uganda compared to \$120/ton in Kenya*
- **Oil & Gas specific:**
 - Class G cement (for well cementing) not available in Uganda
- **Other barriers:**
 - Shortage of electricity
 - Access to cheap power

Source: SBC analysis, company data

Note: *The Mineral Industry of Uganda, Thomas R. Yager, 2012



4 Bulk material industry

Mining and quarrying of bulk construction material
(aggregate, gravel, sand, gypsum)



Bulk material industry overview

SAND OCCURRENCES IN UGANDA

- Sand is generally located close to the lakes
- In the north, coarse and clay-free sands are available in river courses often associated with gravel
- In the east, sands with clay and silt are available in many places
- In the west, clean sand is found in stream courses and on lake shores in the rift areas
- In the center, little sand is available



AGGREGATE OCCURRENCES IN UGANDA

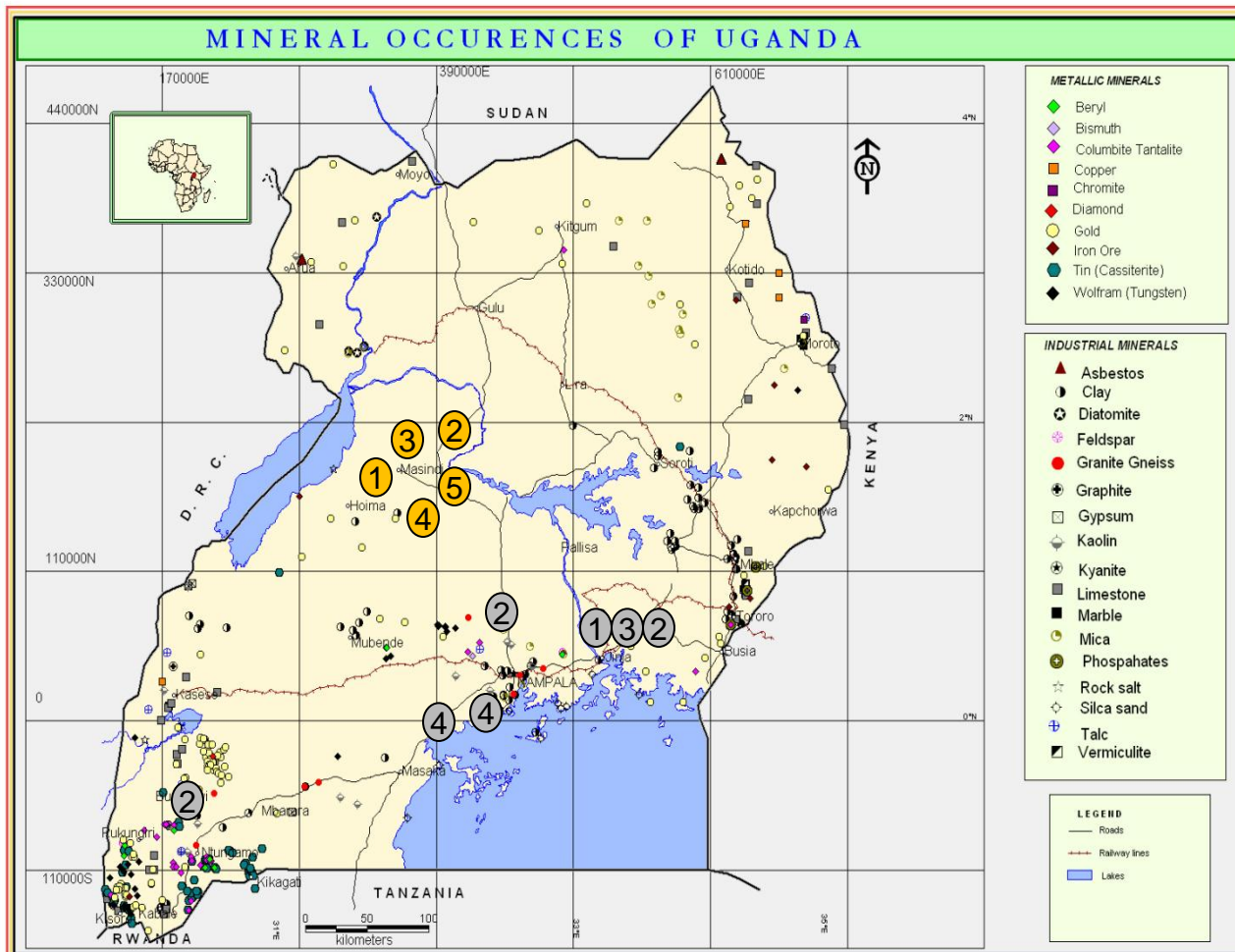
- Stone suitable for crushing is available in most parts of the country
- Granite, gneiss, quartzite and sandstone are widely available throughout the areas of Precambrian Basement
- In the center and east, badly weathered dolerite and amphibolite are available
- In the east and southwest, volcanic lavas and agglomerates are extensively available



Many bulk material players are available in Uganda and fewer in the proximity of Lake Albert

IDENTIFIED BULK MATERIAL PRODUCERS IN UGANDA

NON-EXHAUSTIVE LIST



Quarries close to Lake Albert

1. Quarry Consult (~ 95,000 t/year of sand and aggregate)
2. Atlas Technologies (~80,000 t/year of aggregate)
3. Zange Concrete Works Ltd
4. HAS Ltd
5. Build & Rest (~70,000 t/year of sand)

Other quarries

1. Dott Services (~150,000t/year of aggregate)
2. Nicontra (~60,000 t/year of aggregate)
3. Sterling (~100,000 t/year of aggregate)
4. Build & Rest* (~70,000 t/year of sand)

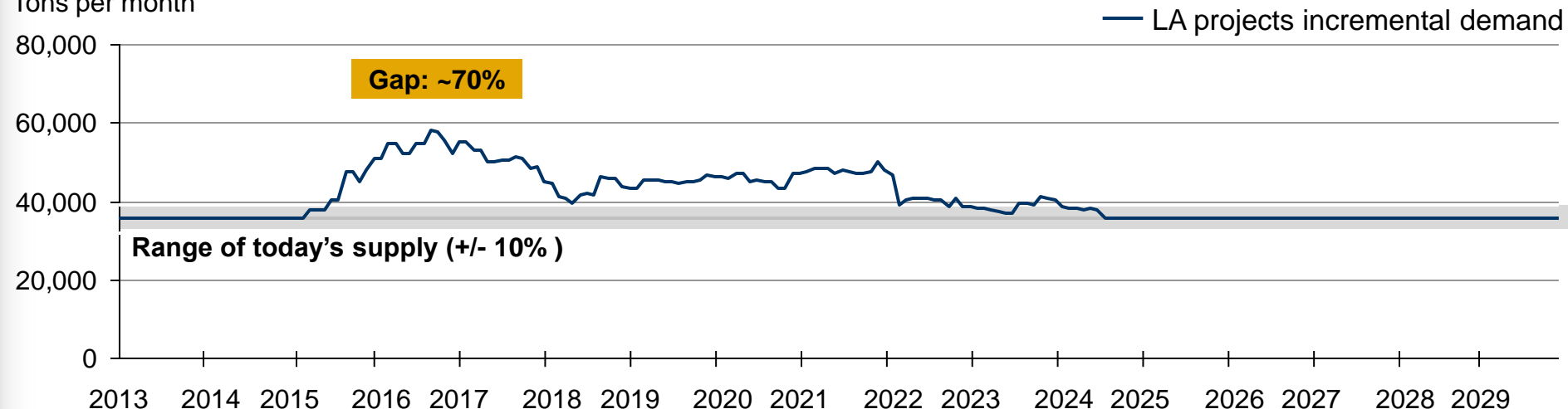
Source: SBC analysis; Interview with the Chairman of the Ugandan Quarries Operators Association
 Note: *Build and Rest has 2 quarries far from LA with combined sand capacity of 70,000 tons/year

Supply and demand analysis shows that there should be a gap between current capacities and future demand of bulk material

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply* of bulk material

Tons per month



QUALITY

DEMAND

- To be defined and communicated by Oil & Gas operators

SUPPLY

- NEMA mining license and environmental certificate
- Compliance with national specifications when sourcing road/civil construction projects

ASSUMPTIONS ON DEMAND

- Composition of bulk material is 24% of sand, 48% of gravel, 10% of gypsum of total aggregated construction material (remainder is cement)

Source: SBC analysis

Note: *Today's supply capacity was evaluated for the companies operating in the proximity of Lake Albert. To account for uncertainty, today's supply capacity range was computed using $\pm 10\%$ deviation

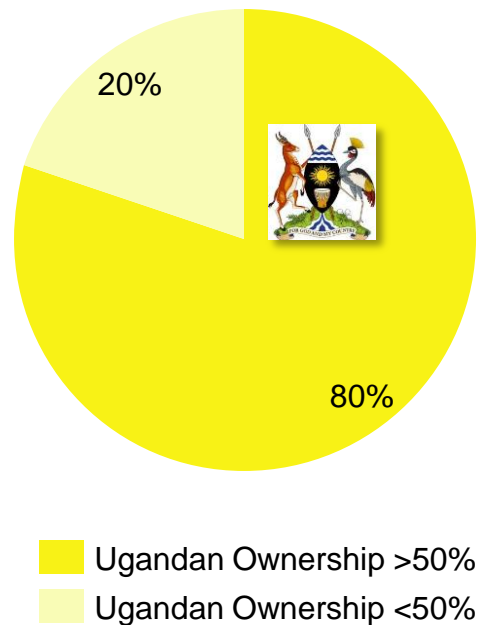


Local content proportion by industry

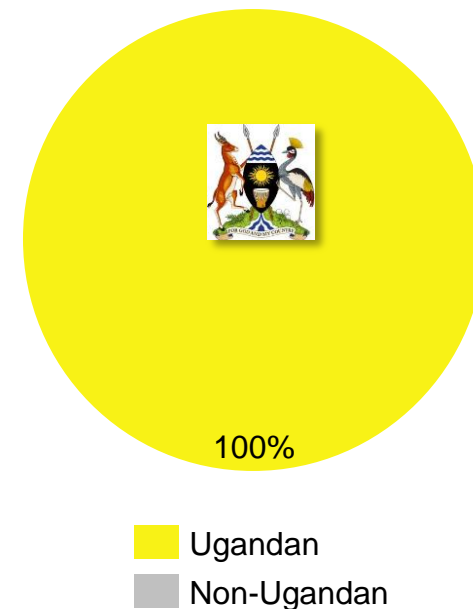
INDICATORS OF UGANDAN CONTENT IN THE SECTOR

2012, based on sample* companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



MANPOWER BY NATIONALITY



Source: SBC analysis, company data

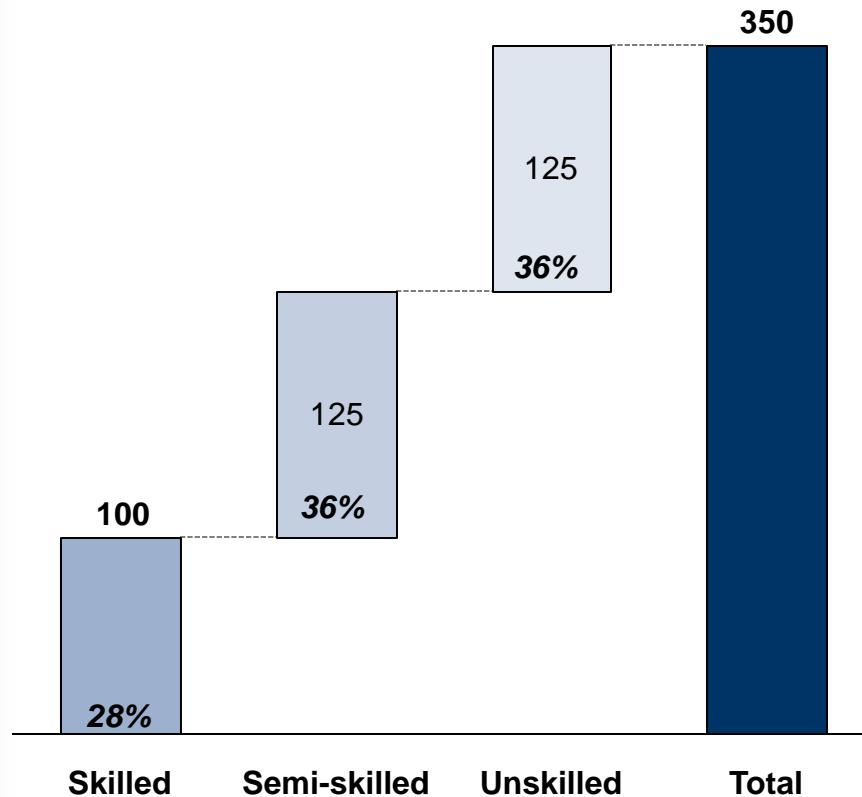
Note: *Local content proportion for the identified companies operating in the proximity of Lake Albert



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on sample* data



FINDINGS

- Skilled: engineers, administrative positions
 - Lack of skilled and qualified people able to drill and blast rocks
- Semi-skilled: supervisors, machine operators, truck drivers
- Unskilled: casual labourers, helpers, cleaners

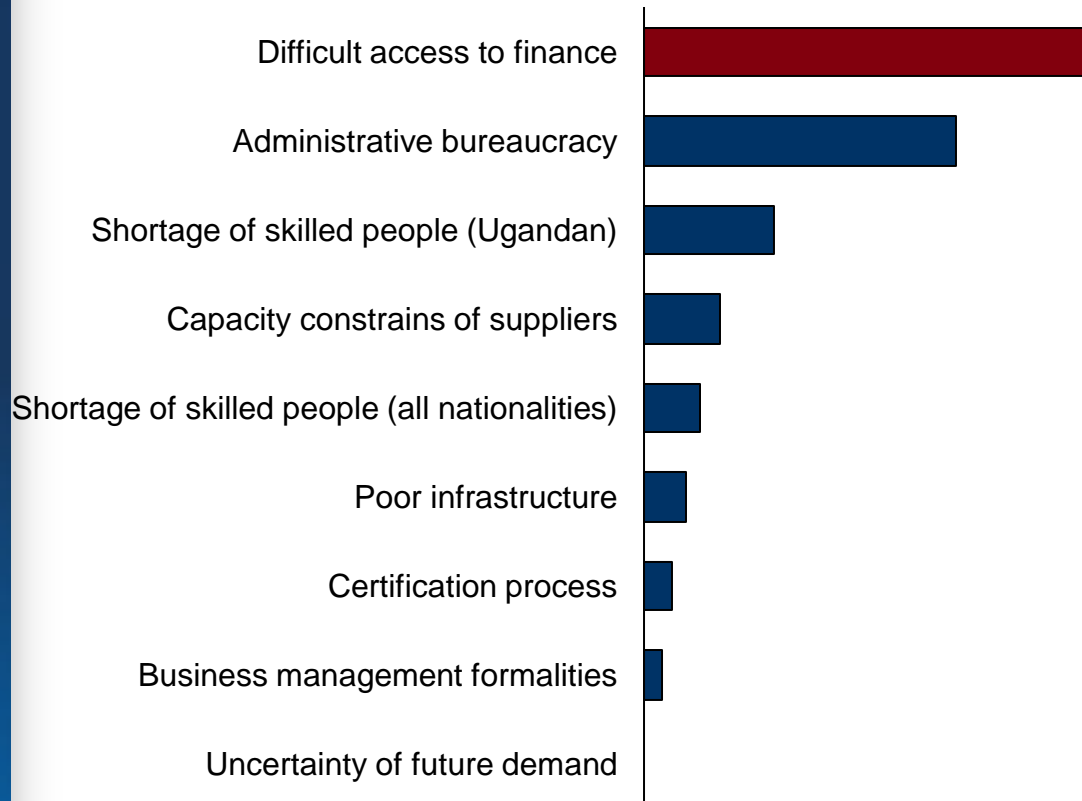
Source: SBC analysis, company data

Note: *Manpower of identified companies operating in the proximity of Lake Albert

The main barrier for growth within the bulk material industry is access to credit

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Prohibitive borrowing rates and loan conditions
 - Huge capital required to buy a quarry
 - Huge capital required to import crushing machinery
- **Oil & Gas specific:**
 - Uncertainty of future oil and gas demand and related standards
- **Other barriers:**
 - Long certification process
 - High import taxes on equipment
 - Fluctuation in exchange rate USD-UGX used to import blasting explosives
 - Shortage of skilled people

Steel industry

Manufacture, treatment and coating of steel required for concrete reinforcement, structural construction, buildings, tanks, containers, etc.

Reinforcement steel rebars produced by Roofings



Steel manufacturing and processing

REINFORCEMENT STEEL



- Example: Steel bars for concrete
- Manufactured out of scrap material
- Coil imported from South Africa
- Compliant with national and British standards

STRUCTURAL STEEL



- Example: Steel beam, angles, etc.
- Manufactured and processed out of scrap material
- Imported from South Africa
- Compliant with international standards

FLAT STEEL



- Example: Steel used for oil tanks
- Manufactured and processed out of scrap material
- Scrap material is locally available and is also imported from South Sudan, DRC, Rwanda and Kenya
- Compliant with national and British standards

Reinforcement steel manufacturing

REINFORCEMENT STEEL



- Example: Steel bars for concrete
- Manufactured out of scrap material
- Coil imported from South Africa
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STRUCTURAL STEEL



- Example: Steel beam, angles, etc.
- Manufactured and processed out of scrap material
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- Compliant with international standards

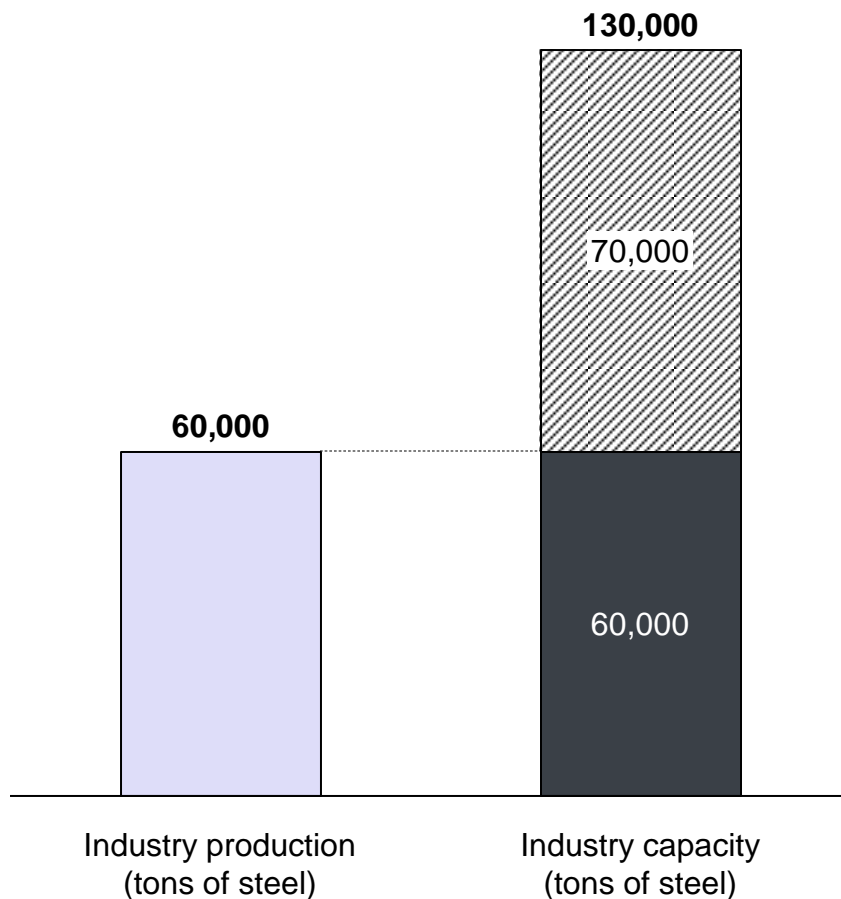
FLAT STEEL



- Example: Steel used for oil tanks
- Manufactured and processed out of scrap material
- Scrap material is locally available and is also imported from South Sudan, DRC, Rwanda and Kenya
- Compliant with national and British standards

60,000 tons of reinforcement steel were produced in 2012 in Uganda

DETAILS OF REINFORCEMENT STEEL MANUFACTURING INDUSTRY 2012, in tons of steel



Companies Surveyed

Roofings*

Tembo Steels*

Tian Tang Group

Steel and Tube

Source: SBC analysis, Meeting with representatives of Roofings and Tembo Steels

Note: *Companies interviewed

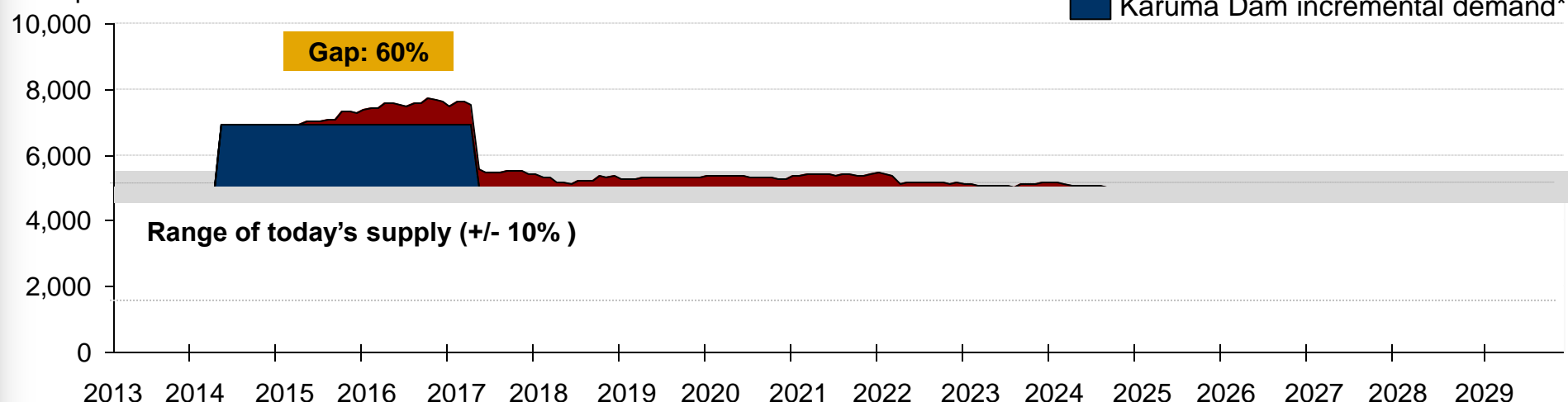


The survey reveals a sizeable gap of supply over future projects' demand for reinforcement steel

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & Supply of reinforcement steel

Tons per month



QUALITY

DEMAND

- To be defined and communicated by Oil & Gas operators

SUPPLY

- Ugandan companies comply with national standards for steel products
- Some companies comply with International standards

ASSUMPTIONS ON DEMAND

- 100% steel required for reinforcement (80 kg per m3 of concrete) produced in Uganda

Source: SBC analysis

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

*Karuma dam incremental demand for steel reinforcement was determined from the required quantities of cement and concrete

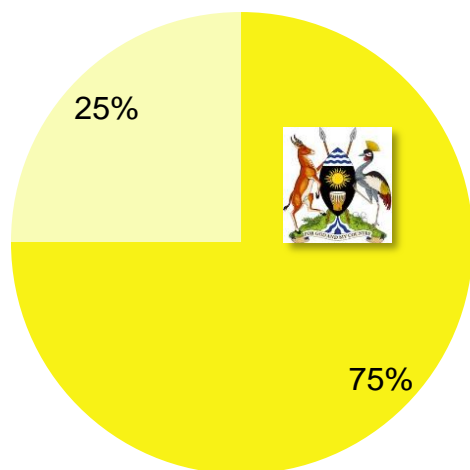


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

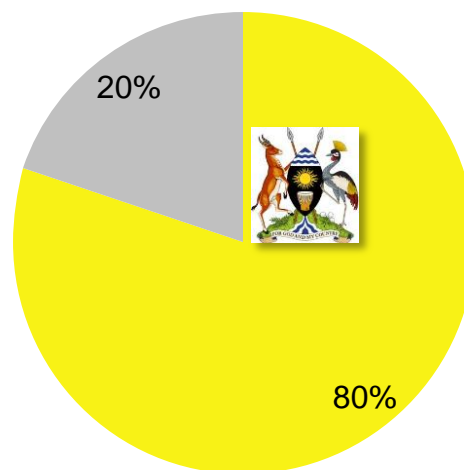
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



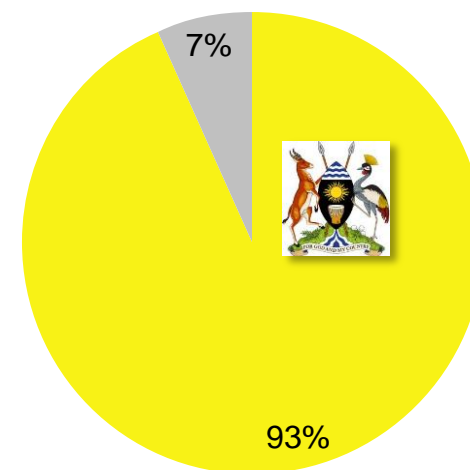
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP*
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

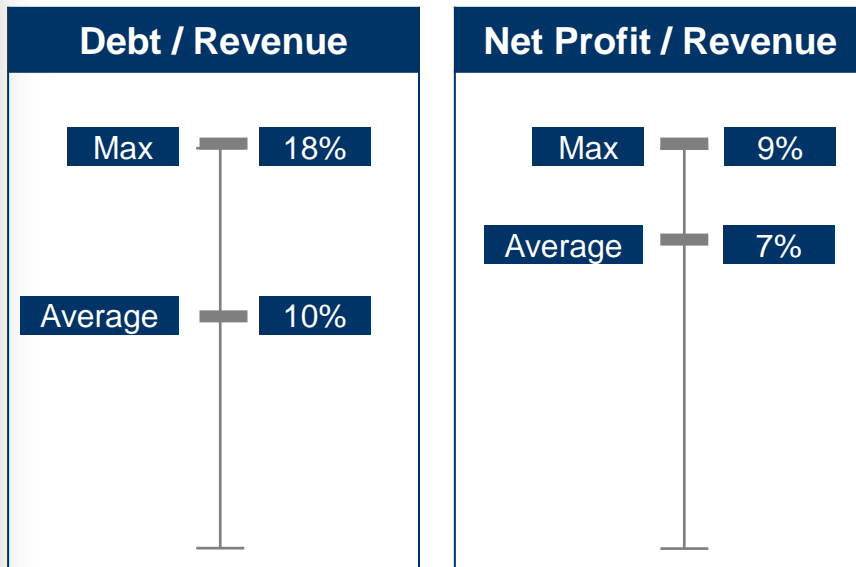


■ Ugandan
■ Non-Ugandan

Overview of financial performances

FINANCIAL DATA

2012, based on sample data*



FINDINGS

- Difficulty to access credit:
 - Complex bank requirements
 - Prohibitive interest rates
- Fluctuation in exchange rate USD-UGX generates uncertainty as imports of steel are in USD
- Increasing costs of production:
 - Soaring energy cost
 - High transportation costs
 - Use of expensive imported raw materials (billets, etc.)

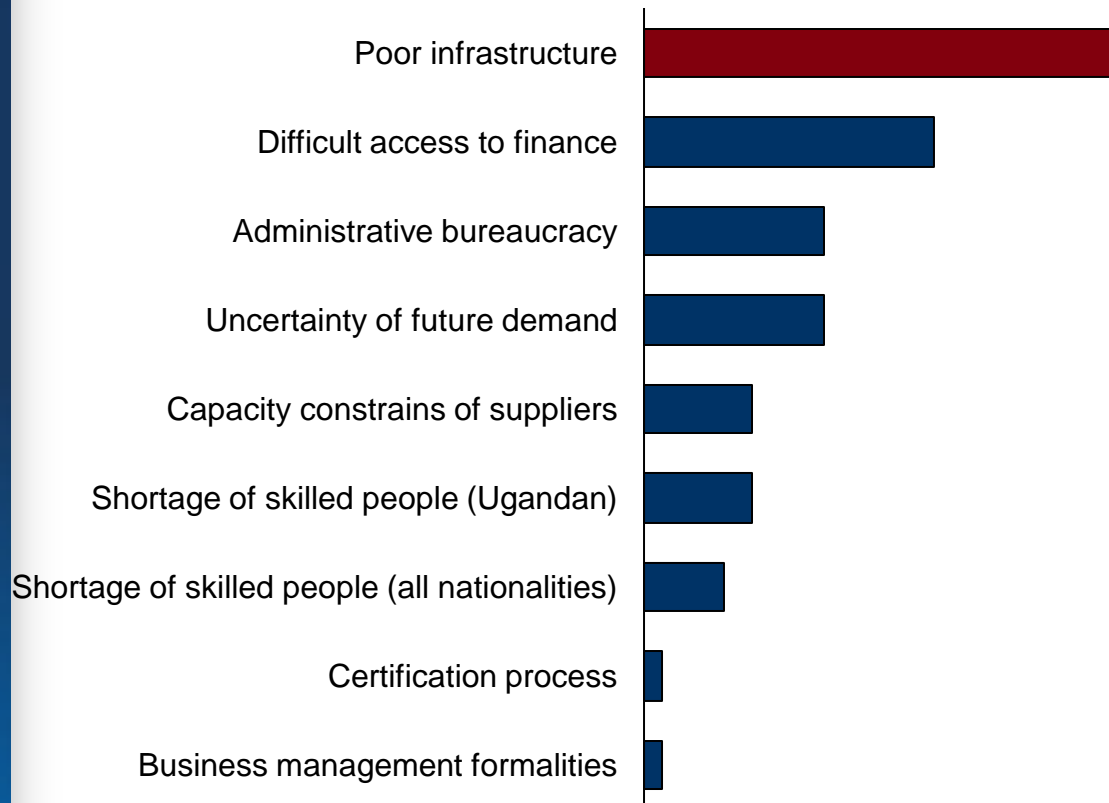
Source: SBC analysis, company data

Note: *Tian Tang Group did not report its financial details

The main barrier for growth within the reinforcement steel industry is poor infrastructure

BARRIERS FOR GROWTH

Relative importance given by companies



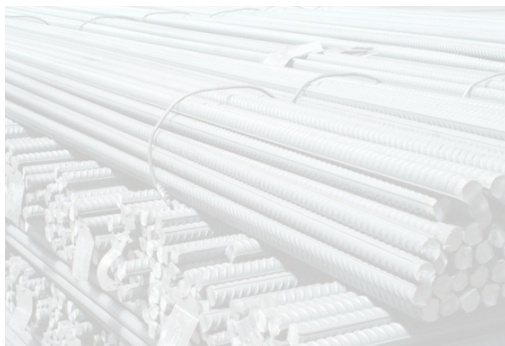
COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Shortage of power supply hinders actual production of steel
 - Shortage of power supply leads to a lower utilization rate of existing capacity
- **Oil & Gas specific:**
 - Uncertainty of quality and quantities needed for Oil & Gas projects
- **Other barriers:**
 - Shortage of skilled personnel
 - Outdated equipment used for steel production
 - Lack of raw material
 - Time-consuming approvals for imports/ exports, freight clearing/ forwarding, registration of a new brand/product, etc.

6 Light iron/steel products (structural and flat steel)

REINFORCEMENT STEEL



STRUCTURAL STEEL



- Example: Steel beam, angles, etc.
- Manufactured and processed out of scrap material
- Imported from South Africa
- Compliant with international standards

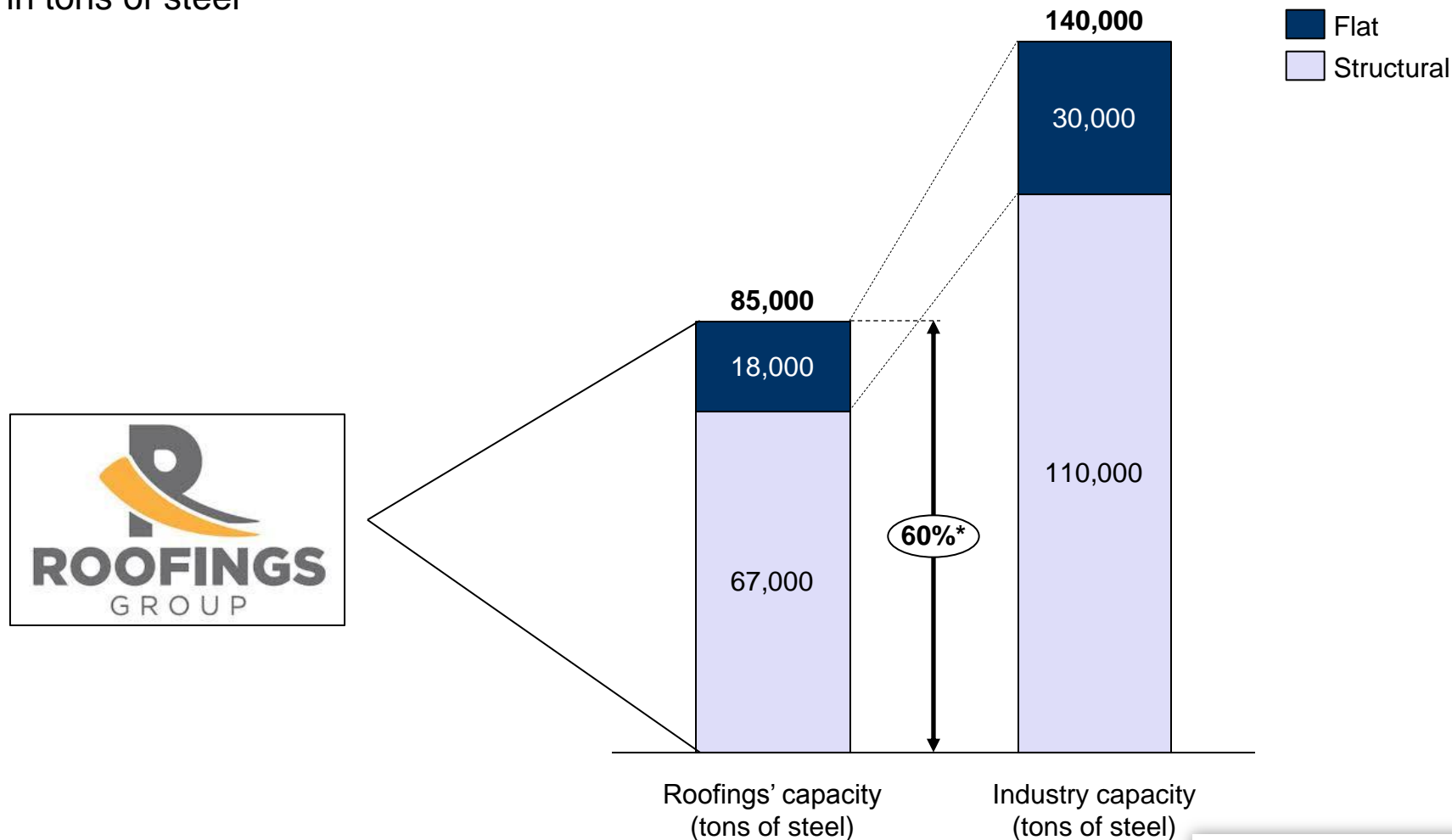
FLAT STEEL



- Example: Steel used for oil tanks
- Manufactured and processed out of scrap material
- Scrap material is locally available and is also imported from South Sudan, DRC, Rwanda and Kenya
- Compliant with national and British standards

Light iron/steel products (structural and flat steel) industry overview

DETAILS OF LIGHT IRON/STEEL PRODUCTS MANUFACTURING INDUSTRY 2012, in tons of steel



Source: SBC analysis, company data

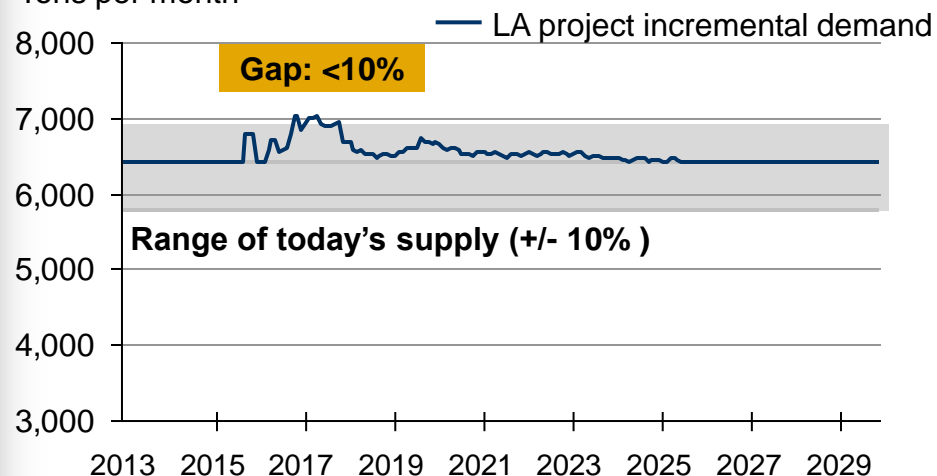
Note: *60% market share was determined based on an interview with Roofings

The survey reveals a small gap of supply over future projects' demand for structural steel and a large gap for flat steel

INDUSTRY SUPPLY & DEMAND ANALYSIS

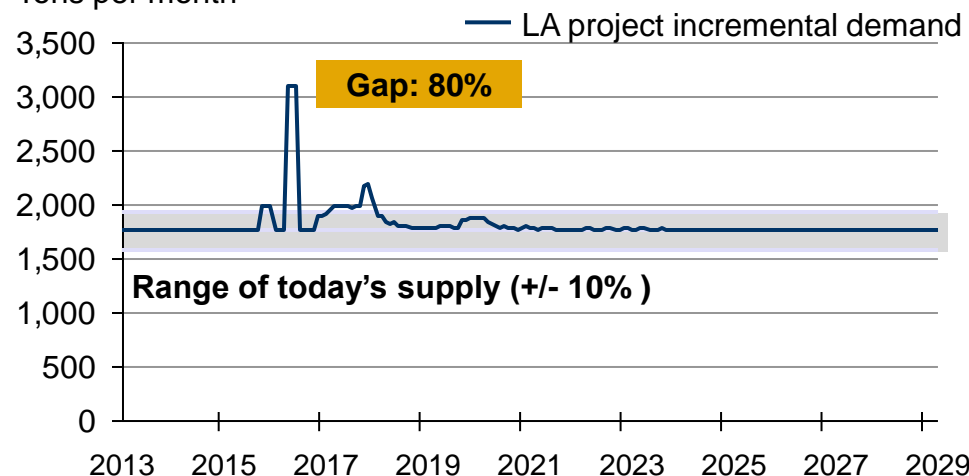
Demand & Supply of structural steel

Tons per month



Demand & Supply of flat steel

Tons per month



QUALITY

DEMAND

- To be defined and communicated by Oil & Gas operators

SUPPLY

- ~70% utilization factor of flat and structural steel production capacity
- Some companies are ISO 9001-2008 certified like Roofings and Tembo Steels

ASSUMPTIONS ON DEMAND

- 60% of structural and flat steel manufactured in Uganda is done by Roofings

Source: SBC analysis

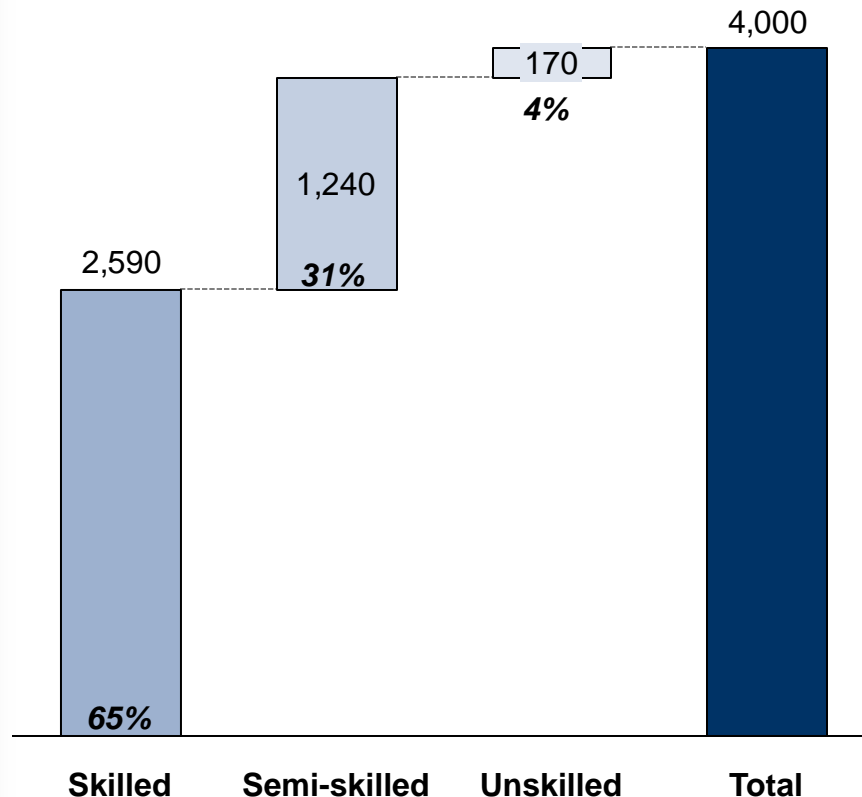
Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: engineers, managers, support staff
 - The majority of the employees are skilled as steel production is non labour intensive and is more equipment intensive
- Semi-skilled: machine operators, quality controller, administrative assistants (legal, marketing, sales)
- Unskilled: loaders, cleaners

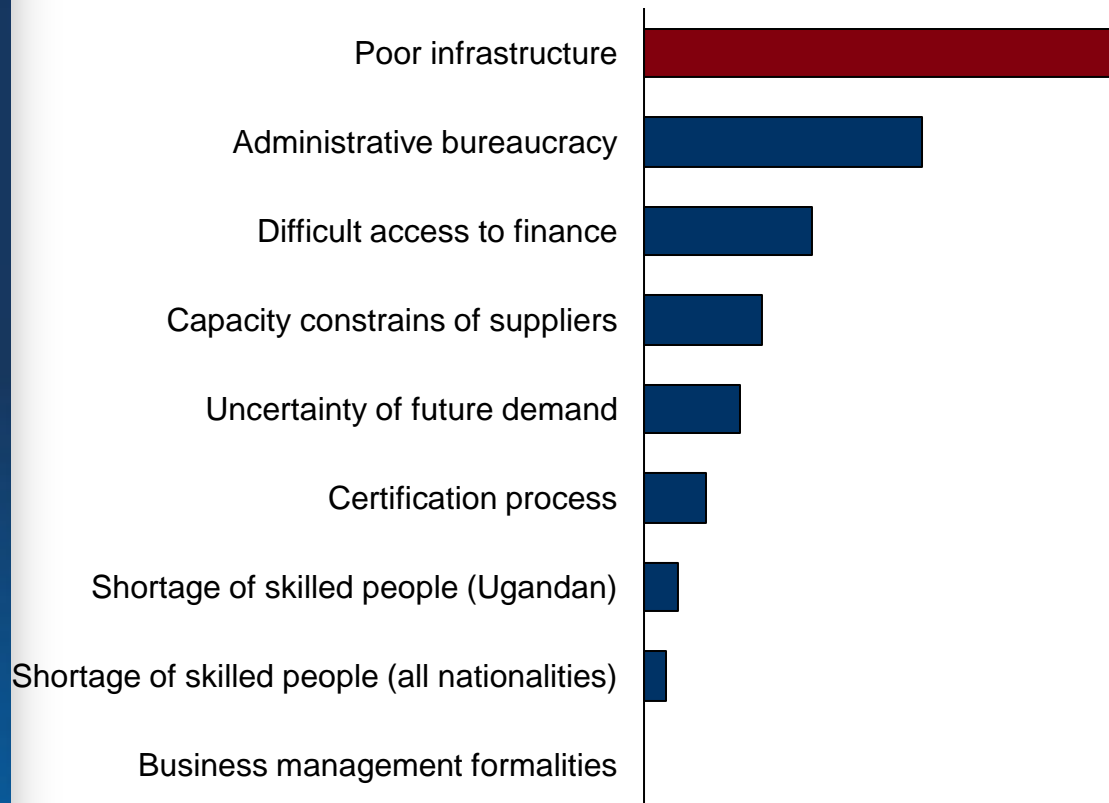
Source: SBC analysis, company data

Note: *Roofings manpower was extrapolated to the industry manpower via defined market share of the company (60%)

The main barrier for growth within the Light iron/steel products (structural and flat steel) industry is poor infrastructures

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Shortage of power supply hinders actual production of steel
 - Shortage of power supply leads to a lower utilization rate of existing capacity
- **Oil & Gas specific:**
 - Uncertainty of quality and quantities needed for Oil & Gas projects
- **Other barriers:**
 - Shortage of skilled personnel
 - Outdated equipment used for steel production
 - Lack of raw material
 - Time-consuming approvals for imports/ exports, freight clearing/ forwarding, registration of a new brand/product, etc.

