SKILLS DEVELOPMENT FOR
GREEN ECONOMY

DATA ANALYSIS

Report 2

Industry analysis of the plumbing industry

November 2018 – July 2019

ABOUT THIS PUBLICATION

GIZ / SD4GE commissioned two studies aimed at deepening an understanding of the trends and dynamics of plumbers and electrical contractors in South Africa. The objectives of this study included the imperative to strengthen the range of institutions (public, private and not-for-profit) that impact these trades. An additional aim of the research was to provide an overview of current development in these trades, both at industry level and firm level. The findings are useful for better planning informed by greater awareness of the transformations and changes emerging in the specific contexts of industry.

The study produced three publicly available reports. This second report homes-in on the plumbing industry-level dynamics. It took the insights from the high-level study further and looked at the key institutions representing the private sector. A firm-level survey was designed to understand better the challenges confronting company owners, and what pressures they were facing in terms of productivity, market changes and staff. The results of the business owner survey for plumbing contractors are discussed in this report.

GIZ/SD4GE commissioned PEM Consulting and Mesopartner Africa to conduct the industry diagnosis. Dr Shawn Cunningham and Annelien Cunningham from Mesopartner led and coordinated the industry diagnosis. A team of researchers from TIPS (Trade & Industrial Policy Strategies) conducted research and statistical analysis. The TIPS team included Asanda Fotoyi, Sajid Sherif, Mbofholowo Tsedu while Saul Levin provided policy insight and guidance.

The research would not have been possible without the help and support of the industry bodies and their members. The Institute of Plumbing (SA) (IOPSA) and Plumbing Industry Registration Board (PIRB) contributed and supported the plumbing analysis. Electrical Contractors Association of South Africa (ECASA) and the National Bargaining Council for the Electrical Industry (NBCEI) supported and contributed to the electrical analysis.

GIZ / SD4GE would like to thank all the stakeholders and industry members for their valuable contribution.

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IOPSA THE INSTITUTE OF PLUMBING SA
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PLUMBING INDUSTRY REGISTRATION BOARD

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1 Introduction

This project concerns the understanding of the trends and dynamics of two trades: plumbers and electrical contractors. In the past, much of the focus of GIZ/SD4GE was on improving the supply-side issues of (green) skills delivery in South Africa. Despite the attention to improving the quality of education, GIZ/SD4GE has always had a strong focus on involving the private sector in its work, especially when it comes to workplace learning, which is central to the dual systems approach.

This report provides an industry perspective of the trade, from the view of the plumbing business owner. Our interpretation of the industry analysis is that it is much more than just understanding the demand for, and shifting patterns of, the uptake of skills. We understand that the purpose of an industry diagnosis is to provide GIZ/SD4GE and its stakeholders with insight into, and several perspectives of, the pressures faced within the industries, the firms that comprise the industries and the institutions that promote them. This analysis will make it possible to strengthen the range of institutions (public, private and not-for-profit). It will also inform GIZ/SD4GE and its stakeholders to better plan for the changes that are emerging. It may even make it possible to detect shifts that have not yet been discovered or articulated.

The report is structured around the work packages that made up the contract. The first work package concerns a high-level overview of the industries, and the results are captured in a separate report, namely report 1. Our aim was to scan the publicly available statistics to better understand what is known, what is being tracked and what is changing. This high-level overview also revealed how the two trades, plumbing and electrical, are structured, which organisations are identified with the sectors and what the high-level dynamics are.

The second work package homed in on the industry-level dynamics. It took the insights from the high-level study further and looked at the key institutions representing the private sector. Then a firm-level survey was designed to better understand the decisions confronting company owners, and what pressures they were facing in terms of productivity, market changes and staff. This report describes the findings of the research into the plumbing business owner and the plumbing industry analysis. The findings of the electrical contracting study are captured in report 3.

The third work package was originally geographically focused on townships and informal enterprises. However, as the project unfolded, PEM/Mesopartner and GIZ/SD4GE realised that as the main challenge was about transformation and change within the industries, an explicit focus on transformation would be more appropriate. The findings of this work are captured in Chapter 7 of this document.

2 Understanding the perspective of the plumbing and electrical contracting industries

Companies make optimal decisions in a local context in a decentralised way. These different experiences and perspectives add up to a rich set of archetypes from which we can extract ideas about problem pressures, appetite for expansion, interest in skills development or market preferences. An industry diagnosis provides more depth than the simpler stereotypes of small vs. large, or white vs. black.

We approached the industry diagnosis on two distinct levels:

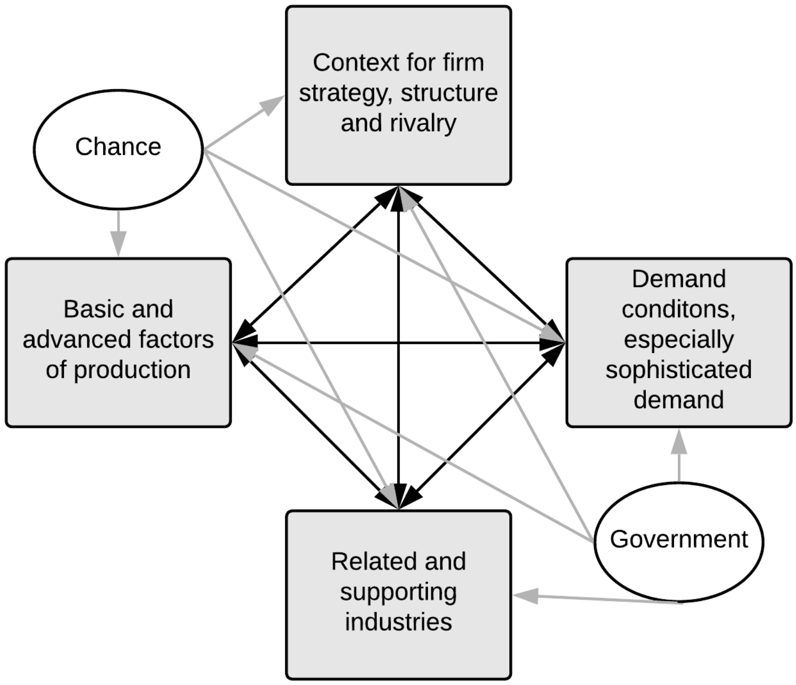
- The first was to develop an understanding of the industries at a more aggregate level, using a combination of interviews, desktop research and statistical analysis. To structure the findings Porters Diamond (Porter, 1998) was used as a guideline, although additional dimensions had to be captured that did not feature in the original work of Professor Michael Porter.
- The second was a firm-level analysis aimed at business owners.

Porter's "Diamond" of competitiveness attempts to isolate the factors that influence the competitiveness of industries and nations (1998:71). An adapted illustration is shown in Figure 1.

Porter's Diamond has four attributes that shape the environment in which local firms compete, promote or impede the creation of competitive advantage. These four dimensions all exert a force on each other, with the Diamonds of different contexts and countries' exerting different kinds of forces on each other.

Porter (1998:77) explains that for each economic activity, goods and services are produced with a combination of factors that reflect the factor endowments of the entity in question. Thus goods and services that can be produced with a relatively high proportion of labour to capital tend to be manufactured in countries where labour is relatively abundant. Arrow (1999:17) adds that knowledge is becoming an increasingly important factor in production, which is affecting the ability of firms to remain competitive. While capital and labour are considered private goods, growth is achieved through increases in knowledge.

Figure 1: Porter's Diamond of competitive advantage



Adapted from Porter (1998:71)

At a later stage, Porter added the government and chance as two additional forces. This is a recognition of the role of governments in creating an enabling business environment. Chance affects not only the industry being studied, but all the factors in the Diamond model.

Table 1 shows the different factors of production as originally described by Porter (1998:77).

Table 1: Different factors of production

Factor type	Description
Factor conditions	Cover natural resources, climate, location, unskilled and semi-skilled labour, and debt capital
Advanced factors	Include modern communications infrastructure, highly educated personnel such as graduate engineers and computer scientists, and university research institutes in sophisticated disciplines
Generalised factors	Include the transport system, debt capital and well-motivated and qualified employees who can be employed in a wide range of industries

Specialised factors	Involve narrowly skilled personnel, infrastructure with specific properties, knowledge bases in particular fields and other factors relevant to a limited range or even just to a single industry

Source: Porter (1998:77)

To conduct the firm-level analysis, we engaged with representatives of industry bodies in plumbing (IOPSA, PIRB) and electrical contracting (ECA) to determine what current data they had in their possession and knowledge gaps. The plumbing engagement was done earlier (November 2018), hence the plumbing research instrument was designed earlier than the electrical survey. The surveys were designed in close cooperation with the industry bodies to ensure that they derived value from the research approach and results, and to enable them to further research questions and interesting findings that arose. In both cases the industry bodies took responsibility for disseminating the surveys to their members and non-members. The survey design process was treated by PEM/Mesopartner as an important capacity development and industry association strengthening process.

The plumbing and electrical contracting industries were diagnosed during the period November 2018 to May 2019, and the main results are discussed in the following two chapters.

3 The plumbing industry landscape in South Africa

The plumbing industry is in a gradual process of improvement and professionalisation. Increasingly the industry is being regulated, with Certificates of Compliance for hot water systems being introduced in the past few years. The industry business membership organisations have matured from voluntary management to full-time professional management with specialised executive functions such as training and technical managers.