7 Civil construction services industry

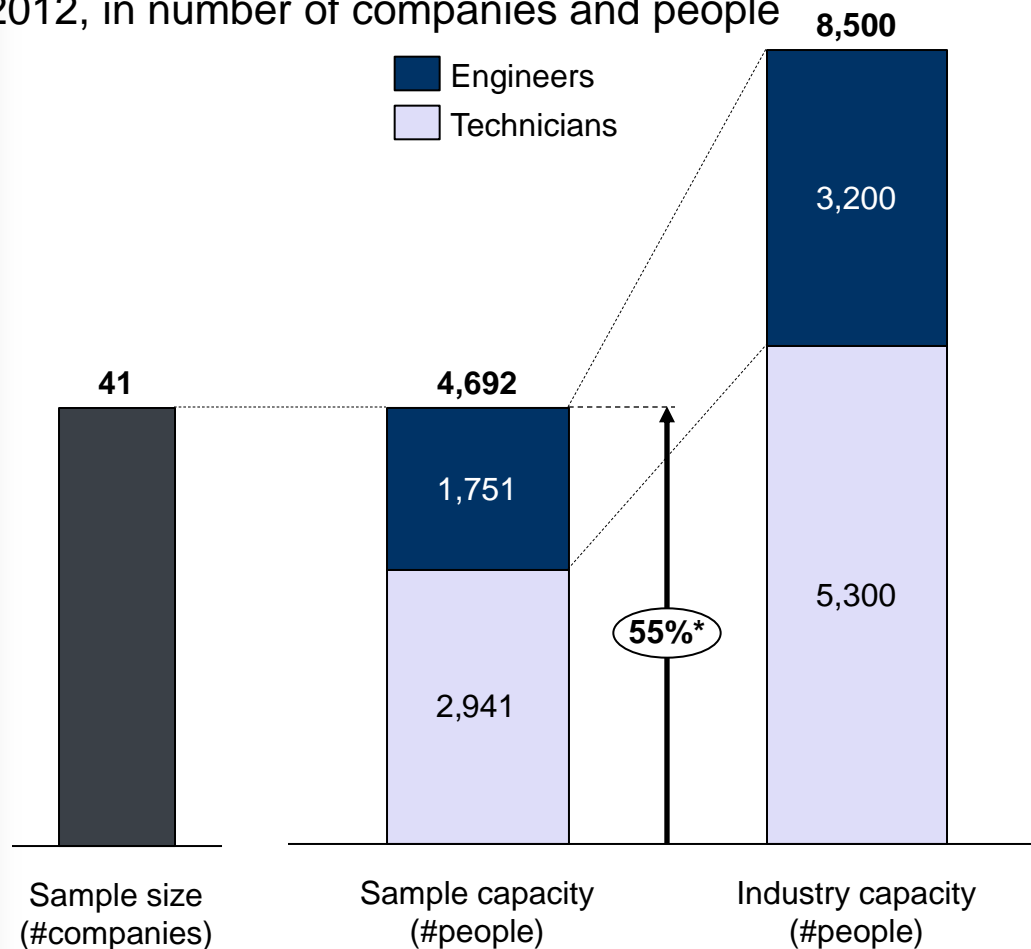
Civil preparation, earth and building works, erection of prefabricated, electrical installation, plumbing, welding, carpentry works, building completion and finishing



41 companies representing 55% of the civil construction services sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – CIVIL CONSTRUCTION SERVICES

2012, in number of companies and people



Companies Surveyed	
Abubaker Technical Services	Kasese
Adapt Technical Services	Keltron**
Babcon Uganda	Mectron
Build and Rest	Muraa Investments
CADG Middle East	Oracle Engineering
Cementers Uganda	Pancon Engineers
Challenger Uganda	Pearl Engineering**
Civicon**	Pioneer Construction
Colas East Africa	Power Arrangers
Dott Services	Provide International
Electrical Excellence	Roi Engineering Services
Engineering Solutions	Roko Construction
Epsilon Uganda**	Skeda Engineering
Es-ko Services	Specialized Tech. Services**
Excel construction	Strategic Logistics**
Fundi Facilities Management	Sumadhura Technologies
Gotino	Technical Masters
Halcons	TGS Water
Integrated Logistics Services	Uganda Baati
Jiemke	Weld-con
Joshi Electrical	

Source: SBC analysis, UBOS Census of Business Establishment 2011/2012, company data

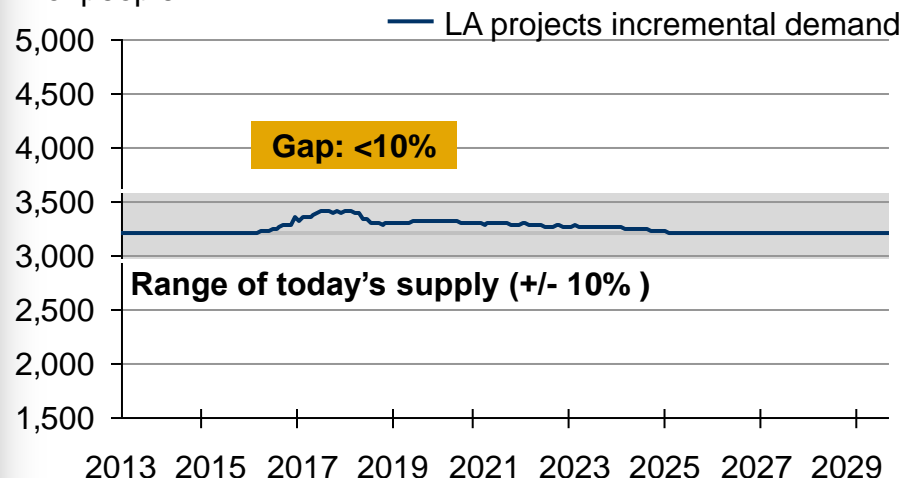
Note: *55% market share was determined by comparing manpower of the sample companies to manpower for the entire construction industry services (excluding road construction) reported by UBOS in 2012. **Companies interviewed

The survey reveals no gap of supply over future projects' demand for civil engineers and a small gap for civil technicians

INDUSTRY SUPPLY & DEMAND ANALYSIS

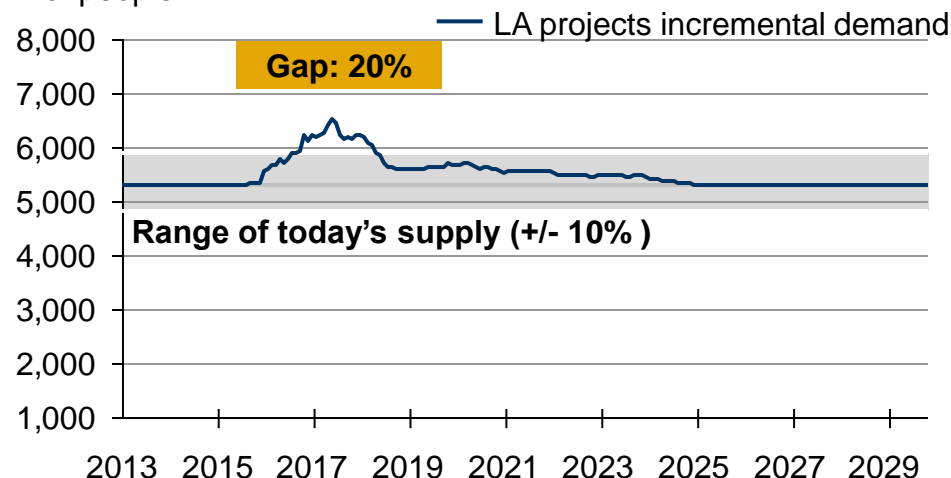
Demand & Supply of civil construction engineers

of people



Demand & Supply of civil construction technicians

of people



QUALITY

DEMAND

- Strict HSE certification required
- ISO compliance is required

SUPPLY

- Few ISO certified companies
- Exist in the largest companies but rarely certified
- Services are generally aligned with Ugandan standards and not international standards

ASSUMPTIONS ON DEMAND

- The number of technicians and engineers are the key measurement units of the industry demand in the future

Source: SBC analysis

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation



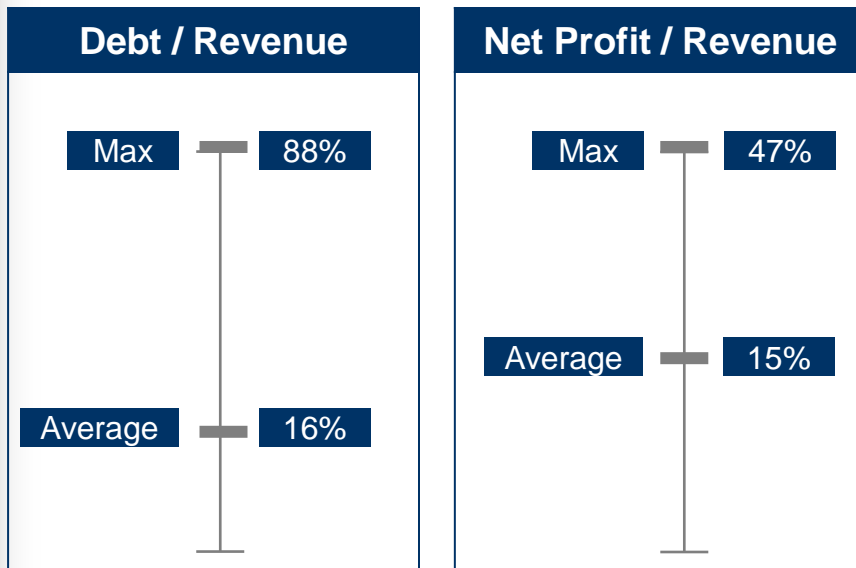
Financial analysis: working capital is the major civil construction industry problem

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 500,000 million
~ USD 195 million

2012, based on sample companies data



FINDINGS

- Working capital is the major industry problem
 - Only 10-20% of the contract is paid in advance
 - Not enough equity to cover project expenses; loans from national banks - the most common financing solution
 - Borrowing rates are prohibitive (20-25%)
 - Some small companies are getting finance from private and independent money lenders at ~10% interest per month

Source: SBC analysis; interview with representatives of Pear Engineering and Civicon, company data

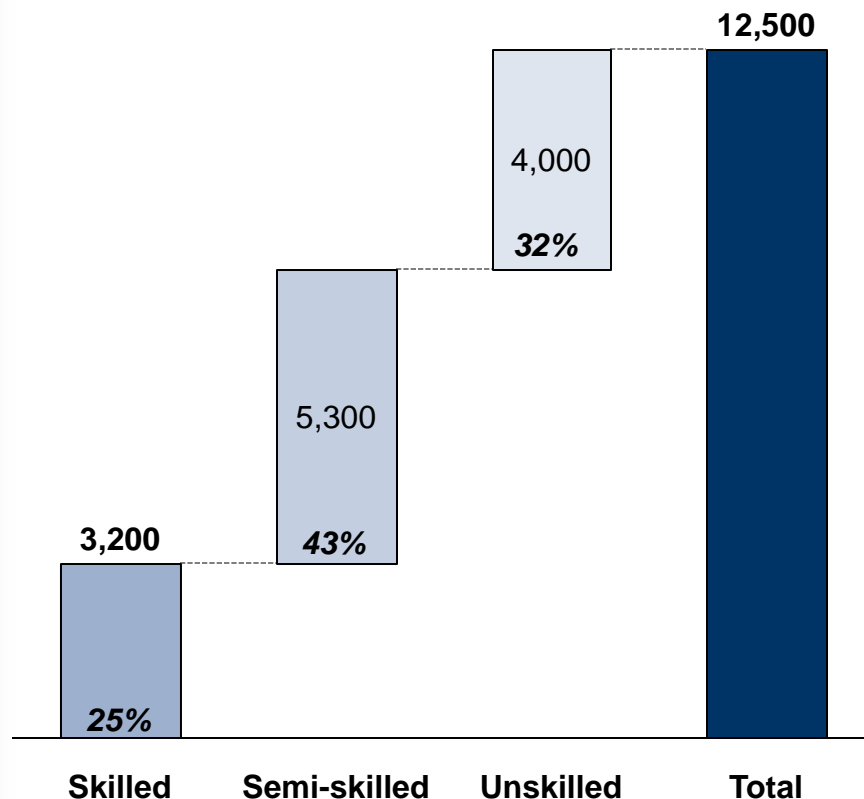
Note: * The sample revenue was extrapolated to the industry revenue via defined market share of the sample (55%)



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: civil engineers, technical managers
- Semi-skilled: welders, masons, carpenters, plumbers, scaffolds, drivers
- Unskilled: labourers, helpers

Source: SBC analysis, company data

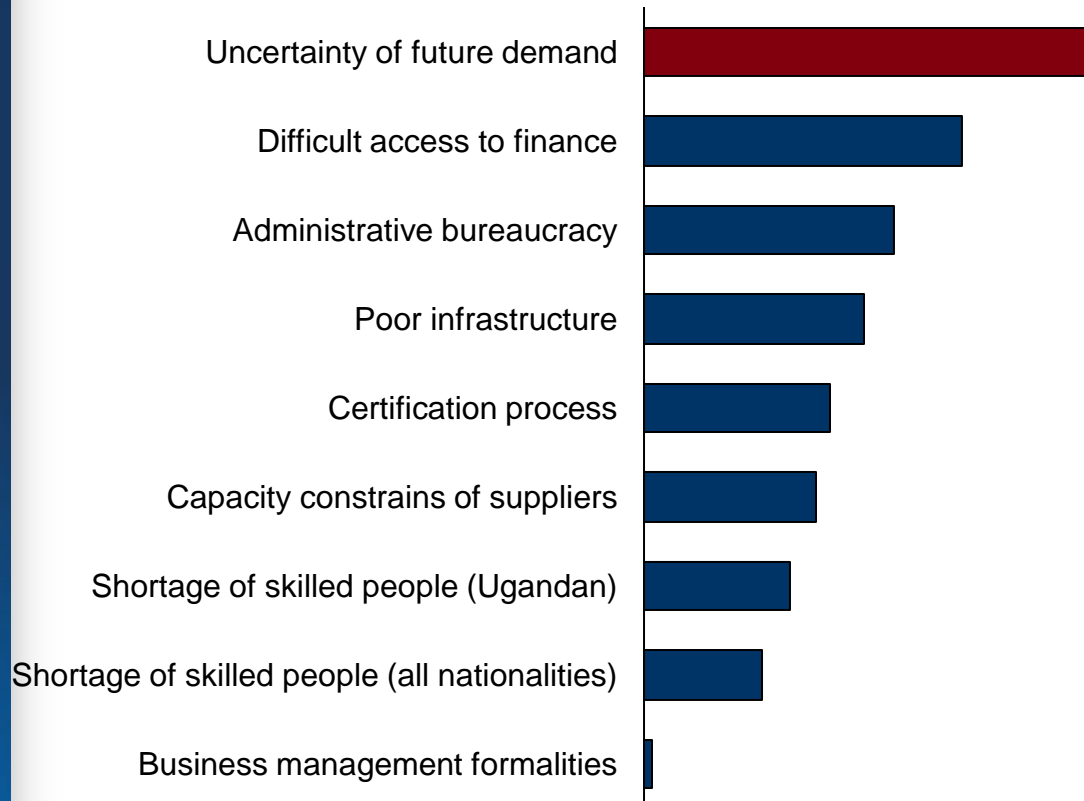
Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (55%)



The main barrier for growth within the civil construction industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Lack of visibility on governmental long term demand for civil construction as only short term visions are communicate to the companies
- **Oil & Gas specific:**
 - Lack of visibility on oil companies' demand
- **Other barriers:**
 - Difficult to access cheap capital in Uganda. Borrowing rates are prohibitive (20-25%)
 - Poor transportation infrastructures
 - Lack of specialized vocational training

8 Mechanical construction industry

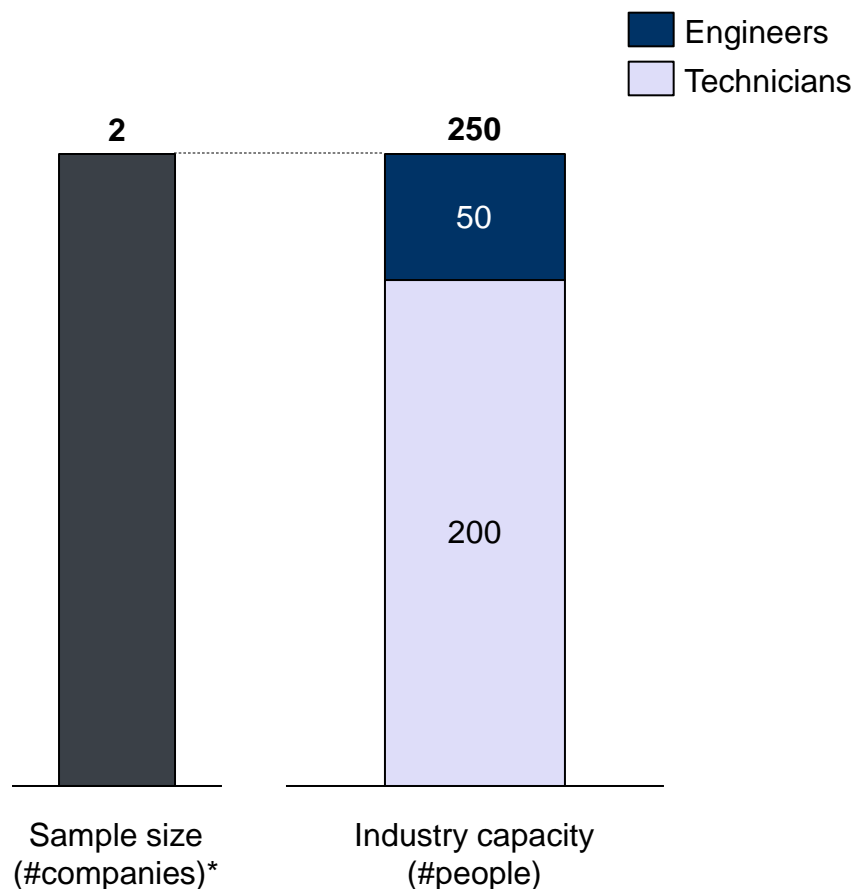
Installation of industrial machinery in industrial plant, manufacture of tanks, reservoirs and containers of metal, and manufacture of structural metal products

Mechanical/ industrial installation conducted by Civicon



Only two companies operating in the mechanical construction sector in Uganda were analysed in detail

DETAILS OF THE SURVEYED SAMPLE* – MECHANICAL CONSTRUCTION SERVICES 2012, in number of companies and people



Companies Surveyed
Adapt Technical Services Limited
Civicon**
Fundi Facilities Management(U) Ltd
Mectron Technical Services Limited
Roi Engineering Services Limited
Specialised Welding Services (ORTEC)**

Source: SBC analysis, company data

Note: *Analysis conducted for Civicon and Ortec as no enough data was available for the rest of the surveyed companies

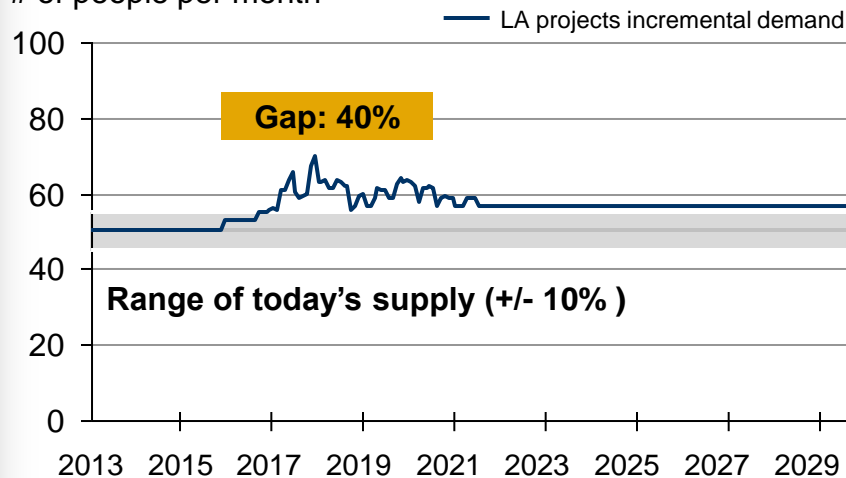
**Companies interviewed

The survey reveals a substantial gap of supply over future projects' demand for mechanical construction, especially for technicians

INDUSTRY SUPPLY & DEMAND ANALYSIS

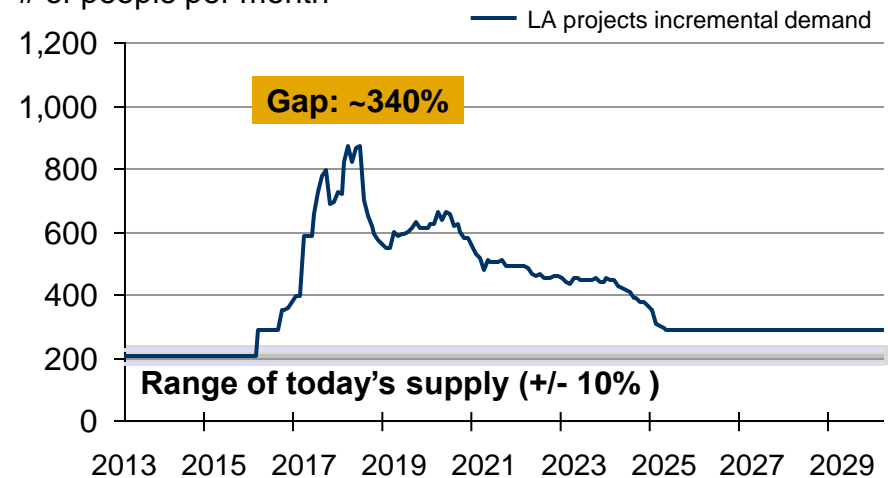
Demand & Supply* of mechanical engineers

of people per month



Demand & Supply* of mechanical technicians

of people per month



QUALITY

DEMAND

- Strict HSE certification required
- ISO compliance is required

SUPPLY

- Supply analysis conducted for Civicon and Ortec as no enough data was available for the rest of the surveyed companies

ASSUMPTIONS ON DEMAND

- Number of technician and engineers are the key measurements units of the industry demand in the future
- Other industry factors are functions of population of technicians and engineers

Source: SBC analysis, company data

Note: *Supply analysis conducted for Civicon and Ortec as no enough data was available for the rest of the surveyed companies. To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

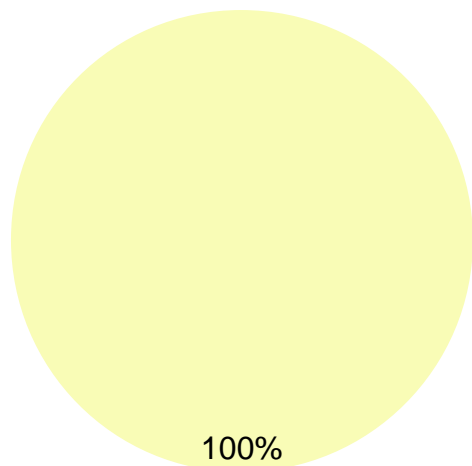


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

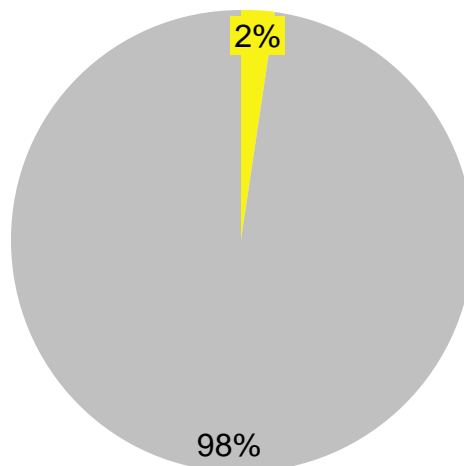
2012, based on sample* companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



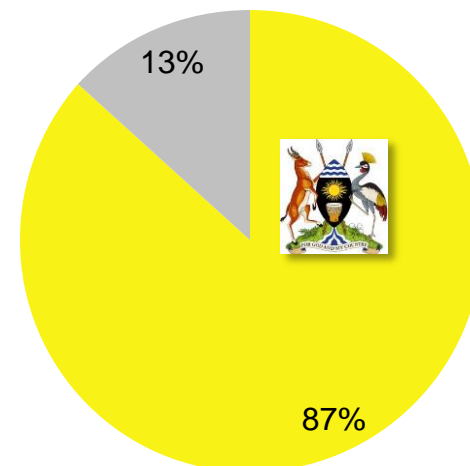
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE*



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

Source: SBC analysis, company data

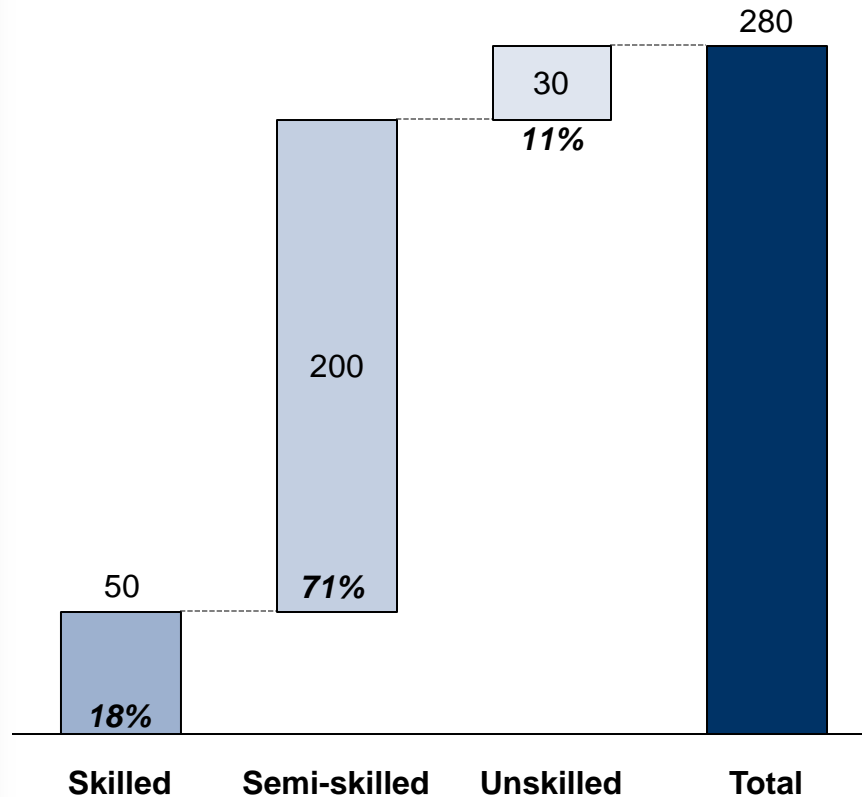
Note: *Analysis conducted for Civicon and Ortec as no enough data was available for the rest of the surveyed companies



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on sample* data



FINDINGS

- Skilled: mechanical engineers, managers, supervisors
- Semi-skilled: mechanical technicians
- Unskilled: cleaners, helpers

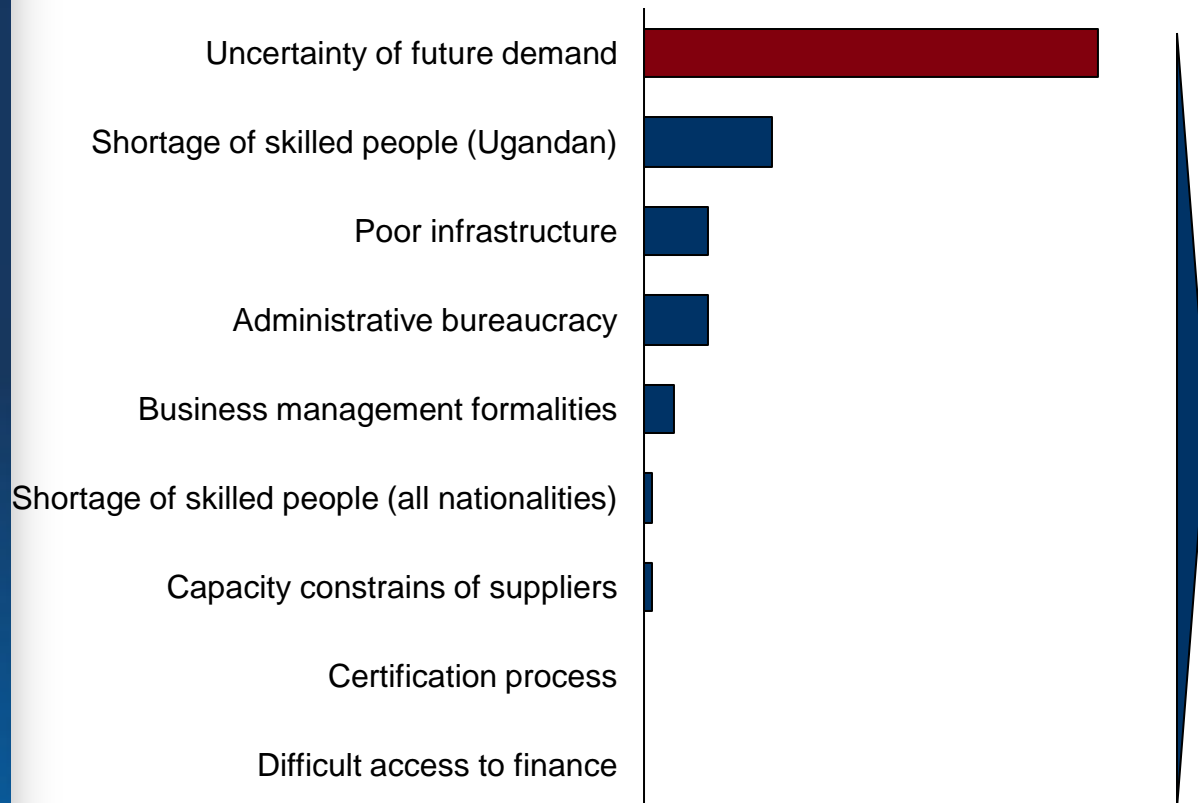
Source: SBC analysis, company data

Note: *Analysis conducted for Civicon and Ortec as no enough data was available for the rest of the surveyed companies

The main barrier for growth within the mechanical construction industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies*



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Lack of visibility on future industrial projects
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Shortage of skilled personnel
 - Lack of specialized vocational training for mechanical trades

Source: SBC analysis, company data

Note: *Analysis conducted for Civicon and Ortec as no enough data was available for the rest of the surveyed companies



9 Road construction industry

Road construction in the Buliisa area



Eight companies operating in the road construction sector were analyzed

INDUSTRY OVERVIEW

- Companies in this industry build new roads and rehabilitate existing ones
- The market is divided into 2 groups:
 - Large companies with contracts above USD 50 millions including SBI (Israeli), RCC (Israeli), ICC, Chico, China Communications systems (Chinese)
 - Smaller companies including Multiplex, Energo, Spencon, Dott Services, etc.
- Companies operating in road construction tend to own/ operate bulk material quarries
- The national budget for road construction for 2012 was around UGX 1.6 trillion
- Around 160 kms of new paved roads were constructed in 2012

Companies Surveyed
Abubaker
CADG Middle East
COLAS East Africa
Dott Services
Kasese
Multiplex**
Nicontra
Pearl Engineering**

Source: SBC analysis, Uganda National Budget 2012/2013, interview with representatives of Multiplex

Note: *Companies interviewed

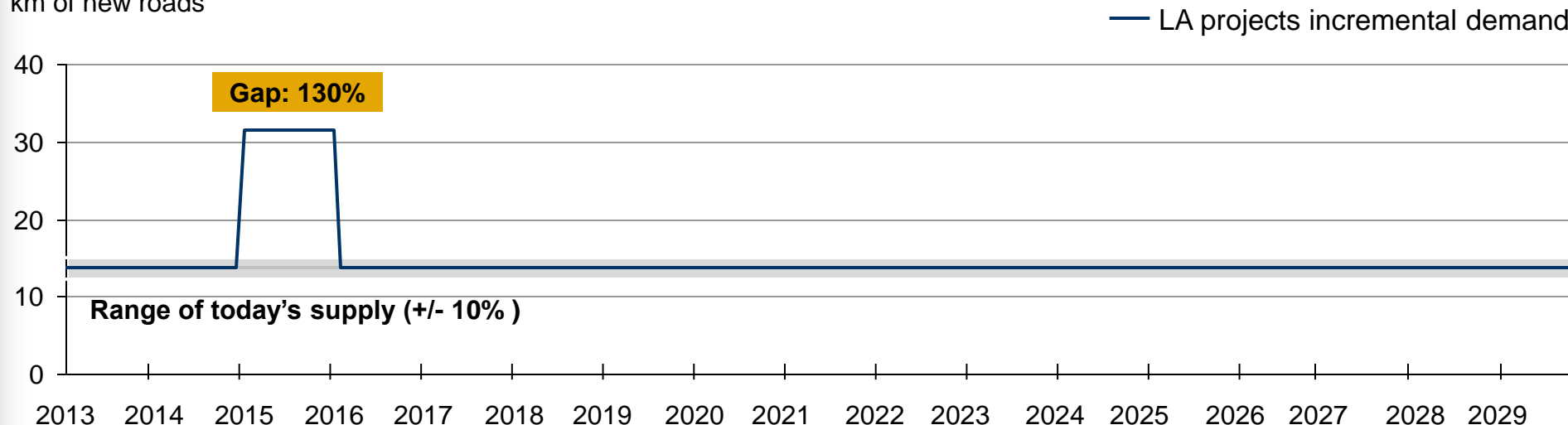


The survey reveals a substantial gap of supply over future projects' demand for road construction

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of new paved roads per month

km of new roads



QUALITY

DEMAND

- To be defined and communicated by Oil & Gas operators

SUPPLY

- Compliance with national and generally British standards, especially when international companies are involved

ASSUMPTIONS ON DEMAND

- Non-paved roads built along connection pipelines from well pads to CPF
- ~90 well pads in LA project; 5km of new non-paved roads per well pad
- Paved road from Hoima to Buliisa area (230 km) to be built between Jan 2015 and Jan 2016

Source: SBC analysis, UNRA, UBOS 2012

Note: Today's industry supply capacity for new road construction is ~160kms/year. To account for uncertainty, capacity range was computed using $\pm 10\%$ deviation

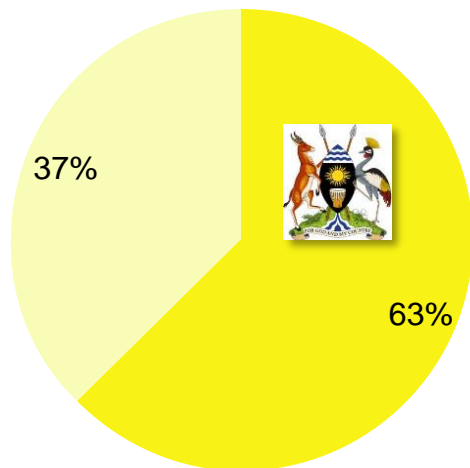




Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

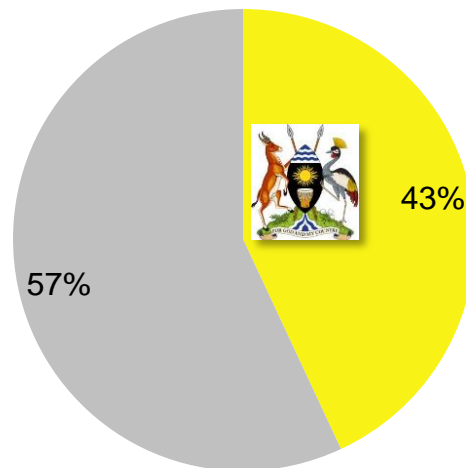
2012, based on sample companies data



COMPANIES WITH 50%>
UGANDAN OWNERSHIP



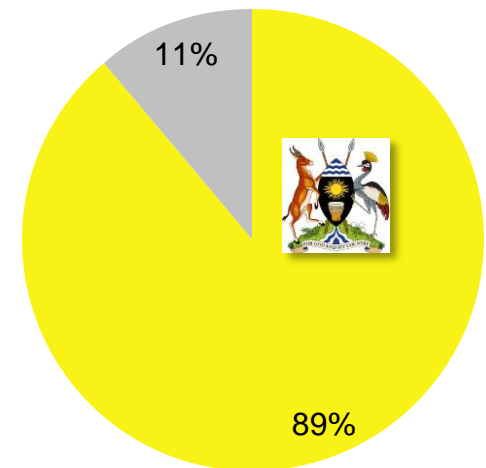
 Ugandan Ownership >50%
 Ugandan Ownership <50%



COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



 Ugandan
 Non-Ugandan

MANPOWER BY NATIONALITY



 Ugandan
 Non-Ugandan

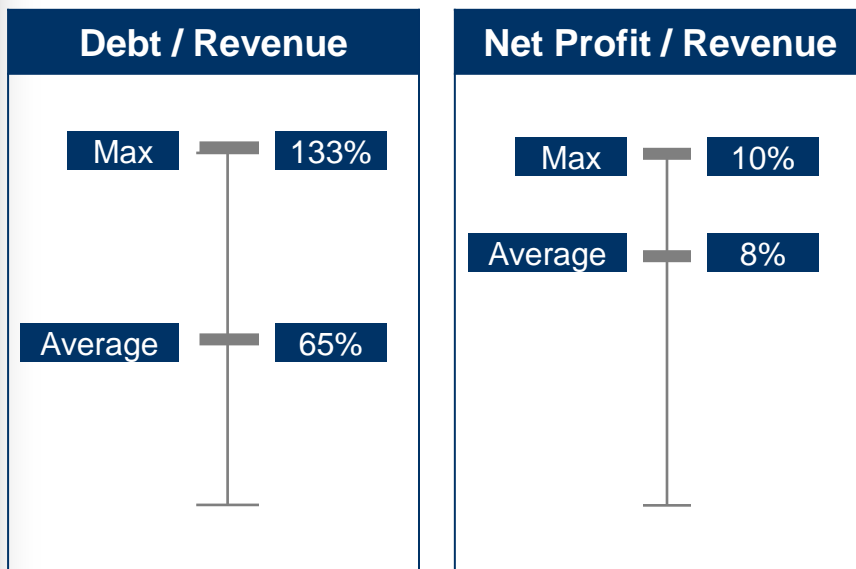
Overview of financial performances

FINANCIAL DATA

2012, based on Uganda National Budget

Total Industry Revenue
~ UGX 1,600,000 million
~ USD 620 million

2012, based on sample companies data**



FINDINGS

- Difficulties to access credit:
 - Prohibitive borrowing rates
 - Loan conditions lack flexibility
- Contracts often hide unexpected expenses:
 - Contracts often hide unexpected specification changes leading to additional expenses
- Increasing costs of production:
 - Soaring energy cost
 - Expensive bitumen imported* from Kenya, Iran, South Africa
- High capital required to buy earth moving equipment

Source: SBC analysis, company data

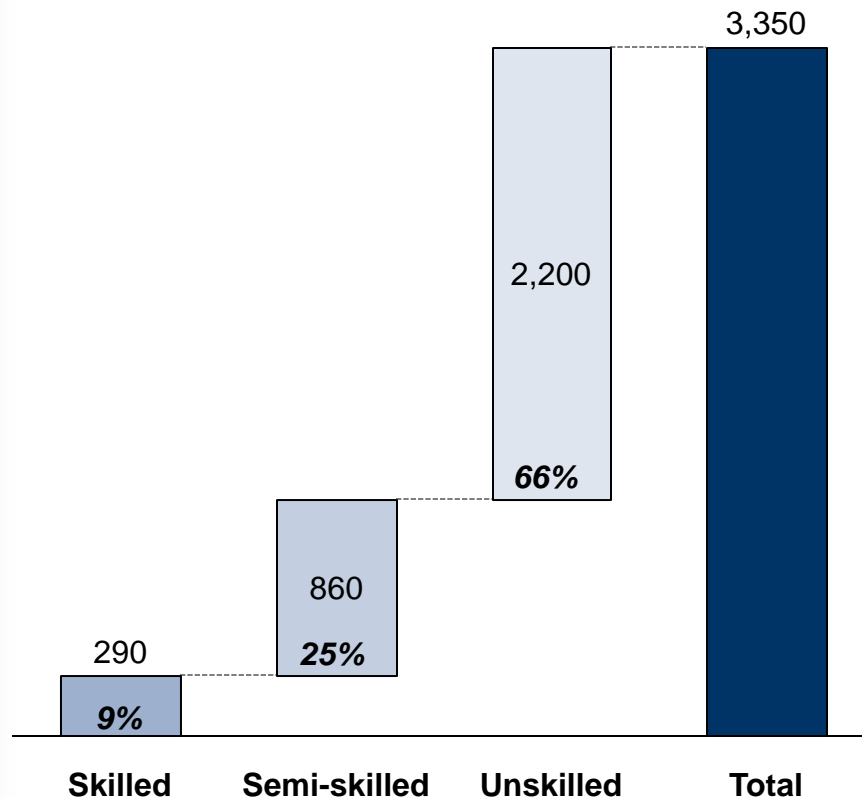
Note: *Bitumen is currently imported and it might be locally produced if the planned refinery has a production unit for bitumen. **Abubaker Technical Services was taken out of sample, because it made a significant loss last year and is not representative of the industry



Manpower overview at the sample level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on sample companies data



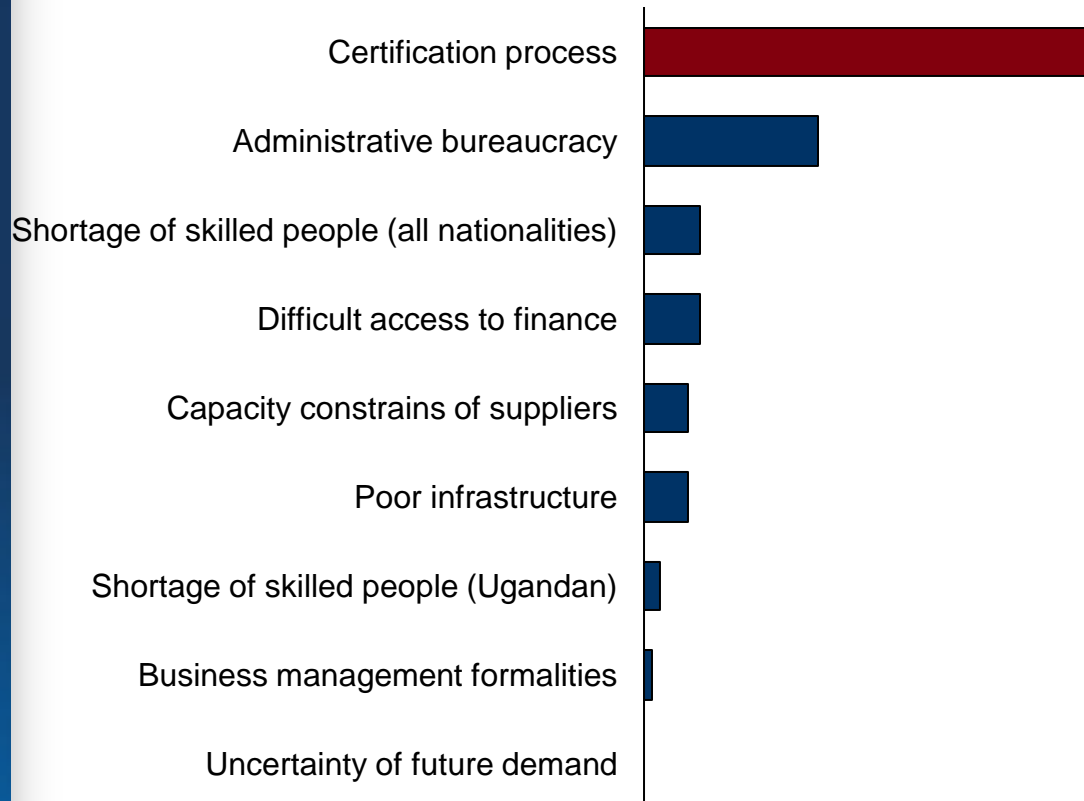
FINDINGS

- Skilled: engineers (project, civil, mechanical)
- Semi-skilled: machine operators, foremen, craftsmen
- Unskilled: casual labourers

The main barrier for growth within the road construction industry is certification process

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - The certification from the Uganda National Road Authority must be renewed every year
- **Oil & Gas specific:**
 - Difficult access to the Albertine graben (terrain structure, distance from Kampala)
 - Long haulage distances
 - Poor work safety ethic
- **Other barriers:**
 - Shortage of quality bulk materials (aggregate, gravel, murrum)
 - Lack of modern equipment
 - Long delays in implementation due to poor/inadequate designs, tedious procurement procedures, poor cash flows, and poor project management

International support for road construction in Uganda

PROJECT #1 (2009-2016)

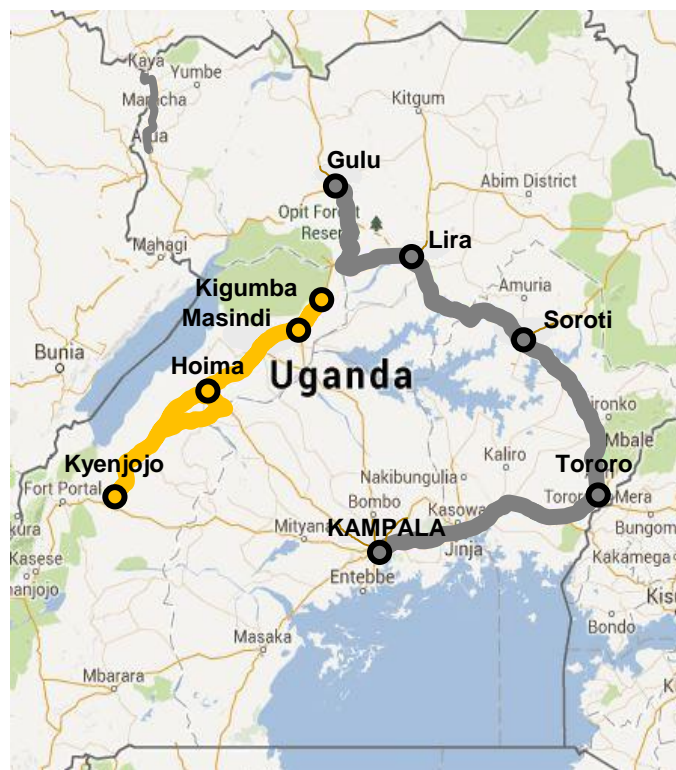


OVERVIEW

- 600 km of road
- US\$198 million
- World Bank (95%), British Dept. for Int. Development (5%)
- Project ID: P092837

OBJECTIVES

- Improve condition of national road network
- Improve capacity for road safety management
- Improve transport sector and national road management



— Project#1
— Project#2

PROJECT #2 (2013-2017*)



OVERVIEW

- 250 km of road
- US\$85 million
- African Development Bank (60%), World Bank (40%)
- Project ID: P145101

OBJECTIVES

- Boost the development of the oil sector
- Improve access for agriculture and tourism
- Link the major urban centres of the region
- Time savings for traffic to South western Uganda and DRC



10 Domestic waste management industry

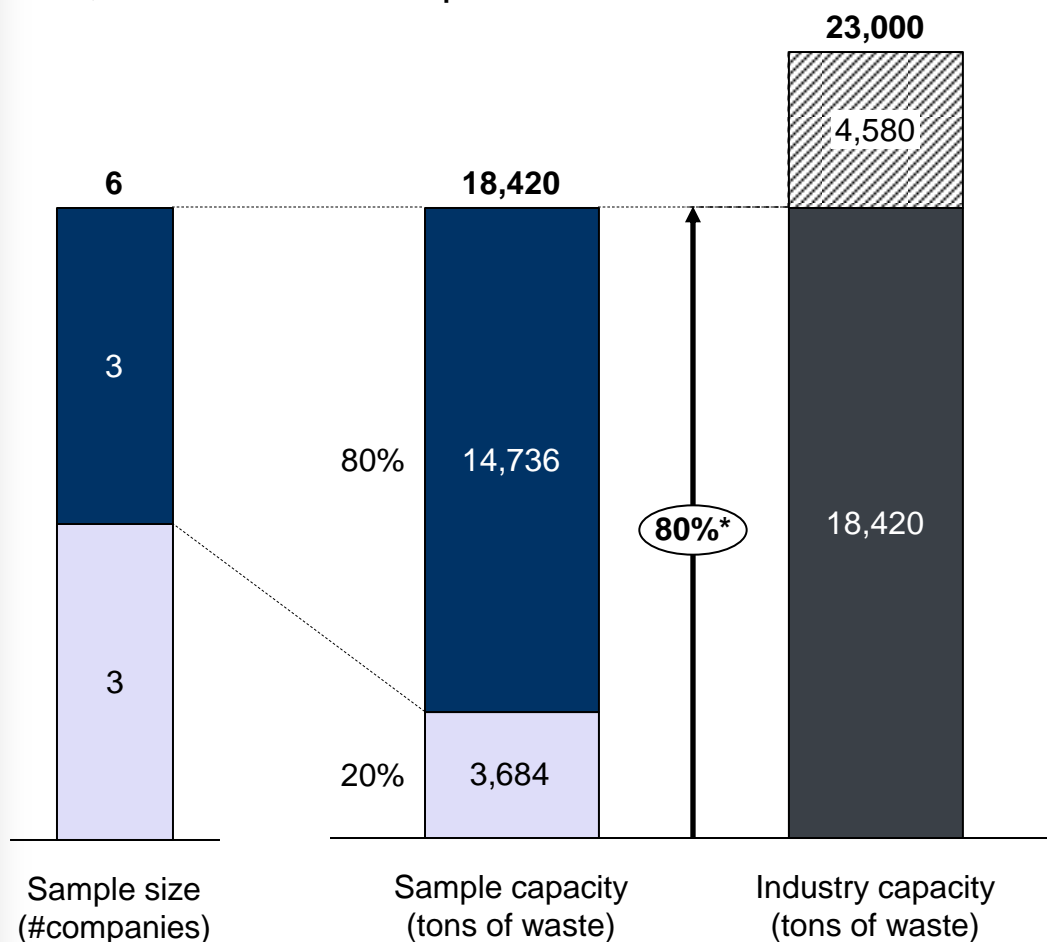
Collection, treatment and disposal of waste water (dark, grey, and water based mud cutting) and non-toxic solid waste (life on the camp)



Six companies representing 80% of the domestic waste management sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – DOMESTIC WASTE (SOLID)

2012, in number of companies and tons of waste



Companies Surveyed
BIN IT Services**
Green Hope**
Jua Kaali
Kibanyi & Sons
Philling Environmental
Plawaste recycling

Source: SBC analysis, National Environment Management Authority, company data

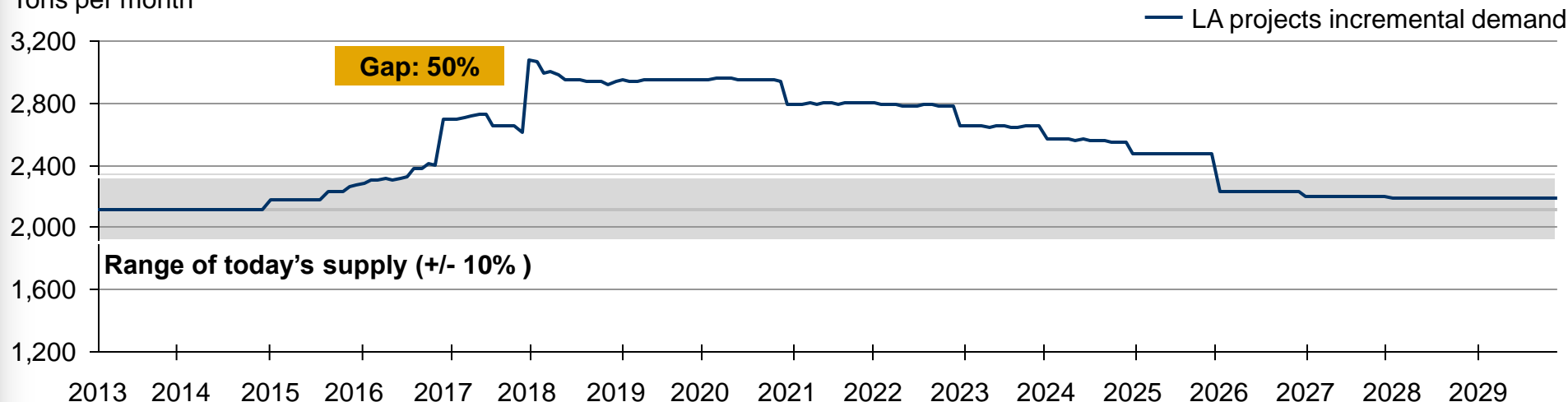
Note: *80% market share was estimated based on tons of solid waste handled by the interviewed certified (NEMA) companies with known market share. Waste handled by municipalities is not included in the analysis. **Companies interviewed

The survey reveals a sizeable gap of supply over future projects' demand for domestic waste management

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of solid domestic waste disposal

Tons per month



QUALITY

DEMAND

- no specifications

SUPPLY

- NEMA license required
- Garbage trucks must comply with NEMA's specifications
- Authorized dumping sites are listed by NEMA

ASSUMPTIONS ON DEMAND

- Solid waste generation 1.15kg per person per day
- Dark Water generation 20 litres per day per person
- Grey water generation 49.8 litres per day per person
- Water based mud cuttings per well - 30% of all cuttings
- 280 tons of cuttings per well

Source: SBC analysis, National Environment Management Authority

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

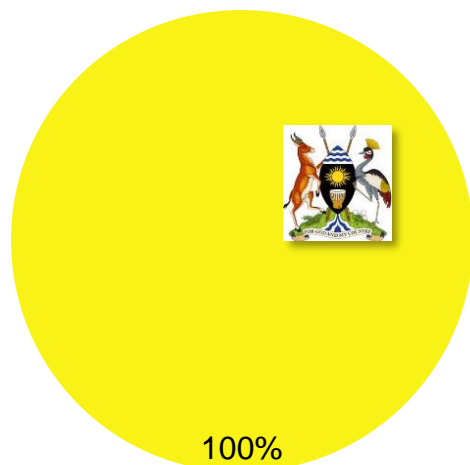


Domestic waste management industry is clearly local

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

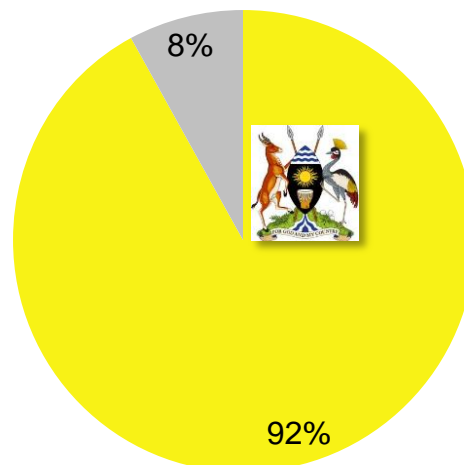
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



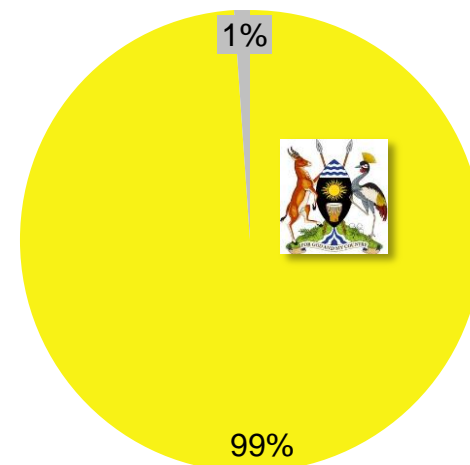
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

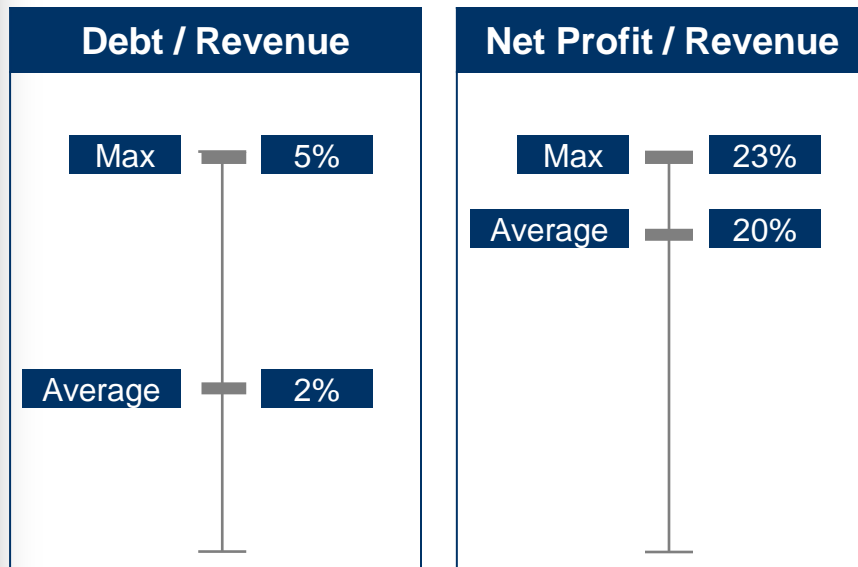


■ Ugandan
■ Non-Ugandan

The survey reveals that domestic waste management companies have very strong difficulties to recover accounts payable

FINANCIAL DATA

2012, based on sample companies data



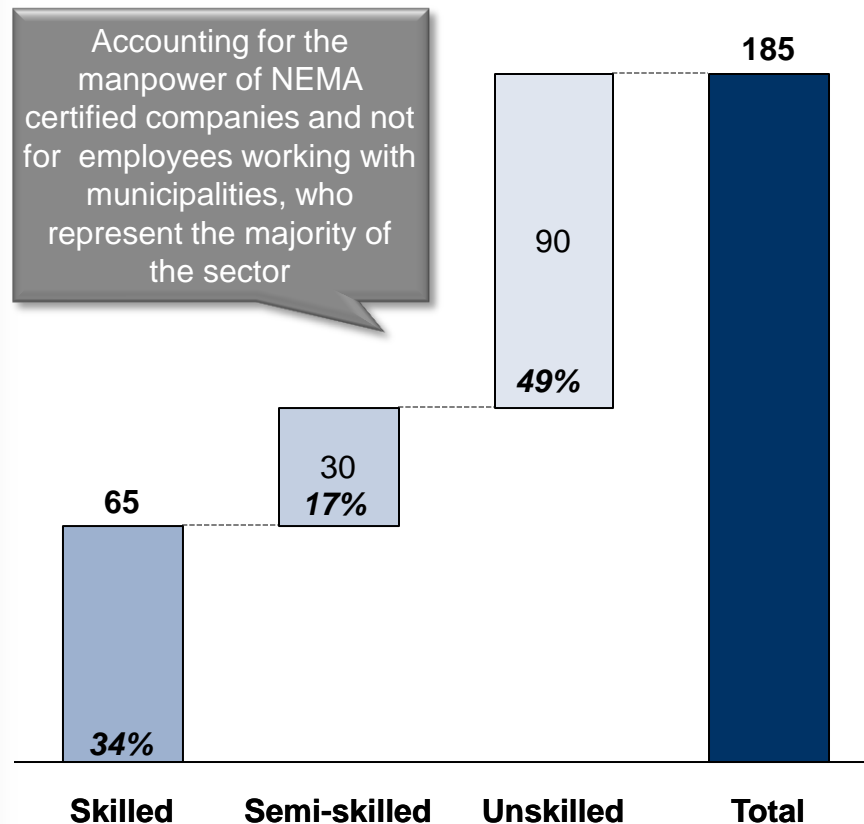
FINDINGS

- Difficult access to credit
- High cost of transport of waste
- Delays in payments (up to 1 year)
- Companies developed special “collector” positions to recover accounts payable from the clients
- High investment needed to buy new trucks, pumps and tanks if operating in liquid generic waste management

Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: managers (HSE, operations), transport officer, technical supervisor
- Semi-skilled: truck driver, assistants
- Unskilled: field loaders, pickers
- Lack of proper training for Oil & Gas related waste management
- Higher skills required if operating in liquid domestic waste management

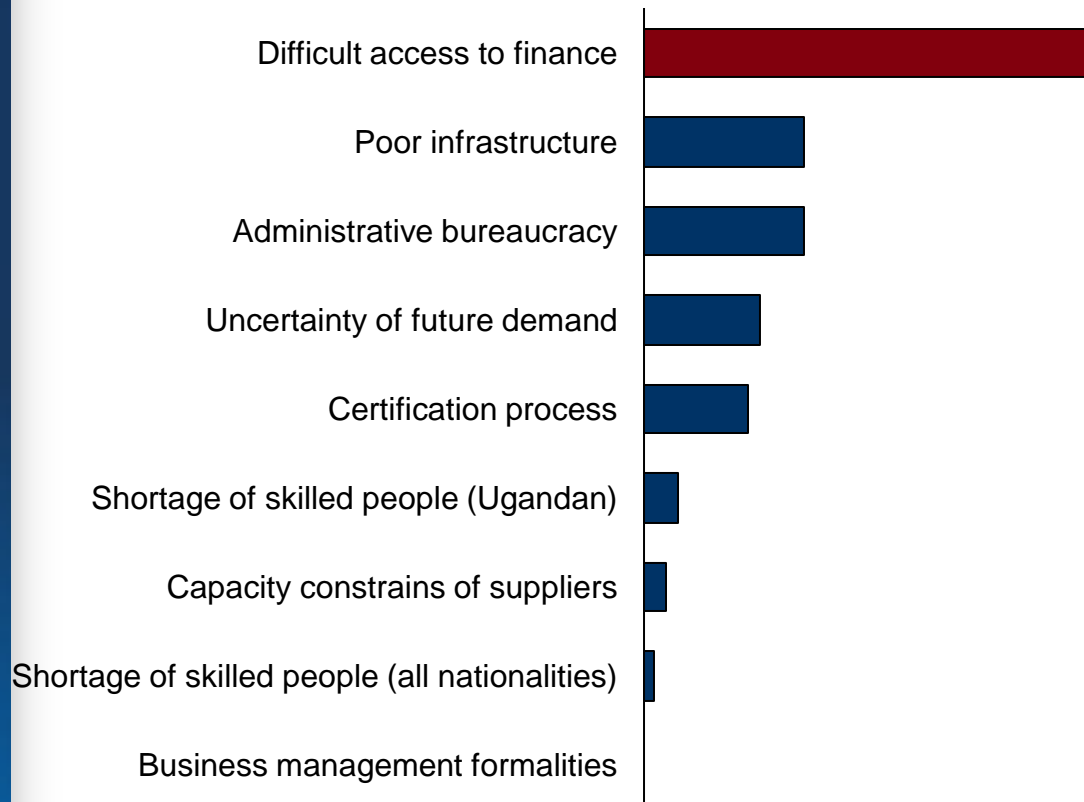
Source: SBC analysis, company data

Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (80%)

The main barrier for growth within the domestic waste management industry is access to credit

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Prohibitive borrowing rates penalize companies in this industry
- **Oil & Gas specific:**
 - More information on demand and standards required
 - Lack of proper training for Oil & Gas project related waste management
- **Other barriers:**
 - Long certification process
 - Lack of suitable infrastructure to transport the waste
 - Lack of suitable facilities to treat the collected waste
 - Bureaucracy and procedures make it difficult to work for the public sector

11 Hazardous waste management industry

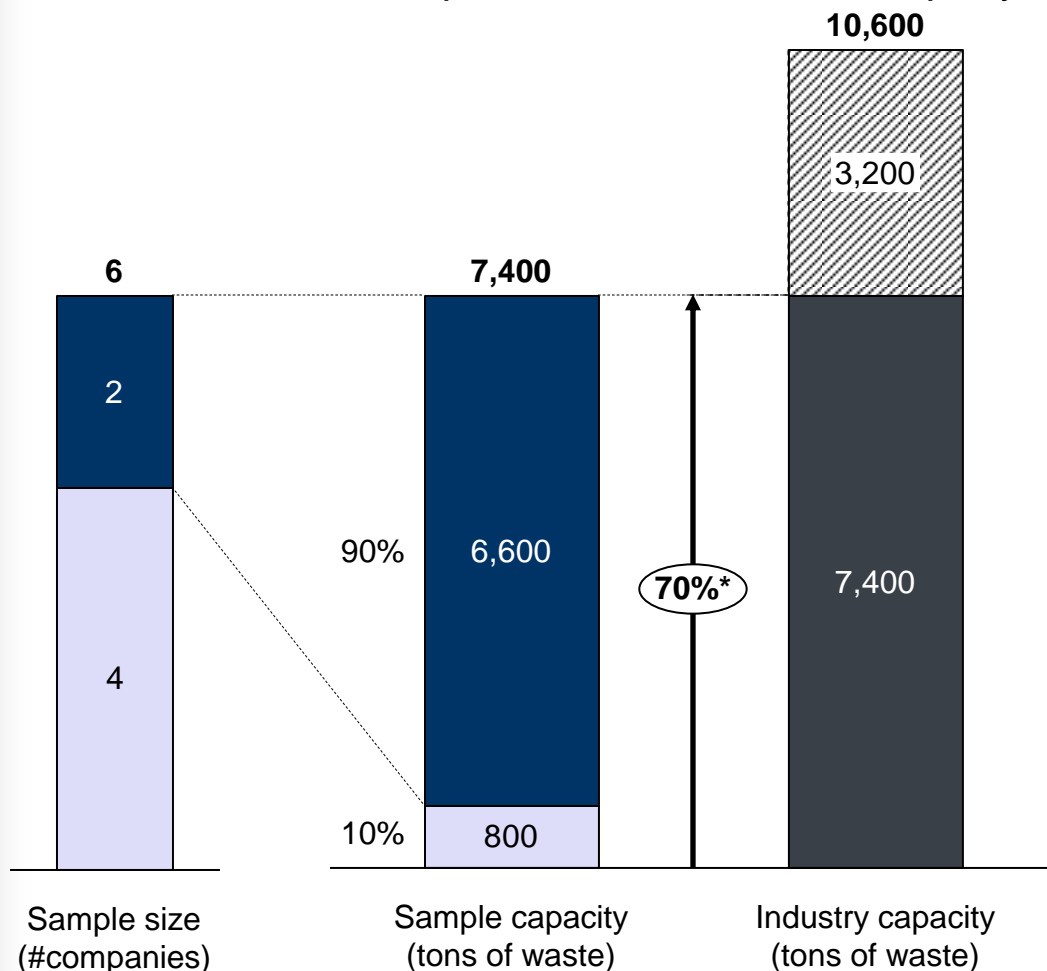
Collection, transportation and storage of hazardous waste (bio-hazardous waste, used oils and batteries, etc.), and collection of oil based mud cuttings from drilling activities



Six companies representing 70% of the hazardous waste management sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – HAZARDOUS WASTE

2012, in number of companies and tons of waste per year



Companies Surveyed
Bio Waste Management
Epsilon**
Green Label
NLS Waste Services
Specialized Tech. Services**
Strategic Logistics**

Source: SBC analysis, company data

Note: *70% market share was estimated based on tons of waste handled of the interviewed companies with known market share. **Companies interviewed

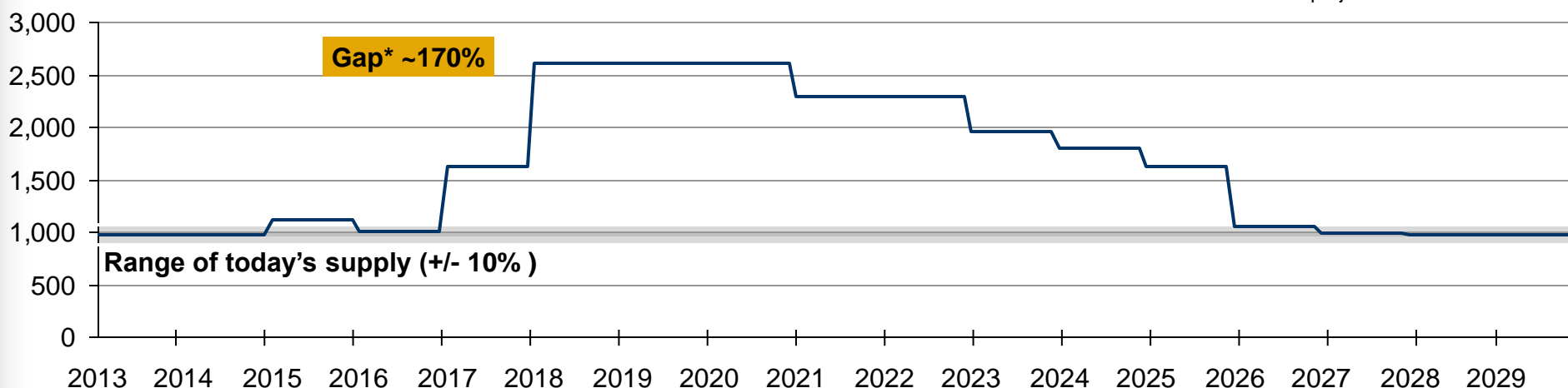


There is a huge gap between local capacities to transport and dispose hazardous wastes and demand

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of hazardous waste disposal

Tons per month



QUALITY

DEMAND

- Compliance with Total's HQ standards and certifications on hazardous waste transportation and disposal

SUPPLY

- NEMA's license and environmental certificate required to dispose hazardous waste
- Authorized dumping sites listed by NEMA

ASSUMPTIONS ON DEMAND

- Oil based mud cuttings constitute the vast majority of total hazardous waste
- Oil based mud cuttings per well - 70% of all cuttings
- 280 tons of cuttings per well

Source: SBC analysis

Note: *The supply-demand gap is taking into consideration only transportation of hazardous waste. If there is no waste treatment today, then the gap is simply the future demand. To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

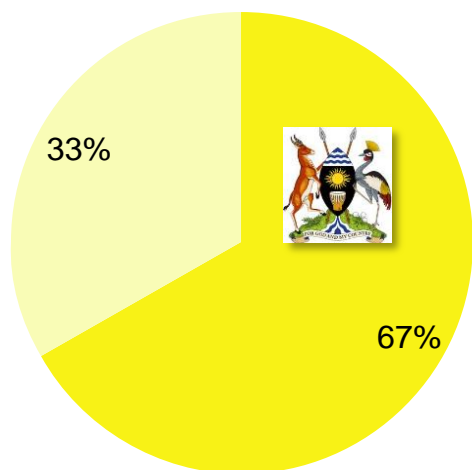


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

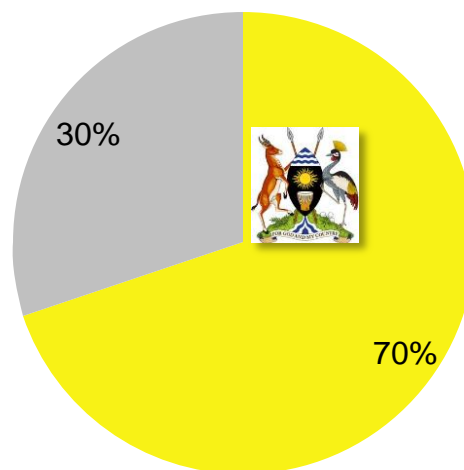
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



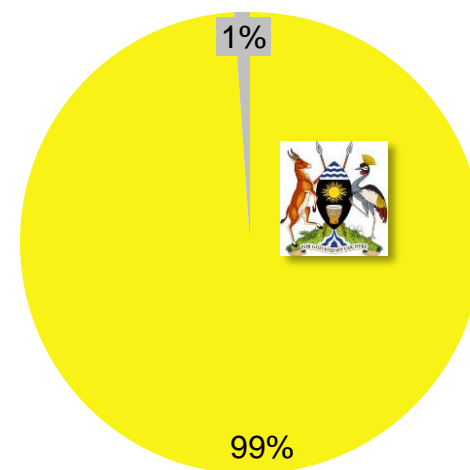
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

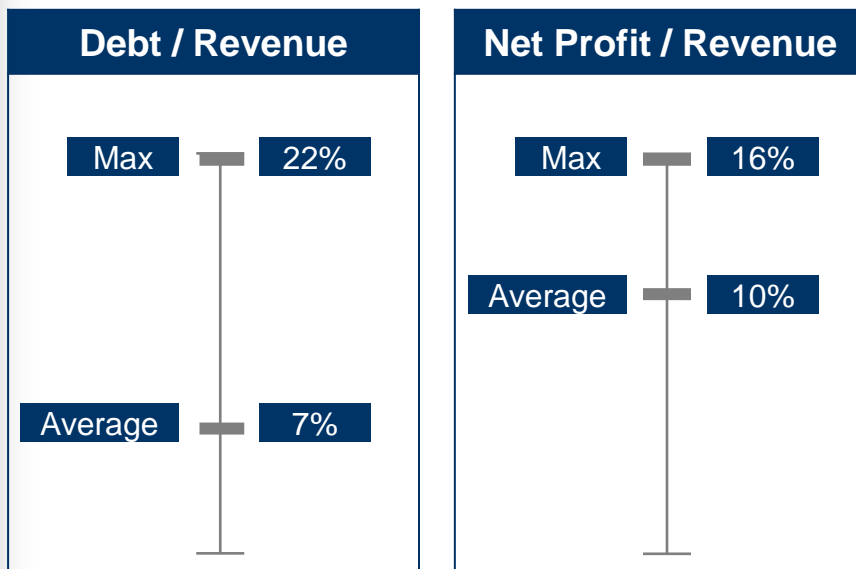
The survey reveals that hazardous waste management companies have very strong difficulties to recover accounts payable

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 35,000 million
~ USD 15 million

2012, based on sample companies data



FINDINGS

- Difficult access to credit
- High cost of transport of waste
- Delays in payments (up to 1 year)
- Companies developed special “collector” positions to recover accounts payable from the clients

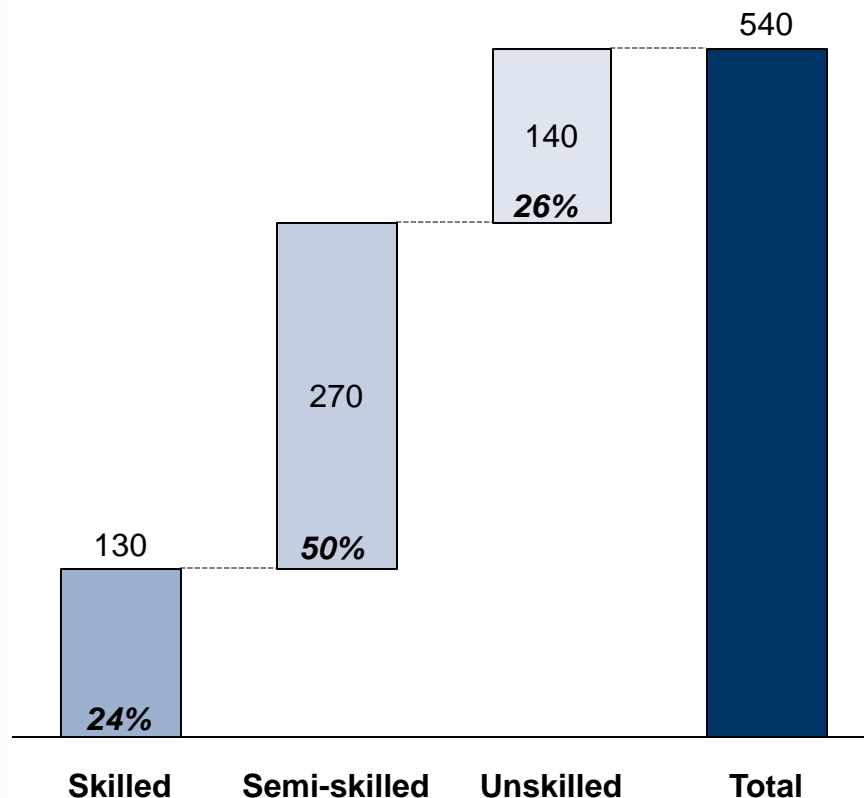
Source: SBC analysis, company data

Note: *The sample revenue was extrapolated to the industry revenue via defined market share of the sample (70%)

Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: managers (HSE, operations), transport officer, technical supervisor
- Semi-skilled: truck driver, assistants
- Unskilled: permanent loaders, casual loaders, pickers
- Lack of proper training for Oil & Gas related waste management

Source: SBC analysis, company data

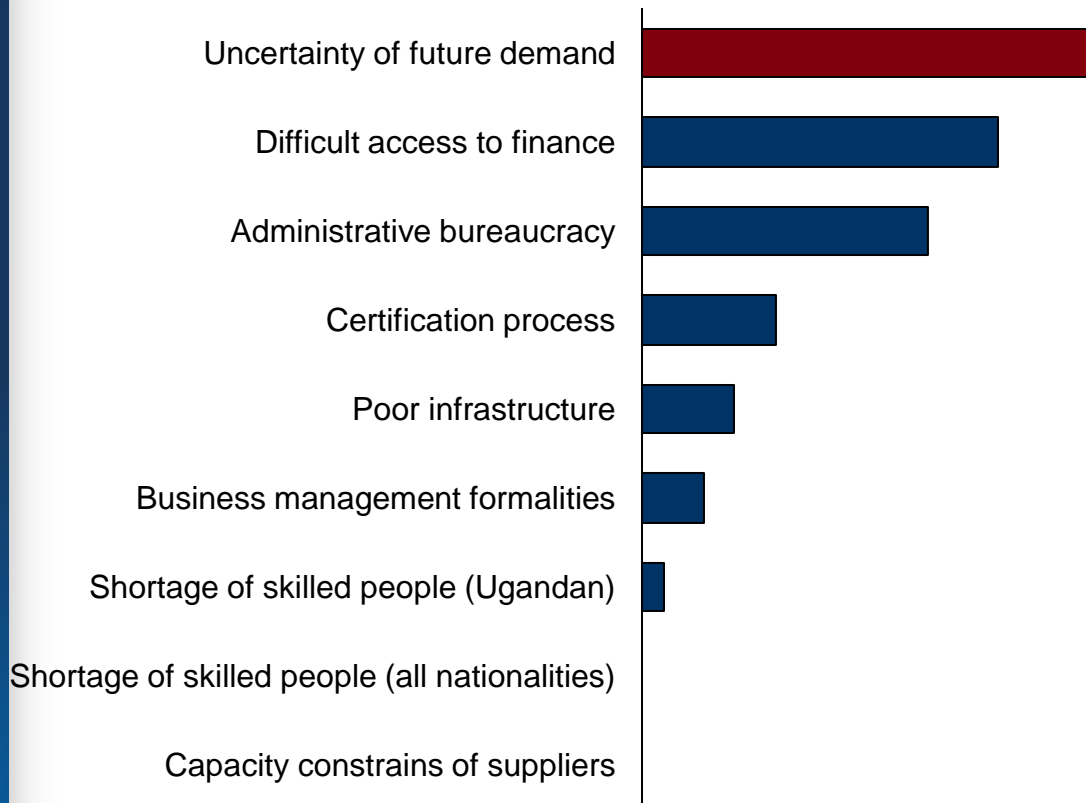
Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (70%)



The main barrier for growth within the hazardous waste management industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Uncertainty of future contracts, payment capacity of the clients, and changes in regulations
- **Oil & Gas specific:**
 - Lack of proper training for Oil & Gas project related waste management
- **Other barriers:**
 - Long certification process
 - Lack of proper enforcement of handling by NEMA
 - Lack of suitable infrastructures to transport the waste
 - Lack of suitable facilities to treat the collected waste

12 General maintenance industry

Repair and general maintenance of equipment, electrical installation, civil facilities, etc.

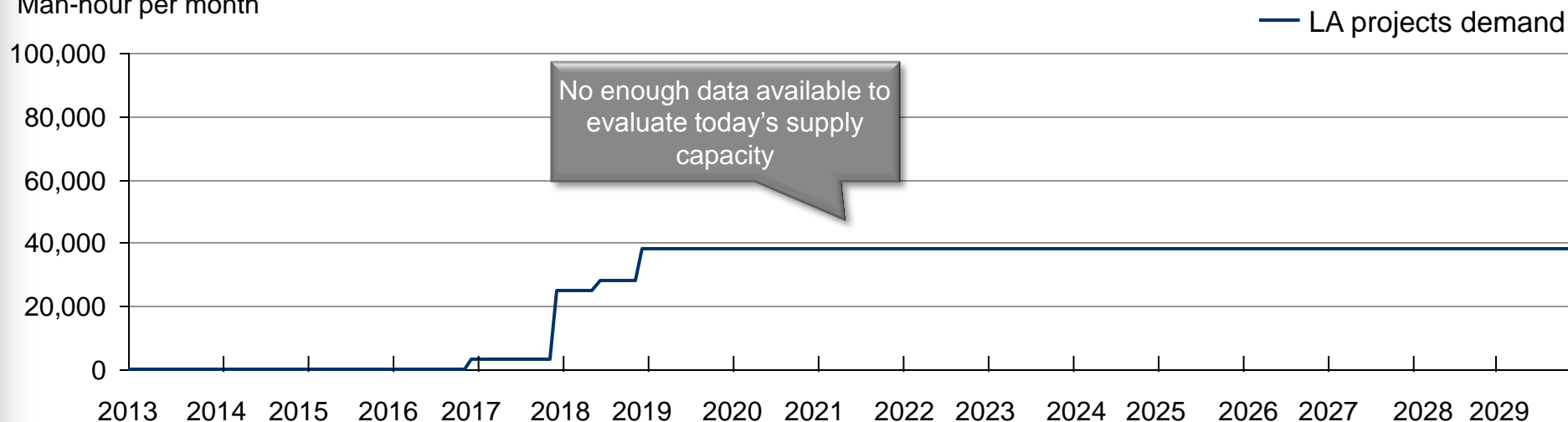


Future LA projects demand of general maintenance services

INDUSTRY DEMAND ANALYSIS

Demand of maintenance services*

Man-hour per month



QUALITY

DEMAND

- GMS is expected to be outsourced to local companies
- Standard HSE, certifications for O&G

SUPPLY

- Absence of international specifications for electrical installation and maintenance
- No enough data available to evaluate today's supply capacity

ASSUMPTIONS ON DEMAND

- No pure general maintenance service company identified in Uganda based on Survey results
- Maintenance services are provided by civil construction companies
- 20% of Operation & Maintenance («O&M») domain personnel – reminder is «Production Operation Services»

Source: SBC analysis

Note: *General maintenance service is mainly provided as a secondary service by construction companies and no enough data was available to evaluate today's supply capacity



13 Production operations services industry

Wells and well pad maintenance, flow-line and pipeline maintained, CPF, Support Base Services, etc.



There is no current supply capacity for production operations services in Uganda

INDUSTRY OVERVIEW

- Companies in this industry supply services of inspection, control and maintenance of oil production facilities including wells, well pads, flow-lines, trunk-lines, CPF, export pipe, etc.
- Currently, no company provides these services in Uganda
- Some international companies available in Uganda can leverage their global expertise and source foreign professionals to do the job

Well and Well pad



Flow-lines and CPF



Export Pipe

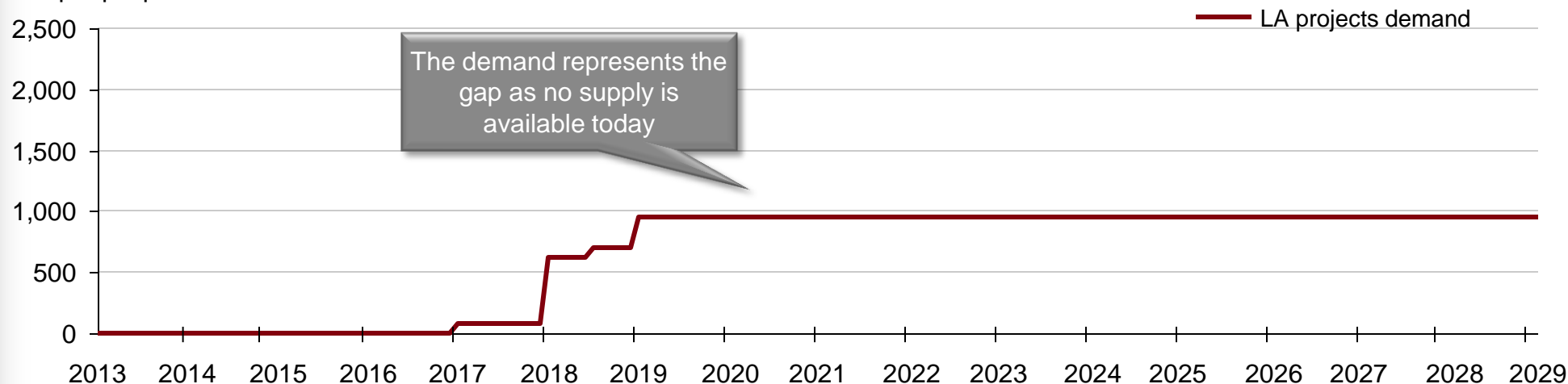


Future LA projects demand of production operations and maintenance services

INDUSTRY DEMAND ANALYSIS

Demand of Production Operation Services

of people per month



QUALITY

DEMAND

- Strict HSE certification required
- ISO compliance is required

SUPPLY

- No supply as of today in Uganda

ASSUMPTIONS ON DEMAND

- 80% of Operation & Maintenance («O&M») domain personnel – remainder is General Maintenance Services

14 Security services industry

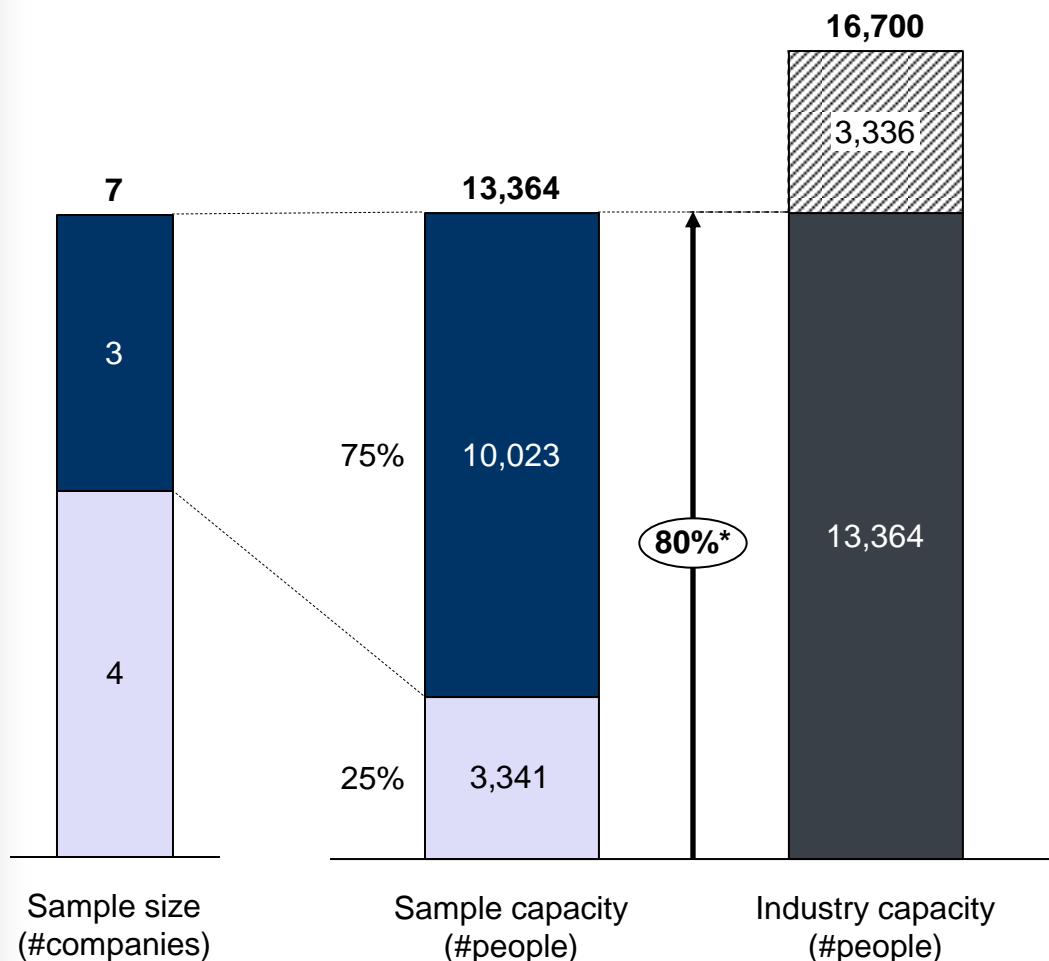
On site security, security of export pipeline and facilities, and private security (armored cars, security guards)



Seven companies representing 80% of the security services sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – SECURITY SERVICES

2012, in number of companies and people



Companies Surveyed
G4S secure solutions**
KK Security
Pinnacle Security
Protectorate SPC
Saracen
Spartasec
Yamasec

Source: SBC analysis, company data

Note: *80% market share was estimated based on manpower of the interviewed companies with known market share.