Over the years the government has supported the activities of IOPSA. Professor Kadar Asmal, in his different roles in several ministries, supported the work of the industry body, and over the years the CSIR completed several studies on the industry regarding standards, regulations and other topics. Important events, books and documents produced by IOPSA have been endorsed by politicians and senior government officials over the years to different extents.

Since the inception of Professional Body recognition through the South African Qualification Authority, in about 2012, the PIRB has been awarded this recognition. Being recognised by SAQA means that the plumbing industry (through the PIRB) is a recognised and trusted professional body (through the NQF Act). The PIRB forms part of a network of professional bodies that are working to uphold high standards and improve competence and ethics in the economy. It means that the plumbing industry can register its own learning programmes and designations aligned to formal qualifications, and that the industry as a whole can be benchmarked against other national and international professional standards. A significant mind shift and change is sector as result of Professional Body status recognition is the introduction of Continuous Professional Development (CPD).

While plumbing is often associated with unblocking drains and repairing geysers (hot water systems), plumbers also work on above- and below-ground drainage, gutters, solar water heaters, gas water heaters, heat pumps and irrigation systems. Plumbers may be employed in companies that are clearly identified as plumbing businesses, but they are also employed in the construction sector, commercial property management, alternative energy, home renovation and hospitals, schools, universities and other facilities. Plumbers may also be employed in the retail or wholesale sectors, or by manufacturers of plumbing equipment and raw materials.

A challenge faced by the plumbing industry is that it is seen by many public and social upliftment programmes as an industry with low access barriers. This means that formally registered (and competent) plumbers have to compete against informal and unregistered plumbers, while at the same time consumers and the construction industry are under pressure to pay lower and lower fees. This undermines investment in the plumbing industry, which then directly affects skills development and improved productivity in the industry.

3.1 Formal organisation of the industry

The officially recognised plumbing industry body is IOPSA (Institute of Plumbing South Africa,) which represents private sector employers. It is recognised by national government departments and institutions such as the South African Bureau of Standards (SABS) as the official representative of the industry.

IOPSA was formalised in 1989 and is affiliated to the World Plumbing Council, the South African Institute of Occupational Health and Safety and the Federated Employers Mutual (FEM) Assurance Company (RF) Proprietary Limited. In the last 15 years it has changed from a voluntarily managed organisation to professional management organisation with specialised functional areas such as training, technical support and standards development.

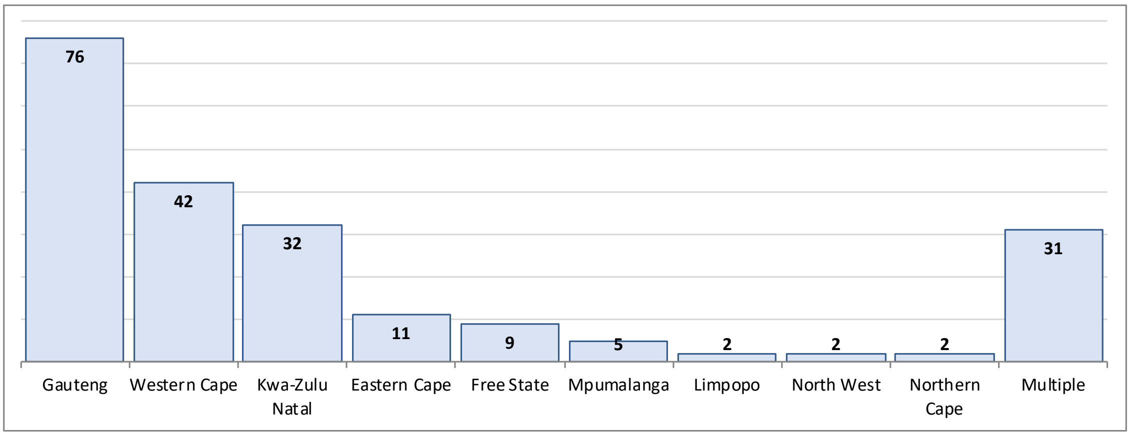
However, before formalisation the plumbing industry was already well organised and pro-active. For instance, to celebrate its 21st year of existence in 2009, IOPSA published a book that contains an historical oversight of the efforts by the industry association and its members to improve their trade, industry and contribution to the economy. This book explains in detail efforts to improve the quality of workmanship and materials, skills development and formalisation of the industry. Several of the current champions were already featured in this book. The foreword to the book was written by the then minister of water affairs.

At a provincial level, IOPSA is represented by voluntary committees consisting of members. In each of the provinces monthly technical meetings are held. The following sub-chapters are active:

- Gauteng
- Western Cape
- Southern Cape
- Eastern Cape
- Free State
- Border (greater East London area)
- Kwazulu Natal

Working committees do not exist in Mpumalanga, North West province and Limpopo. A challenge in establishing working committees is that the activities are voluntary and time consuming. Means of sustaining these committees in the more rural areas have not yet emerged. The respondents of the plumbing business owner survey mirror the functionality of the IOPSA provincial structures (see Figure 2).

Figure 2: Provincial representation in the plumbing firm-level survey



Source: Plumbing Business Owners Survey (TIPS, 2019b)

All administration, event organisation and technical support are provided from the IOPSA head office in Dowerglen, Johannesburg. IOPSA has several permanent functions, including a technical manager, a training manager with supporting staff, a marketing and membership support function, and an active executive. IOPSA is actively involved in several collaboration projects with GIZ/SD4GE, DHETSSACI, the NBI, Harambee, Nedbank and also private training providers. They regularly meet with SETAS, the QCTO and other public organisations to further the interests of plumbers and to advocate for better standards, support, training and working conditions for plumbers.

The Plumbing Industry Registration Board (PIRB) works to promote good plumbing practices that protect the health and safety of the community. They strive to protect the integrity of the water supply and waste water systems by providing a comprehensive registration system for individual qualified plumbers. The performance of the plumbing trade is measured through auditing processes and the issuing of certificates of compliance. The PIRB is a professional body that is recognised by the South African Qualifications Authority to uphold high standards of competence and ethics. The PIRB is tasked with quality assurance within the plumbing industry, the development of standards in the national qualification framework (NQF), strengthening the accountability within the plumbing profession, and to promote fair policies and practices. Also, the PIRB is tasked with maintaining and administering a live and updated registration system and database of all registered plumbing practitioners in South Africa.

Plumbers who are registered with the PIRB are recognised as professional tradespeople. They receive a registration card and attend a variety of events, training courses and opportunities to earn continuous professional development points (CPD). The CPD system allows the PIRB to incentivise knowledge improvement, participation in events, awareness raising about new developments, standards and practices. The CPD system is significant in how it strengthens the professional development of the system. It allows for differentiation, yet it also sets recognised pathways and promotion opportunities.

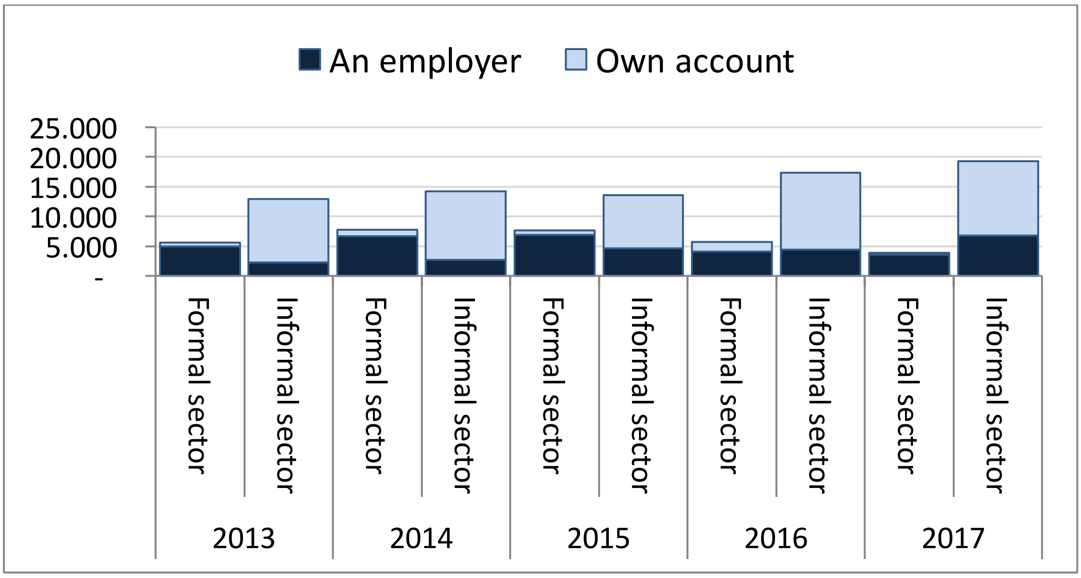
There are other smaller forms of industry organisation, such as the plumber's sub-category in the Master Builders Association. The National Home Builders Registration Council regulates the structural elements of a home and does not appear to have a programme for, or specific interest in, developing the plumbing trade.