**Companies interviewed

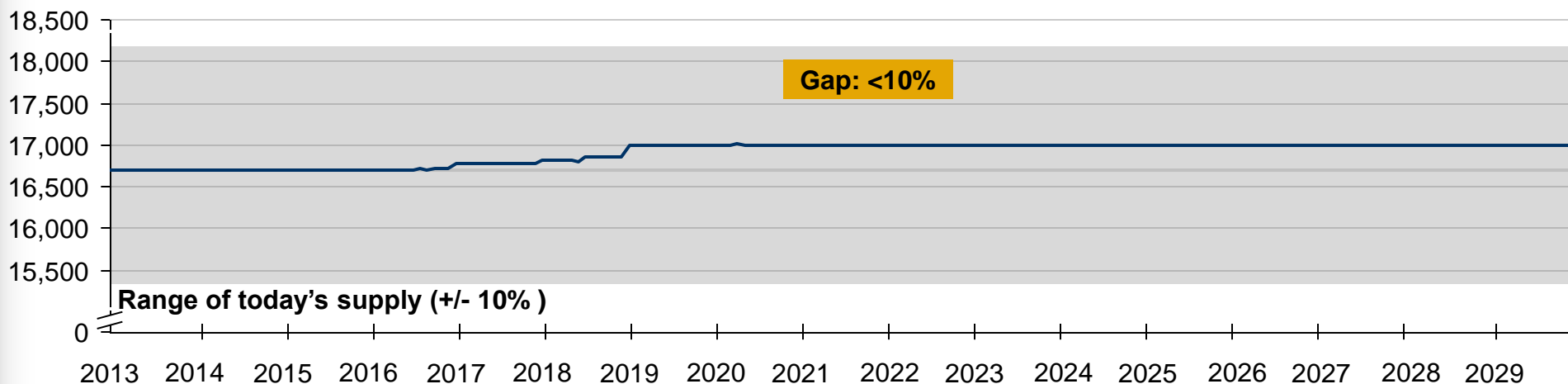
Supply and demand analysis shows that there should not be a gap between current capacities and future demand of security services

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of security personal

#people per month

— LA projects incremental demand



QUALITY

DEMAND

- No specifications

SUPPLY

- All companies have the private security operators license, issued by the Ugandan police
- Some companies have firearms license

ASSUMPTIONS ON DEMAND

- Security guards definition excludes managerial positions in security services

Source: SBC analysis

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

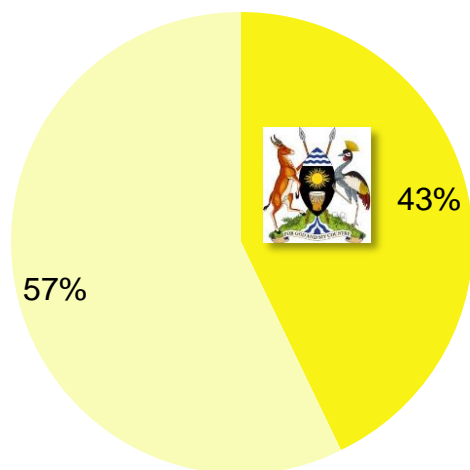


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

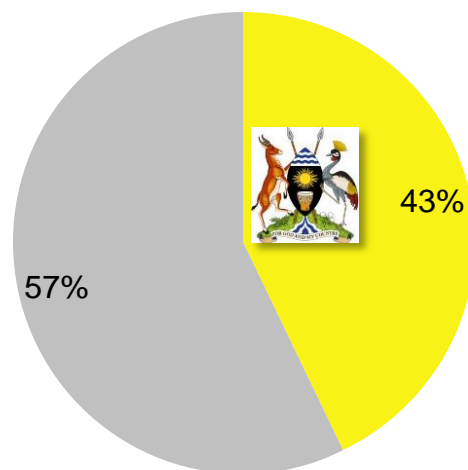
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



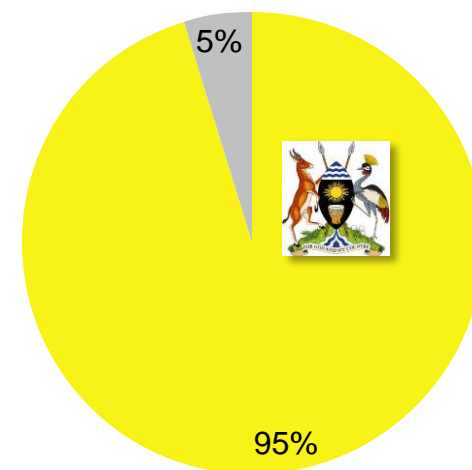
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

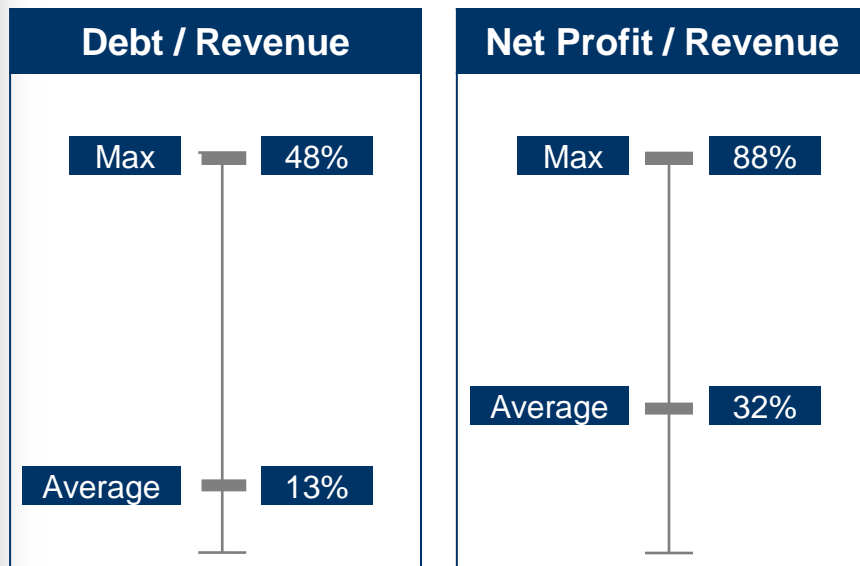


■ Ugandan
■ Non-Ugandan

The survey reveals that security services companies have less financial constraint

FINANCIAL DATA

2012, based on sample companies data



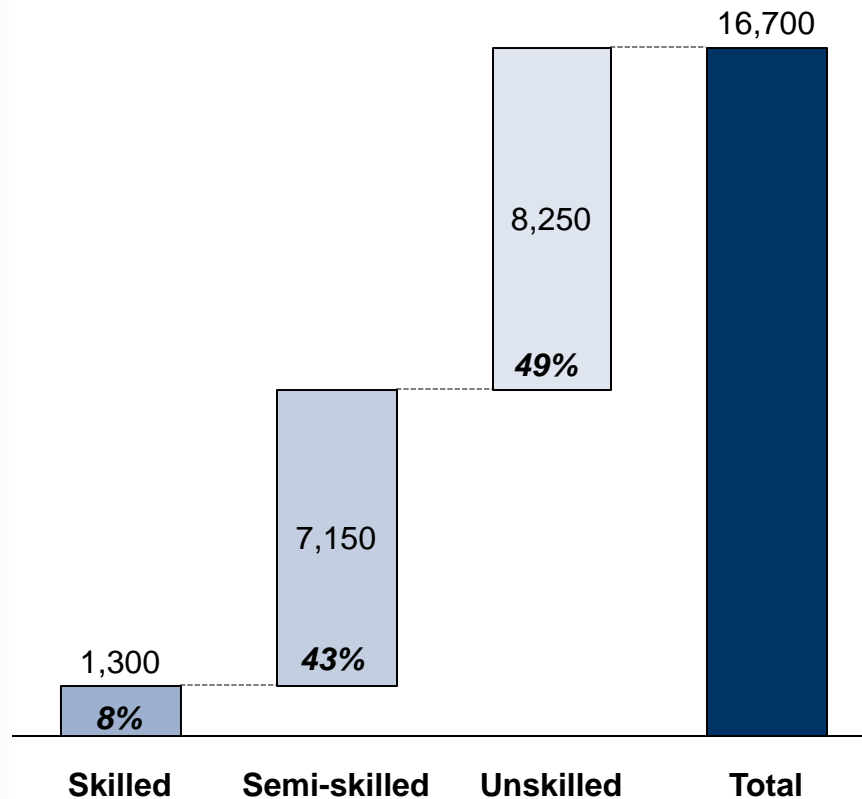
FINDINGS

- Security services is considered a low-risk and growing sector
- Clients pay with short delays (< 30 days)
- Steady cash flows

Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: supervisors, managers
- Semi-skilled: security guards, field commanders
- Unskilled: security guards**
- Shortage of trained people

Source: SBC analysis, company data

Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (80%)

** Some companies consider security guards as unskilled employees



The main barrier for growth within the security services industry is administrative bureaucracy

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - License from the Ugandan police must be renewed every year
- **Oil & Gas specific:**
 - Lack of proper training for Oil & Gas related standards
 - Uncertainty of required personal for Oil & Gas projects/ sites
- **Other barriers:**
 - Corruption
 - Shortage of trained people

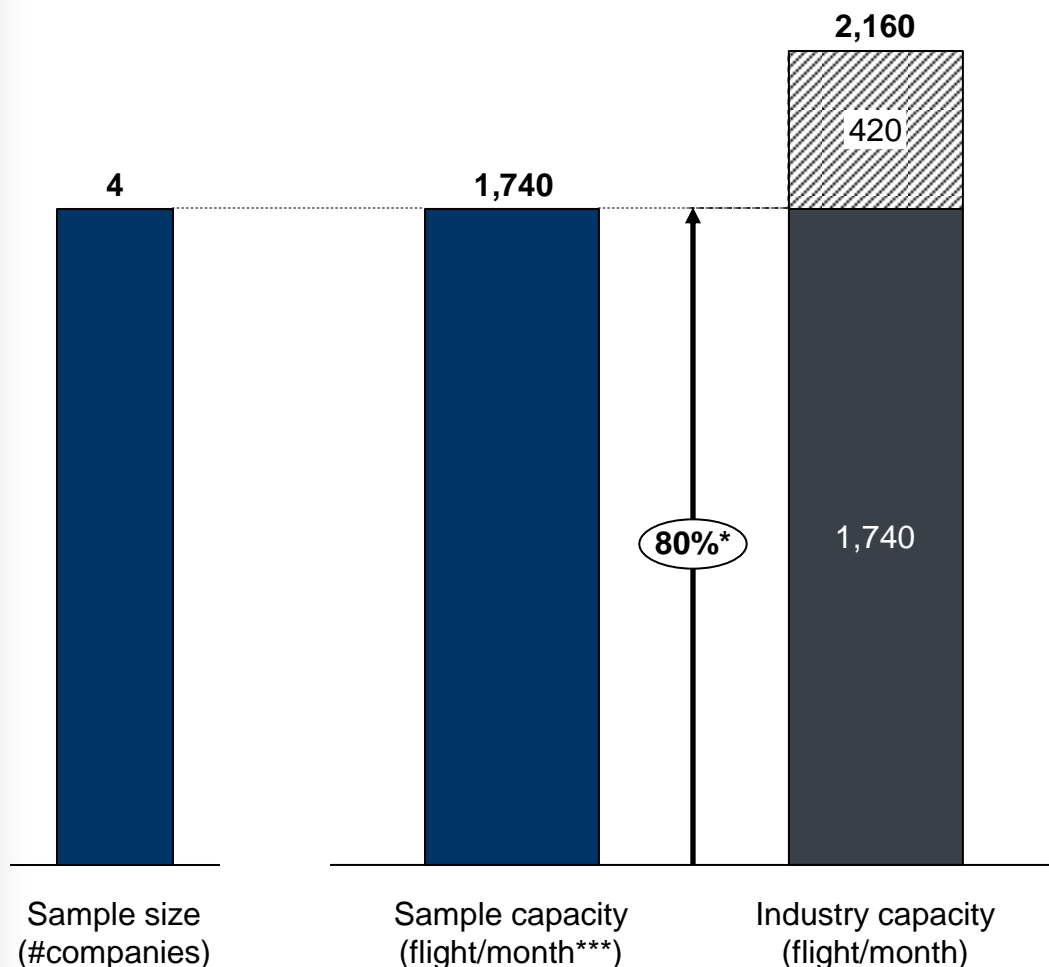
Air transportation of personnel



4 companies representing 80% of the domestic airline sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – DOMESTIC AIRLINE

2012, in number of companies and flights/month



Companies Surveyed	
Air Serv	
Eagle Air**	
Kampala Aeroclub	
Kampala Executive Aviation	

Source: SBC analysis, company data

Note: *80% market share was estimated based on number of airplanes/ flights of the interviewed companies with known market share. **Companies interviewed. *** On average one airplane will make 1 roundtrip per day

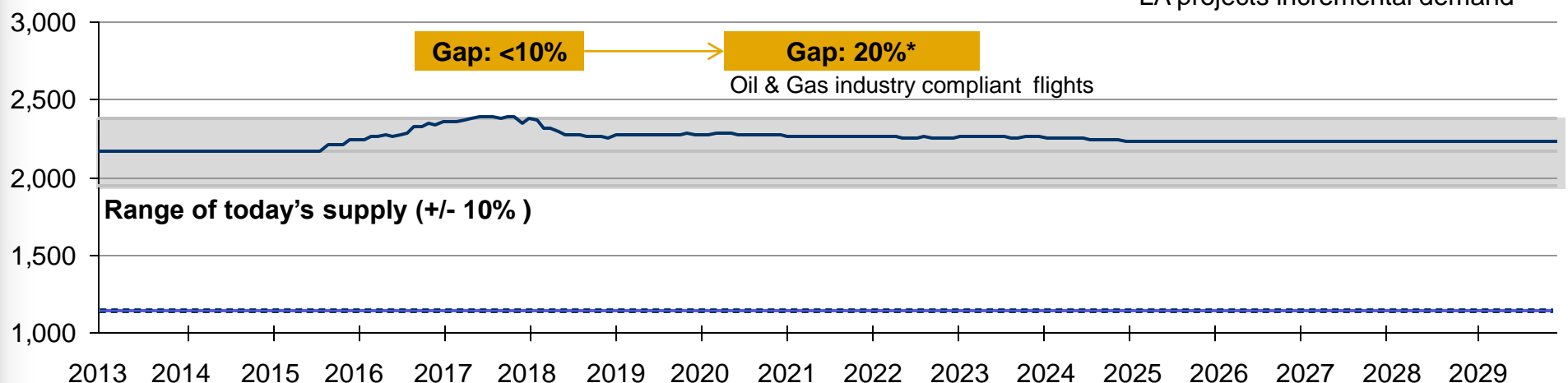


Supply & Demand analysis reveals that almost half of the domestic airline industry is not compliant with Oil & Gas standards

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of domestic flights

of flights per month



QUALITY

DEMAND

- International Civil Aviation Organization (ICAO) rules + IATA rules for dangerous goods transportation

SUPPLY

- All companies have the authorizations required by the Ministry of Transport
- Only Eagle Air and Kampala Aeroclub are compliant with Oil companies' standards

ASSUMPTIONS ON DEMAND

- 50% of personnel are on flight rotations
- 1 roundtrip per day
- 20 people per aircraft
- Itinerary: Kampala – Buliisa area

Source: SBC analysis

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

*Today's capacity of oil and gas compliant flights (Eagle Air & Kampala Aeroclub) is ~1100 flights/ month and demand at peak is 225 flights/ month, hence gap is 20%

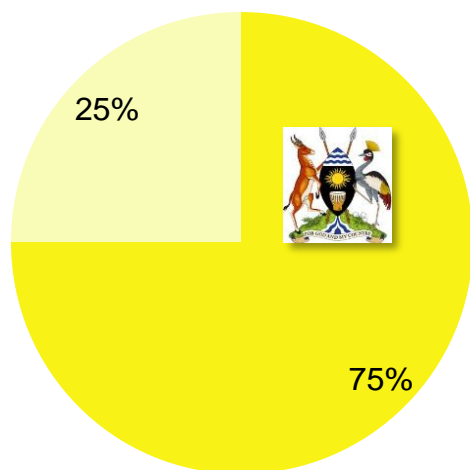


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

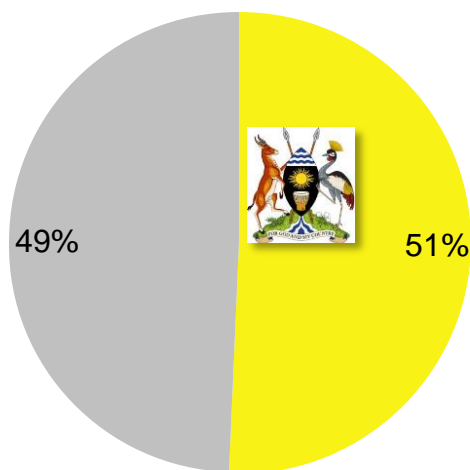
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



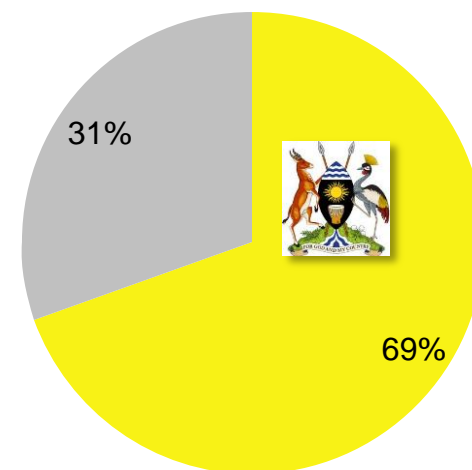
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

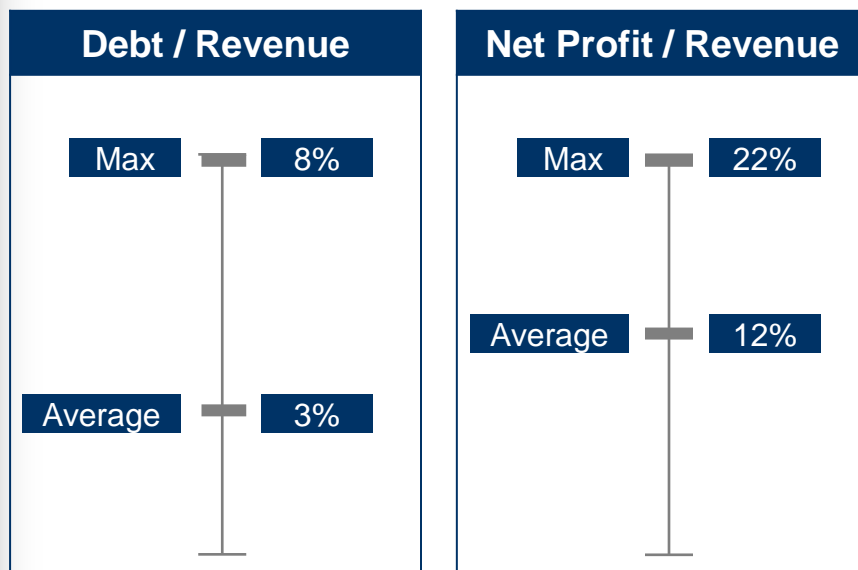
The survey reveals that domestic airline companies have no financial constraint

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 95,000 million
~ USD 35 million

2012, based on sample companies data



FINDINGS

- Domestic airline companies have large equity and low debt
- Access to credit is easy once contracted by an internationally company
- Steady cash flows

Source: SBC analysis, company data

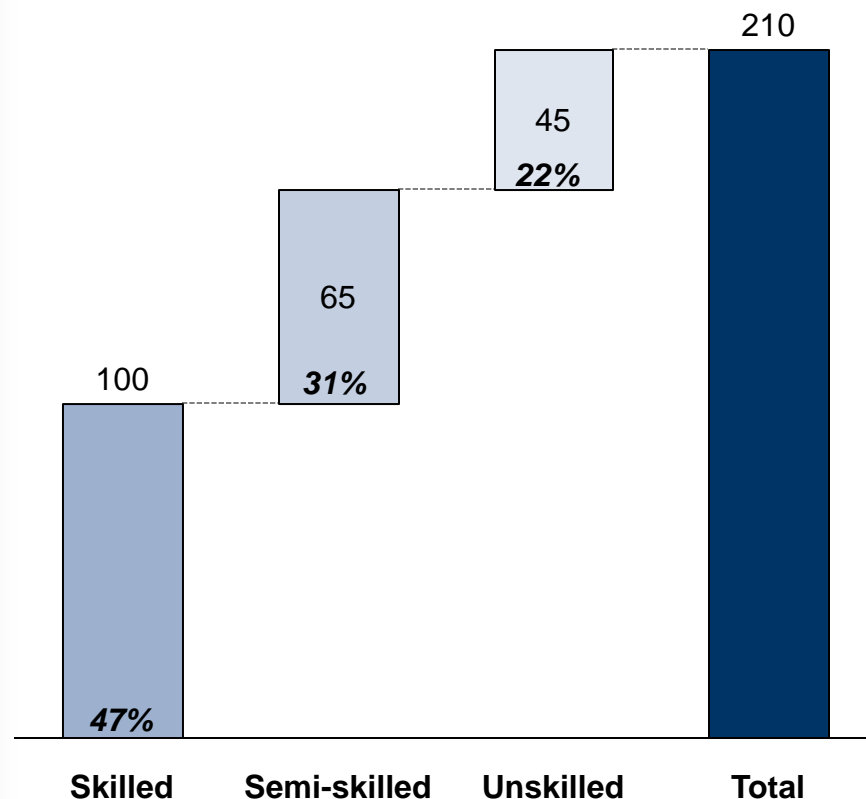
Note: *The sample revenue was extrapolated to the industry revenue via defined market share of the sample (80%)



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: Pilots, engineers, flight operations dispatchers
- Semi-skilled: technical assistants, administrative positions (secretary, record keepers)
- Unskilled: cleaners

Source: SBC analysis, company data

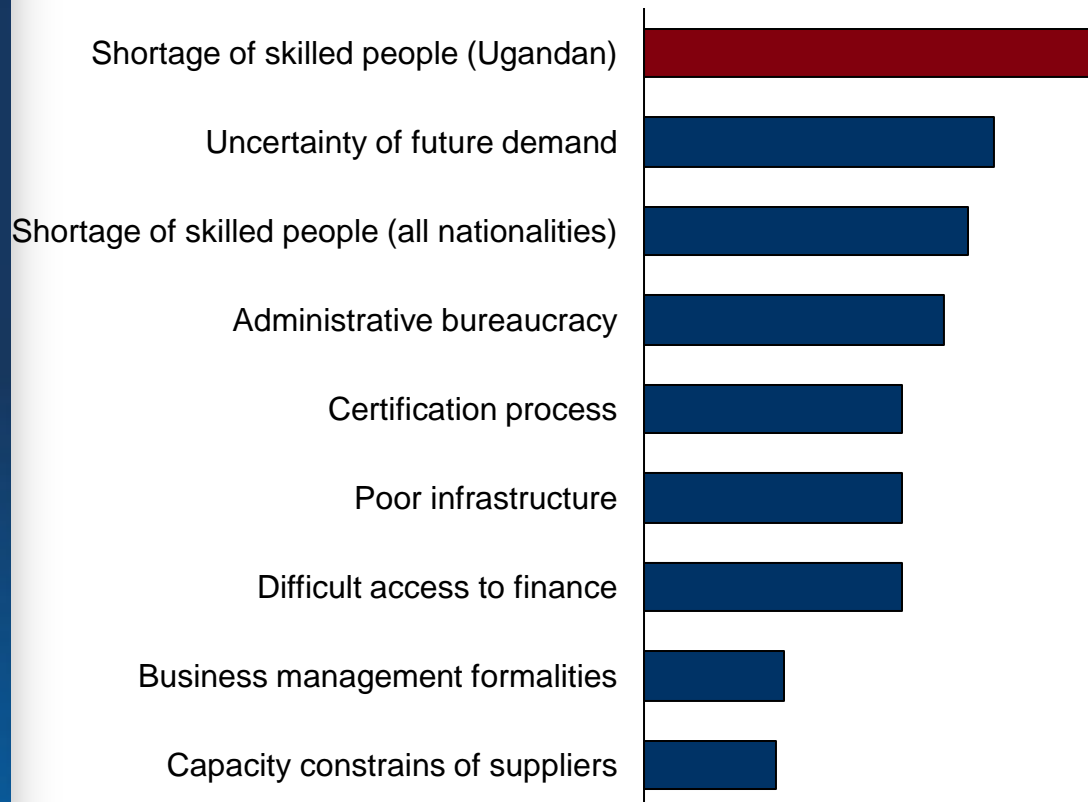
Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (80%)



The main barrier for growth within the domestic airline industry is shortage of skilled Ugandan people

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Difficult to recruit local pilots and engineers
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - High cost of airplane

16 Fuel wholesale industry

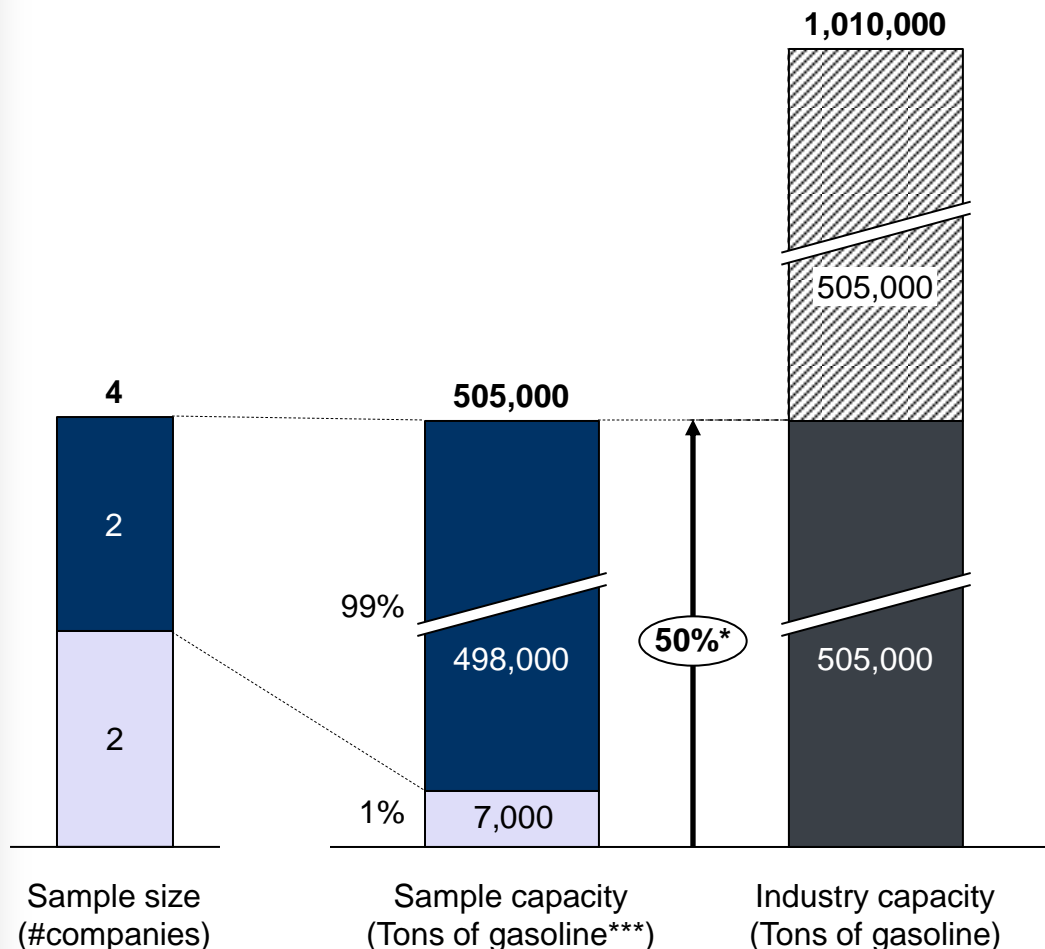
Wholesale of fuels, oils, lubricants, liquefied gas for machines and vehicles (land/air/water), and fuel for drilling rigs



Four companies representing 50% of the fuel wholesale sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – FUEL WHOLESALE

2012, in number of companies and tons of gasoline



Companies Surveyed
Bwik
Primefuels
Total Uganda**
Vivo

Findings
<ul style="list-style-type: none"> Very fragmented industry with two major players, Total & Vivo, with 25% market share each Some volumes of lubricant and specialty products are illegally smuggled into the country Bituminous market is not managed by Oil companies and the majority of the products are independently sourced by individual companies

Source: SBC analysis, company data

Note: *50% market share was estimated based on an interview with Total Uganda. **Companies interviewed. ***All types of gasoline

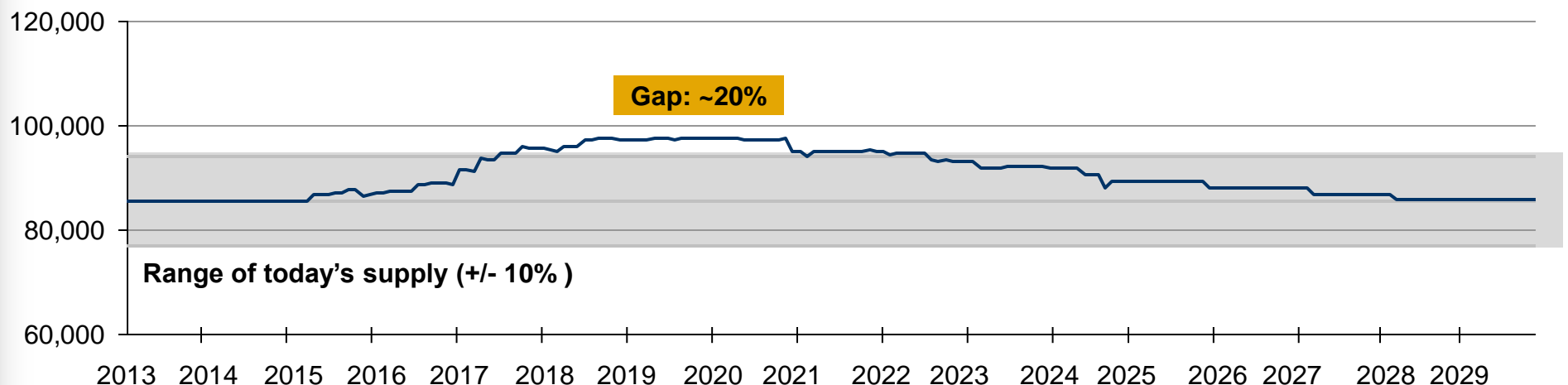


Supply and demand analysis shows that there should be a small gap between current capacities and future demand of fuel

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply* of gasoline (all types)

Tons per month



QUALITY

DEMAND

- no specifications

SUPPLY

- Compliant with UNBS standards for fuel quality
- License required for import, storage and distribution
- Compliant with NEMA's EIA

ASSUMPTIONS ON DEMAND

- Rig fuel consumption – 1200 liters/day
- Truck fuel consumption – 20 liters per 100 km

Source: SBC analysis

Note: *Supply of lubricant and other specialty products cannot be fully evaluated because of some illegal trading of these products. Also supply of bituminous material cannot be evaluated as it is managed by individual companies and the government. To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

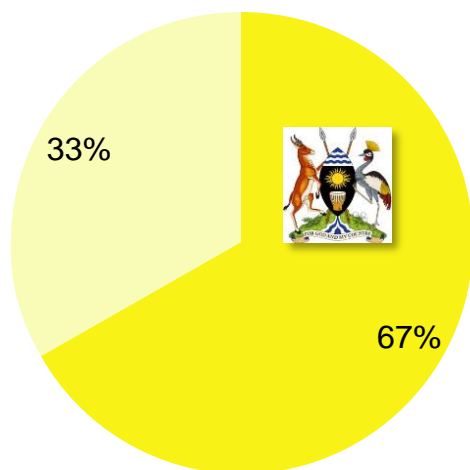


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

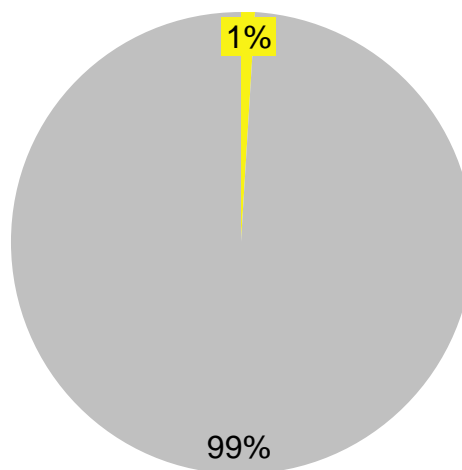
2012, based on sample* companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



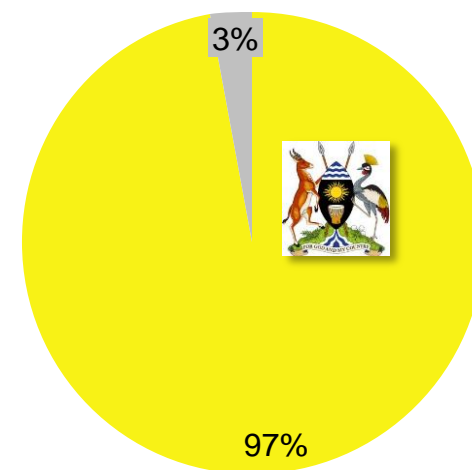
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE**



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

Source: SBC analysis

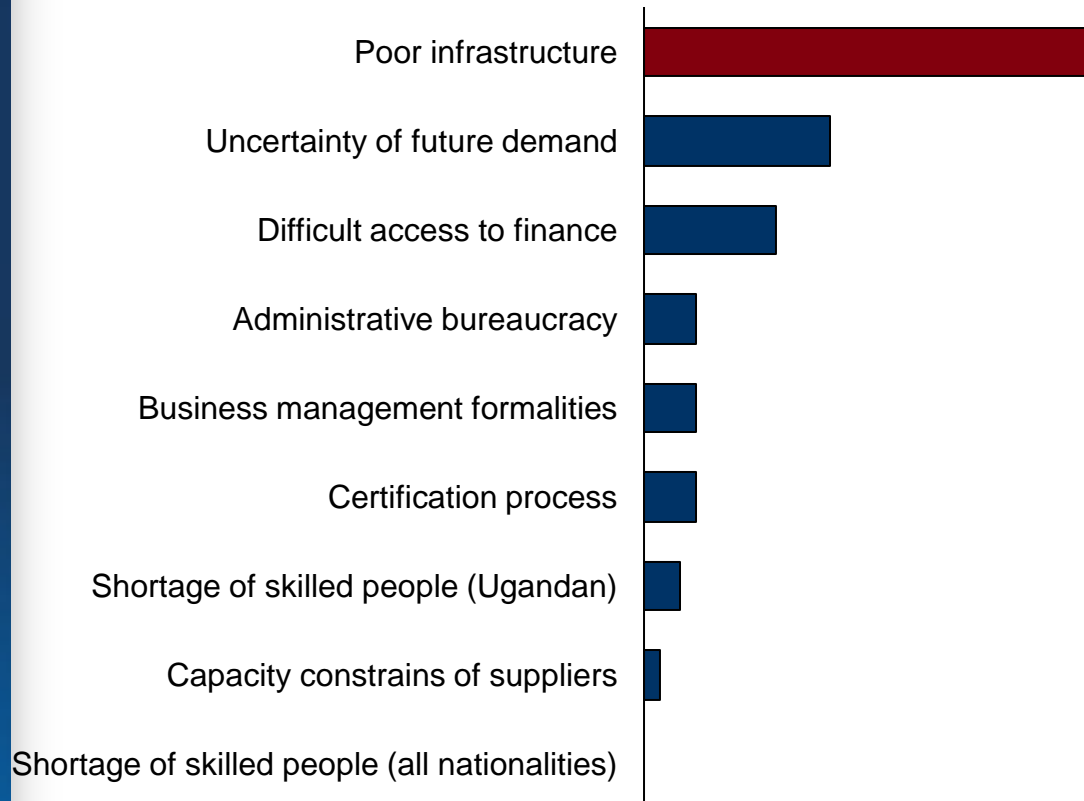
Note: *Vivo was not analyzed in terms of ownership and manpower capabilities. **Ownership weighted by revenue is 99% non-Ugandan as the sample analyzed is composed of Total (French) and two other smaller local players with relatively small revenues compared to Total



The main barrier for growth within the fuel wholesale industry is poor infrastructures

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - High sensibility to electricity supply & demand fluctuations
 - Poor road infrastructures leading to higher fuel transport cost
- **Oil & Gas specific:**
 - More information on demand and standards required
 - Visibility on governmental decisions on the construction of refinery and export pipeline
- **Other barriers:**
 - Lack of excess capacity (storage/ trucks) in case of future expansion
 - Lack of appropriate logistics and HSE culture in the country
 - Equipment/ systems failure
 - Supply delays (vessel delays, etc.)



17 Manpower agencies industry

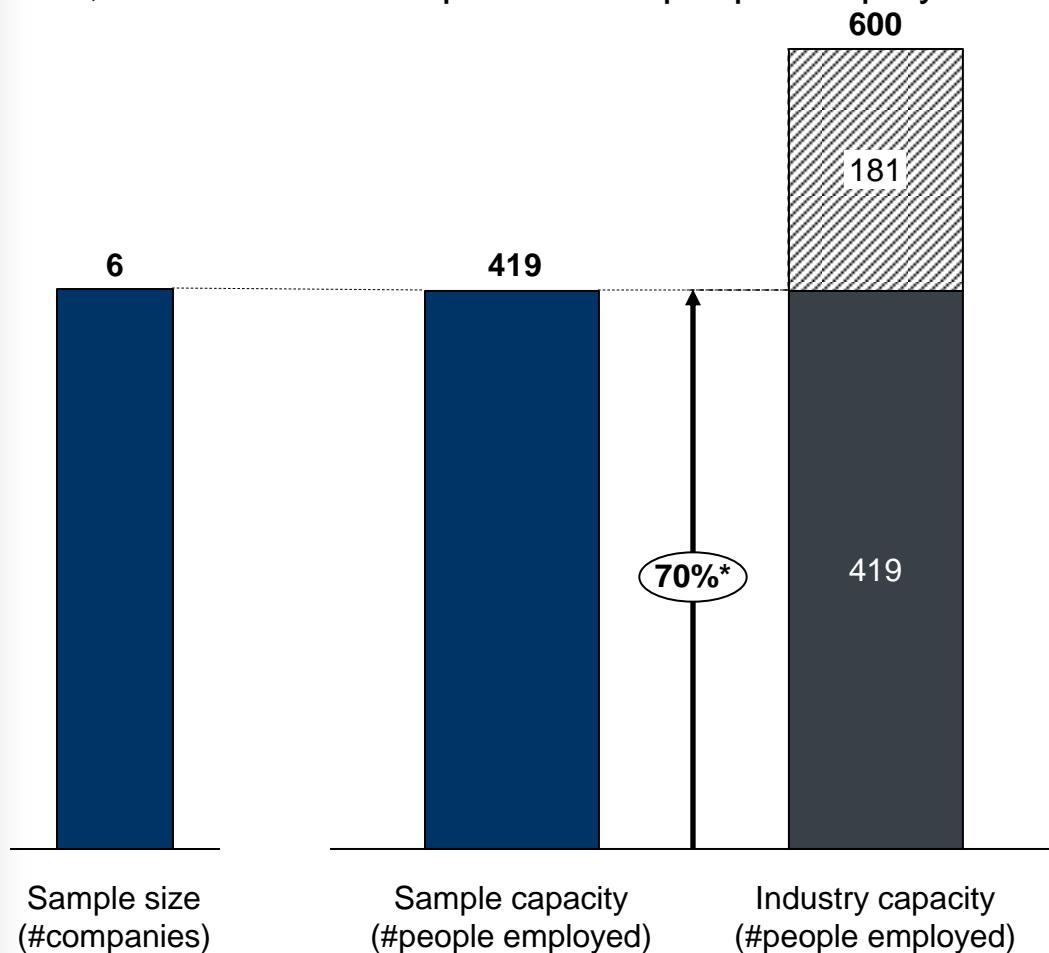
Manpower consultancy to manage unskilled workforce, also agencies of placement and temporary employment



Six companies representing 70% of the manpower agencies sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – MANPOWER AGENCIES

2012, in number of companies and people employed



Companies Surveyed
24-7 cars
Contracts Consultancy
Expat Africa Payroll
Intercar Uganda
NFT Consult**
People Performance Group**

Source: SBC analysis, company data

Note: *70% market share was estimated based on number of people employed by the interviewed companies with known market share. **Companies interviewed

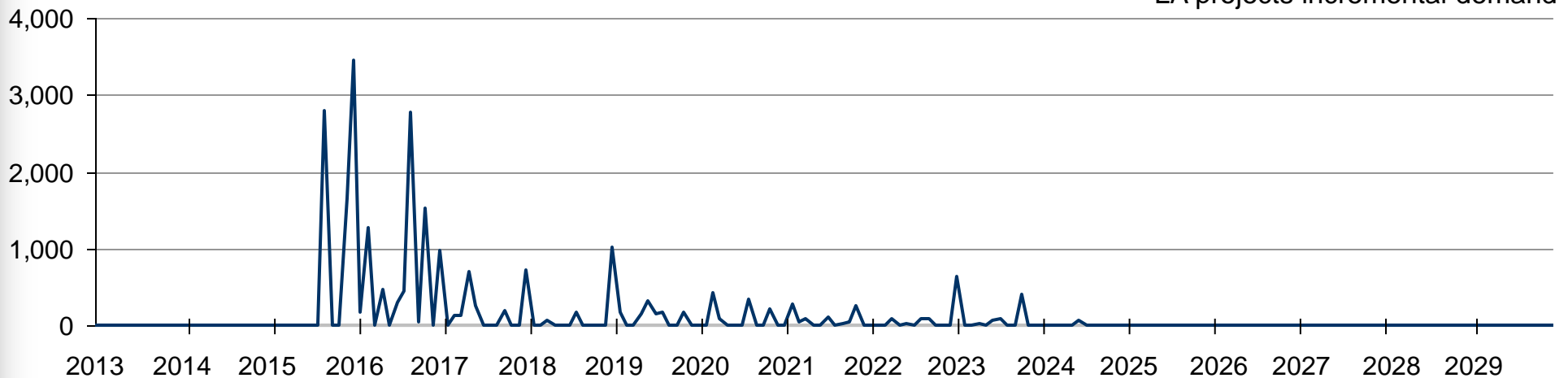


The study shows that there will be a large demand of unskilled people for LA projects that can be sourced from LA communities

INDUSTRY DEMAND ANALYSIS

Demand of unskilled people

of people



QUALITY

DEMAND

- Compliance with HSE standards

SUPPLY

- Manpower agencies are mainly sourcing skilled and semi-skilled people
- Unskilled people required for construction can be sourced from the LA community

ASSUMPTIONS ON DEMAND

- 100% unskilled people employment managed by external manpower agencies
- Demand is composed of unskilled people which will be recruited from LA communities
- For each position 4 candidates should be considered

Source: SBC analysis

Note: Manpower agencies in Uganda are mainly sourcing skilled and semi-skilled people like drivers and supervisors. The supply of unskilled people can be addressed by sourcing people from the LA community

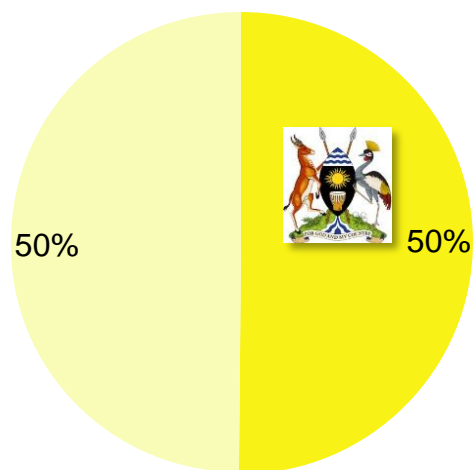


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

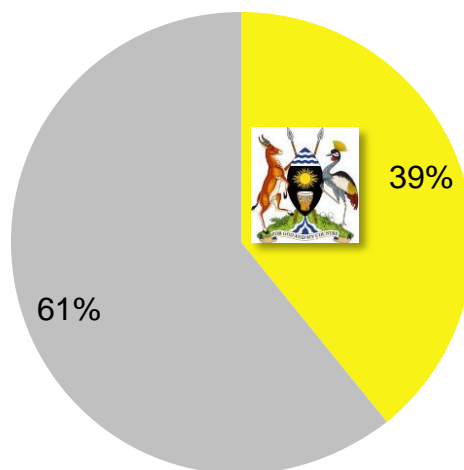
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



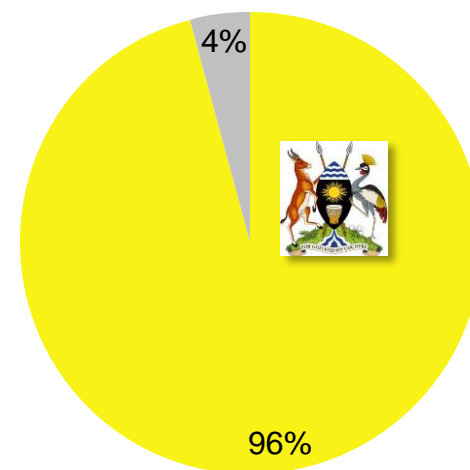
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

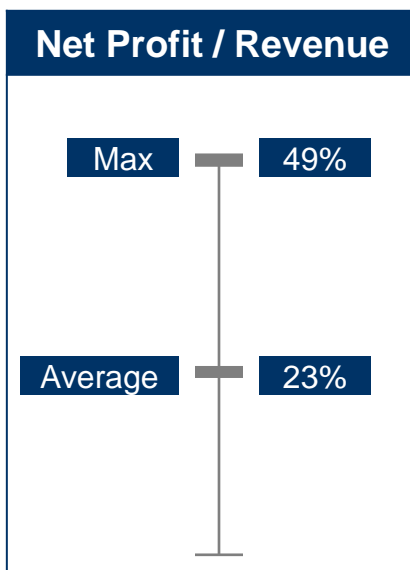
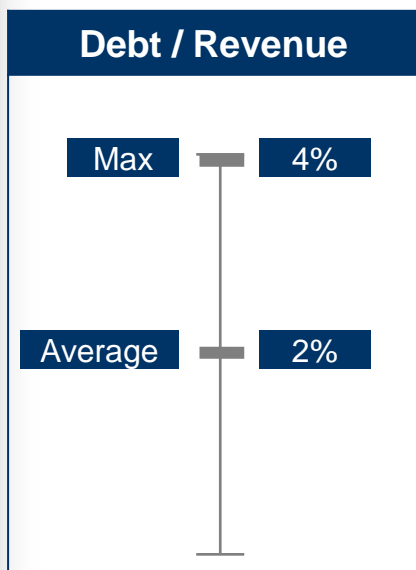
The survey reveals that manpower agencies have limited financial constraint

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 10,000 million
~ USD 4 million

2012, based on sample companies data



FINDINGS

- No major financial issue
- Workers' salaries are paid in advance by the manpower agency
- High interest rate ~20%

Source: SBC analysis, company data

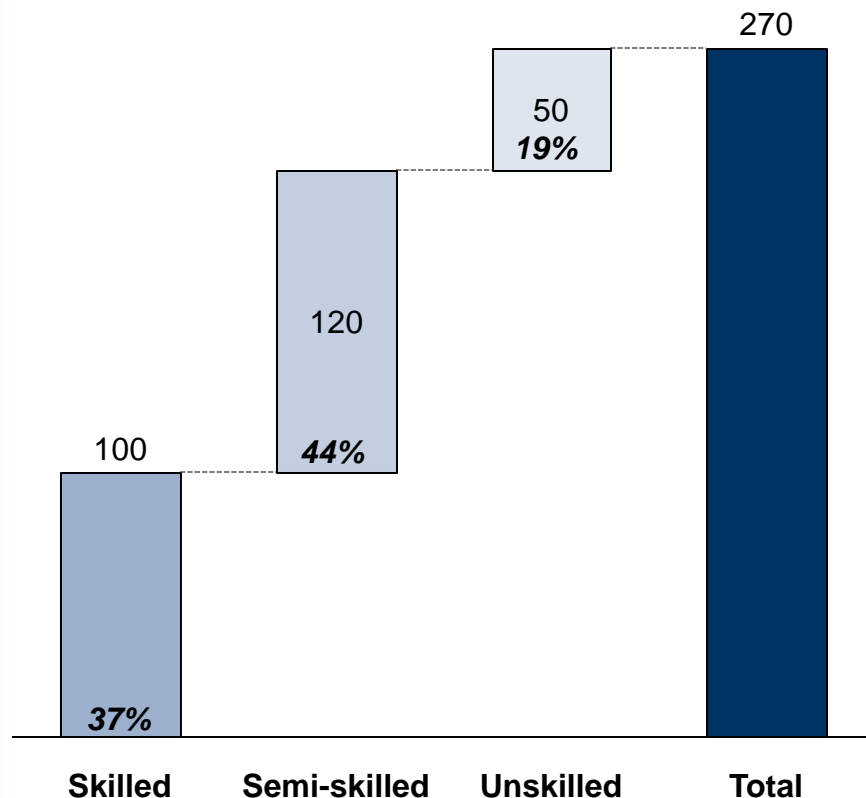
Note: *The sample revenue was extrapolated to the industry revenue via defined market share of the sample (70%)



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: managers (recruitment, client relationship, database, IT), head of operations, head of welfare, accountant
- Semi-skilled: administrative assistants
- Unskilled: drivers, cleaners, receptionists

Source: SBC analysis, company data

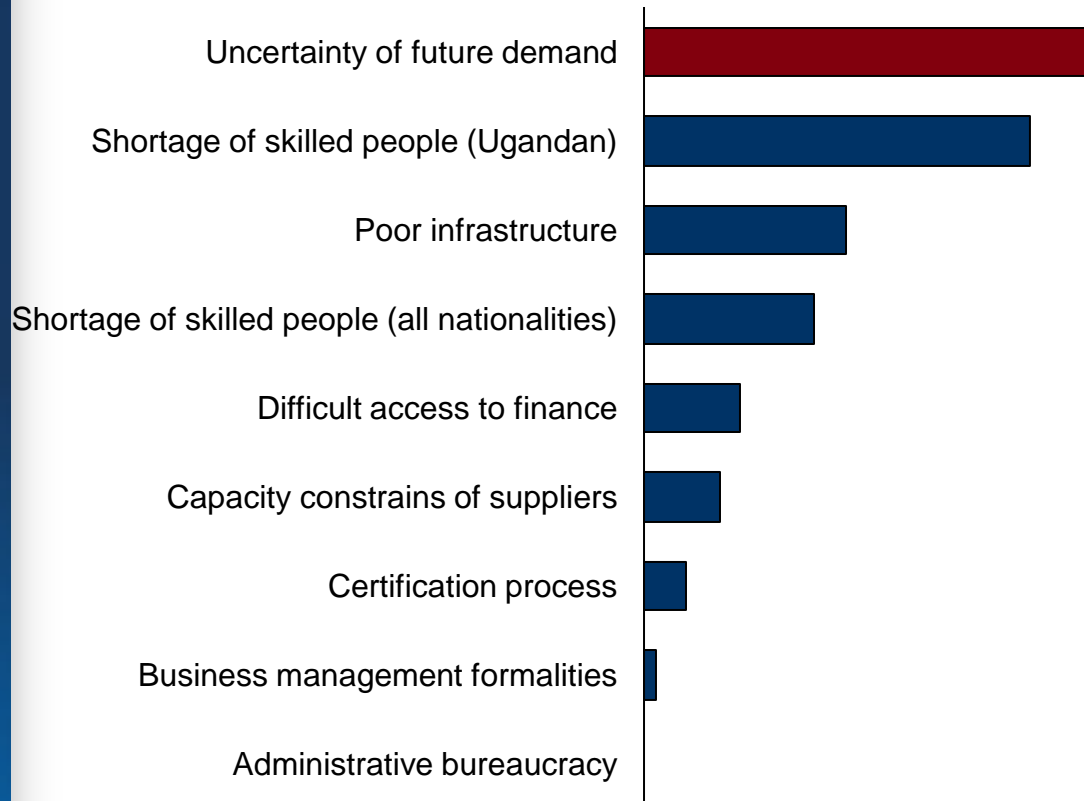
Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (70%)



The main barrier for growth within the manpower agencies industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Uncertainty of future demand in terms of skills and manpower needed
- **Oil & Gas specific:**
 - Many special trainings are required by Oil companies
 - Short-term contracts make access to credit difficult
- **Other barriers:**
 - Shortage of skilled Ugandans
 - High pre-recruitment training failure rate (~50%)

18 Catering industry

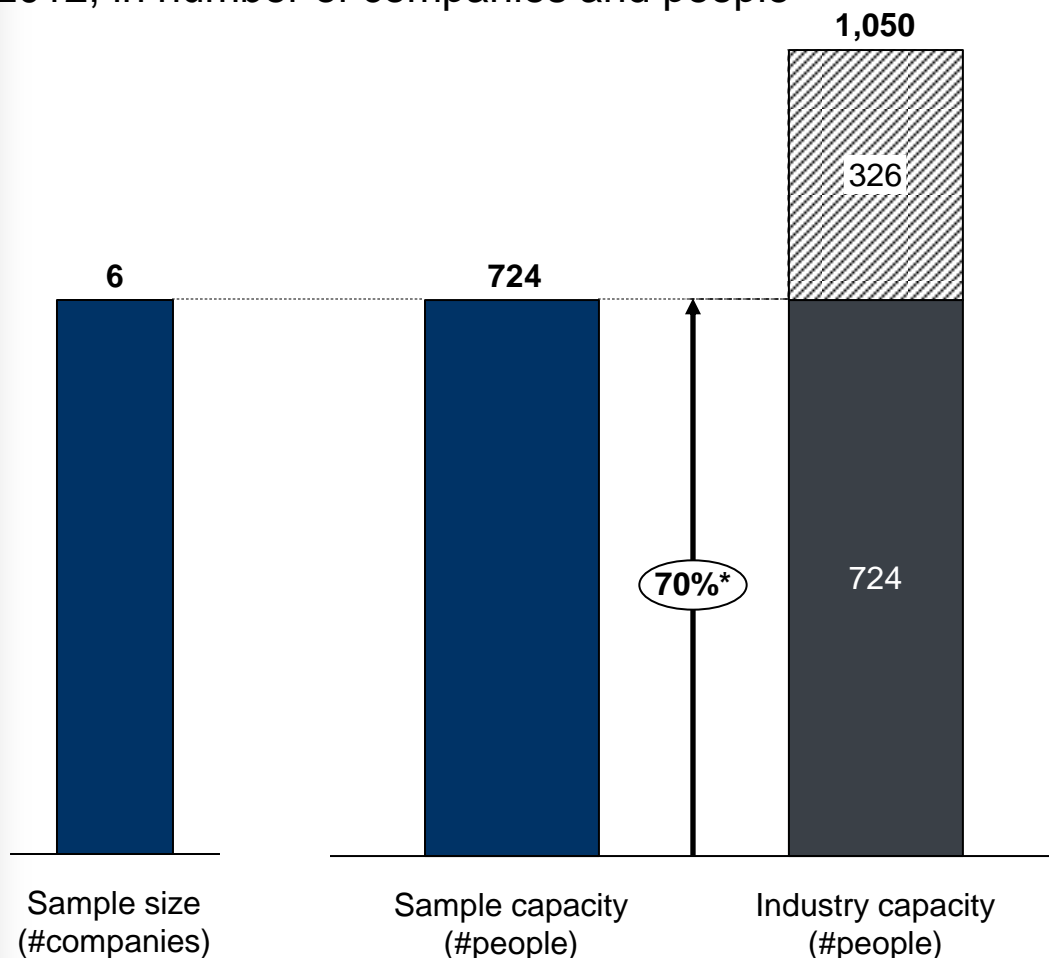
Catering of camp facilities



Six companies representing 70% of the camp catering sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – CATERING***

2012, in number of companies and people



Companies Surveyed	
Equator**	
Klab Investments	
MSL**	
Nalugom	
Newrest	
The Red Apple	

Source: SBC analysis, company data

Note: *70% market share was estimated based on the revenue of interviewed companies with known market share.

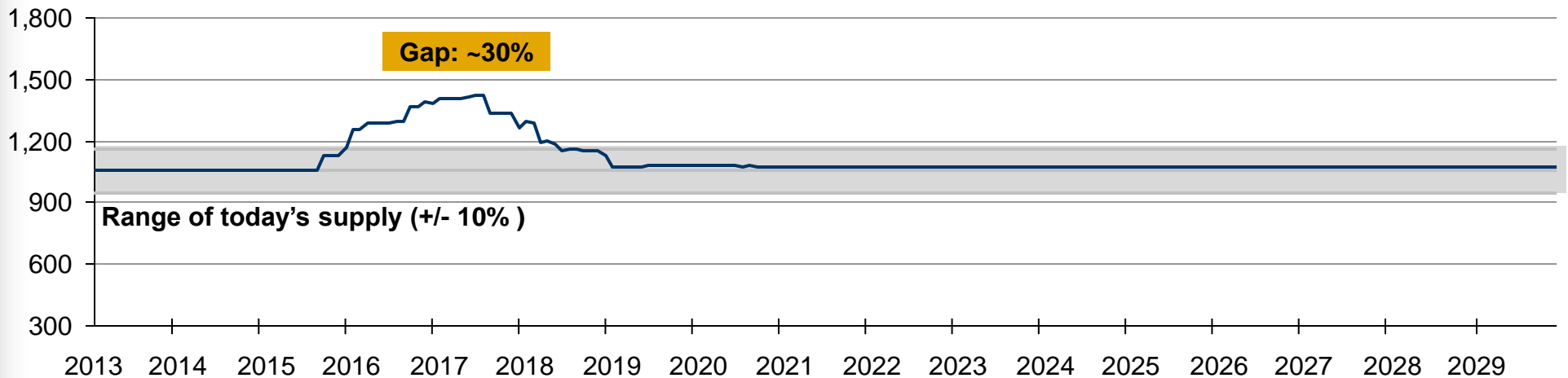
Companies interviewed. *Catering for camps was only considered in this analysis to avoid including small restaurants and hotels

The survey shows that there should not be a large gap for catering services, however the real problem will be on the quality of supply

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of people

of people



QUALITY

DEMAND

- No specifications

SUPPLY

- Low quality of supply

ASSUMPTIONS ON DEMAND

- 80% of Domestic Services («DS») domain personnel – before first oil, 20% - after first oil - after first oil at Buliisa South

Source: SBC analysis

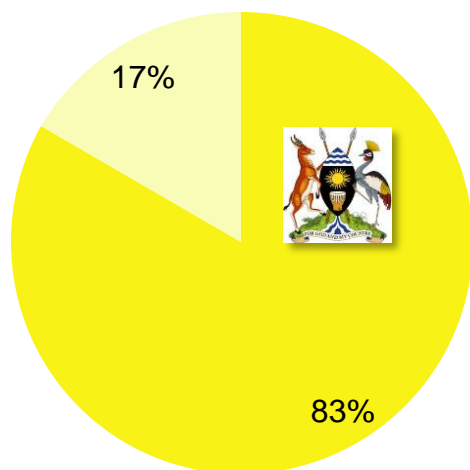
Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

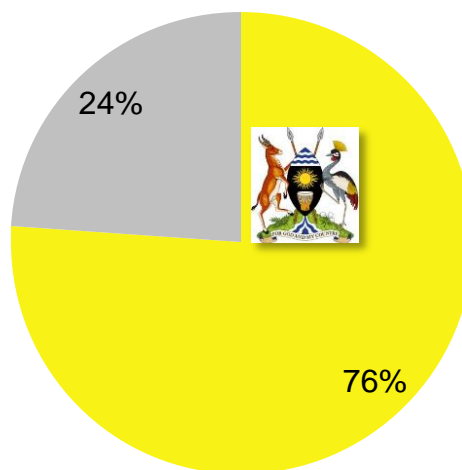
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



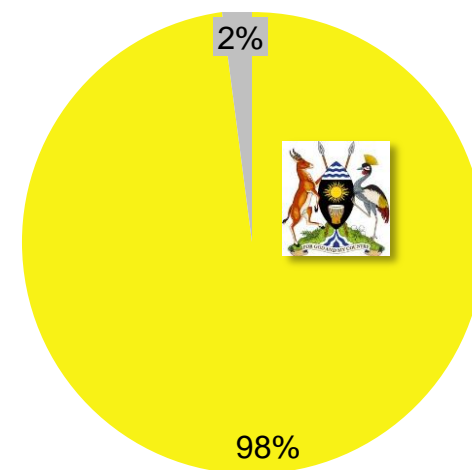
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

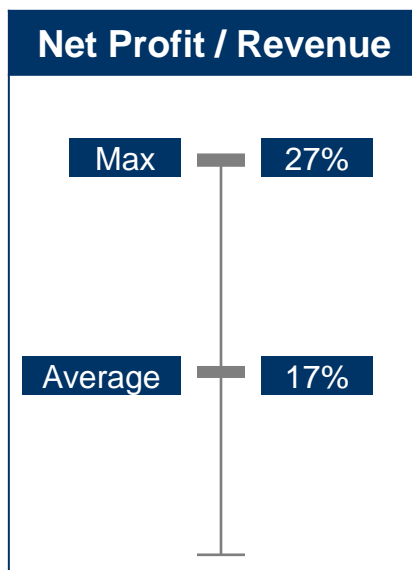
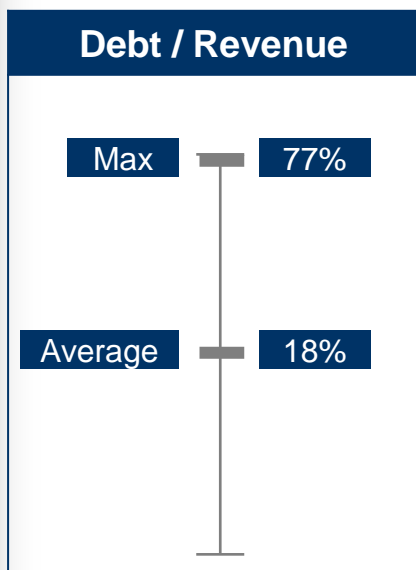
Overview of financial performances

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 85,000 million
~ USD 35 million

2012, based on sample companies data



FINDINGS

- Difficult to access credit
- No other major financial issues

Source: SBC analysis, company data

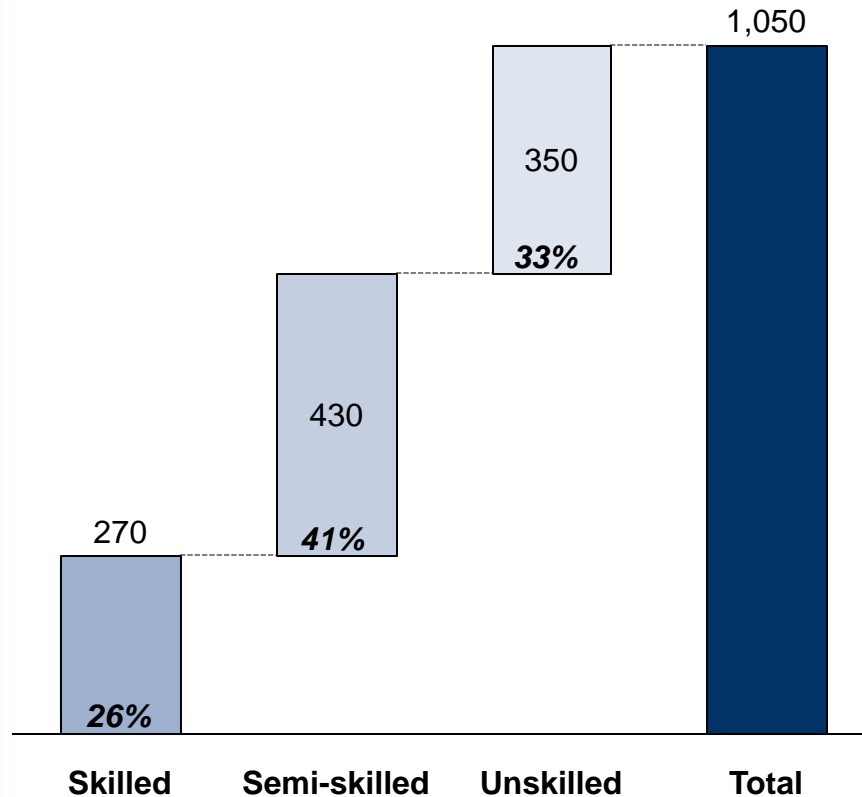
Note: *The sample revenue was extrapolated to the industry revenue via defined market share of the sample (70%)



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: camp manager, head chef
- Semi-skilled: head housekeeper, second line chef
- Unskilled: cleaner, waiter
- Lack of proper training for catering services
- Some trainings conducted in big hotels

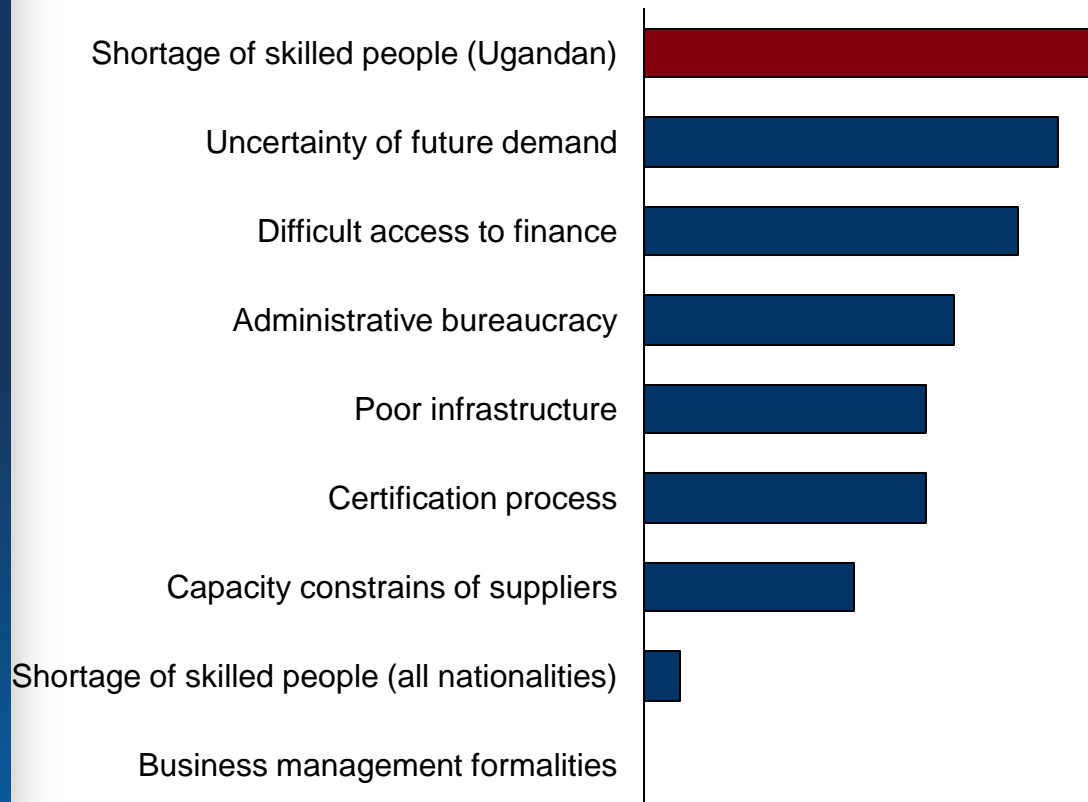
Source: SBC analysis, company data

Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (70%)

The main barrier for growth within the catering industry is shortage of skilled Ugandan people

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Lack of skilled Ugandan employees (chefs, etc.)
 - Lack of proper trainings for catering
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Lack of suitable infrastructure to transport food to the camp

19 Facility management industry

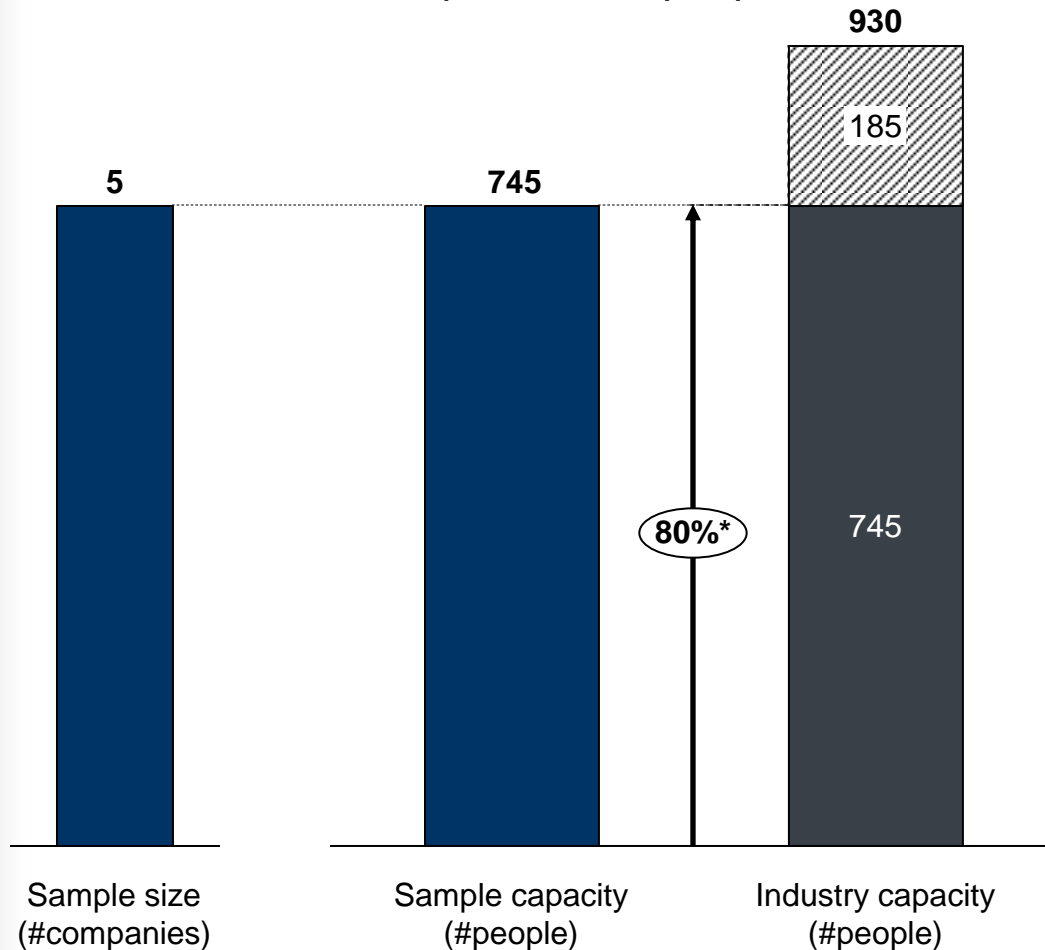
Camp/ facility services including: cleaning, fire fighting, facility maintenance, office supply



Five companies representing 80% of the facility management sector were analyzed

DETAILS OF THE SURVEYED SAMPLE – FACILITY MANAGEMENT

2012, in number of companies and people



Companies Surveyed
All Terrain Services
Equator**
GCC Services**
MSL**
Newrest

Source: SBC analysis, company data

Note: *80% market share was estimated based on the revenue of interviewed companies with known market share.

**Companies interviewed

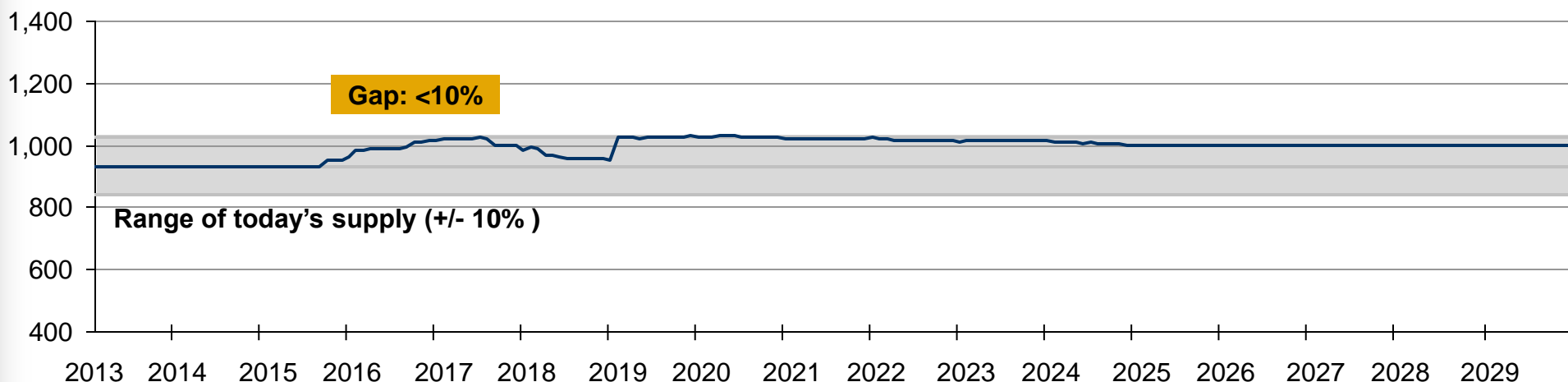


The survey reveals a small gap of supply over future projects' demand for facility management services

INDUSTRY SUPPLY & DEMAND ANALYSIS

Demand & supply of people

of people



QUALITY

DEMAND

- No specifics

SUPPLY

- Some companies have environmental certifications from the Ministry of agriculture and NEMA
- Some companies have ISO certifications

ASSUMPTIONS ON DEMAND

- 20% of Domestic Services («DS») domain personnel – before first oil, 80% - after first oil at Buliisa South

Source: SBC analysis

Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation

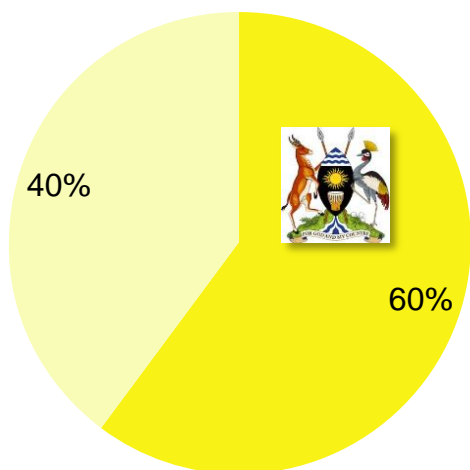


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

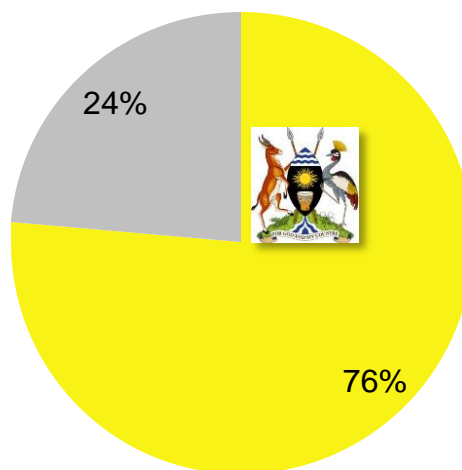
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



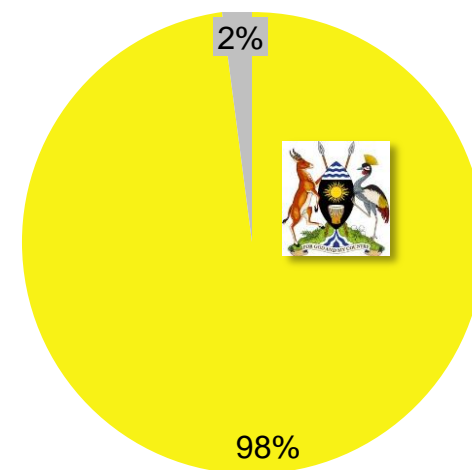
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY



■ Ugandan
■ Non-Ugandan

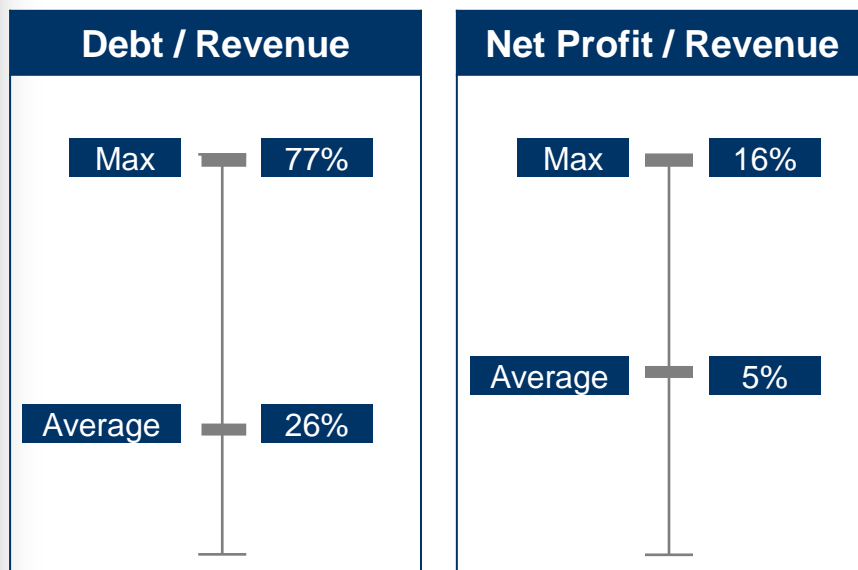
Overview of financial performances

FINANCIAL DATA

2012, based on extrapolated* industry data

Total Industry Revenue
~ UGX 85,000 million
~ USD 35 million

2012, based on sample companies data



FINDINGS

- Difficult to access credit for local players
- Easy to access credit for international players who have financial support from their mother company

Source: SBC analysis, company data

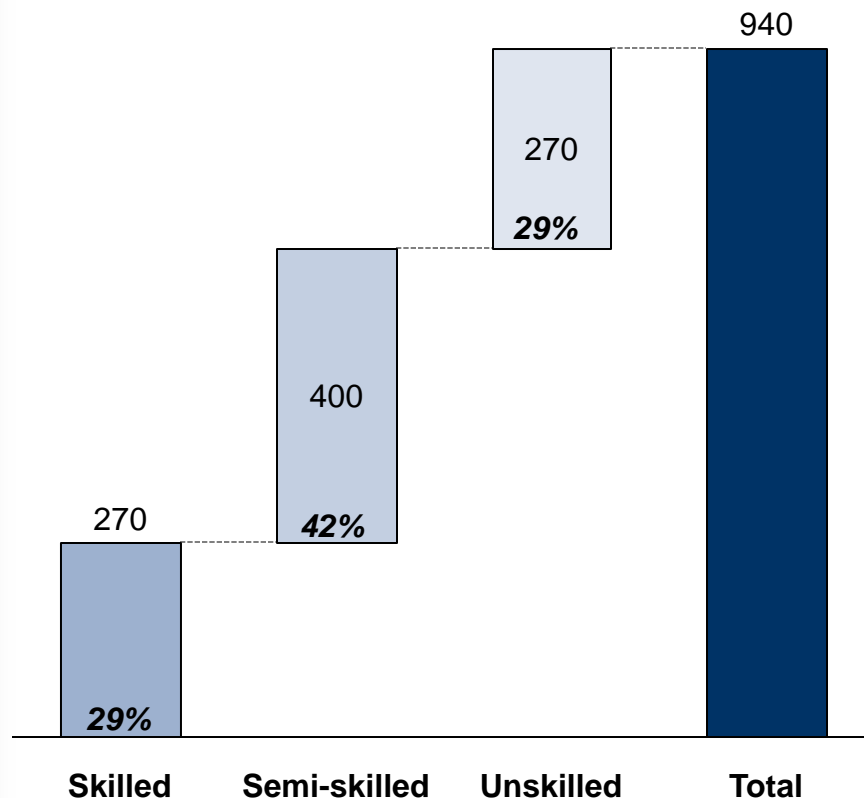
Note: *The sample revenue was extrapolated to the industry revenue via defined market share of the sample (80%)



Manpower overview at the industry level

MANPOWER SPLIT BY SKILL LEVELS

2012, based on extrapolated* industry data



FINDINGS

- Skilled: camp manager, head chef, maintenance supervisor, mechanical & electrical engineers
- Semi-skilled: head housekeeper, second line chef, technician, electrician, plumber
- Unskilled: cleaner, clerk
- Lack of proper training for facility management services

Source: SBC analysis, company data

Note: *The sample manpower was extrapolated to the industry manpower via defined market share of the sample (80%)



The main barrier for growth within the facility management industry is poor infrastructures

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Lack of suitable infrastructures to transport equipment and food to the camp
 - Lack of suitable infrastructures surrounding the camp
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Lack of proper trainings for facility management and maintenance

20 Food supply industry

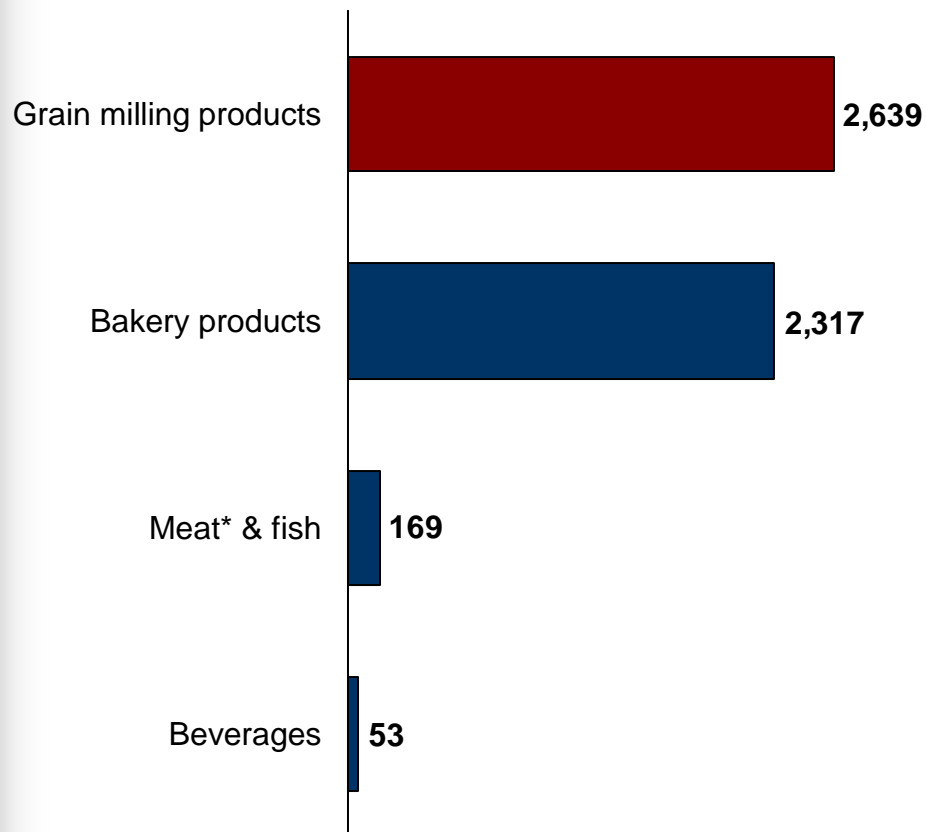
Food production, processing, preserving and supply



Food supply overview at the country level

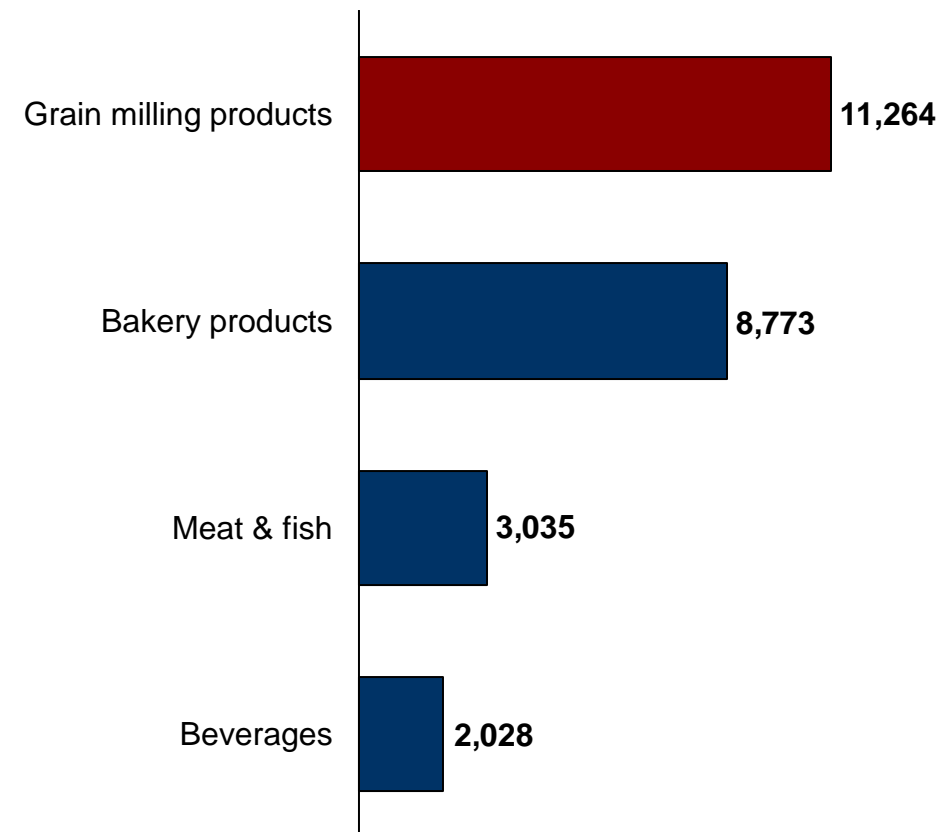
BUSINESSES IN FOOD MANUFACTURING

of companies in Uganda



MANPOWER IN FOOD MANUFACTURING

of employees in Uganda



Source: UBOS 2012

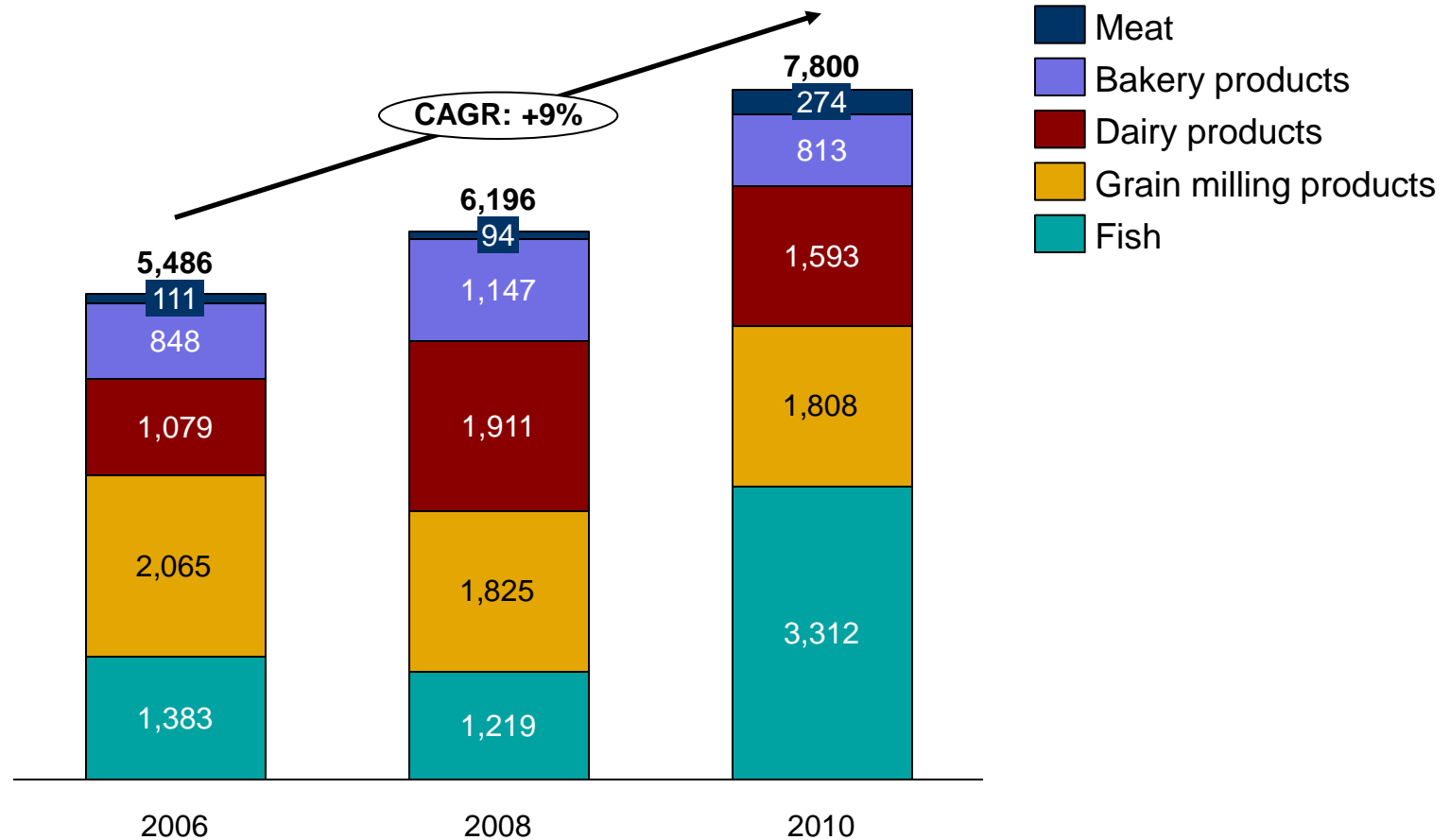
Note: *Including beef, pork and goat meat



Total food production in Uganda is increasing at a 9% growth rate per annum

FOOD PRODUCTION IN UGANDA

Thousand tons, year

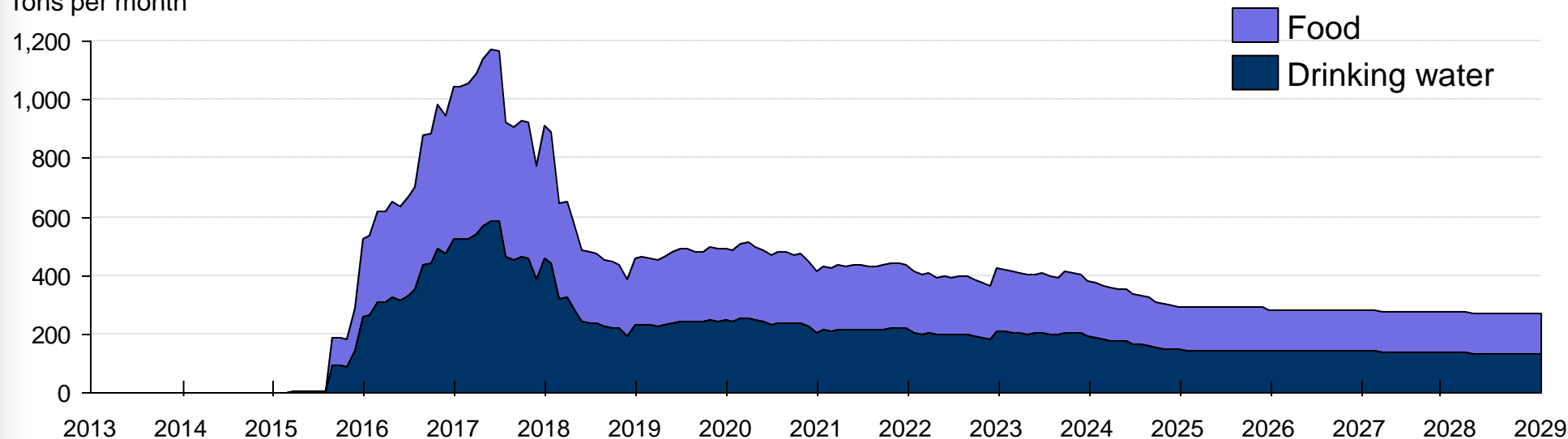


Future LA demand of food & water supply

INDUSTRY DEMAND ANALYSIS

Demand of food

Tons per month



QUALITY

DEMAND

- Majority of food supply should be sourced locally

SUPPLY

- Some companies have ISO certifications

ASSUMPTIONS ON DEMAND

- 2 kg of food per person per day
- 2 liters of water per person per day

Source: SBC analysis

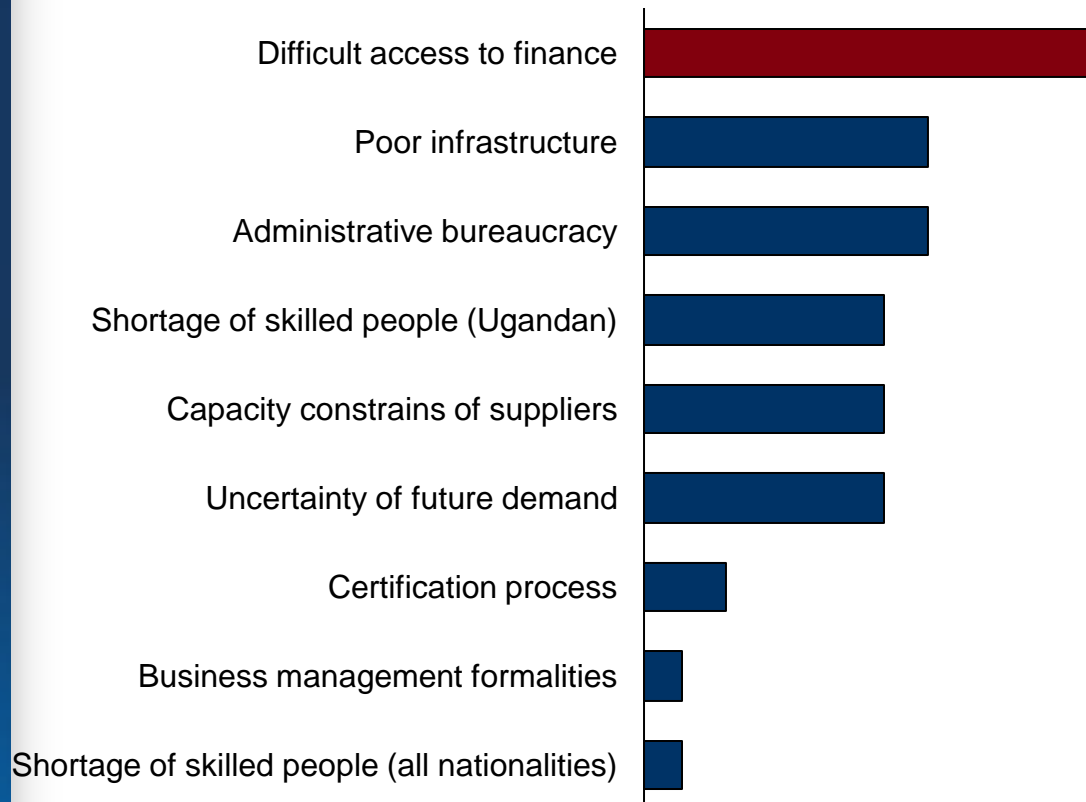
Note: To account for uncertainty, today's industry supply capacity range was computed using $\pm 10\%$ deviation



The main barrier for growth within the food supply industry is access to credit

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Difficult access to finance
 - High capital required for investing in food processing plants
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Time consuming procedures for import of goods
 - Lack of reliable distributors

21 Work safety products industry

Protection clothes, boots, glasses, etc.