3.2 Plumbers in South Africa

Plumbers are mainly tradespeople who operate as self-employed, informal or small businesses in South Africa. Using Statistics South Africa data, TIPS estimates that there are more than 125 000 self-identified plumbers in South Africa. In this same dataset, 10 359 employed one or more people and 12 860 are own-account workers.

The plumbing industry is characterised by far more informal activity than formal, with the number of formal enterprises declining every year and the number of informal operators increasing (see Figure 3).

Figure 3: Plumbing business owners by sector, 2013-2017

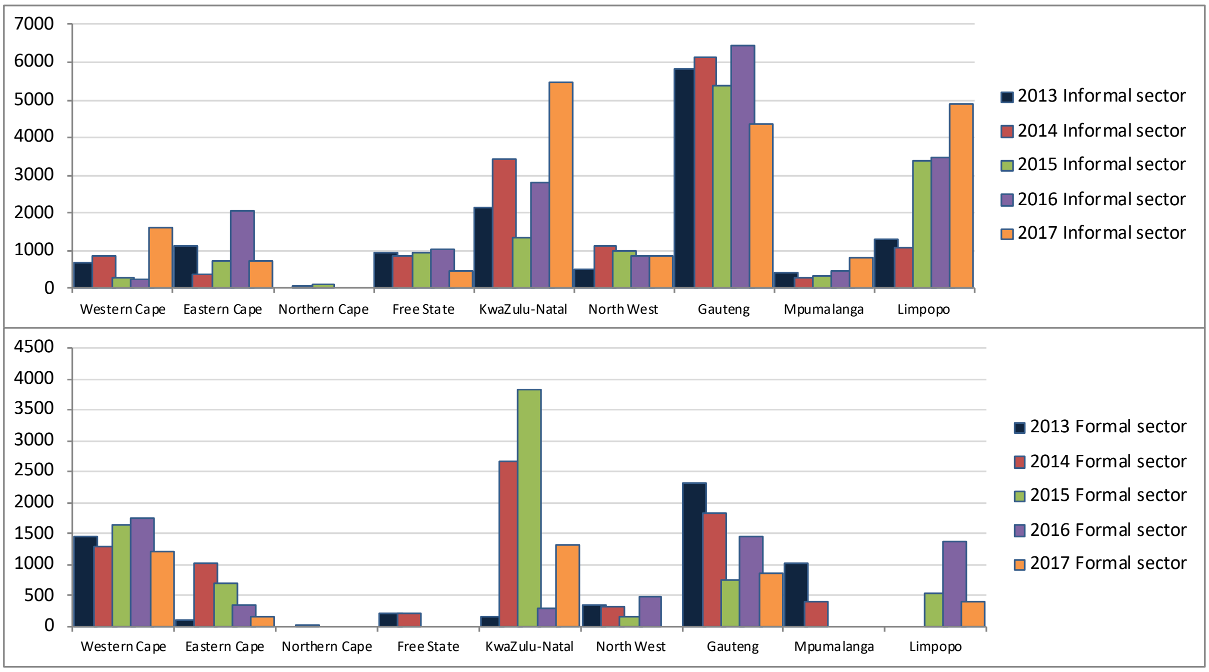


Source: Statistics South Africa, Labour Market Dynamics, 2013-2017. Electronic Database

The extent of the informal activity was also a surprise to IOPSA and the PIRB. While some informal plumbing activity could be ascribed to do-it-yourself activity, and some to working in a reciprocal way for family, friends and neighbours, it is hard to determine where the more than 100 000 unaccounted informal plumbers are working.

Figure 4 shows the extent of the informality according to the LMD data. It shows that the majority of plumbing businesses are operating in the informal sector. The only exception is the Western Cape province, where there are more formal than informal plumbing businesses.

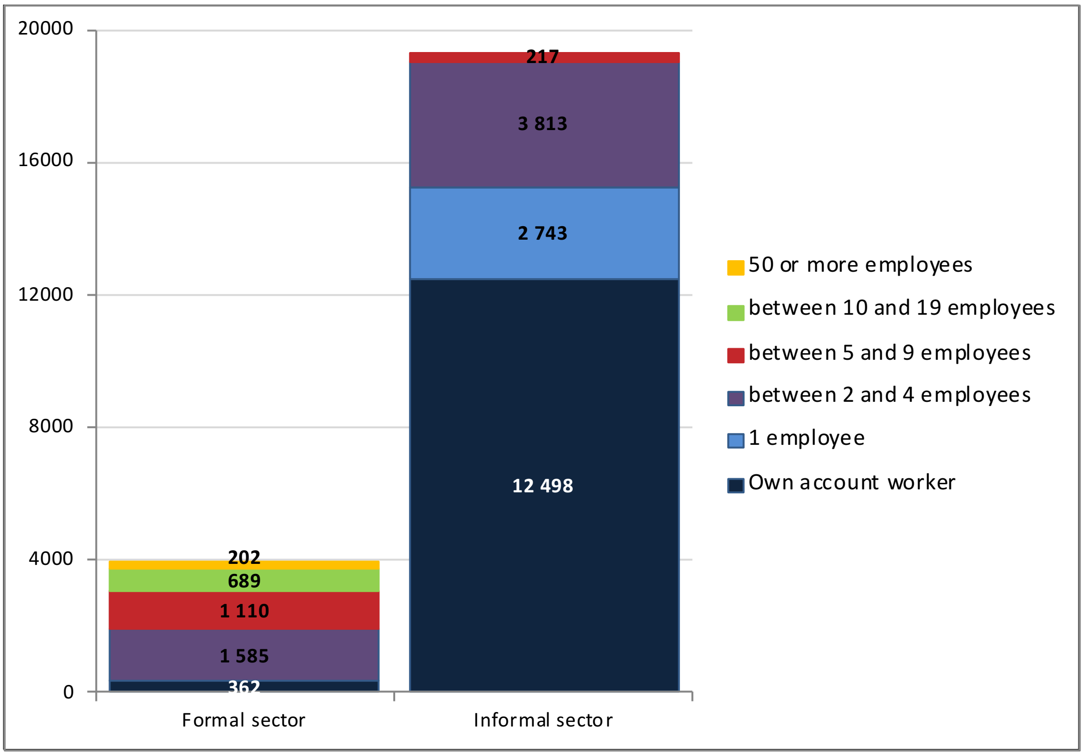
Figure 4: Formal and informal plumbers in the LMD data, 2013-2017



The TIPS was asked to further unpack these numbers, and they found that in 2017, 3 586 employers operated in the formal sector (employing one or more people), while 6 773 own-account businesses were operating as informal enterprises. This means that they did not employ anybody formally except as casual or wage-based workers with no fixed-term employment contracts, benefits or social benefits.

The high-level data analysis by the TIPS confirmed that most plumbers are small with either one own-account operator, or between 2 to 9 workers (see Figure 5).

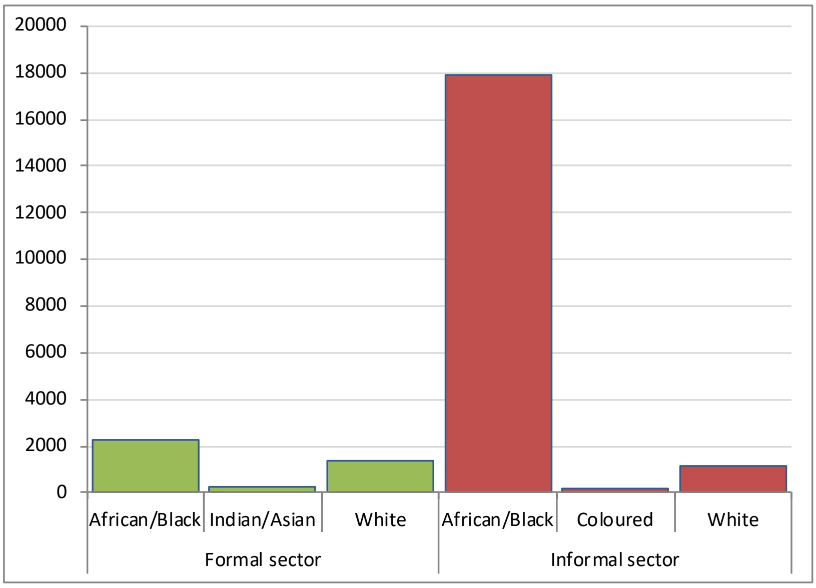
Figure 5: Plumbing business owners by business size, 2017



Source: Statistics South Africa, Labour Market Dynamics, 2017. Electronic Database

An analysis by race of the owners shows that there are increasing numbers of formal black, Indian and coloured plumbers. Figure 6 shows that there are more formal black, Indian and coloured plumbing business owners than white owners. However, the great majority of plumbing businesses were in the informal sector by a large margin, with coloured and white informal plumbers at much lower levels.