Four work safety products companies were analyzed – most PPEs are imported

INDUSTRY OVERVIEW

- Most of PPE are imported (South Africa) and only minor quantity is manufactured locally, though not always at the required standards
- The market is expanding with the increasing presence of international companies focusing on HSE
- Major players are Frenah Safety & Security, Safield, Heights, Safety & Business Center and Sujuzu
- Some other small companies are emerging in the market with low quality and fake products
- Overall, PPE in Uganda are not up to the Oil & Gas standards

Companies Surveyed
Frenah
Heights**
SA Field
Safety & Business Centre**

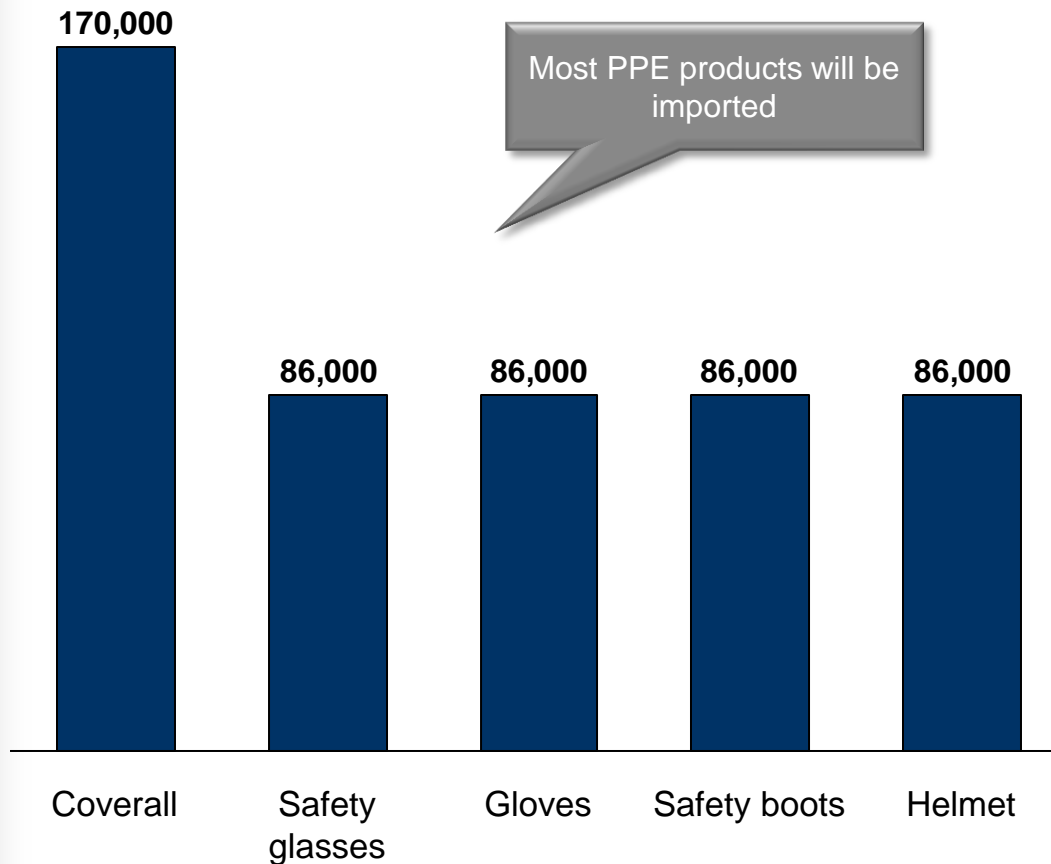
Source: SBC analysis

Note: *Companies in blue have been interviewed



Future PPE demand for entire LA Project duration

TOTAL QUANTITY OF PPE PRODUCTS REQUIRED units



Assumptions:

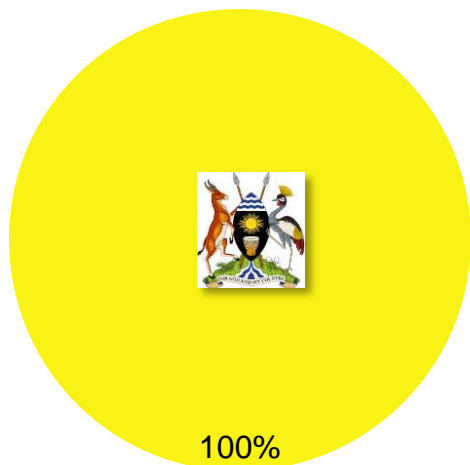
- 60% of manpower will require regular replacement of PPE, 40% will require one purchase of PPE
- Personal protective equipment set with frequency of replacement:
 - Coverall every 3 month
 - Safety glasses every 6 month
 - Gloves every 6 month
 - Safety boots every 6 month
 - Helmet every 6 month
- Purchase of PPE will happen in two phases:
 - Phase 1 to cover peak of 11,000 people from Jan 2015 to Dec 2017
 - Phase 2 to cover production operation of 3000 people from Jan 2018 to Dec 2029

All companies in the work safety products industry are local but the majority of the safety products are imported

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

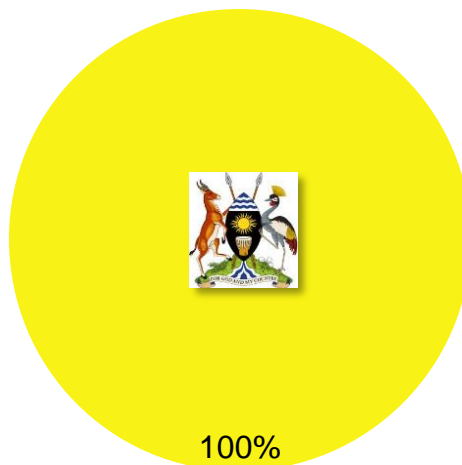
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



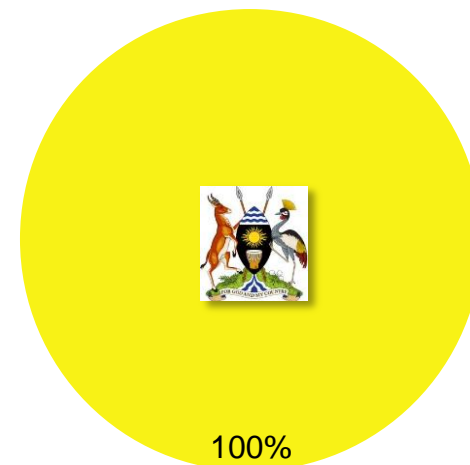
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

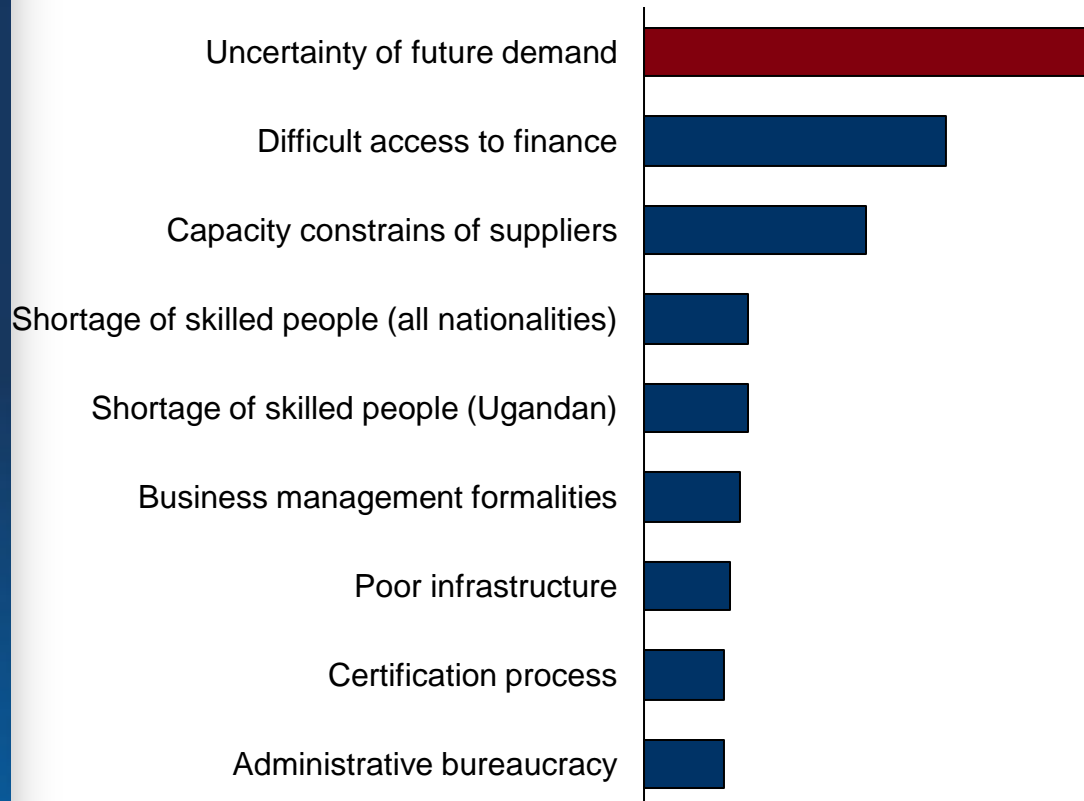


■ Ugandan
■ Non-Ugandan

The main barrier for growth within the work safety products industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Uncertainty of future contracts, payment capacity of the clients, and changes in specifications
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Difficult access to finance
 - High capital required in case of a high increase in demand
 - Capacity of foreign suppliers to supply large quantities of PPE

22 Light equipment manufacturing industry

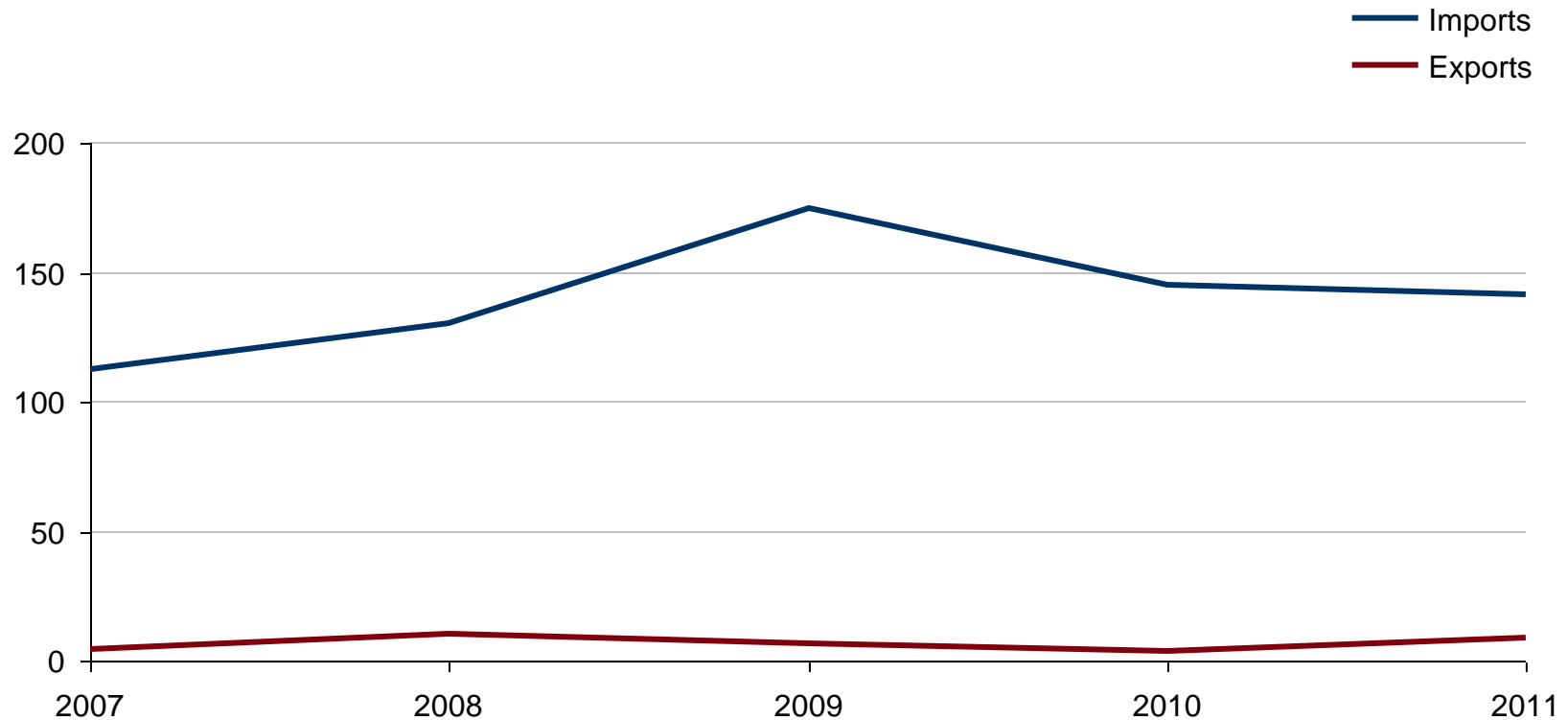
Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus, fibre optic cables, other electrical equipment



The majority of the light/ electrical equipment available in Uganda are imported (1/2)

IMPORTS & EXPORTS OF LIGHT EQUIPMENT

Million USD, year



The majority of the light/ electrical equipment available in Uganda are imported (2/2)

IMPORTED LIGHT EQUIPMENT

High Voltage Cables



Country of origin: China & India

Generators



Country of origin: Europe

Transformers



Country of origin: Tanzania

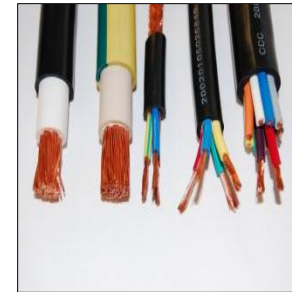
Electric Motors



Country of origin: China & India

LOCALLY PRODUCED LIGHT EQUIPMENT

Power Cables



Low voltage cables, armoured underground cables, flexible cables, house wiring cables, etc.

23 Technical consulting industry

Land and boundary surveying activities, hydrologic surveying activities, projects involving civil engineering, hydraulic engineering, traffic engineering, water management projects, etc.



12 technical consulting companies were analyzed

INDUSTRY OVERVIEW

- Consulting companies provide technical expertise in infrastructure projects (bridges, roads), water works, electrical transmission, environmental impact assessment, etc.
- The market is growing slowly with few consulting projects and fierce competition on bids
- The market is fragmented with around 50 local and international companies
- Major players are Kagga & Partners, Kom and Gauff
- Some small companies work in partnership due to the lack of experts and projects in the market

INDUSTRY DEMAND

- Demand for technical consultancy is hard to assess at conceptual stage of project development, since no clear work scope is known
- Measurement units for industry is number of engineers and consultants
- A project of \$2M dollars will require 30 engineers/ consultants with 100% utilization. Technical consulting will take 2-5% of total CAPEX

Companies Surveyed
Air Water Earth
Associated Consult. Surveyors
Atacama Consulting
Bimco Consult
Cowi
Eco & Partner
KKATT Consult
MBW Consulting**
Pilot International
Savimaxx
Turner & Townsend
Water Env. & Geo Services

Source: SBC analysis
Note: *Companies interviewed

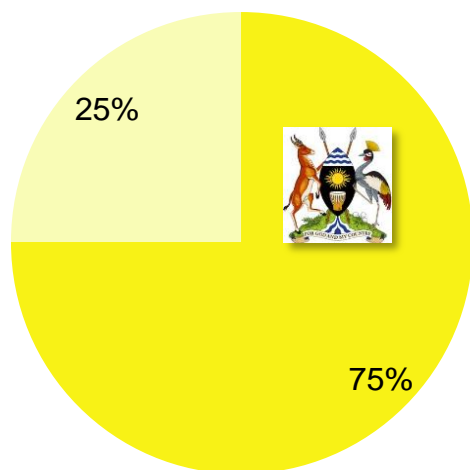


Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

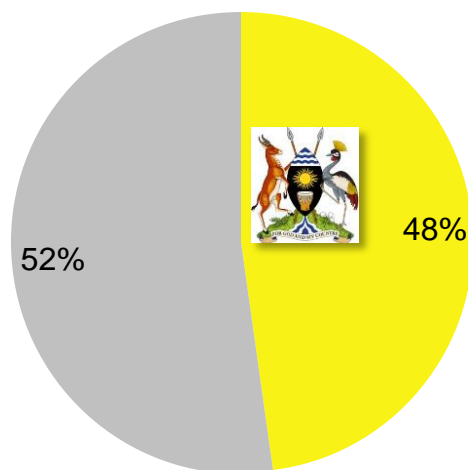
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



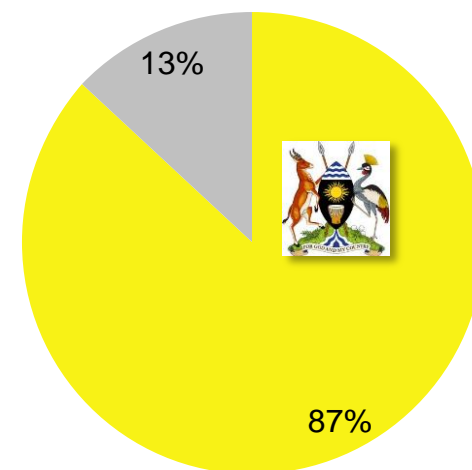
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

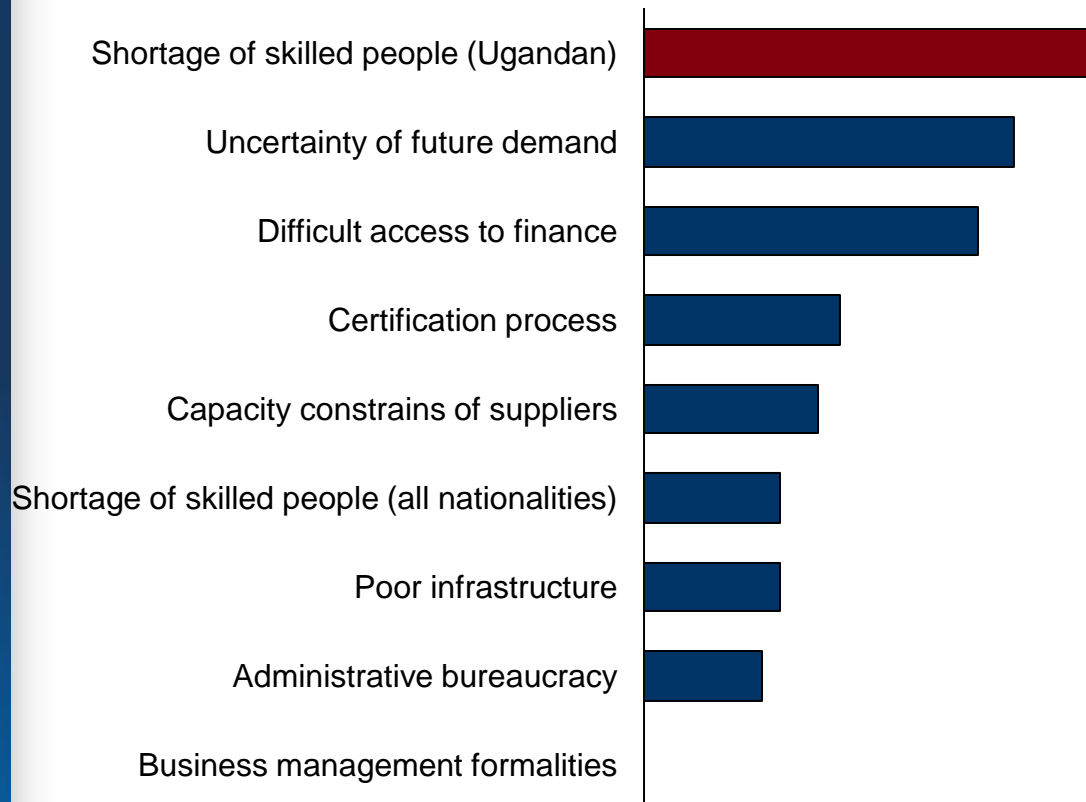


■ Ugandan
■ Non-Ugandan

The main barrier for growth within the technical consulting industry is the shortage of skilled Ugandan people

BARRIERS FOR GROWTH

Relative importance given by companies



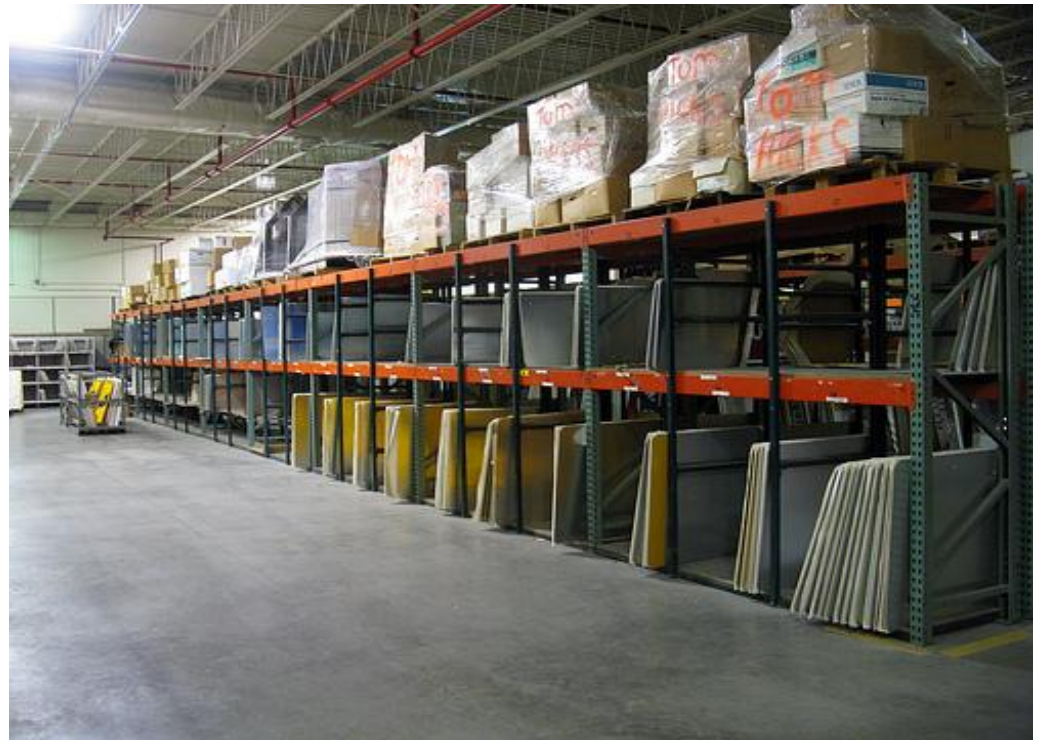
COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Lack of skilled Ugandan people with relevant consulting experience
- **Oil & Gas specific:**
 - Lack of consulting experience in the Oil & Gas industry
 - Foreign independent consultants hired by Oil & Gas companies
- **Other barriers:**
 - Complex requirements from clients
 - Difficult access to finance

24 Vendor services industry

Wholesale on a fee or contract basis of machinery, ores, metals and industrial chemicals, including fertilizers, timber and building materials



21 companies operating in the trading sector were analyzed

INDUSTRY OVERVIEW

- Companies in this industry sell machinery, metals, industrial chemicals, building materials, etc.
- The market is fragmented with several businesses
- The majority of the traded products are imported
- Many foreign companies are present in this sector
- Oil & Gas will have a significant impact (induced) on this sector by generating new jobs and more activity

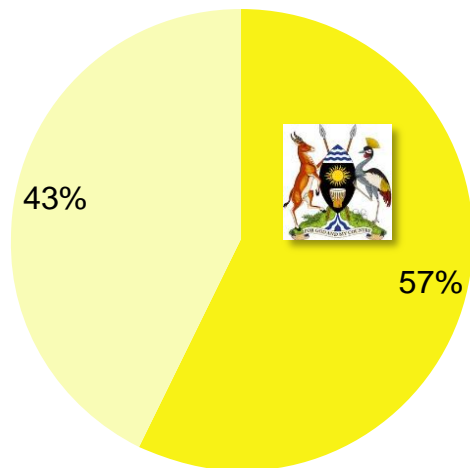
Companies Surveyed	
Belmar	Oracle Engineering
Bolex	Power Arrangers
Cable Corporation	Procure Services
Desbro	Safety & Business Centre**
Electrical Excellence	Taho Enterprises
Engineering Solutions	Terrain Plant
Farm Engineering	TTB Investments
Herton Concepts	Utrade Company
Inspecta	Victoria Engineering
Mechtools and Equipment**	Western Cable
Motorcare	

Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

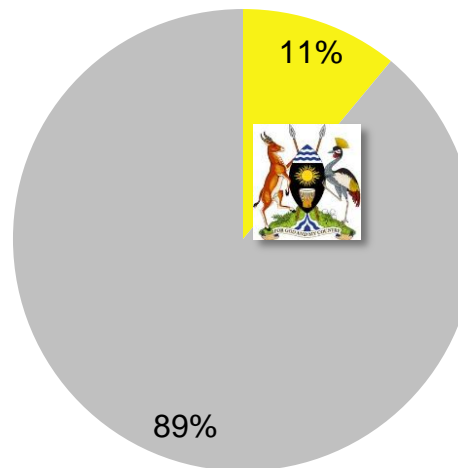
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



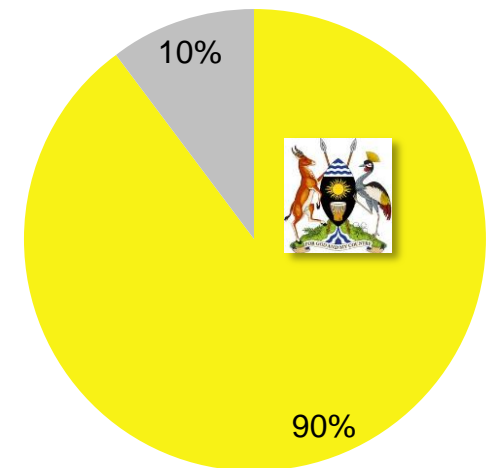
■ Ugandan Ownership >50%
■ Ugandan Ownership <50%

COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

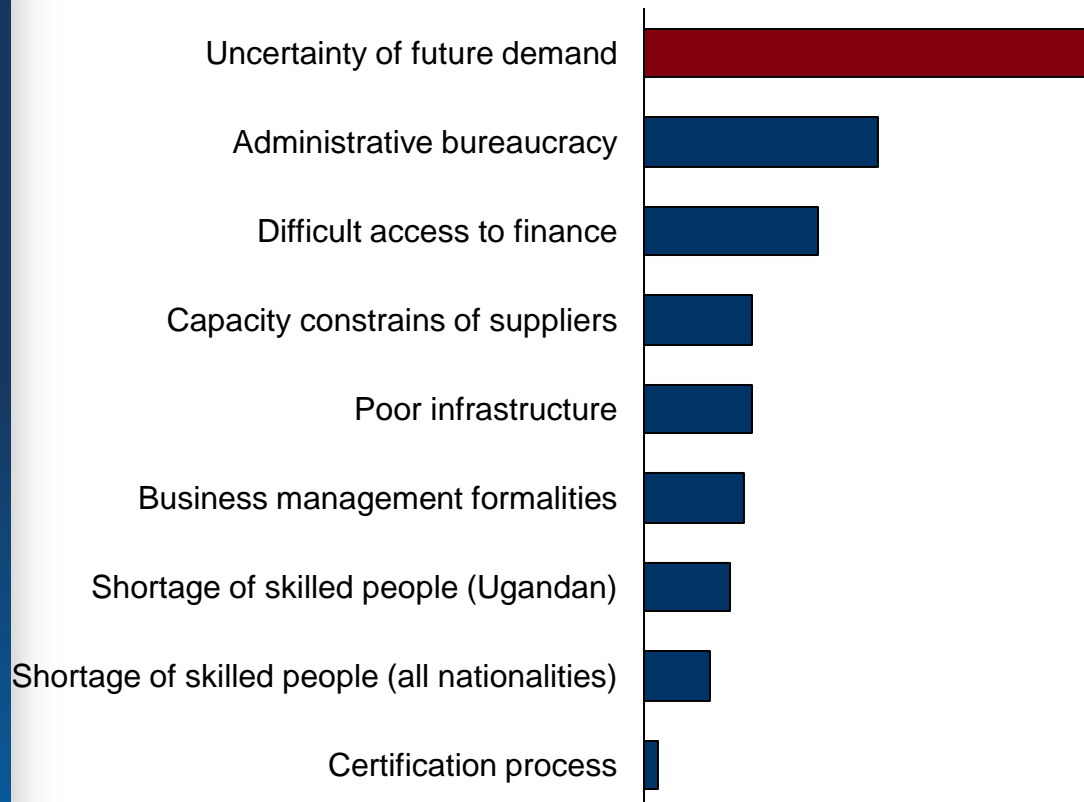


■ Ugandan
■ Non-Ugandan

The main barrier for growth within the trading industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Uncertainty of future contracts and required inventories
- **Oil & Gas specific:**
 - More information on demand and standards required
- **Other barriers:**
 - Long delays from order of goods to delivery to the warehouse
 - Time-consuming clearing and forwarding of goods
 - Capacity of foreign suppliers to supply goods on time
 - Difficult access to finance

Manufacture of chairs and seats for office, sofas, sofa beds and sofa sets, office furniture, etc.



Six companies operating in the furniture sector were analyzed

INDUSTRY OVERVIEW

- Companies in this industry manufacture and supply office furniture, sofas, sofa beds, etc..
- The market is fragmented with around 5,400 businesses and 18,000 employees (Ugandan and non-Ugandan)
- ~90% of the companies in this industry are small in size
- The majority of these small companies operate in public markets (on the street)
- The overall quality of the furniture in Uganda is not up to the standards of Oil & Gas companies

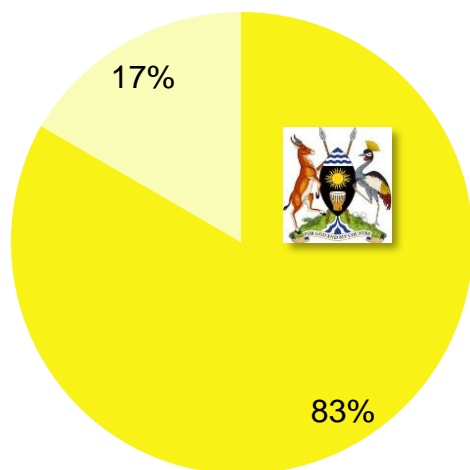
Companies Surveyed
Awaka
Kwatampora Workshop
Malaysia Furnishing Centre
Master Wood Investment
Nina Interiors
Signcare

Local content proportion by industry

INDICATORS OF UGANDAN CONTENT IN THE SECTOR

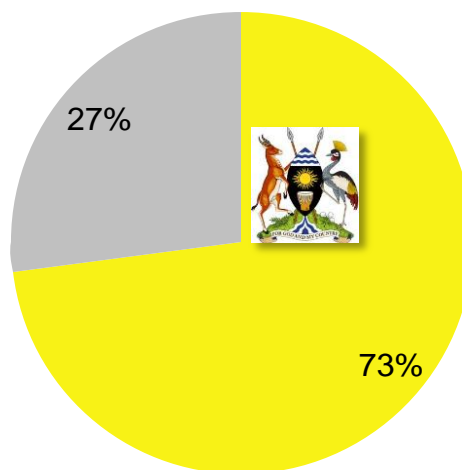
2012, based on sample companies data

COMPANIES WITH 50%>
UGANDAN OWNERSHIP



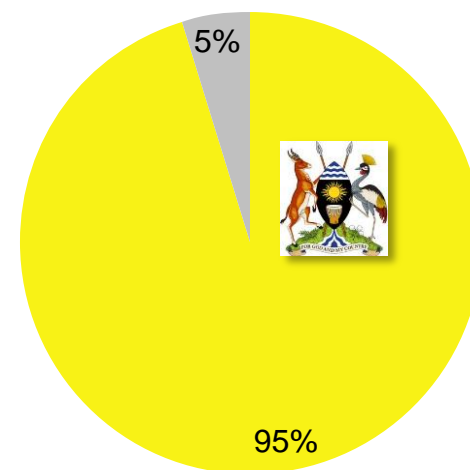
■ Ugandan Ownership >50%
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COMPANIES OWNERSHIP
WEIGHTED BY REVENUE



■ Ugandan
■ Non-Ugandan

MANPOWER BY NATIONALITY

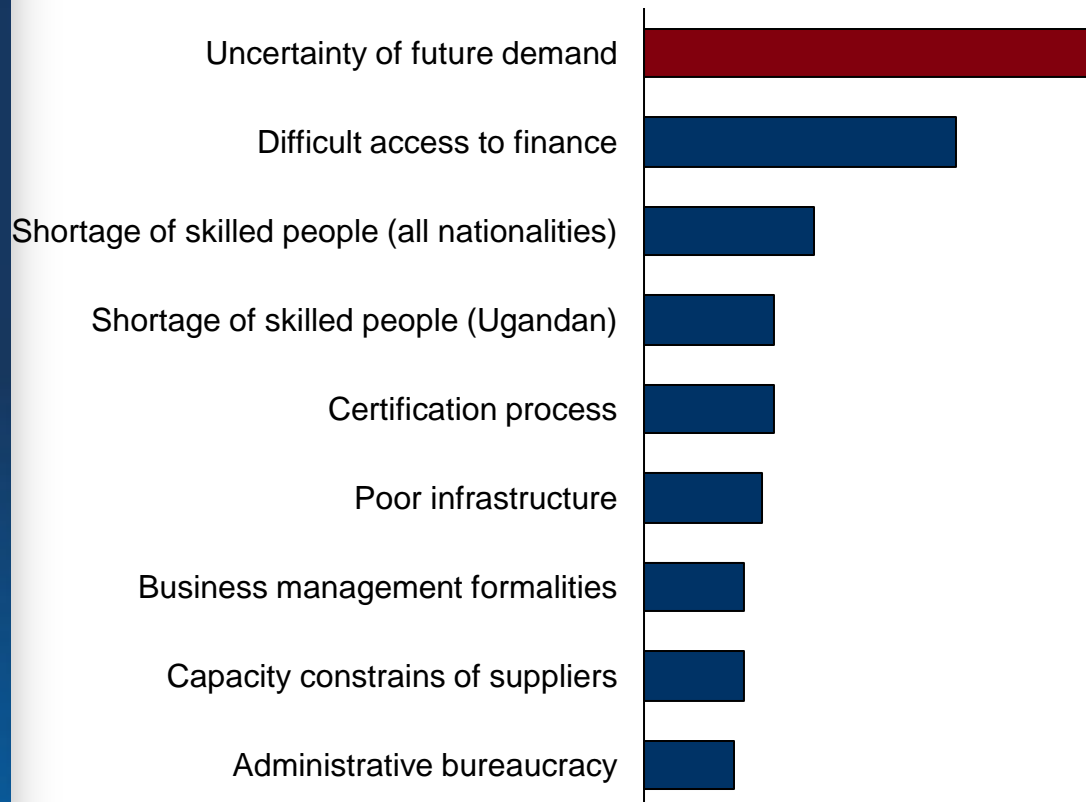


■ Ugandan
■ Non-Ugandan

The main barrier for growth within the furniture industry is uncertainty of future demand

BARRIERS FOR GROWTH

Relative importance given by companies



COMMENTS FROM COMPANIES

Based on interviews

- **Main barrier:**
 - Uncertainty of future contracts, payment capacity of the clients, and changes in specifications
- **Oil & Gas specific:**
 - More information on demand and standards required
 - Quality of furniture in Uganda is below the Oil & Gas standards
- **Other barriers:**
 - Difficult access to finance

Agenda

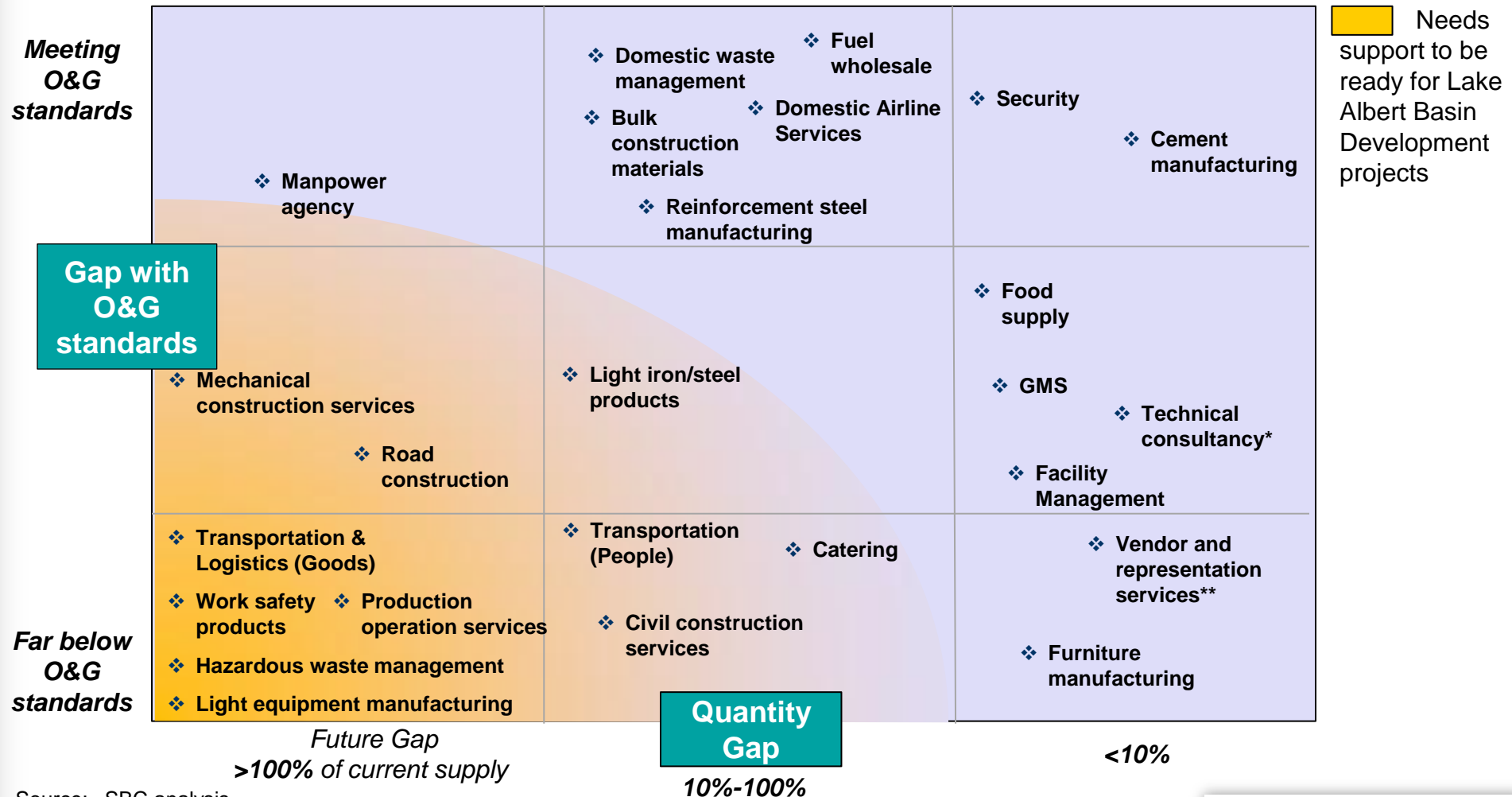
- | | |
|--|---------------|
| ▪ Introduction | 9:30 – 10:00 |
| • Survey's objective, scope of work, approach, methodology and general assumptions | |
| ▪ Manpower supply & demand analysis | 10:00 – 11:30 |
| • Future manpower requirements | |
| • Summary of education system analysis | |
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| ▪ Industry analysis – Q&A | 15:00 – 15:30 |
| ▪ Recommendations | 15:30 – 16:30 |
| ▪ Way forward | 16:30 – 17:00 |

Agenda

- | | |
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| ▪ Way forward | 16:30 – 17:00 |

The survey highlights industries whose capacity or compliance with O&G standards require future support

MAPPING OF INDUSTRIES REQUIRING FUTURE SUPPORT



Source: SBC analysis

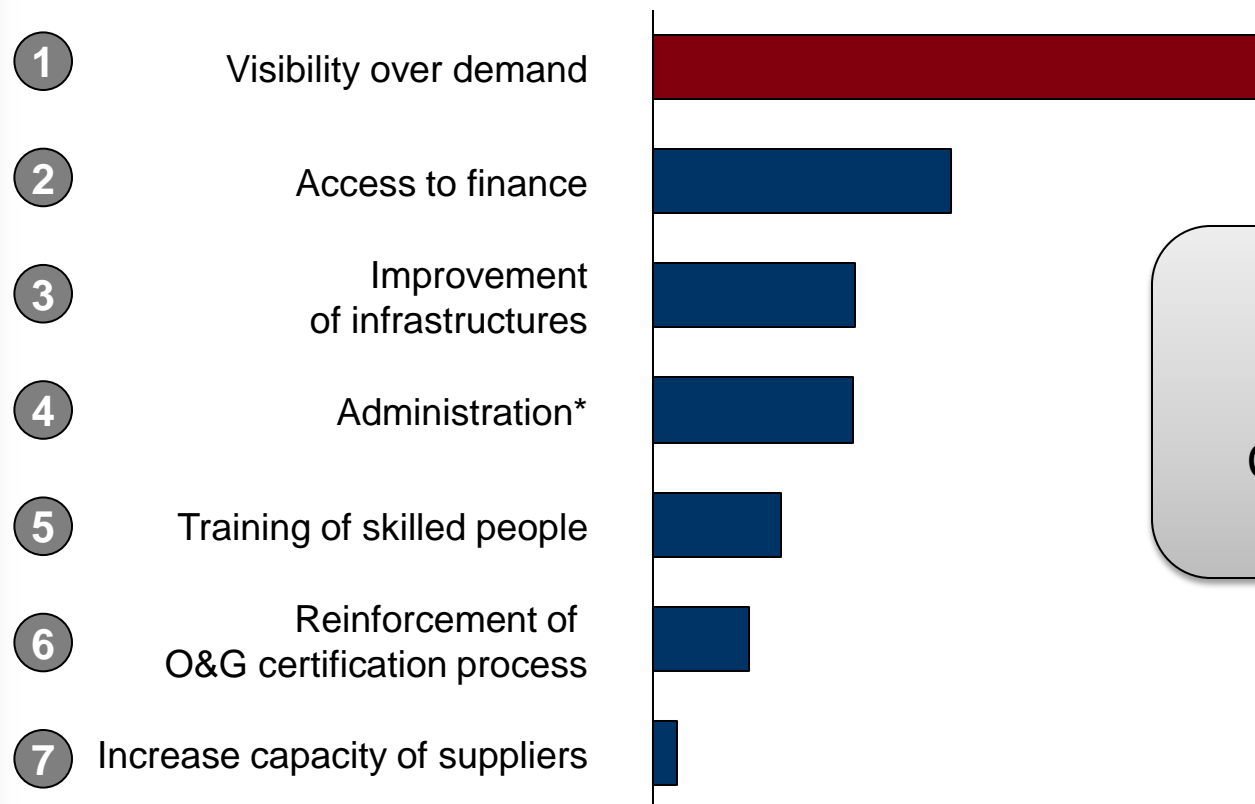
Note: Industries within quadrants are not evaluated relatively to each other

*Consultancy for land and boundary surveying activities, hydrologic surveying activities, projects involving civil engineering, hydraulic engineering, traffic engineering, water management projects, etc.

Ugandan companies call for clear and straightforward support

MAIN REQUIREMENTS REPORTED BY SUPPLIERS IN UGANDA

In descending order as per suppliers' answers



MAIN ISSUES TO BE
ADDRESSED FOR
ENHANCEMENT OF
CAPACITY BUILDING IN
UGANDA

Source: SBC analysis; Supply survey of Ugandan companies , 2013

Note: *Process of obtaining required approvals (safety, environmental, electricity installation, investment, etc.) from the public administration



Proposed way forward to support the O&G development in Uganda

HIGH LEVEL VIEW OF NATIONAL CONTENT INITIATIVES

Transversal initiatives

Target sectors initiatives

Support to Small and Middle Enterprises (SMEs)

1 Communicate oil & gas projects demand

2 Create an 'Industry enhancement Center'

3 Facilitate business relations:
• National Talent register
• National suppliers database

Support to large companies

4 Support specific sectors to develop Ugandan players:

- Production Operation Services (O&G GMC)
- Steel products (i.e. beams, scaffoldings)
- Hazardous waste mgt
- Protective Personal Equipment (PPE),
- Agriculture

Support to Education system

5 Support existing vocational and technical institutions

6 Support existing academic systems

7 Collaborate with educational institutions on job demand

8 Develop a vocational institute for disciplines unlikely to be supplied by the current system

Partners should communicate on future demand to prepare Ugandan suppliers for the projects



RATIONALE

Relative importance given by companies



DESCRIPTION

Event to launch the NC initiatives program

- Objectives
 - Communicate Lake Albert Basin Development project's high level demand for Manpower & Equipment
 - Share timeline of the projects
 - Present Local initiatives road map
- Actions
 1. Important forum in Kampala in Q4 2013
 - Large number of potential suppliers to invite
 - Professional associations (PSFU, UMA, AUOGS, UNABCEC,...), Banks, ...
 2. Regular smaller forums focused on specific sectors throughout the following months

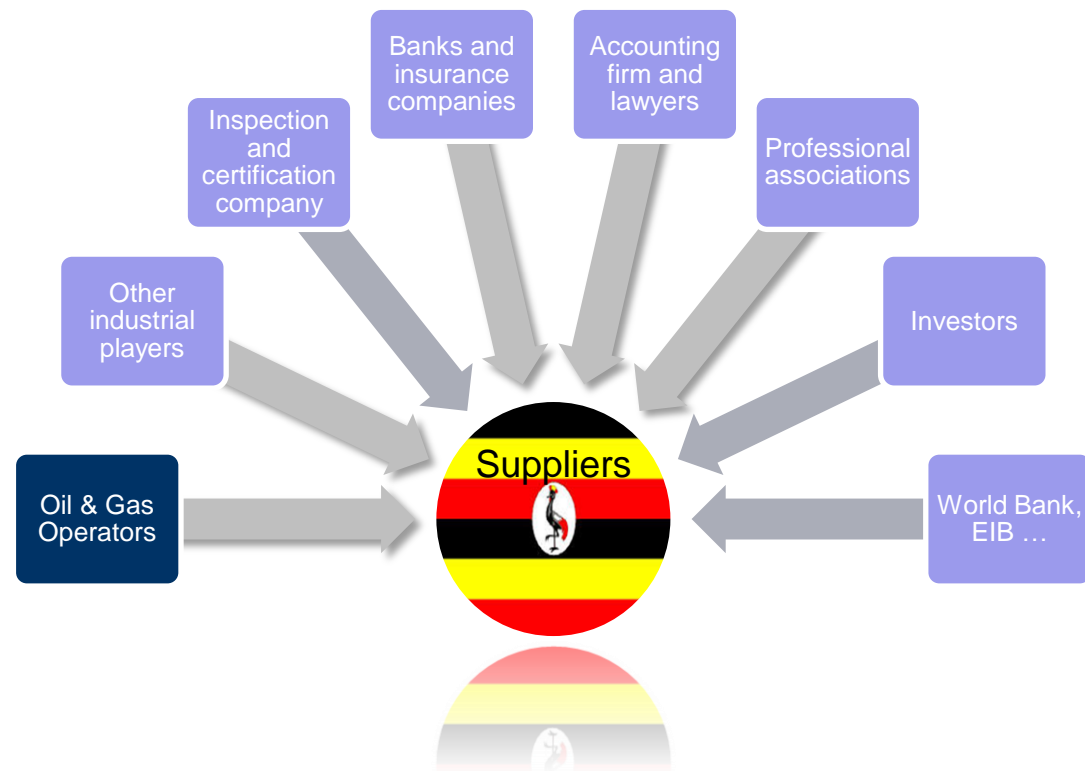
The Industry enhancement Center would assist Ugandan suppliers steer up their operations



DESCRIPTION

- Assist & coach enterprises on, e.g.:
 - Securing funding with investors
 - HSEQ and compliance standards
 - Accounting rules, P&L
 - Answering to a tender
 - Contractual clauses in large contracts
 - Business activity indicators
 - Technical standards

POTENTIAL ACTORS

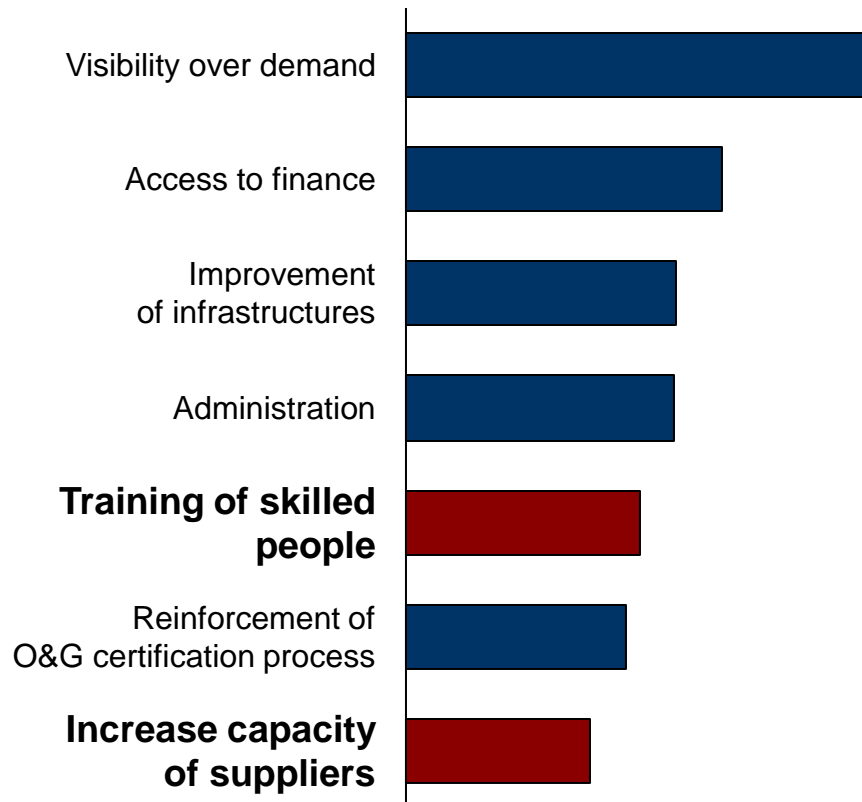


All suppliers and skilled workers should be registered



RATIONALE

Relative importance given by companies



Objectives

- Facilitate reemployment of trained workers and engineers after the construction phase
- Make demand and supply of skilled workers match
- Facilitate the sourcing of identified suppliers
- Encourage business connections between Ugandan companies

Tools to develop:

- Talent register to track availability of local skills
- Suppliers database to track availability of local suppliers

Support specific sectors with National content potential to develop Ugandan players



Reasons for development

Hazardous waste management



- ❖ Inadequate training
- ❖ Long certification process
- ❖ Lack of transportation/treatment infrastructure

Operations and maintenance services



- ❖ Currently, no services in Uganda
- ❖ Demand will reach 1000+ people
- ❖ Short training time to start work

Metal scaffolding



- ❖ Traditional bamboo/wooden scaffolding is not compliant with oil & gas standards
- ❖ Expanding market

Work safety products (PPE)



- ❖ Most of PPE imported
- ❖ Local PPE not up to standards
- ❖ Expanding market

Road safety



- ❖ number of road accidents is increasing every year
- ❖ Oil production will intensify traffic between Mombasa-Kampala-Hoima

Agriculture

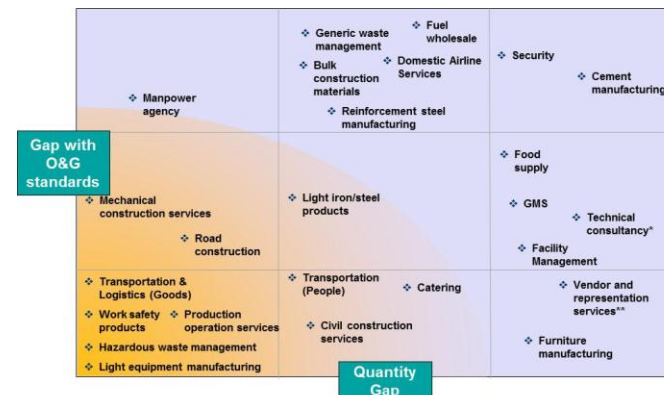


- ❖ Agriculture is the first employer in Uganda
- ❖ Unprepared increase in demand may have negative impact

Light equipment manufacturing



- ❖ Most of light equipment imported
- ❖ Only power cables produced locally
- ❖ Imported raw materials: aluminum, copper, plastics

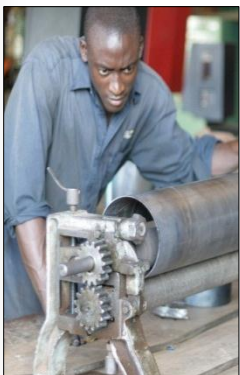


- ❖ Some products could be produced in the country with relatively small efforts
- ❖ Success of one/several industries will benefit local economy in the long run

Supporting the education system is important to ensure sustainability of Ugandan skills



UGANDA VOCATIONAL TRAINING CENTRE



REASONS FOR DEVELOPMENT

- Need to certify several hundreds of welders, machine operators and drivers
- Training needs for certain disciplines for O&G projects: mechanical technicians
- Need to support on-the-job practical training infrastructure

POSSIBLE ACTIONS TO ENSURE DEVELOPMENT

Min

- Finance scholarships
- Train the trainers
- Support the most advanced training institutions:
- Develop one or several technical and vocational training centres to provide the additional support required for the construction and the beginning of the operations phase

Max

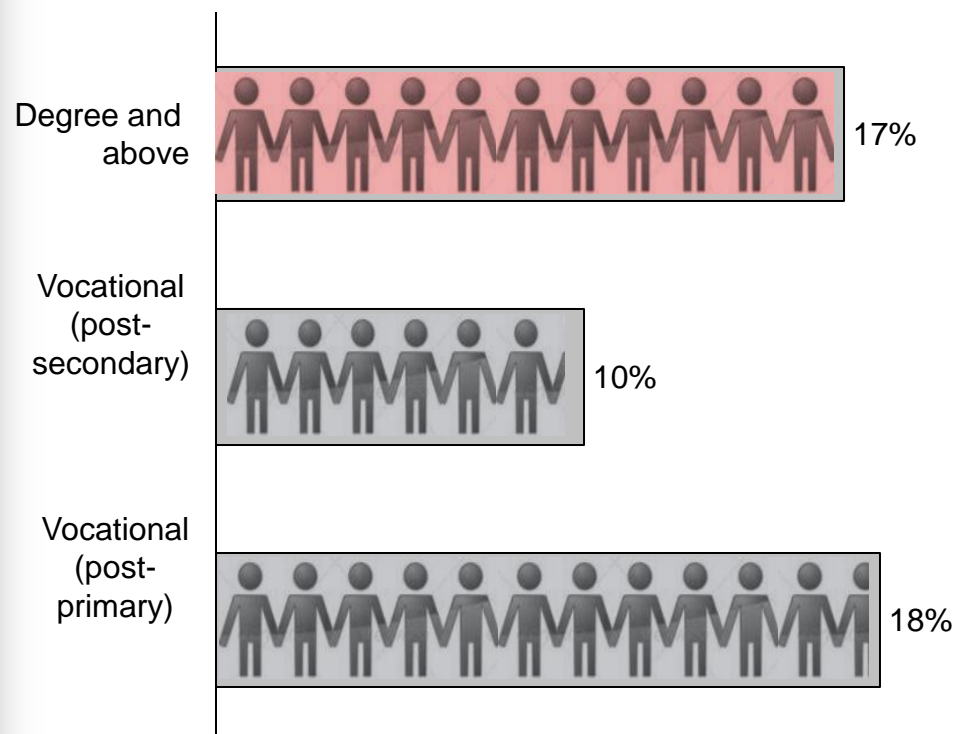


The partners should participate in career events in Uganda universities



YOUTH UNEMPLOYMENT BY EDUCATION

% of total youth unemployed, 2009/10



DESCRIPTION

Objectives

- Improve adequacy between the disciplines that students choose during their academic studies and the sectors that offer jobs
- Make the Oil & Gas industry attractive for young graduates
- Give visibility on demand (see initiative 1)

Actions

- Participate to career events in 2014 with a large panel of private industrial companies

Agenda

- | | |
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Way forward

- Submission of final report to PEPD before end of November 2013
- Review of the comments / input of the different ministries Q4/ 2013
- Presentation of the industrial base line survey to all other key stakeholders – Q1/ 2014
- Development of strategies for and implementation of IBS recommendations – in 2014

END – Thank you



- **Data sources**
- **Manpower - hypotheses on Supply & Demand**
- **Industry - hypotheses on Supply & Demand**
- **Detailed methodology of the IBS**

100+ meetings and interviews have been conducted

Companies visited/ interviewed

- Transportation (Goods) – 4
- Transportation (People) – 1
- Generic waste management – 2
- Manpower agency – 2
- Civil construction services – 2
- Cement manufacturing – 2
- Hazardous waste management – 1
- Technical consultancy – 2
- Facility management – 3
- Construction steel – 3
- Mechanical construction – 2
- Catering – 1
- Certification – 3
- Bulky material – 1
- Domestic airline – 1
- Retail – 1
- PPE – 2
- Road construction – 1
- Food supply – 1
- Security – 1
- Light iron/ steel products – 5
- Light equipment – 1
- Fuel wholesale – 2
- Banks – 2
- Other sectors - 2

Associations

- PSFU
- AUOGS
- UMA
- USSIA
- UNABCEC
- FUE
- Ugandan Insurers Association

Education

Universities

- Makerere University
- Kyambogo University

Technical Institutes

- Nakawa Vocational Institute
- UPIK

Government - Education

- BTVET (and UGAPRIVI)
- MOES
- DIT
- NCHE
- NCDC
- UIPE

Oil companies

CNOOC
TOTAL
TULLOW

Embassies

- French Embassy
- Chinese Embassy

International organizations

- World Bank
- UN

Governmental bodies

- UBOS
- UIA

Supply survey results

- ~200 filled questionnaires returned



200 questionnaires received for the IBS (1/4)

LIST OF COMPANIES SURVEYED

Companies		
24-7 CARS LIMITED	BEIJING CONSTRUCTION	China Petroleum Engineering & Construction
A&M EXECUTIVE CLEANING SERVICES CO. LTD	BELMAR	CIVICON LIMITED
Abu baker Technical Services	BEMUGA FORWARDERS LTD	CNOOC Energy Technology & Services-HR
ADAPT TECHNICAL SERVICES LIMITED	BIMCO Consult Limited	COLAS East Africa Ltd
ADEN Remote Site Limited	BIN IT Services Limited	Contracts Consultancy Limited
AGILITY LOGISTICS LIMITED	Bio waste Management(U)Ltd	Corimec Italiana SpA
AGS FRASERS	BOLEX LTD	COWI LTD
AIR SERV	BOLLORE AFRICA LOGISTICS LTD	Crown Worldwide (China) Co. Ltd
AIR WATER EARTH LTD	BUILD AND REST (U) LTD	DAMCO LOGISTICS UGANDA LTD
ALLTERRAIN SERVICE (Uganda)l td.	Bwik Petroleum Ltd.	DB SCHENKER
AMZAR TRADING & SERVICES	CABLE CORPORATION LIMITED	DESBRO (U) LTD
ARAMEX UGANDA LIMITED	CADG Middle East JLT	DESIGNiT Ltd
ASSOCIATED CONSULTING SURVEYORS	CARE MISSION WATER SERVICES	DHL GLOBAL FORWARDING
ATACAMA CONSULTING	Cargostore International Limited	Dott Services Ltd
ATACO FREIGHT SERVICES LIMITED	Catering International & Services Uganda Ltd.	Eagle Air
Atlas Technologies LTD	CEMENTERS UGANDA LIMITED	EAGLE LOGISTICS SOLUTIONS LIMITED
AWAKA LIMITED	CETS Optimus Logistics (U) Limited	EAST AFRICAN CRANES Ltd.
BABCON UGANDA LTD	CHALLENGER UGANDA LIMITED	East African Petroleum Services Ltd

200 questionnaires received for the IBS (2/4)

LIST OF COMPANIES SURVEYED

Companies		
Eco & Partner Consult Limited	Green Hope Uganda	Joshi Electrical & General Services
ELECTRICAL EXCELLENCE LTD	GREEN LABEL	JUA KAALI
Engineering Solutions (U) Limited	GREENFIELDS UGANDA LIMITED	Kampala Aeroclub and Flight training Centre Ltd
EPSILON UGANDA LIMITED	HALCONS LTD.	Kampala Executive Aviation Ltd
Equator Catering Ltd	HAS SERVICES	KASESE NAIL & WOOD INDUSTRY LIMITED
ES-KO SERVICES LIMITED	HEIGHTS UGANDA LIMITED	KELTRON DEVELOPMENT SERVICES LTD
EXCEL CONSTRUCTION LTD	HERTON CONCEPTS LTD	KENFREIGHT (U) LTD
EXPAT AFRICA PAYROLL LIMITED	HERTZ	KENLLOYD LOGISTICS LTD
FARM ENGINEERING INDUSTRIES LTD.	HI- TECH METAL INDUSTRIES LIMITED	Kentz (Pty) Ltd
FIRE AND SAFETY APPLIANCES LTD	HIMA CEMENT LIMITED	KIBANYI & SONS COMPANY LTD
FIRE MASTERS LTD	Inspecta (A) Ltd	KK SECURITY (U) LIMITED
FRENAH SAFET & SECURITY (PTY) LTD	INTEGRATED FIRE & SAFETY SOLUTIONS LTD.	KKATT CONSULT
Fundi Facilities Management(U) Ltd	Integrated Logistics Services Limited	KLAB INVESTMENTS LTD
G4S Secure Solutions (Uganda) Limited	Intercar Uganda Limited	KLEAN SERVICES LTD
GCC Services Uganda LTD	IOTA SA	KWATAMPORA WORKSHOP LTD
GENTEX ENTERPRISES LTD.	JAFFER FREIGHTERS LTD	MacDonald Energy Consultants Limited
GLOBE TROTTERS LTD	JAKOBU ENTERPRISES LIMITED	MALAYSIA FURNISHING CENTRE
GOTINO CONSTRUCTION SPECIALIST LTD	JIEMKE LTD.	MANSONS UGANDA LIMITED

200 questionnaires received for the IBS (3/4)

LIST OF COMPANIES SURVEYED

Companies		
Master Wood Investment Limited	NLS WASTE SERVICES LTD	PROCURE SERVICES LIMITED
MBW Consulting Ltd	OILFIELD SERVICES LTD	PRONAL SA
MECHTOOLS AND EQUIPMENT LTD.	ORACLE ENGINEERING LIMITED	PROTECTORATE S.P.C. (U) LIMITED
Mectron Technical Services Limited	PANCON ENGINEERS LIMITED	Provide International Limited
MINERAL SERVICES LIMITED	Pax Mondial Africa Ltd.	QUANTUM ASSOCIATES
MOTORCARE UGANDA LTD	PAX TRANSPORT	Quarry Consult
MPH Global Services	PEARL ENGINEERING COMPANY LTD	Richflo Lift Services Limited
MULTILINES EAST AFRICA LIMITED	People Performance Group (PPG	ROI ENGINEERING SERVICES LIMITED
Multilines International Ltd	Petro city Enterprises Ltd	ROKO CONSTRUCTION LTD.
Multiplex limited	Philling Environmental Ltd	ROOFINGS LIMITED
Muraa Investments And General Contractors Ltd	PILOT INTERNATIONAL (www.pilot-int.org)	SA FIELD (U) LTD
N.C.BEVERAGES LTD	PINNACLE SECURITY LIMITED	Sabre Safety Limited
NALUGOM LTD	Pioneer Construction	Safety & Business Centre Ltd
NEWREST UIS LTD.	Plawaste Recycling Company Limited	SARACEN UGANDA LIMITED
NFT Consult	POWER ARRANGERS	Savimaxx Limited
Nicontra Limited	PRIMEFUELS UGANDA LTD	SEMLIKI RIFT TRADING COMPANY
NIGETS LIMITED	PRO RIDE LIMITED	SGS Uganda Limited
Nina Interiors Ltd	PROCLEAN SERVICES LIMITED	SIGNCARE LTD

200 questionnaires received for the IBS (4/4)

LIST OF COMPANIES SURVEYED

Companies		
Silver Tours and Logistics Ltd	TECHNICAL MASTERS LTD	UGANDA BAATI LIMITED
Skeda engineering limited	TEMBO STEELS	Uganda Gatsby Trust
SPARTASEC LIMITED	Terrain Plant Limited	United Safety
Spear Motors Ltd	TGS Water Limited	Utrade Company Limited
SPECIALISED TECHNICAL SERVICES LIMITED	The Red Apple Ltd	Victoria Engineering Ltd
SPECIALISED WELDING SERVICES	THREEWAYS SHIPPING SERVICES(GROUP)LTD	Water Environment & Geo Services Limited
SPEDAG INTERFREIGHT UGANDA LIMITED	TIAN TANG GROUP	Weld-Con Limited
Steel and Tube Industries Ltd.	TORORO CEMENT LIMITED	WESTERN CABLE CO LTD
Sterling	TOTAL Uganda Limited	Whitelines Services
STRATEGIC LOGISTICS Ltd.	TROPICAL HEAT UGANDA LIMITED	Yamasec Limited
Sumadhura Technologies Ltd	TTB INVESTMENTS LTD	
Taho Enterprises Limited	Turner & Townsend	

Meetings and interviews conducted (1/4)

LIST OF COMPANIES AND INSTITUTIONS INTERVIEWED

Company/Institution	Interviewee	Position	Date
Alam Group (Casements, Oxy Gas, and Steel Rolling Mills Ltd)	Mr Das	Alam Group Financial Director	15 June, 2013
A&M Executive Cleaning Services	Lydia Munyaneza / Nelson Mulli	Executive Director / Marketing Director	6 June, 2013
AUOGS	Prof. Charles Kwesiga / Denis Kamurasi / Bob Kabonero / Omar Mayanja / Jeff D. Bihamaiso-Baitwa / Capt Tony Rubombora / Ben Mugasha / Sabiiti Jonan / Bernard Opio / Richard Magezi	Members of AUOGS	30 April, 2013
Bin It Services Ltd	Otori Aggrey Kinyera	Chief Operations Officer	6 June, 2013
BOLLORE	Patrick Katayi / Dolores Biamou	MD / O&G manager	8 May, 2013
British Lloyds	Stewart Anderson / Andrew Davies	Country Manager / Training Manager	20 June, 2013
Bureau Veritas	Henry Mitegyeko Ntaro	Managing Director	10 June, 2013
Civicon	Jason Horsey	Managing Director	11 June, 2013
Crestanks	Ajay Sharma	Business Development Manager	11 June, 2013
Doshi Group	Vinubhai Prajapati	Marketing Manager	13 June, 2013
Eagle Air	Tony Rubombora	Chief Executive Officer	17 June, 2013
Eastern Africa Petroleum Services	Patrick Kimbaleeba	Director	21 June, 2013
Epsilon	Moses Kitaka	Manager	7 June, 2013
Equator Catering	Peter Bowser / Georgie Moore	Director / Operations Manager	12 June, 2013
French Embassy	Gaultier Brand-Gazeau	In charge of SMEs development	30 April, 2013



Meetings and interviews conducted (2/4)

LIST OF COMPANIES AND INSTITUTIONS INTERVIEWED

Company/Institution	Interviewee	Position	Date
G4S	Martin Mungai	Business Development Manager	18 June, 2013
GCC Services Uganda LTD	Ibrahim Idi / Mohammad Mousa	Deputy Country Manager / Facilities Engineering Manager	7 June, 2013
Green Hope Uganda	Paul Serwada	Director	6 June, 2013
Heights Uganda	Mathias Kamugasho	Managing Director	19 June, 2013
Hima	Patrick Mugenyi	Commercial Manager	28 May, 2013
Keltron	Warom Wilbert	Operations Manager	6 June, 2013
MBW consulting	Wayne Slack	Director	5 June, 2013
Mechtools	Mitesh Raichura	Chief Executive Officer	11 June, 2013
MSL Logistics	Edward Kabuchu	-	21 June, 2013
NFT consult ltd	Elizabeth Ntege	Director	11 June, 2013
ORTEC	Stephane Bouisset	Managing Director	8 May, 2013
People Performance Group (PPG)	Helen O'flinn, Daniel Balaba, Moses Mosing	Country Mgr, Sales Mgr, Mgr Outsourcing	11 June, 2013
Quantum Associates	Dennis Kamurasi	Owner	22 May, 2013
Quarry Consult Limited	George Kyaligonza, Kwebiiha James	Chief Executive Officer / Administrator	14 June, 2014
Roofings	Stuart Jason Mwesigwa	Business Development Manager	29 May, 2013
Safety & Business Centre	Nobert Jiga	Director	18 June, 2013
SGS Uganda	Joseph Mugula	Operations and Quality Supervisor	11 June, 2013

Meetings and interviews conducted (3/4)

LIST OF COMPANIES AND INSTITUTIONS INTERVIEWED

Company/Institution	Interviewee	Position	Date
Specialised Technical Services	Florence Nyika	Managing Director	7 June, 2013
Tembo Steels	Anand Kedia	Chief Executive Officer	5 July, 2013
Threeways Shipping	Jeff Baitwa	Chief Executive Officer	14 June, 2013
Tororo Cement	Alok Kala	Chief Marketing Manager	27 June, 2013
Total Uganda	Ada Eze	Managing Director	15 July, 2013
Tropical Heat	Subhash Raval	General Director	20 June, 2013
UBOS	John B. Musoke/ Dorcas Nabukwasi / Simon Kyewalyanga	Statisticians	2 & 14 May, 2013
Uganda Investment Authority	Albert Ouma	In charge of SMEs	29 April, 2013
Uganda Manufacturers Association	Sebagala Kigozi / Nico Mugira	Executive director / Board member	8 May, 2013
Uganda National Building and Civil Engineering Contractors	Gumisiriza Birantana	Chairman	9 May, 2013
Uganda Small Scale Industries Association	John Walugembe	Executive Secretary/ CEO	2 May, 2013
Uganda Insurers Association	Mariam Magala	Chief Executive Officer	25 June, 2013
Whitelines Group	Oscar Ofumbi	Managing director	5 June, 2013
World Bank	Luke Jordan	Finance and Private Sector Development	21 May, 2013

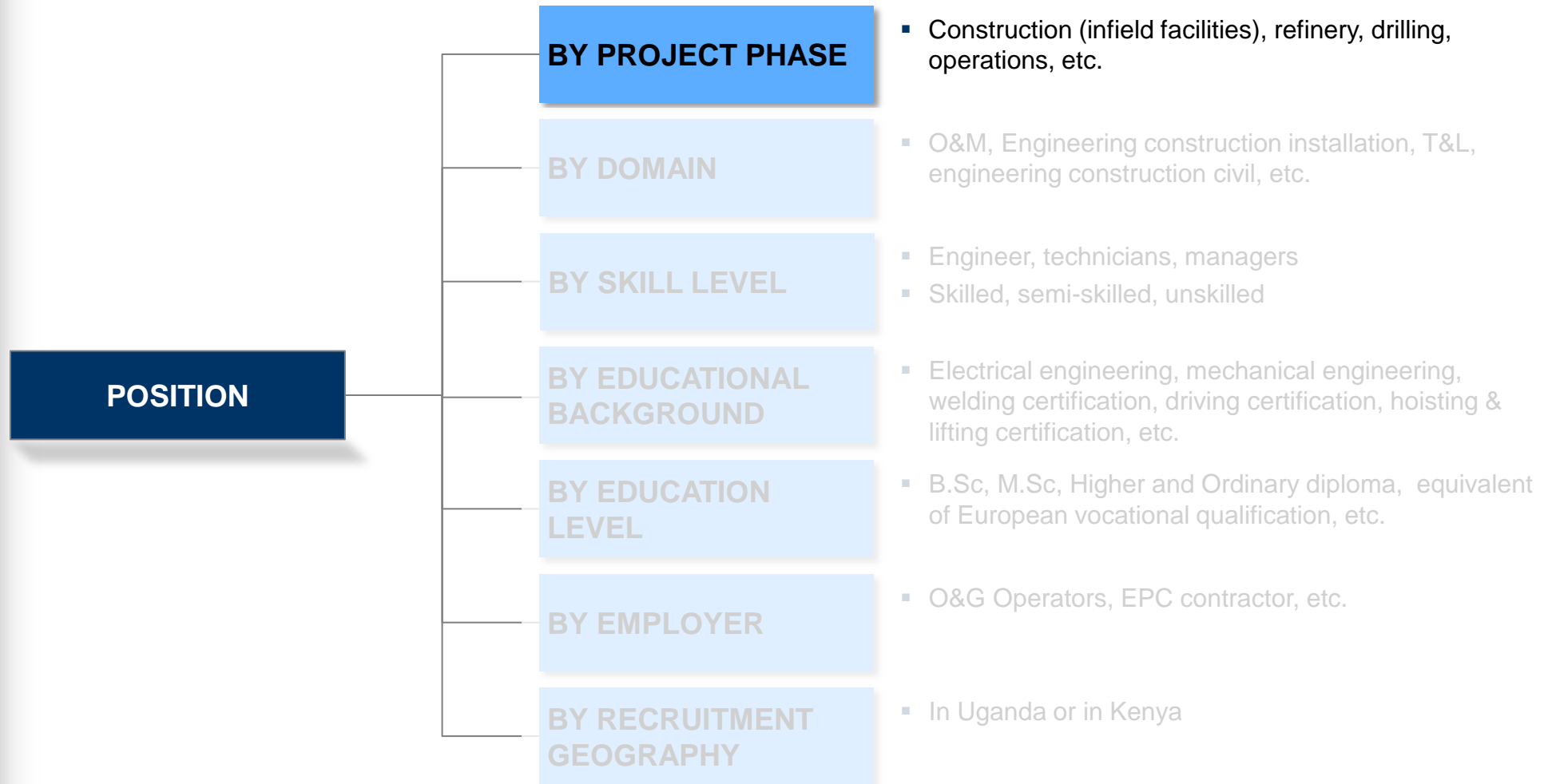
Meetings and interviews conducted (4/4)

LIST OF INTERVIEWS IN THE EDUCATIONAL SECTOR

Company/Institution	Interviewee	Position	Date
BTJET	Sarah Namuli-Tamale / Ilahi Mansoor	Assistant Commissioner	17 May, 2013
Directorate of Industrial Training	Francis Okinyal	Commissioner	16 May, 2013
Kyambogo University	Daudi Mugisa	Acting Dean, Faculty of Engineering	5 June, 2013
Makerere University	T. Otim / Eng Bagampadde / Erasmus Barifaijo	Engineering College Registrar / Dean Engineering / Ass Prof Natural Sciences (Geology)	5 June, 2013
Ministry of Education and Sports	Godfrey Arnold Dhatemwa	Commissioner- Education	15 May, 2013
Nakawa Vocational Institute	Mr Mubiru	Deputy Principal Training	4 June, 2013
National Council for Higher Education	Yeko W Acato	Assistant Executive Director	14 May, 2013
Total E&P Uganda	Audrey Giacomini	Education & Vocational Training Program Coordinator	12 April, 2013
Tullow Oil Uganda	Nelson Ofwono	Local Content Manager	12 April, 2013























Manpower demand over the entire period of Lake Albert project was analyzed along several segments

ASSUMPTIONS ON MANPOWER SEGMENTATION



The three Partners have provided data to assess the Lake Albert projects' demand in people, material and equipment

DATA SOURCES FOR DEMAND FOR LAKE ALBERT PROJECT

Segments	Manpower		Raw material		Equipment	
Drilling						
Construction						
Operations			--			
Export pipe						
Refinery (construction)						
Refinery (operations)			--		--	

Hypothesis – Explanations by phase

■ Construction (infield facilities):

- Source: Spie Capag and revised by Total
- Infield facilities include:
 - 3 CPFs, operational camps, temporary camps, water intake facilities, pumping stations, well pads, above ground installations
- Construction of infield facilities starts with KF and KT followed by BS and BN
- Kaiso Tonya and Kingfisher manpower estimated based on extrapolation coefficients
- “Stick built” approach to construction to be adopted, as opposed to “modularization” approach

Hypothesis – Explanations by phase

■ Export pipe construction:

- Source: CNOOC and TOTAL
- ~30% Ugandan and ~70% Kenyan based on the length of export pipe
- Graph for Export pipe manpower excludes Kenyans
- ~600m of pipeline installation per day
- 3 crews required for construction
- Duration assumptions:
 - Mobilization and infrastructure: 9 months
 - Construction on site: 18 months
 - Final test and commissioning: 9 months

■ Refinery construction:

- Source: CNOOC
- CNOOC provided the overall manpower needed for construction
- Splits determined by analogy with CPF construction manpower (Spie Capag) with 2 phases:
 - Phase 1: Earth works and civil works
 - Phase 2: Building & Structure, Equipment installation, Piping works, E&I works

Hypothesis – Explanations by phase

■ Drilling:

- Source: Total
- Drilling manpower needed from day 1 considering office support for drilling
- ~80 people per rig for 40 positions
- 9 rigs at peak (2018 – 2020)
- ~ 670 wells in total

■ Transportation:

- Source: LADPG
- Manpower based on the number of trucks, trailers, and buses required
- 1.2 drivers required per truck/bus
- 1 traffic coordinator per 10 drivers
- Graph excludes Kenyans
- 60% of drivers of trailers for equipment coming from Mombasa port are Kenyan

Hypothesis – Explanations by phase

■ Production operation:

- Source: Tullow, Total (GAPI), and Total EP Uganda
- 6 months of mobilization before production starts
- Operation starts with KT followed by KF then BS then BN
- Manpower required primarily to:
 - Operate CPFs serving four distinct areas (BS, BN, KT and KF)
 - Conduct well intervention and workover
 - Monitor reservoir during production operations
- 2018-2023: 2 workover units and 2 well intervention units required
- 2023-2030: 4 workover units and 5 well intervention units required

■ Export pipe operations:

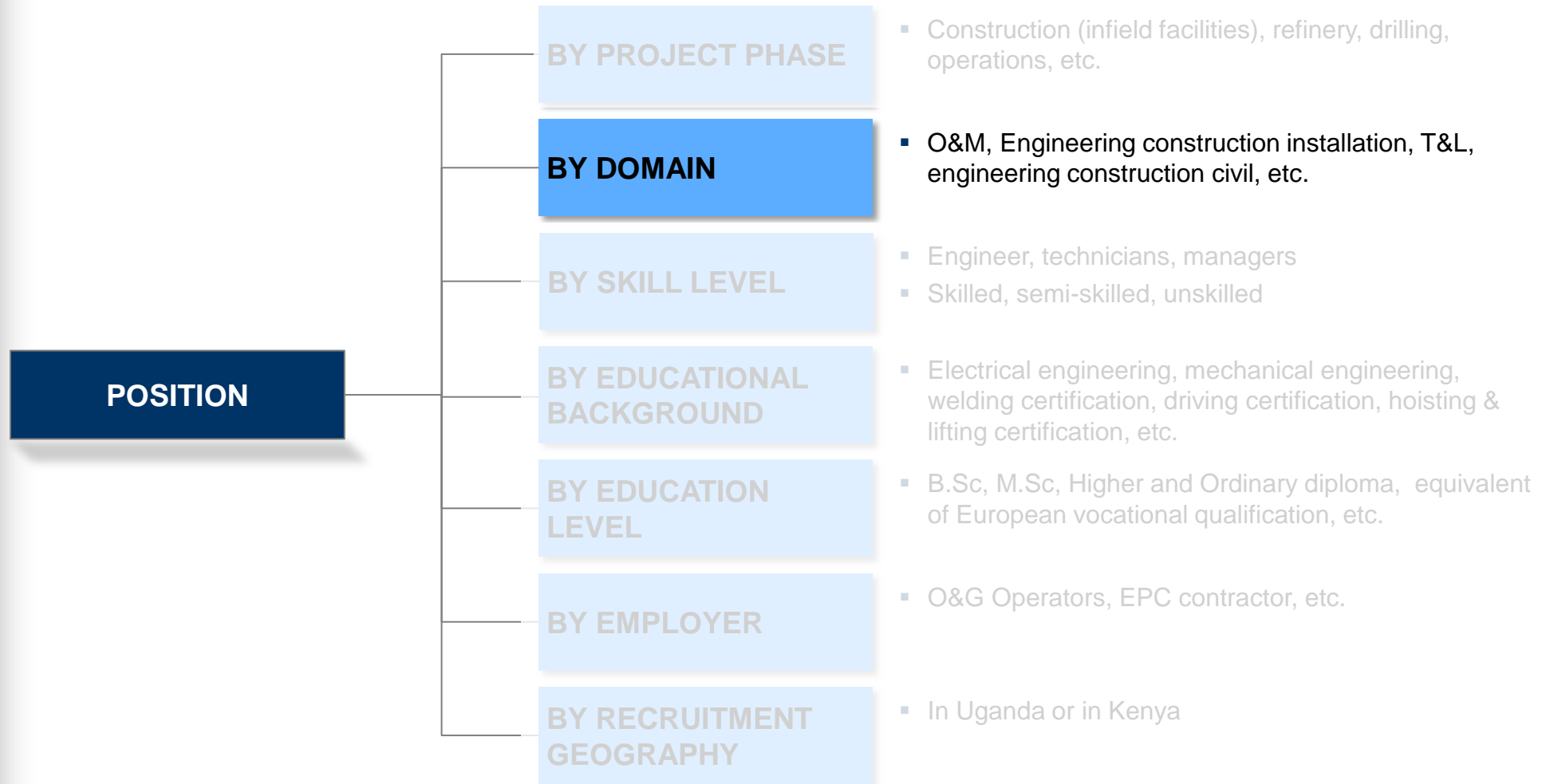
- Source: discussion with O&G partners / was not assessed by LADPG and GAPI
- ~200 people for export pipe operation (indicative estimation)
- No distinction between Kenyan and Uganda personnel

■ Refinery operation:

- Source: Total
- 30 kbpd capacity (as a reference)

Manpower demand over the entire period of Lake Albert project was analyzed along several segments

ASSUMPTIONS ON MANPOWER SEGMENTATION (CONTRACTORS AND OPERATORS)



Hypothesis – Explanations by domain

- **Well intervention (all types):**

- Includes work over unit, slick line unit, coiled tubing unit, snubbing unit. Hired by drilling specialist contractor

- **Drilling rig crew:**

- All personnel required for drilling operations. Hired by O&G operators and rig contractors

- **Engineering, civil:**

- Includes managers, engineers, technicians, and unskilled people providing civil construction services. Hired by EPC contractor

- **Engineering, installation:**

- Mainly includes managers, engineers, technicians, and unskilled people providing mechanical construction services. Mainly hired by EPC contractor

- **Domestic services:**

- Includes manpower for catering and facility management. Mainly hired by other contractors and EPC contractor

- **Office support:**

- Includes support staff in offices like planners and contract managers. Mainly hired by O&G operators and EPC contractor

Hypothesis – Explanations by domain

- **Transportation & Logistics:**

- Includes drivers of trucks and buses and traffic coordinators. Mainly hired by EPC contractor and other contractors

- **Security services:**

- Includes security guards for facilities and export pipe. Hired by O&G Operators, EPC contractor, and other contractors

- **Reservoir & Geoscience:**

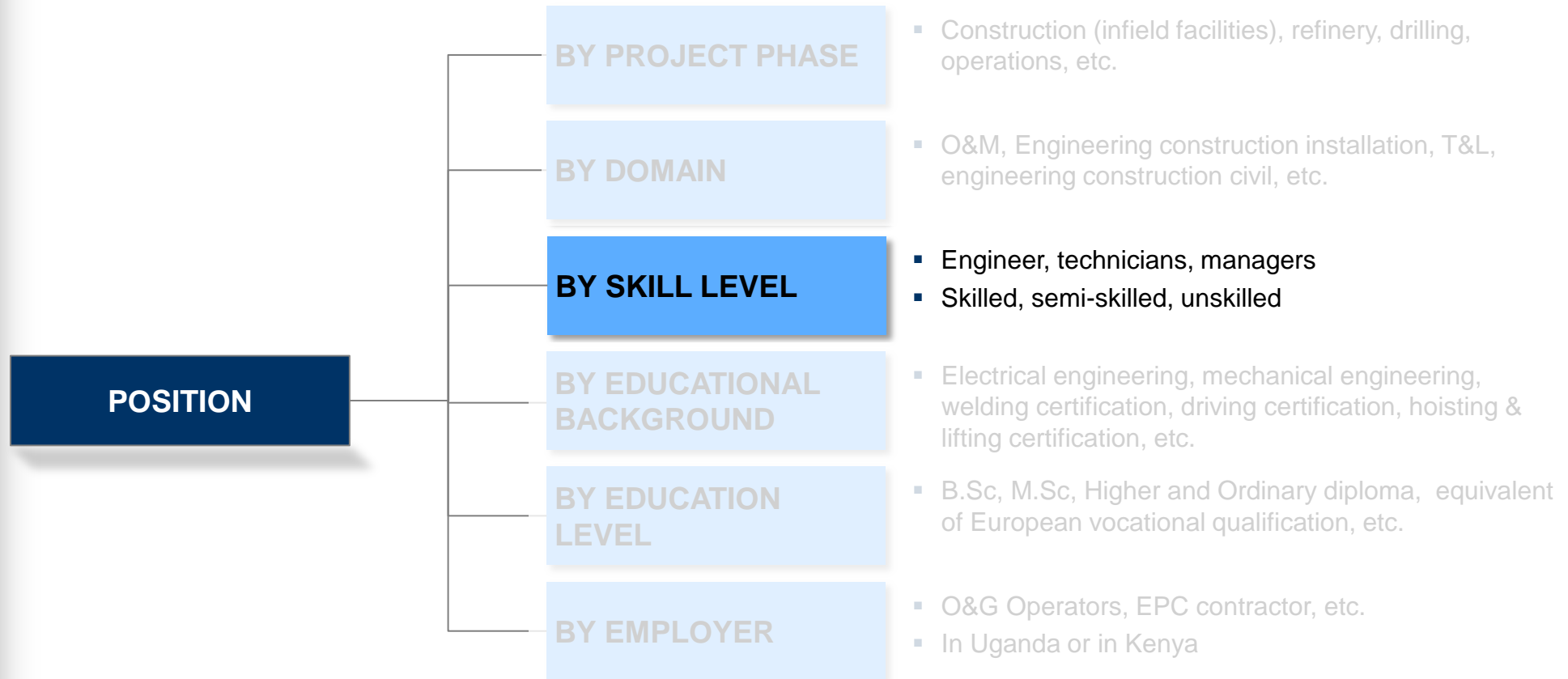
- Includes geologists, geophysicists, etc. Hired by O&G Operators

- **Operation & maintenance:**

- Includes production planners, production technicians, inspectors, maintenance supervisors, etc. Hired by O&G Operators or contractors

Manpower demand over the entire period of Lake Albert project was analyzed along several segments

ASSUMPTIONS ON MANPOWER SEGMENTATION (CONTRACTORS AND OPERATORS)



Hypothesis – Explanations by skill level

Terms used in the graph on SKILL LEVEL

‘Managers and Engineers or equivalent’

= SKILLED

Definition given by the O&G partners:

“Are managers, workers or people possessing special skills or knowledge usually attained/acquired through specialized training. In other words – skilled workers have a certain skill set necessary to work in a specialised field e.g. Chemists, Architects, Physicians , Auto mechanics...”

‘Technicians or equivalent’

= SEMI SKILLED

Technicians or equivalent includes drivers, craftsmen, electrical technicians, mechanical technicians...

“Usually workers who have trade or craft skills e.g. drivers, carpenters, welders, cooks, and security guards. Often, semi-skilled jobs require a minimum degree of formal training and language skills prior to commencement of employment”

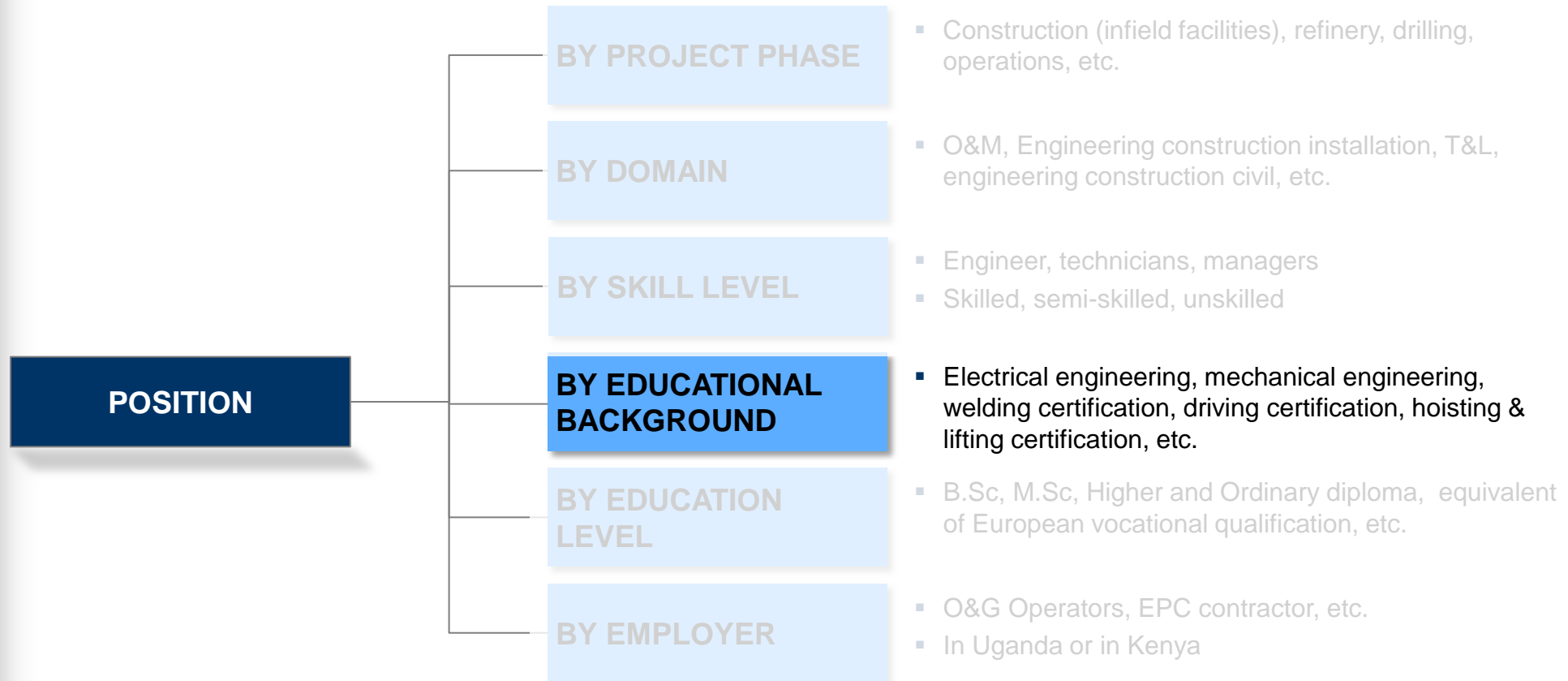
‘Unskilled people’

= UNSKILLED

“Usually performing work that does not require formal skills, language skills, training or education to perform effectively (e.g. cleaners, loaders, trench diggers, line cutters, etc.)”