Figure 6: Plumbing business owners by race, 2017

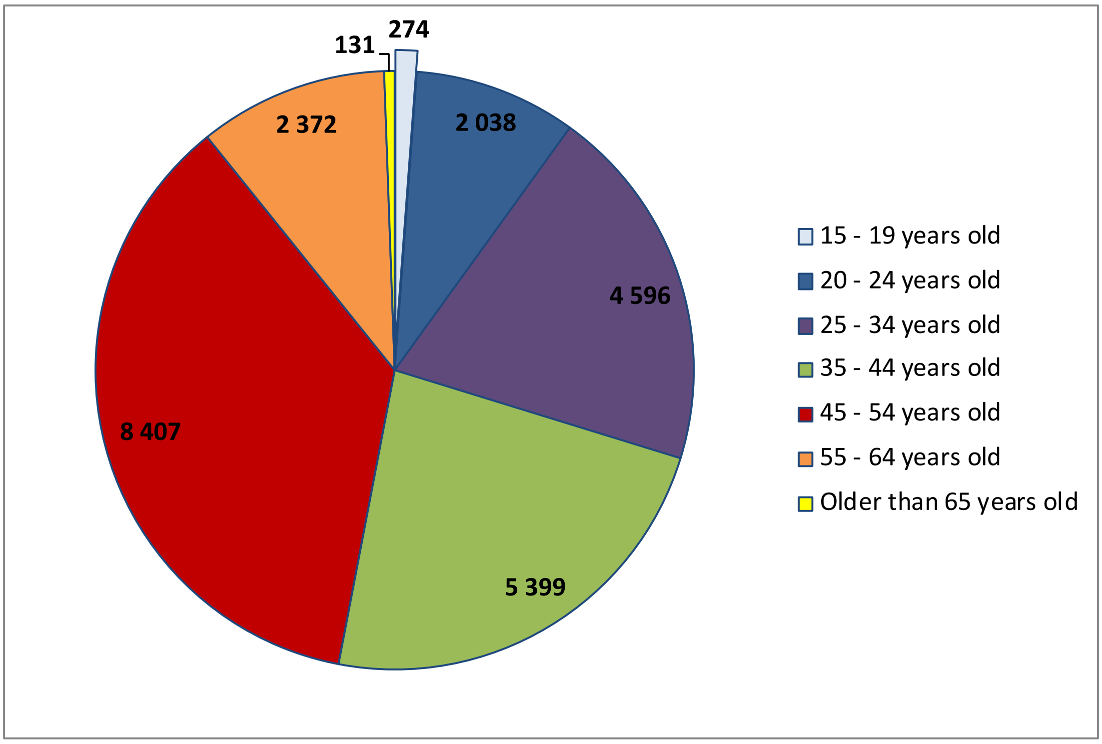


Source: Statistics South Africa, Labour Market Dynamics, 2017. Electronic Database

Regarding gender, most plumbing business, whether formal or informal, are dominated by men. Female business owners are most likely to be operating in the informal sector.

The age analysis of the Statistics South Africa LMD shown in Figure 7 reveals that more than three-quarters of plumbing business owners are between the ages of 25 and 54. There is a very small proportion of very young and very old plumbing business owners.

Figure 7: Plumbing business owners by age, 2017



Source: Statistics South Africa, Labour Market Dynamics, 2017. Electronic Database

4 The plumbing business owner survey process and results

The firm-level research started with an analysis of the data that IOPSA and the PIRB had already collected in a first plumbing firm survey conducted in 2018. The August 2018 IOPSA survey was a comprehensive survey that gave rise to many important insights. Their survey received an astonishing 779 responses due to an incentive to earn CPD points from the PIRB. It is the stated intention of IOPSA to repeat this survey annually (at the time of finalising this report in August 2019 IOPSA had just sent out their 2019 annual survey). Meetings were held at the PIRB and IOPSA premises to assess the industry data that IOPSA and the PIRB collect and maintain. During these meetings it became apparent that IOPSA and the PIRB still had many unanswered questions that could be further explored in GIZ/SD4GE-supported industry analysis.

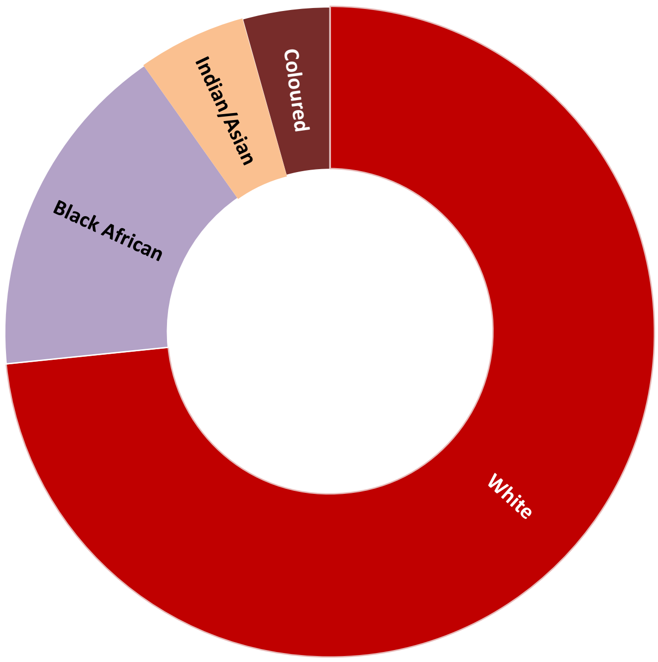
The questionnaire was designed in collaboration with IOPSA, the PIRB, GIZ/SD4GE and TIPS (see Annexure 2.1). The aim was to better understand the constraints and reality of owners of plumbing enterprises. The questionnaire was designed to supplement the current database of IOPSA and the PIRB, while assisting GIZ/SD4GE to better understand future skills demand and the overall health of workplaces. It was targeted specifically at plumbing business owners. On 28 February, the final research instrument was handed over to IOPSA and the PIRB for distribution to the industry. The plumbing business owner survey was conducted in March 2019 and a total of 212 responses were received.

The results of the business owner plumbing survey are included as Annexure 2.2 in the form of a presentation prepared by TIPS. The first part of the TIPS presentation is a further statistical overview from Stats SA on company owners to give a better overview of the survey results received based on discussions between IOPSA, the PIRB and the research team.

We will provide a brief overview of the research findings here. The results are integrated into the rest of this chapter.

The business owners survey was mostly completed by men. Of the 212 responses, only 11 female responses were received. Interestingly, the ratio of female respondents is much higher than that in the LMD data from Statistics South Africa (see Chapter 3.2). Figure 8 shows the racial profile of the firm-level respondents.

Figure 8: Plumbing survey results, ownership by race

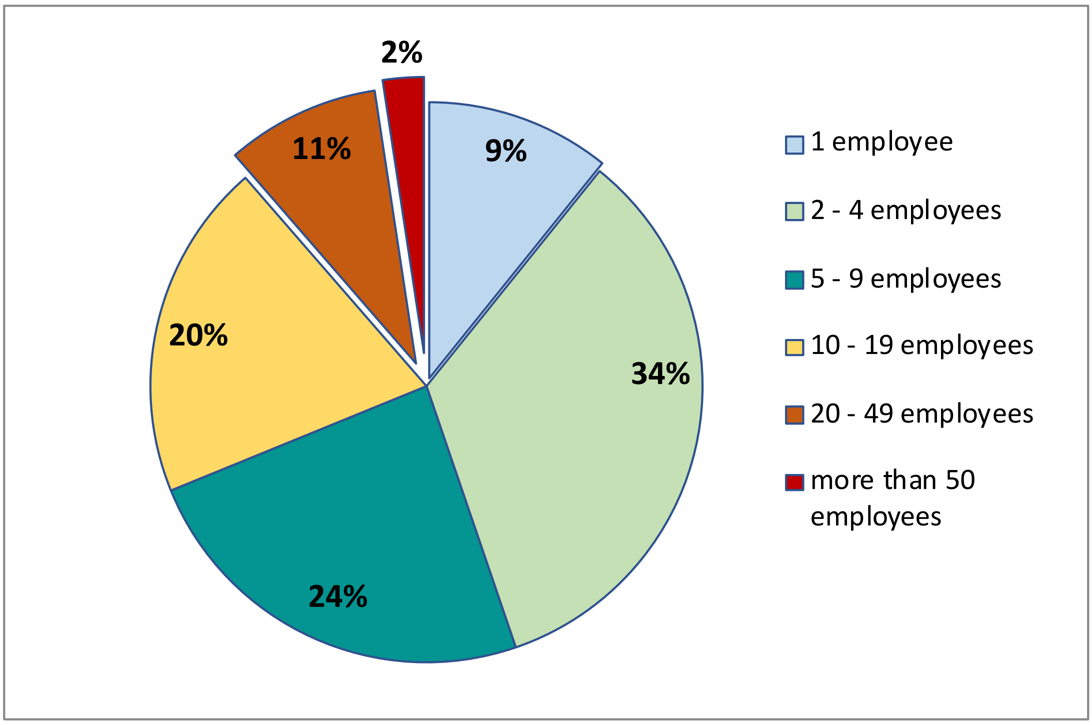


Source: Plumbing Business Owners Survey (TIPS, 2019b)

The high-level statistical review showed that the plumbing industry itself is dominated by smaller plumbing businesses (see Figure 5). IOPSA estimates that more than 90% of their members employ fewer than five permanent staff. This was also reflected in the plumbing business-level survey. Of the 212 respondents, 194 indicated that they operated from one office or branch, with an additional 11 indicating that they operated from two sites. Figure 9 shows the company size of the respondents. 34% (72 respondents) had 2–4 employees, while

87% (188 respondents) had fewer than 20 employees. Only 2% of the respondents had 50 or more employees.

Figure 9: Plumbing survey results: Company size



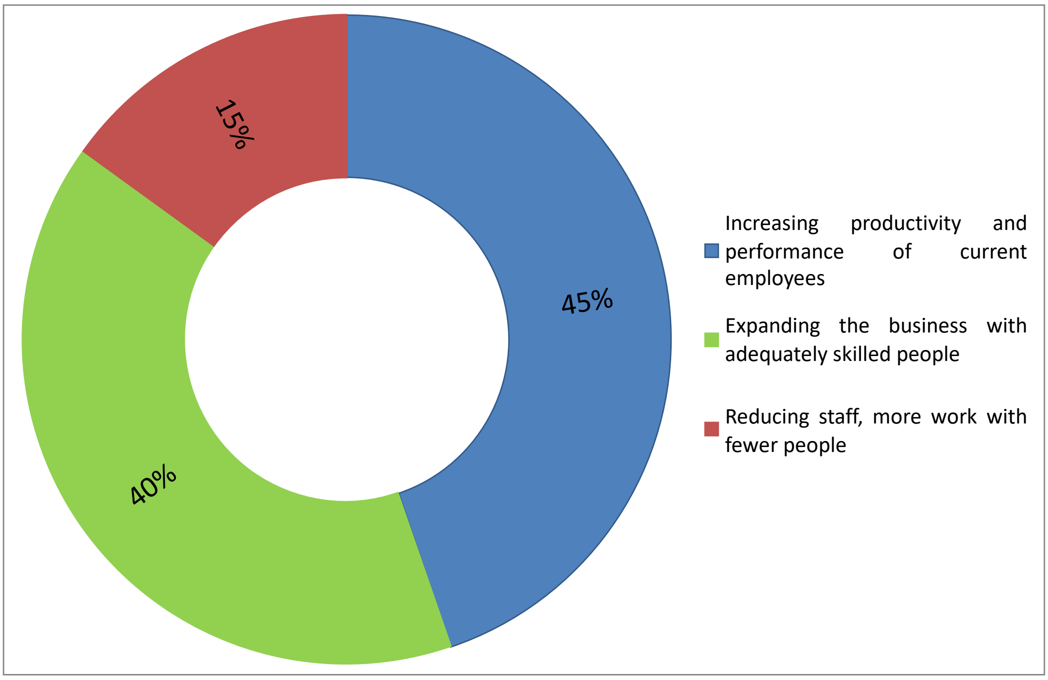
Source: Plumbing Business Owners Survey (TIPS, 2019b)

A question was formulated to understand the strategic response of the plumbing business owners to the pressure in the business. The business owners could choose whether their priority was to:

- Increase productivity and performance of current employees
- Expand the business with adequately skilled people
- Reduce staff, doing more work with fewer people.

The results of this question are shown in Figure 10. The graph shows that increasing the productivity and performance of current employees was the highest priority, whereas expanding the business with adequately skilled people was a slightly lower albeit significant response. This question also provides an interesting way to segment all the respondents into three different strategic priority groups. This discussion will be held in Chapter 3 of this report.

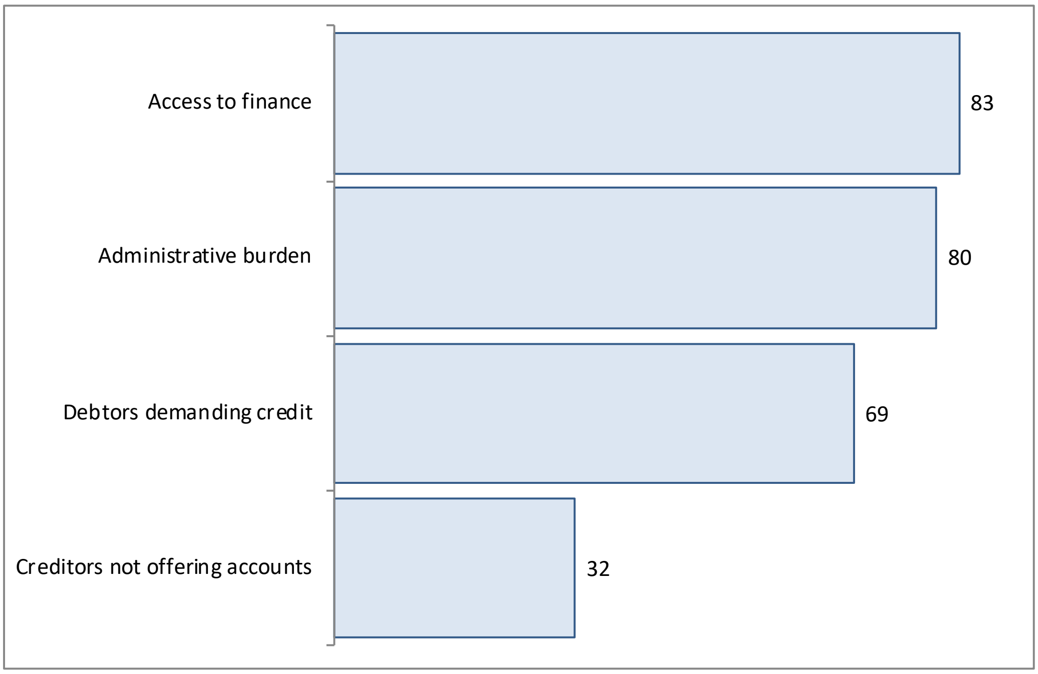
Figure 10: Response to business pressure



Source: Plumbing Business Owners Survey (TIPS, 2019b)

The majority of the survey respondents were small businesses, and their challenges mirror the general patterns in the economy. From interviews with IOPSA and selected plumbers, we know that many plumbers draw family members in to assist with administration, logistics and payroll duties. Figure 11 shows the extent of the burden of financial and administrative management in the company.

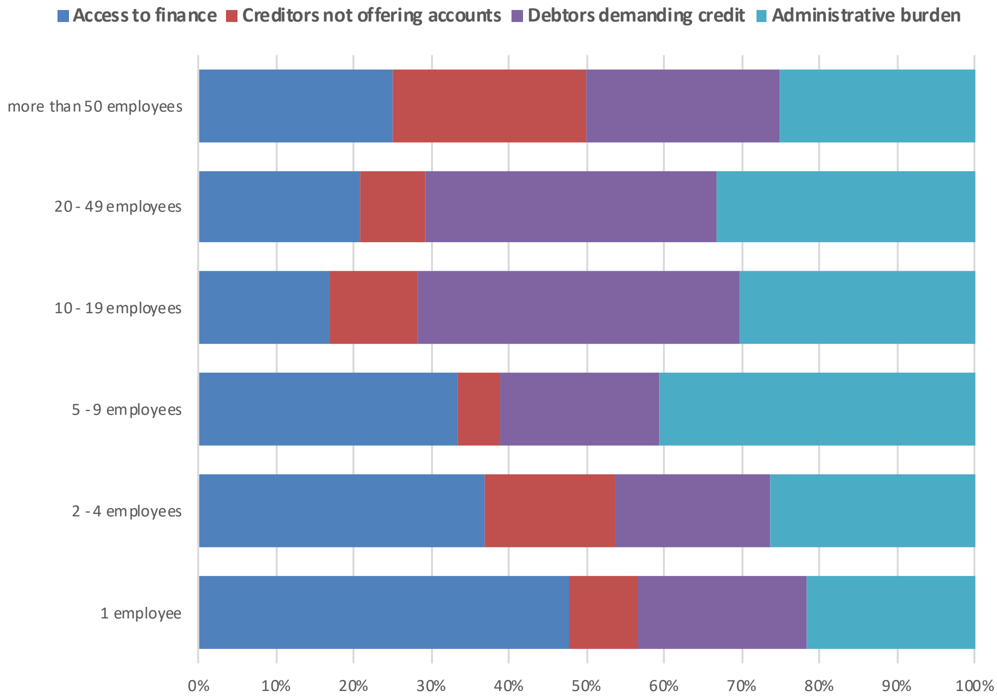
Figure 11: Major challenges faced by the plumbing business owner



Source: Plumbing Business Owners Survey (TIPS, 2019b)

The same question is analysed in Figure 12, but from a company-size perspective. The results show that as companies grow in size, there is a tendency for access to finance to become less of a challenge. In fact, at 50 employees the challenges are more or less equally spread over the four areas. Debtors demanding credit are more of an issue for larger firms as opposed to smaller ones, probably because of the more corporate clients in construction and commercial maintenance. Administrative burdens seem to increase as companies grow from 1 employee to 10 employees.