Manpower demand over the entire period of Lake Albert project was analyzed along several segments

ASSUMPTIONS ON MANPOWER SEGMENTATION (CONTRACTORS AND OPERATORS)



Hypothesis – Explanations by education background

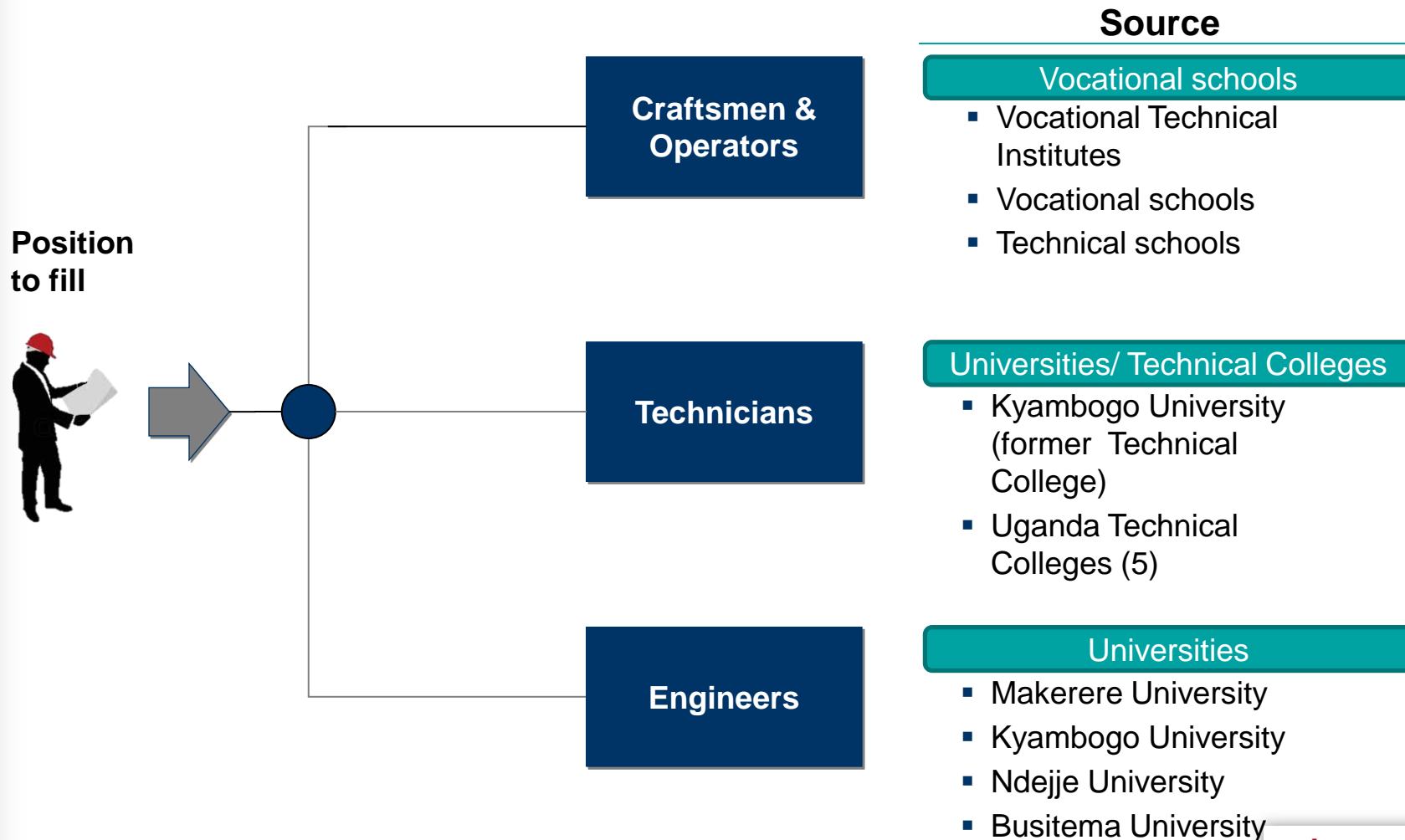
- Education background segmentation from discussions with Total and Tullow
- **“Other certifications” background:**
 - Includes driving (heavy duty and passengers trucks), welding (pipes), welding (plate), hoisting and lifting, and machine operators
- **“Non-technical” education:**
 - Educational background other than engineering.
 - Example: Finance, Legal, ...
- **“Not required” background:**
 - Unskilled labor
 - Example: Security guards, ...

Hypothesis – Explanation for key certifications

- **Approach:**
 - List of certifications provided by Total
 - Required positions mapped with required certification
 - Validation of certification mapping with Tullow
- **“Craftsman certification” certification:**
 - Certification for civil craftsman

There are three main sources for fresh graduates in Uganda

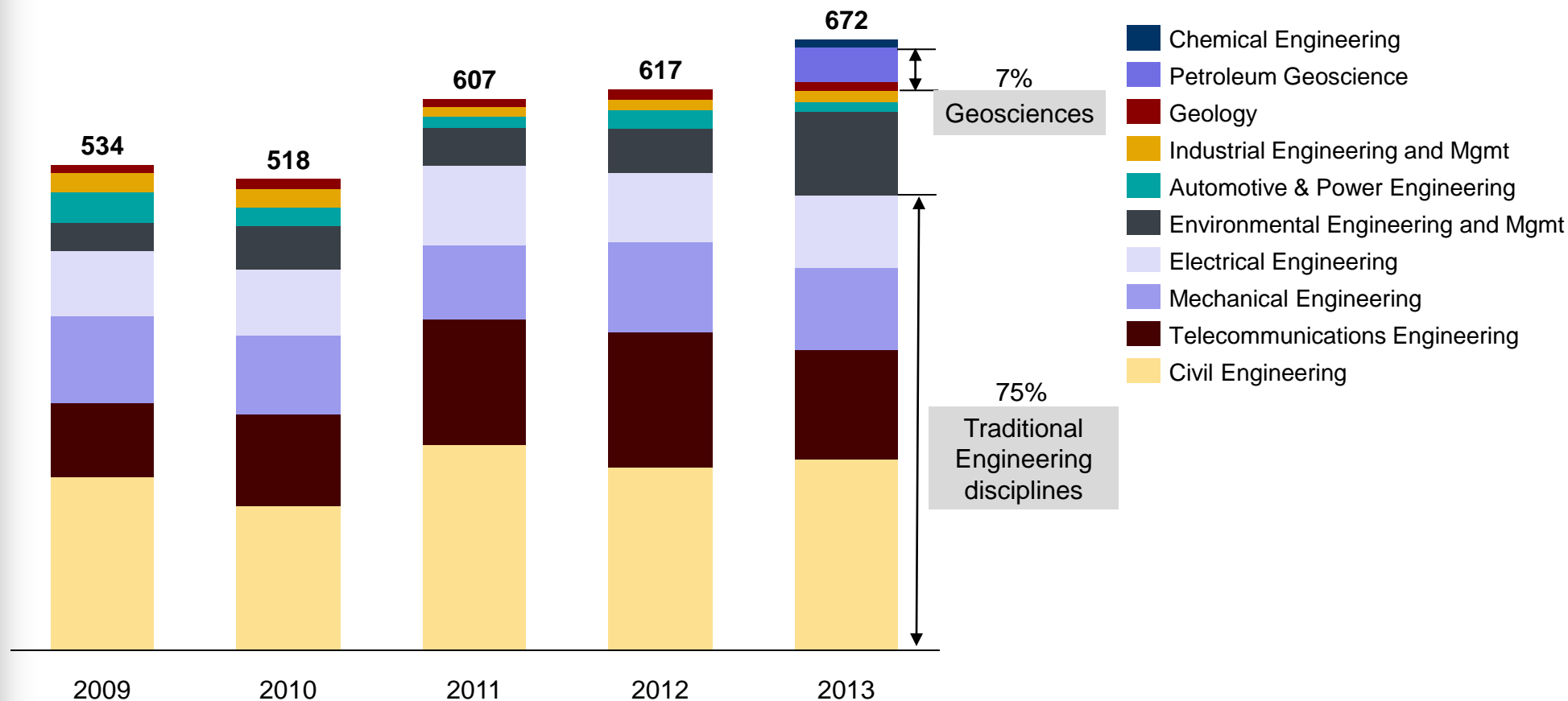
RECRUITMENT SOURCES BY JOB TYPE



500-700 Engineering and Geoscience students graduate annually from recognized universities

MANPOWER SUPPLY BY EDUCATION FRESH GRADUATES ENGINEERING & GEOSCIENCE

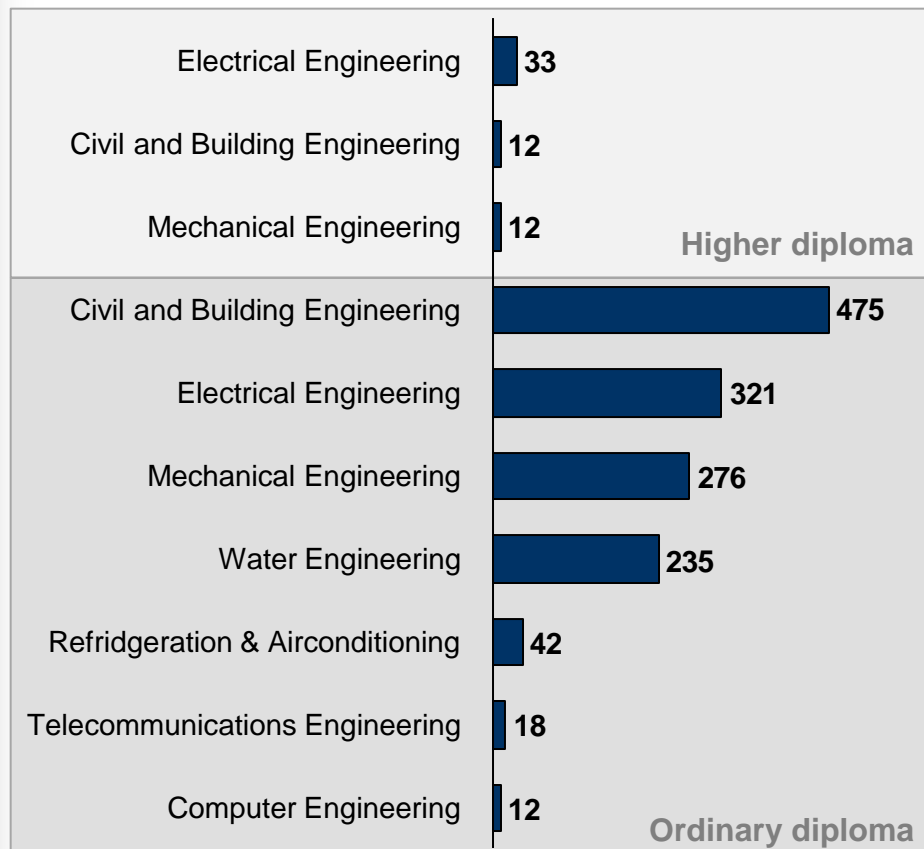
Number of new graduates from Makerere, Kyambogo, Ndejje, Busitema



Over 1,400 technicians and 7,000 craftsmen graduate from formal educational institutions in Uganda annually

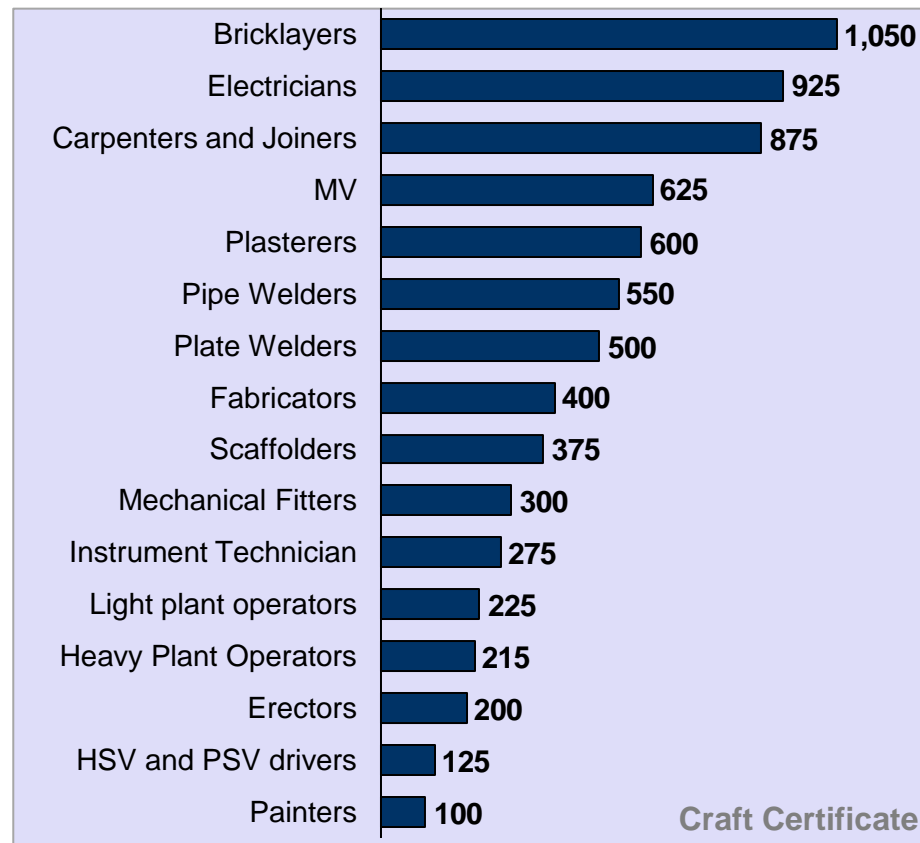
TECHNICIANS IN UGANDA*

Number of new graduates, 2012



CRAFTSMEN IN UGANDA*

Number of new graduates, 2012



Source: SBC Analysis, Kyambogo University, Tullow Oil/Department of Industrial Training (DIT)
 Note: Supply of Craftsmen and categorisation by Tullow Oil and DIT; Categorisation has been redefined



A number of key measurement units based on certain assumption group were identified for each industry - example

INDUSTRY DECOMPOSITION INTO MEASUREMENT UNITS

FOR DISCUSSION



Industry	Measurement units	Key Assumptions*
1. Transportation & Logistics (Goods)	<ul style="list-style-type: none"> Trailers for equipment Trucks for bulky material Trucks for food Value of imported equipment 	<ul style="list-style-type: none"> Trucks for bulky material capacity – 15m3 Trailer for equipment capacity – 20 tons Truck for food – 20 tons Rotation time for MSA - 15 days , for Uganda – 7 days
2. Transportation (People)	<ul style="list-style-type: none"> Buses for local transfers (daily) Buses for long haul transfers (weekly) 	<ul style="list-style-type: none"> Capacity of daily bus - 30 people, Capacity of regional bus - 40 people 25% of manpower will require regional rotation via bus
3. Bulky materials	<ul style="list-style-type: none"> Sand Aggregate (gravel) Gypsum 	<ul style="list-style-type: none"> Composition of bulky material is 24% of sand, 48% of gravel, 10% of gypsum of total aggregated bulk material (remainder is cement)
4. Road construction	<ul style="list-style-type: none"> Length of non-paved roads Length of paved roads 	<ul style="list-style-type: none"> Gravel roads built along connection pipelines from well pads to CPF Paved road built from Hoima to Buliisa area (240 km)
5. General maintenance services	<ul style="list-style-type: none"> Required manhours for General maintenance services 	<ul style="list-style-type: none"> 20% of Operation & Maintenance («O&M») domain personnel – reminder is «Production Operation Services»
6. Light iron/steel products	<ul style="list-style-type: none"> Structural steel Tank (flat) steel 	<ul style="list-style-type: none"> Demand is inferred from construction details on CPF and refinery

Source: SBC analysis

Note: *Only key assumptions are presented. For an exhaustive list of assumptions, consult the main excel model

A number of key measurement units based on certain assumption group were identified for each industry (2/5)

INDUSTRY DECOMPOSITION INTO MEASUREMENT UNITS

FOR DISCUSSION



Industry	Measurement units	Key Assumptions*
7. Civil construction services	<ul style="list-style-type: none"> Number of civil engineers Number of civil technicians 	<ul style="list-style-type: none"> Demand can be inferred based on manpower (engineers and technicians)
8. Mechanical construction services	<ul style="list-style-type: none"> Number of mechanical engineers Number of mechanical technicians 	<ul style="list-style-type: none"> Demand can be inferred based on manpower (engineers and technicians)
9. Cement manufacturing	<ul style="list-style-type: none"> Quantity and type of cement required 	<ul style="list-style-type: none"> Cement is 18% of total weight of bulky materials Cement density is 3000 kg/m3
10. Reinforcement steel manufacturing	<ul style="list-style-type: none"> Quantity of reinforcement steel 	<ul style="list-style-type: none"> 100% steel required for reinforcement (80 kg per m3 of concrete) produced in Uganda
11. Light equipment manufacturing	<ul style="list-style-type: none"> No applicable 	<ul style="list-style-type: none"> Not applicable

Source: SBC analysis

Note: *Only key assumptions are presented. For an exhaustive list of assumptions, consult Appendix

A number of key measurement units based on certain assumption group were identified for each industry (3/5)

INDUSTRY DECOMPOSITION INTO MEASUREMENT UNITS

FOR DISCUSSION



Industry	Measurement units	Key Assumptions*
12. Generic waste management	<ul style="list-style-type: none"> Solid waste Liquid waste (grey+dark water) Cutting (water base mud - WBM) 	<ul style="list-style-type: none"> Solid waste generation 1.15kg per person per day Dark Water generation 20 liters per day per person Grey water generation 49.8 liters per day per person WBM cuttings per well - 30% of all cuttings 280 tons of cuttings per well
13. Fuel wholesale	<ul style="list-style-type: none"> Fuel for rigs Fuel for transportation (goods and people) 	<ul style="list-style-type: none"> Rig fuel consumption – 1200 liters/day Truck fuel consumption – 20 liters per 100 km
14. Manpower agency	<ul style="list-style-type: none"> Demand for unskilled people 	<ul style="list-style-type: none"> 100% unskilled people employment managed by external manpower agencies
15. Work safety products	<ul style="list-style-type: none"> Quantity of protective clothing and apparel 	<ul style="list-style-type: none"> All personnel involved in construction required regular replacement of PPE; other personnel requires a unique purchase of PPE Replacement is done every 6 month years (3 months for coveralls)
16. Furniture manufacturing	<ul style="list-style-type: none"> Number of people working on site and living in temporary and permanent camps 	<ul style="list-style-type: none"> 100% of furniutre demand generated the by needs of living camps

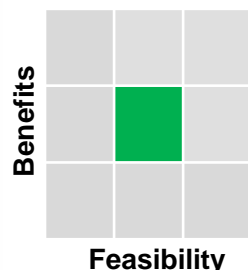
Source: SBC analysis

Note: *Only key assumptions are presented. For an exhaustive list of assumptions, consult Appendix

A number of key measurement units based on certain assumption group were identified for each industry (4/5)

INDUSTRY DECOMPOSITION INTO MEASUREMENT UNITS

FOR DISCUSSION



Industry	Measurement units	Key Assumptions*
17. Vendor and representation services	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Not applicable
18. Hazardous waste management	<ul style="list-style-type: none"> Drilling cuttings (oil base mud – OBM) 	<ul style="list-style-type: none"> OBM cuttings per well - 70% of all cuttings 280 tons of cuttings per well
19. Technical consultancy	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Not applicable
20. Food supply	<ul style="list-style-type: none"> Amount of food required Amount of drinking water required 	<ul style="list-style-type: none"> 2 kg of food per person per day 2 liters of water per person per day
21. Domestic Airline Services	<ul style="list-style-type: none"> Number of flights from Kampala to Buliisa area 	<ul style="list-style-type: none"> 50% of personnel are on flight rotations 1 roundtrip per day 20 people per aircraft Itinerary: Kampala – Buliisa area
22. Production operation services	<ul style="list-style-type: none"> Manhour required for production operation services 	<ul style="list-style-type: none"> 80% of Operation & Maintenance («O&M») domain personnel – remainder is General Maintenance Services

Source: SBC analysis

Note: *Only key assumptions are presented. For an exhaustive list of assumptions, consult Appendix

A number of key measurement units based on certain assumption group were identified for each industry (5/5)

INDUSTRY DECOMPOSITION INTO MEASUREMENT UNITS

FOR DISCUSSION

Industry	Measurement units	Key Assumptions*
23. Facility Management	<ul style="list-style-type: none"> Number of people working for facility management on site 	<ul style="list-style-type: none"> 20% of Domestic Services («DS») domain personnel – before first oil, 80% - after first oil
24. Site safety and security	<ul style="list-style-type: none"> Number of security guards 	<ul style="list-style-type: none"> Security guards definition excludes managerial positions in security services
25. Catering	<ul style="list-style-type: none"> Number of people to working for catering services on site 	<ul style="list-style-type: none"> 80% of Domestic Services («DS») domain personnel – before first oil, 20% - after first oil



Source: SBC analysis

Note: *Only key assumptions are presented. For an exhaustive list of assumptions, consult Appendix

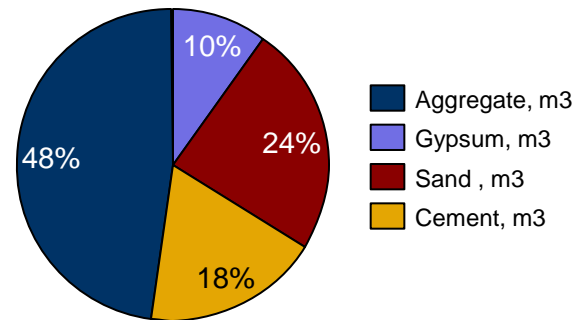
We took an assumption that the split of bulky materials will be similar for Construction, Export Pipe and Refinery construction

ASSUMPTIONS ON VOLUMETRIC RAW MATERIALS SEGMENTATION

DRILLING

- Calcium carbonate required for drilling mud
- Only import, no procurement in Uganda

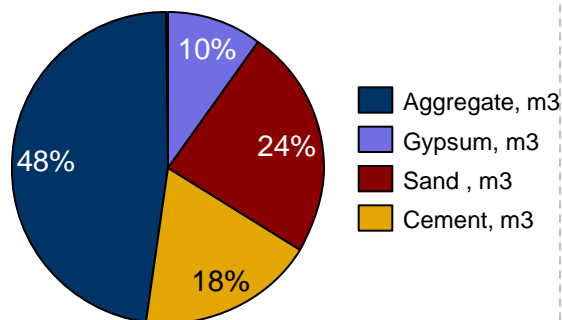
CONSTRUCTION (infield facilities)



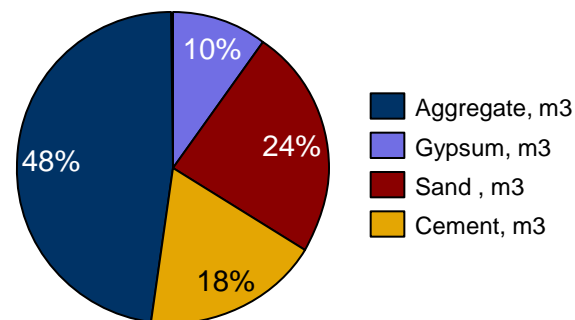
OPERATIONS

- Only minor quantities

EXPORT PIPE (pumping stations)



REFINERY - CONSTRUCTION



REFINERY - OPERATIONS

- Only minor quantities

Source: Discussion with Partners; data on demand provided by CNOOC, Total and Tullow; SpieCapag report (page 26 and 37)

Consolidated equipment required was split into a limited number of major categories for each phase of development

ASSUMPTIONS ON EQUIPMENT (MANUFACTURING) SEGMENTATION

DRILLING

- Tubular (Conductor, 13-3/8", 9-5/8", Tubing Screens, Tubular Accessories)
- Tangibles (Bits, Well head and trees, Other including soap, ropes & dopes)
- Consumables (Mud Chemical, chemical additives)

CONSTRUCTION (infield facilities)

- **Construction steel**
- **Flat steel**
- Pipe steel
- **Reinforcement steel**
- **Electrical and Instrumentation equipment**
- Machinery and heavy equipment

OPERATION

- Pumps and spares
- Motors and spares
- Chemicals (demulsifier, corrosion Inhibitor, scale inhibitor)

EXPORT PIPE

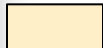
- Pumping stations
- Pipe steel
- Pipe material

REFINERY - CONSTRUCTION

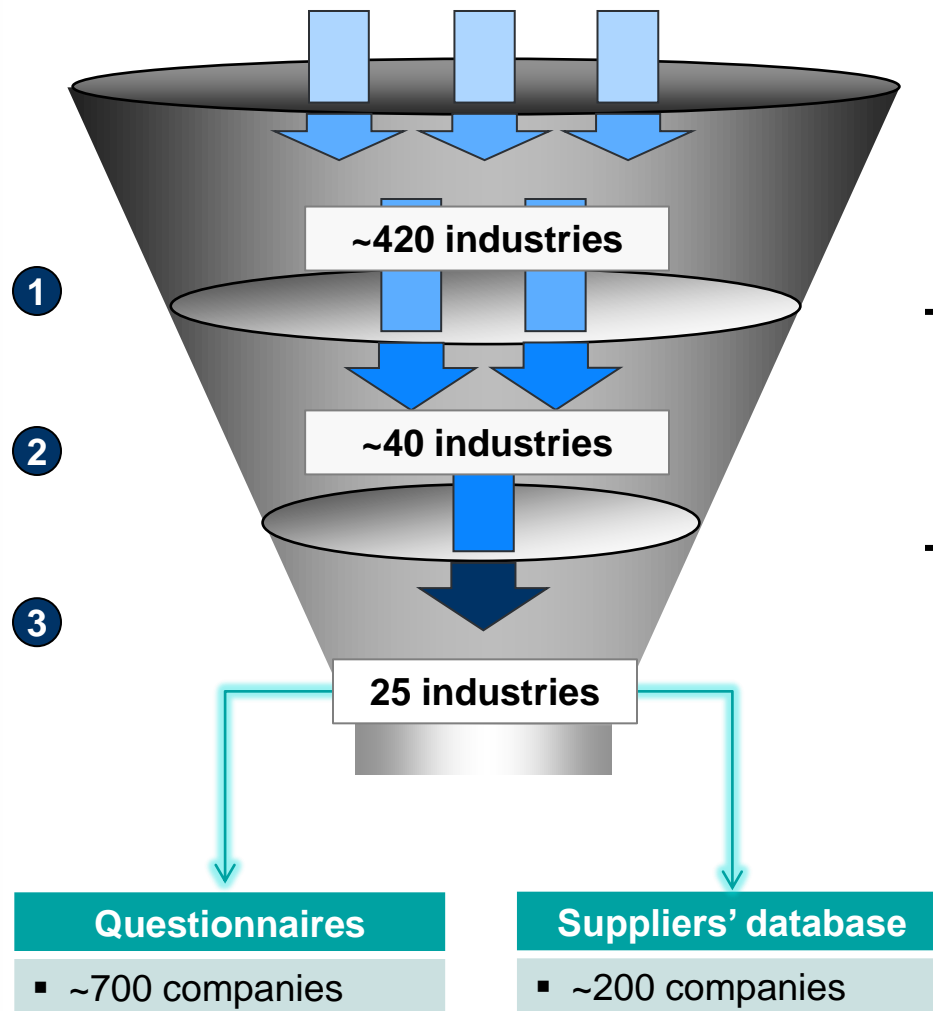
- **Construction steel**
- **Flat steel**
- Pipe steel
- **Reinforcement steel**
- **Electrical and Instrumentation equipment**
- Construction support machines

REFINERY - OPERATION

- None

 Could be sourced in Uganda

Local companies with high potential for National Content industries were surveyed in details



Initial list of industries

- Exhaustive list of industries (UN stats)
- International classification used by UBOS

Target list of industries

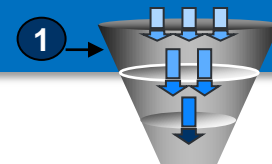
- O&G direct and indirect industries*
- Industries widely recommended for National Content

Industries with high potential for National Content

- Industry evaluated along Feasibility and Benefits
- Only highly beneficial and feasible industries passed further

Note: Initial list of industries was sources from UN Statistics Division, ISIC Revision 4
* based on the detailed value chain of O&G activities

A list of target industries was deduced by picking O&G related and 'Local Content must-have' industries



PROCESS OF TARGET INDUSTRY LIST COMPOSITION

 **International Standard Industrial Classification of All Economic Activities, Rev.4**
United Nations Statistics Division

- **A** - Agriculture, forestry and fishing
 - 01 - Crop and animal production, hunting and related service activities
 - 02 - Forestry and logging
 - 03 - Fishing and aquaculture
- **B** - Mining and quarrying
 - 05 - Mining of coal and lignite
 - 06 - Extraction of crude petroleum and natural gas
 - ★ 07 - Mining of metal ores
 - 08 - Other mining and quarrying
 - 09 - Mining support service activities
- **C** - Manufacturing
 - ★ 10 - Manufacture of food products
 - 11 - Manufacture of beverages
 - 12 - Manufacture of tobacco products
 - 13 - Manufacture of textiles
 - 14 - Manufacture of wearing apparel
 - 15 - Manufacture of leather and related products
 - 16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
 - 17 - Manufacture of paper and paper products
 - 18 - Printing and reproduction of recorded media
 - 19 - Manufacture of coke and refined petroleum products
 - 20 - Manufacture of chemicals and chemical products
 - 21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations
 - 22 - Manufacture of rubber and plastics products
 - 23 - Manufacture of other non-metallic mineral products
 - 24 - Manufacture of basic metals
 - 25 - Manufacture of fabricated metal products, except machinery and equipment
 - ★ 26 - Manufacture of computer, electronic and optical products
 - 27 - Manufacture of electrical equipment
 - 28 - Manufacture of machinery and equipment n.e.c.
 - 29 - Manufacture of motor vehicles, trailers and semi-trailers
 - 30 - Manufacture of other transport equipment
 - 31 - Manufacture of furniture
 - 32 - Other manufacturing
 - 33 - Repair and installation of machinery and equipment
- **D** - Electricity, gas, steam and air conditioning supply
 - 35 - Electricity, gas, steam and air conditioning supply
- **E** - Water supply; sewerage, waste management and remediation activities
 - 36 - Water collection, treatment and supply
 - 37 - Sewerage
 - ★ 38 - Waste collection, treatment and disposal activities; materials recovery
 - 39 - Remediation activities and other waste management services
- **I** - Information and communication
 - 58 - Publishing activities
 - 59 - Motion picture, video and television programme production, sound recording and music publishing activities
 - 60 - Programming and broadcasting activities
 - 61 - Telecommunications
 - 62 - Computer programming, consultancy and related activities
 - 63 - Information service activities
- **K** - Financial and insurance activities
 - 64 - Financial service activities, except insurance and pension funding
 - 65 - Insurance, reinsurance and pension funding, except compulsory social security
 - 66 - Activities auxiliary to financial service and insurance activities
- **L** - Real estate activities
 - 68 - Real estate activities
- **M** - Professional, scientific and technical activities
 - 69 - Legal and accounting activities
 - 70 - Activities of head offices; management consultancy activities
 - 71 - Architectural and engineering activities; technical testing and analysis
 - 72 - Scientific research and development
 - 73 - Advertising and market research
 - 74 - Other professional, scientific and technical activities
 - 75 - Veterinary activities
- **N** - Administrative and support service activities
 - 77 - Rental and leasing activities
 - 78 - Employment activities
 - 79 - Travel agency, tour operator, reservation service and related activities
 - ★ 80 - Security and investigation activities
 - 81 - Services to buildings and landscape activities
 - 82 - Office administrative, office support and other business support activities
- **Q** - Public administration and defence; compulsory social security
 - 84 - Public administration and defence; compulsory social security
- **P** - Education
 - 85 - Education
- **Q** - Human health and social work activities
 - 86 - Human health activities
 - 87 - Residential care activities
 - 88 - Social work activities without accommodation
- **R** - Arts, entertainment and recreation
 - 90 - Creative, arts and entertainment activities
 - 91 - Libraries, archives, museums and other cultural activities
 - 92 - Gambling and betting activities
 - 93 - Sports activities and amusement and

ILLUSTRATIVE

List of target industries

O&G direct and indirect industries

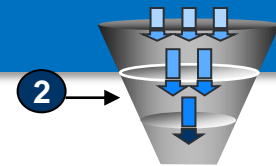
- ★ Civil construction
- ★ Cement
- ★ Waste mgmt.
- ★ etc.

"LC must have" industries

- ★ Cleaning
- ★ Security
- ★ Food supply
- ★ etc.

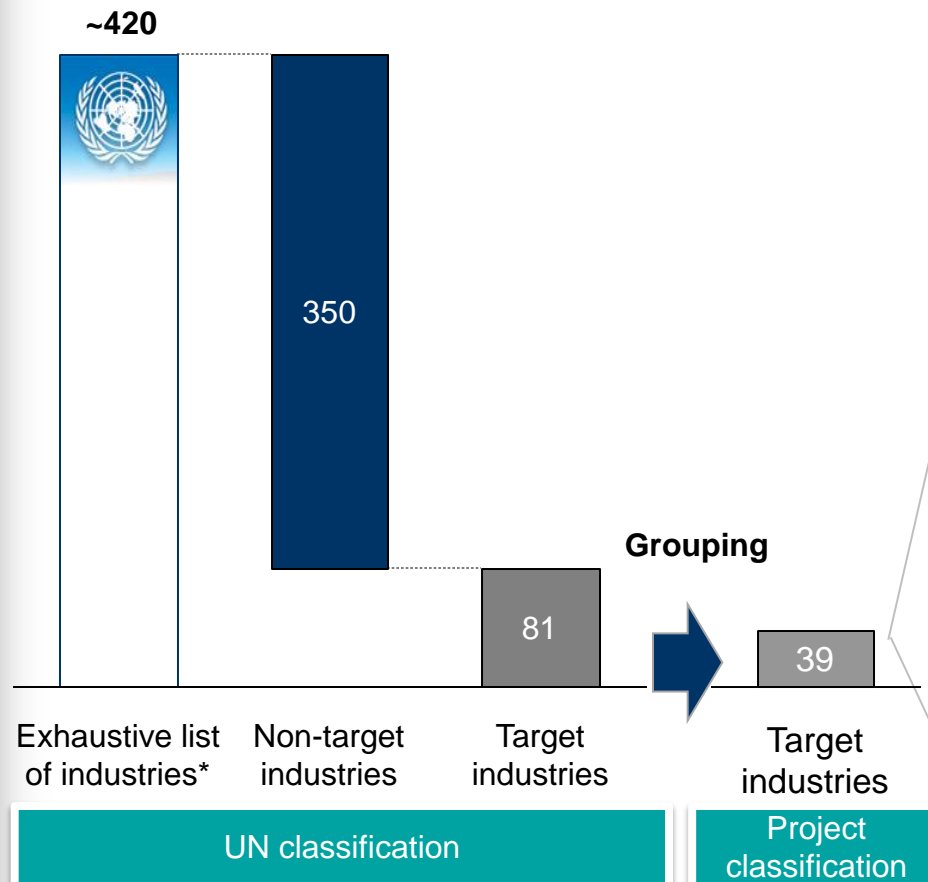


Target list consists of 39 industries related to O&G direct and indirect activities or considered as 'LC must-have'



FROM PRELIMINARY TO TARGET INDUSTRY LIST

Number of industries, order of magnitude



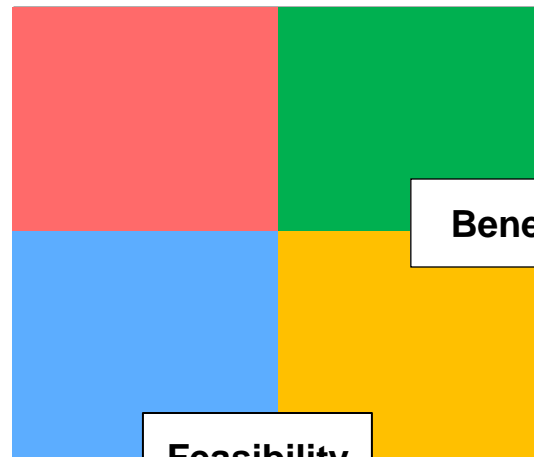
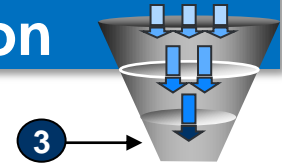
List of target industries

1. Bulky construction materials
2. Catering
3. Cement additives
4. Cement manufacturing
5. Civil construction services
6. Civil project engineering
7. Construction steel
8. Domestic Airline Services
9. Drilling equipment
10. Drilling services
11. Drilling supplies
12. Engineering consultancy
13. Facility Management
14. Fertilizer
15. Food supply
16. Fuel wholesale
17. Furniture manufacturing
18. General maintenance
19. Generic waste mgmt
20. Hazardous waste mgmt
21. Light equipment manufacturing
22. Light steel manufacturing
23. Machinery and heavy equipment manufacturing
24. Manpower agency
25. Mechanical construction
26. O&G specific emergency services
27. Oil/Water pipe installation
28. Oilfield chemicals
29. Oilfield equipment manufacturing
30. Oilfield services
31. Petrochemical
32. Pipe steel
33. Production operation services
34. Road construction
35. Site safety and security
36. Transportation & Logistics (Goods)
37. Transportation (People)
38. Vendor and representation services
39. Work safety product manufacturing

Source: UN Statistics Division; SBC analysis

Note: * at Classes level (Level 4) of the UN stats classification

The industries retained were ranked along the benefits they offer and the feasibility of their implementation



Benefits

Feasibility

- **Number of new jobs generated**

- Based on creation of new positions driven by Oil & Gas activity
- Estimated as “Low” (<1000) or “High” (>1000) over the lifetime of the entire project

- **Average skill level requirements from employee**

- Used as a proxy to estimate industries added value
- Estimated as “Unskilled”, “Semi-skilled” and “Skilled” based on the definition agreed by Partners

- **CAPEX intensity**

- Based on CAPEX requirements to build/develop industry to meet the Oil&Gas standards
- Estimated as “Low” (<\$100M) or “High” (>\$100M)

- **Capability ramp-up time**

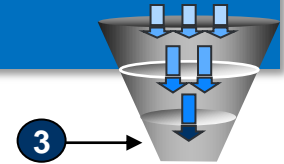
- Based on the time needed by industry to reach required capabilities
- Estimated as “Short” (0-3 years), “Mid” (3-10 years) and “Long” (10+ years)

Source: SBC analysis

Notes: This ranking exercise is used only for positioning industries on the matrix, not to evaluate market size or supply capacity



Each industry was scored on Feasibility and Benefits dimensions



FEASIBILITY

Scoring method

		<div>2</div> Capability ramp-up time		
		Long	Mid	Short
<div>1</div> CAPEX intensity	High	1	1	2
	Low	1	2	3

- **Score 1** – Either not present locally or unlikely to be present in the future
- **Score 2** – Significant efforts required
- **Score 3** – Local presence could be developed to meet the Oil and Gas standards

Comments:

- A similar score assigned to high CAPEX and short ramp-up time as to low CAPEX and mid-ramp up time

BENEFITS

Scoring method

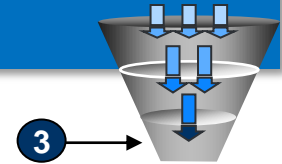
		<div>2</div> Skill level		
		Unskilled	Semi-skilled	Skilled
<div>1</div> Number of jobs	Low	1	2	2
	High	3	3	3

- **Score 1** – Few new jobs generated in a low added value industry
- **Score 2** – Few jobs generated, but in skilled required industries
- **Score 3** – Numerous new jobs generated

Comments:

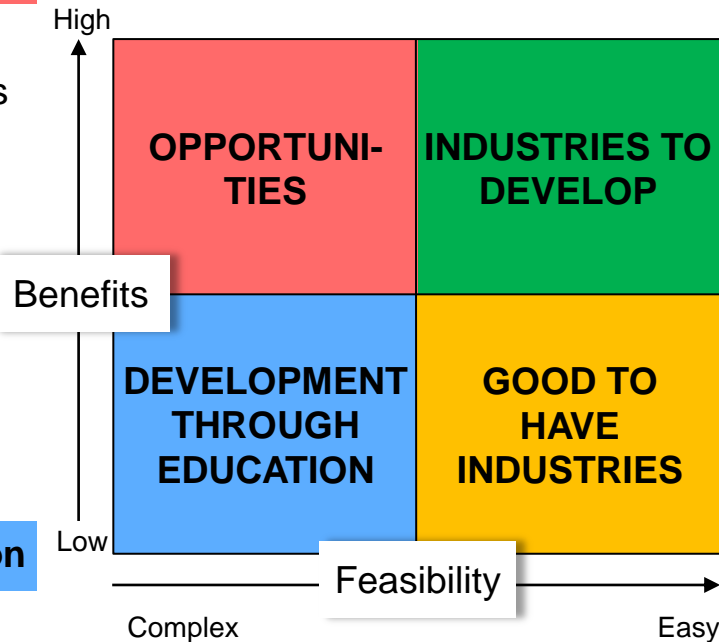
- A premium is given to 'high number of jobs' in the grading

Target industries were plotted on a matrix into four different clusters defining actions to implement



Opportunities

- Industries to select cautiously
- To be selected for the suppliers survey if there is a consensus that the low feasibility is not a definitive burden



Development through education

- Long-term vision to be established
- Education program to lay the foundation for future development
- Little current industrial potential
- Not addressed through suppliers survey

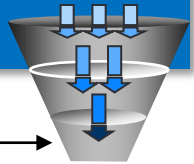
Industries to develop

- High-impact industries for local content
- Short lead time, fast impact
- “Must have” industries for local content
- To address through suppliers questionnaire

Good to have industries

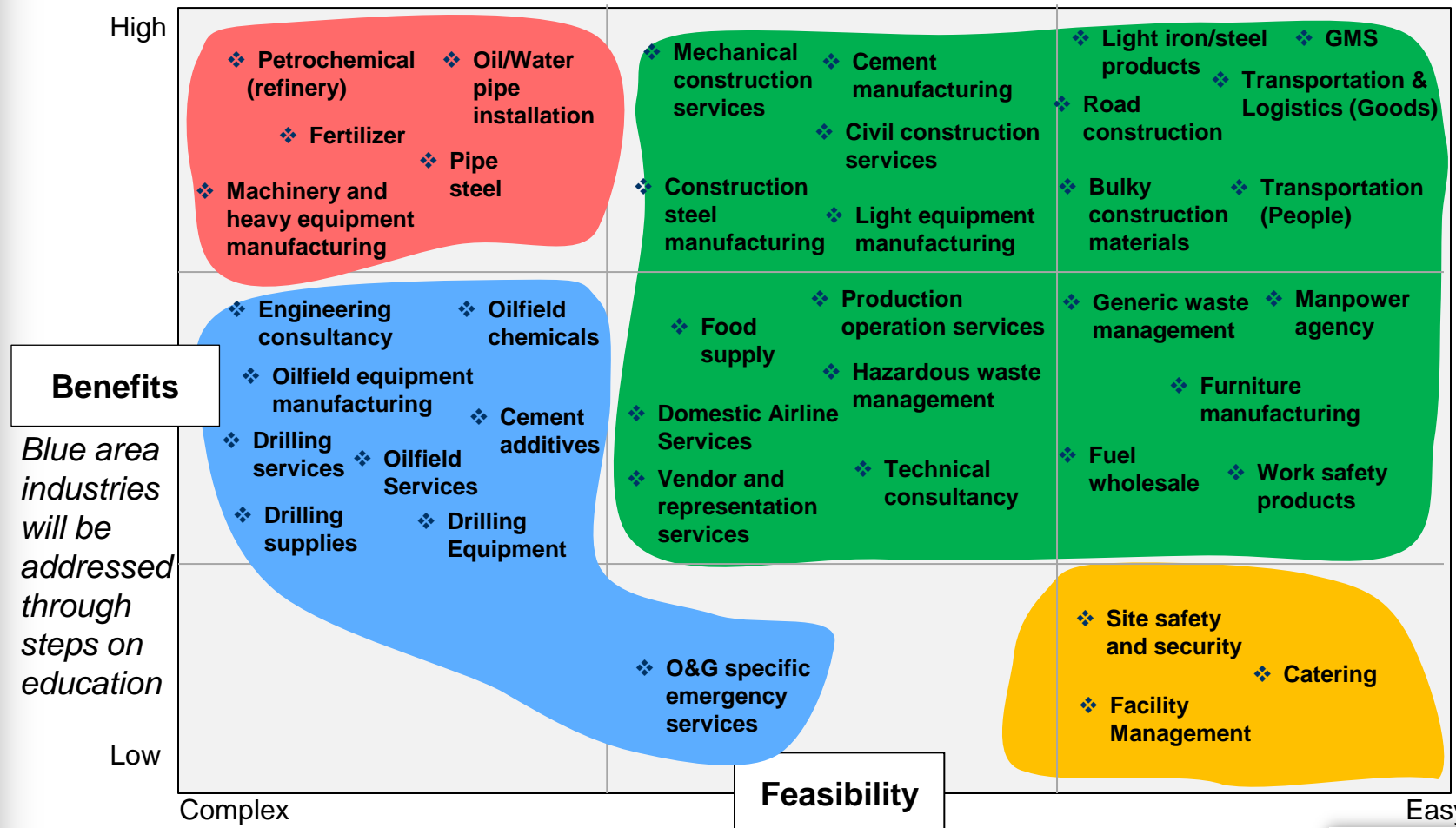
- Low priority industries for development in Uganda
- To be selected for the suppliers survey if future perspectives offer larger benefits

Industries related to oil & gas projects in Uganda have been classified in terms of potential for local content development



MAPPING OF SELECTED INDUSTRIES ON BENEFITS-FEASIBILITY MATRIX

Green and Yellow areas are the scope of the supply survey



Note: Detailed definition of each industry is provided in the Appendix

Source: SBC analysis

Note: Industries within quadrants are not evaluated relatively to each other