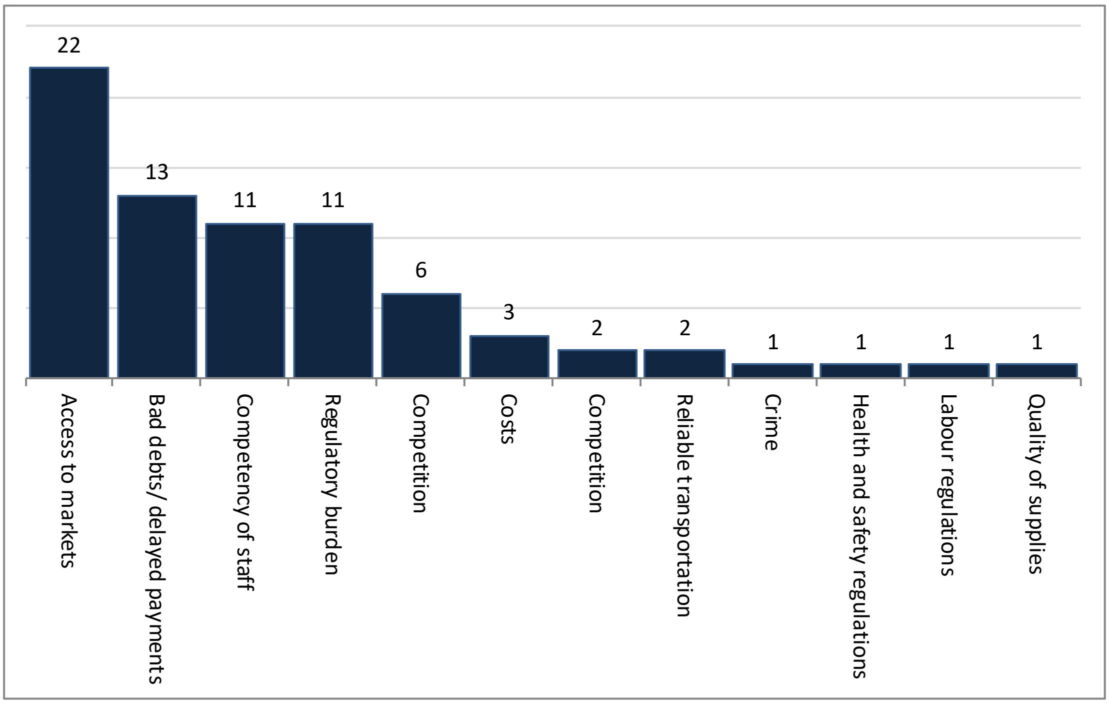
Figure 12: Company size by major challenges



Source: Plumbing Business Owners Survey (TIPS, 2019b)

When asked about “other” factors that were affecting their enterprises, access to markets, bad debt and staff competencies as well as regulatory burdens were most often cited (see Figure 13).

Figure 13: Other challenges faced by the plumbing business owners



Source: Plumbing Business Owners Survey (TIPS, 2019b)

Surprisingly, quality of supplies and labour relations, health and safety and crime had very low frequencies in the survey.

When asked about the external environment, most respondents complained about the current economic climate and the high number of unlicensed plumbers who are operating in the economy, followed by a lack of skilled people and lastly black economic empowerment legislation.

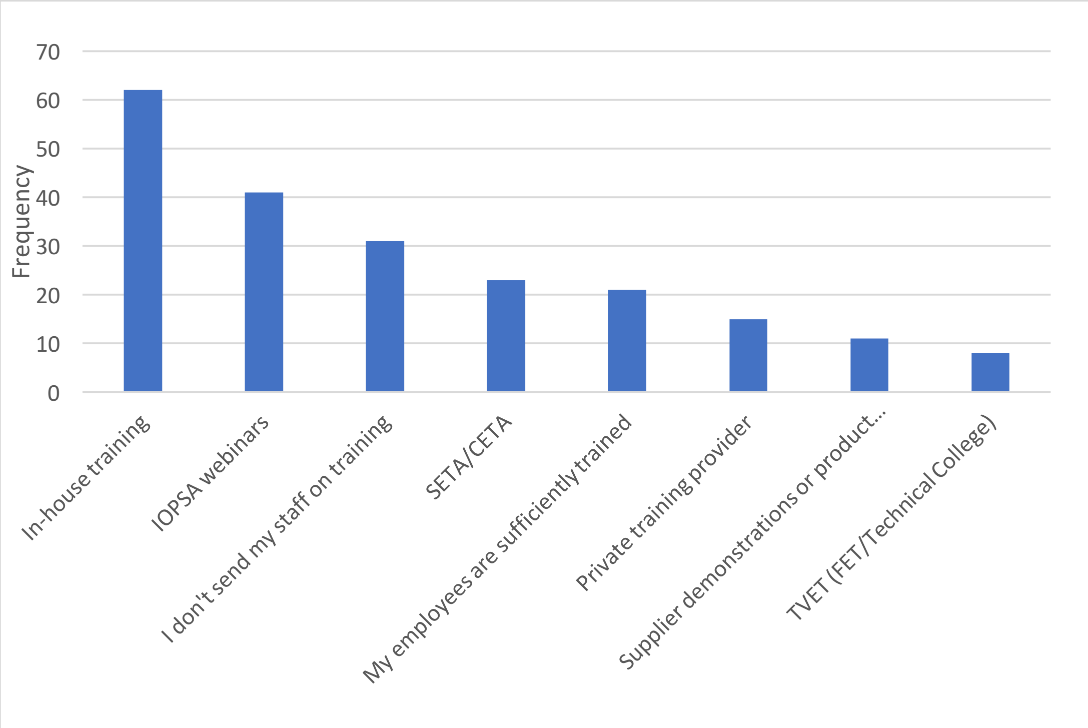
From a financial and profitability perspective, it appears that most plumbers are charging low rates, and also paying low salaries. Most plumbing business owners charge between R300-R600 per hour. Qualified plumbers are mostly paid more than R10 000 per month. Unqualified plumbers are paid more than R4 000 per month, with more than 80 respondents indicating that unqualified plumbers were paid more than R5 000 per month. Learners, assistants and apprentices were generally paid between R2 000 to just over R5 000 per month.

Most plumbing companies had one or two full-time managers and only one administrative person. The owners in most cases were still working as plumbers. Almost 40% of the plumbing owners reported paying their staff on a weekly basis, with 30% reporting that they paid monthly salaries. A further 30% reported that they paid some workers monthly while they paid others weekly.

In the firm-level survey, most plumbers did not use any formal recruitment methods to find new staff. Most appointments were from the curb-side or walk-in. Referrals from family and friends were also important sources.

Figure 14 shows that most plumbing owners prefer to train their staff on the job (in-house) or via the IOPSA website or YouTube channels.

Figure 14: Preferred form of training



Source: Plumbing Business Owners Survey (TIPS, 2019b)

Not surprisingly, many owner respondents indicated that they did not send their staff on training (31), or that their staff were sufficiently trained (21). Only 8 reported using TVET colleges, with private training providers (15) or events arranged by SETA/CETA (23) being preferred.

The demands on skills development and education will be discussed in more detail in Section 4.1.1.

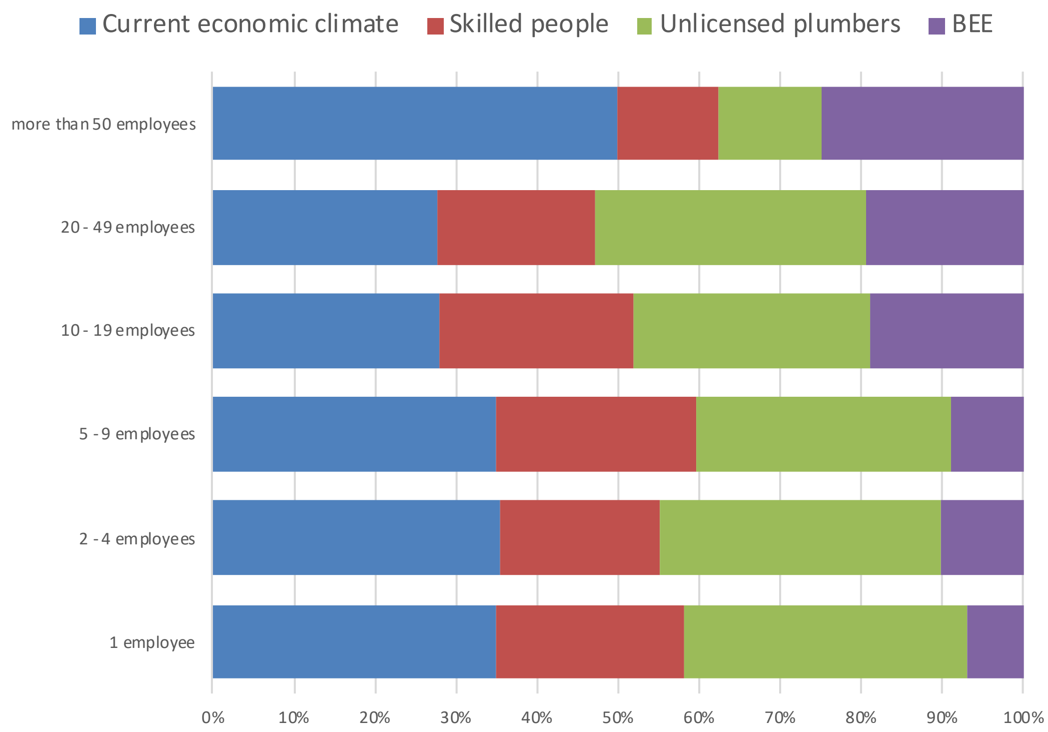
Question 34 in the Business Owner Survey asked: ‘Do you have any suggestions to IOPSA?’. The responses were very valuable and are categorised in suggestions to IOPSA; suggestions to the PIRB; Skills; Regulatory and Insurance. See Annexure 2.4 for all the responses to the survey question.

The image below is a word cloud of the ‘Suggestions to IOPSA’ responses.

4.1 Basic factors of production

The economic environment is strongly shaped by the cost and accessibility of supply-side inputs. Plumbers find themselves squeezed between the costs and efficiencies of supply-side factors, the ability of larger client groups (such as construction and insurance) to negotiate terms of trade, and the regulatory environment. Before we looked deeper into these different aspects, our plumbing owner survey probed to see how the external environment shaped the strategies of the companies. Figure 15 shows that smaller companies (below 9 employees) are strongly affected by the prevailing economic context, challenges with securing skilled workers, and competition from unlicensed plumbers. The figure shows that most companies employing 50 or more workers reported the external economic climate as an important factor constraining business. On balance, skilled people and unregistered plumbers are an equal concern across all company sizes. Black economic empowerment (BEE) requirements are less of a problem for smaller firms, probably because more black, Indian and coloured firms are smaller. But this could also be because the markets served by smaller firms are domestic households for whom BEE credentials are not so important.

Figure 15: Company size and external challenges expressed by plumbing business owners



Source: Plumbing Business Owners Survey (TIPS, 2019b)

It is important for GIZ/SD4GE to consider that skills uptake is also affected by costs of land and capital, and that the ability of plumbers to finance a vehicle might affect their willingness to employ or take on more learners.

The following sub-sections take a look into the basic factors of production:

- Skills
- Labour
- Finance,

Thereafter the more advanced factors of production are discussed.

4.1.1 Skills

The plumbing trade is one of the critical skills areas identified by the Department of Higher Education and Training. Over the past few years the plumbing trade has received a lot of support from GIZ/SD4GE, especially regarding solar water heaters, and also from other international and domestic development cooperation partners.

However, plumbers regularly express their frustration with the quality of graduates who complete the formal education at TVET colleges. This despite the huge amount of funds and support being poured into the education of plumbers at public TVET colleges.

IOPSA recognises five public TVET colleges:

- Northlink College (Belhar, Cape Town)

- College of Cape Town (Cape Town)
- Flavius Mareka (Sasolburg)
- Ekurhuleni East College (Springs)
- Umfolozi College (Richards Bay)

IOPSA also recognises the following five private colleges:

- Africa International Training Facilities (Bredell, Gauteng)
- Tjeka Training Matters (Krugersdorp)
- Africa Skills Village Training and Management Services (George, Southern Cape)
- PCD College (Pretoria)
- MAASA (East London)

In interviews with IOPSA, PIRB staff and industry representatives, we were told that the industry is frustrated by the lack of responsiveness of the TVET sector. Complaints about the lack of responsiveness ranged from lecturers not showing up for courses (co-arranged with GIZ/SD4GE), to lecturers not being qualified plumbers. Expressions of doubt about the commitment of the TVET sector also included statements that ranged from the poor career advice and guidance given to young entrants into the system to the fact that training of existing staff was very difficult to arrange with public TVET colleges.

Since 2012, registered and licensed plumbers must issue certificates of compliance for hot water systems (geysers, solar geysers and heat pumps) in terms of the respective mandatory standards. Although these regulations and standards are not new, what is different is an emphasis on enforcement and compliance that is applied within the certificate of compliance. Just having a qualification of a plumber is not enough, all plumbers must be registered with the PIRB and must pass an assessment before they are qualified as being licensed. Only licenses plumbers can issue certificates of compliance.

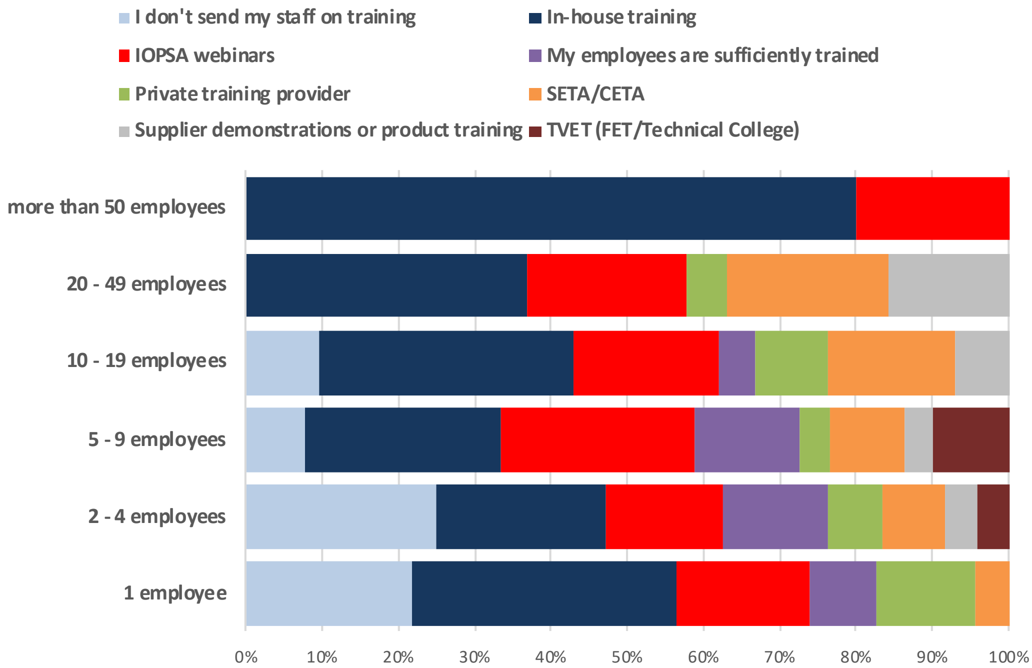
The challenge is that many untrained staff members appear to be stuck at low levels of formal qualification with little opportunity for them to receive further formal training during work time. This means that plumbers have to dispatch more senior and qualified plumbers to oversee and sign off on the work of less experienced and lower qualified staff, thus increasing the costs of the business and making the logistics more complicated. While some of the larger plumbing companies have found ways of doing this, some of the smaller plumbers are struggling as the only person that is often the business owner.

At this point the full costs of issuing certificates of compliance cannot yet be passed on to the market, because there are people willing to pay for and plumbers willing to do work that is not certified as compliant. While the cost of issuing a certificate and compliance is only R160, many plumbers are not able to absorb the cost or pass on this cost to their clients. Plumbers that are licensed are not yet perceived by the market as being more valuable and qualified than an unlicensed plumber. For instance, the insurance market is not yet willing to insist on certificates of compliance for work done by plumbers, despite the regulations. The insurers do not allow licensed plumbers to claim higher rates (to cover the certificate of compliance). However, the increased compliance and its enforcement is critical in strengthening the professionalisation of the plumbing trade.

IOPSA reports that the most searched-for term on their website is skills development. It is not clear whether these searches are being done by individuals wanting to further their own careers, or by firm owners or training providers.

In Figure 16, the training preferences by different sized companies are shown. It is interesting to see how, as companies grow, the importance of in-house training increases. IOPSA webinars are also an important source of knowledge content. The bigger the company, the more likely the SETA/CETA will be to play an important role. As companies grow beyond 2 employees, supplier demonstrations and product training also grow in importance.

Figure 16: The current training preferences according to company size



Source: Plumbing Business Owners Survey (TIPS, 2019b)

In the past year IOPSA introduced a service to assist its members with skills development plans. It was reported that many IOPSA members were unaware of skills development plans, levies and formal training options. In the Western Cape the bargaining council still claims a levy from employers, and they arrange the training programmes that are implemented by the MBA.

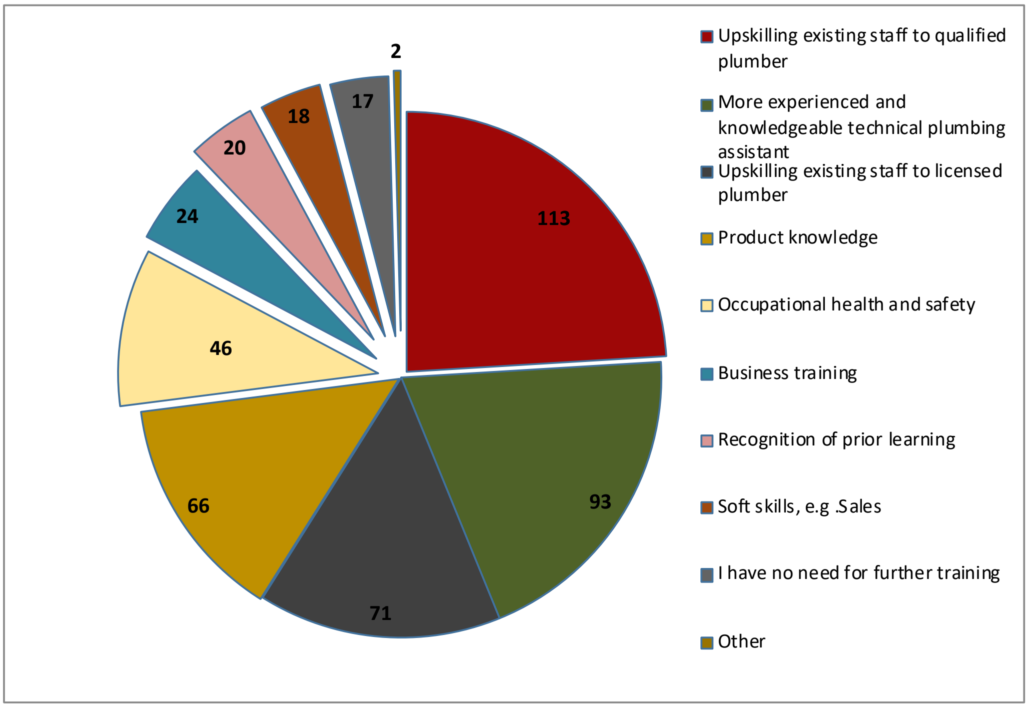
We were told that IOPSA was increasingly working with private training colleges to ensure a sufficient supply of graduates that meets the theoretical and practical requirements of the industry. Generally, it was felt that the graduates from the private training colleges exceeded the expectations of industry and were able to meet the trade test requirements more easily. In Figure 16 the role of private colleges is show in green, and it is clearly visible that TVET students are important mainly for companies with 2 to 9 employees. Interestingly enough, for companies with 1 staff member, a private training provider is preferred.

Although IOPSA participated in the curriculum development process at QCTO, they are not satisfied with the quality of the trade test or the quality of graduates from the TVET sector. Contrary to the opinion of IOPSA, other participants in the curriculum development process feel that the industry had an opportunity to make inputs, and that some of the demands of the industry were unnecessary and did not fit into the timelines or the specifications of the curricula.

With regard to the dual system approach, both IOPSA and the PIRB strongly expressed the opinion that the dual system is exactly what South Africa needs. However, it also felt that many plumbers did not use the word "apprentice" in the same way as GIZ/SD4GE or PIRB, and that there were different opinions between the industry bodies, GIZ/SD4GE and other organisations such as SSACI and the DHET about how the dual system is supposed to work. For instance, many plumbers (and other trades in general) refers to an apprentice as any younger person who is working to gain experience, even if they are not on a formal education programme. There are also differences in how the dual system is described by different stakeholders.

In terms of anticipated training priorities, the owners were asked about their future training priorities (see Figure 17). The graph in Figure 23 shows the importance of upskilling existing staff (113) and improving the qualifications of technical plumbing assistants (93). This shows that most of the immediate training demand is for short courses.

Figure 17: Training priorities of respondents



Source: Plumbing Business Owners Survey (TIPS, 2019b)

Product knowledge, occupational health and safety, business training and soft skills training were all given much lower priority. Only 20 respondents indicated that recognition of prior learning was important.

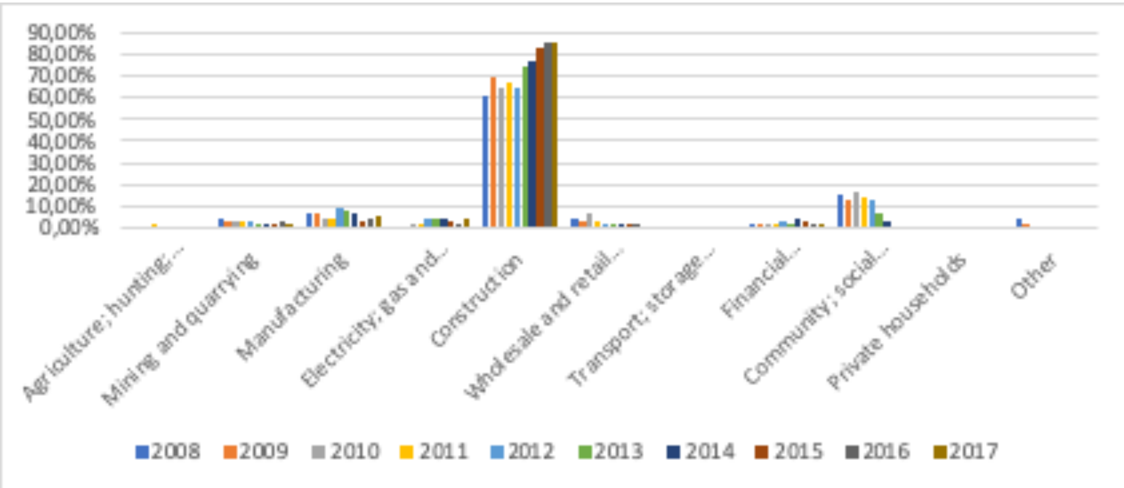
4.1.2 Labour

The bargaining councils are reported not to be active, except in the Western Cape. The wages in the plumbing industry vary according to provinces and the market segments they serve. The wages are estimated to be half of those paid in the electrical trade.

The high-level study conducted by TIPS (2019b) showed that a huge number of workers are employed in the sector in an informal capacity. The LMD data estimates that there are 125 000 plumbers in the South African economy.

TIPS further analysed the LMD data to determine where the plumbers are employed. The LMD asked the respondents for the name of the organisation which they worked for and the main type of goods and services produced. This information is used to classify individuals according to the Standard Industrial Classification (SIC) codes. These codes are then grouped together according to the type of industry as shown in Figure 18 for plumbers.

Figure 18: Plumbers by industry, LMD data 2008-2017



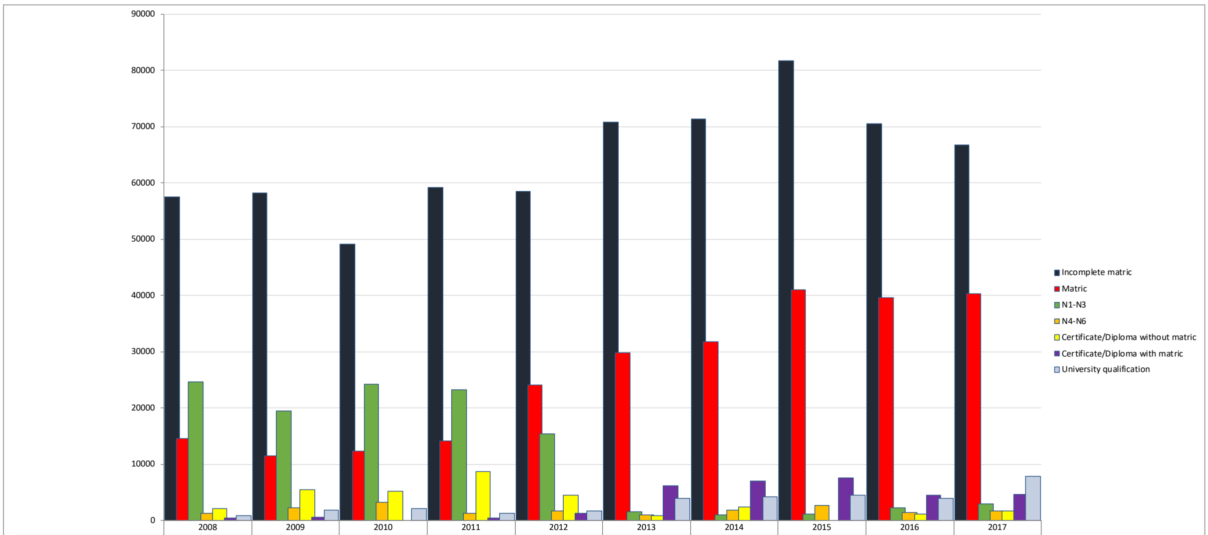
Source: TIPS in Annex 1.1, calculations based on LMD 2008-2017.

Figure 18 shows that the majority of plumbers work in the construction industry where there has been an increase in their proportion over the analysis period (60% in 2008 and 85% in 2017). The construction industry consists of 5 SIC codes: site preparation; building of complete constructions or parts thereof; building installation; building completion; and renting of construction of demolition equipment with operators. In 2017, more than 99% of plumbers in the construction industry were found to be working in the ‘building installation’ category.

The other salient feature in Figure 18 is the declining proportion of plumbers working in the community, social and personal services industry. In 2008, when this industry exhibited the largest proportion of plumbers, more than half of those individuals worked for the ‘local authority’ and approximately 15% worked for ‘central government’. Later years’ results are concerning for plumbers in this industry as there was a sharp decline in plumbers post-2012, where this trend continued such that in 2017 only 0.22% of plumbers worked in the community, social and personal services industry.

TIPS analysed the LMD data to assess the reported qualifications of the plumbing workforce as it was recorded in the labour market dynamics statistics. The results are shown in Figure 19 below.

Figure 19: Highest qualifications of plumbing workforce according to the LMD



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Incomplete matric	57507	58220	49060	59137	58452	70808	71292	81739	70580	66696
Matric	14592	11574	12397	14206	24142	29807	31741	40953	39632	40358
N1-N3	24595	19440	24258	23307	15380	1605	1041	1108	2259	2940
N4-N6	1266	2315	3211	1359	1677	1083	1813	2703	1402	1676
Certificate/Diploma without matric	2094	5448	5233	8697	4532	927	2496	0	1153	1708
Certificate/Diploma with matric	404	680	0	484	1358	6164	7047	7572	4484	4731
University qualification	946	1869	2107	1347	1711	4027	4299	4465	3985	7872

Source: TIPS Annexure 1.1 calculated from LMD 2008-2017 (TIPS, 2019a).

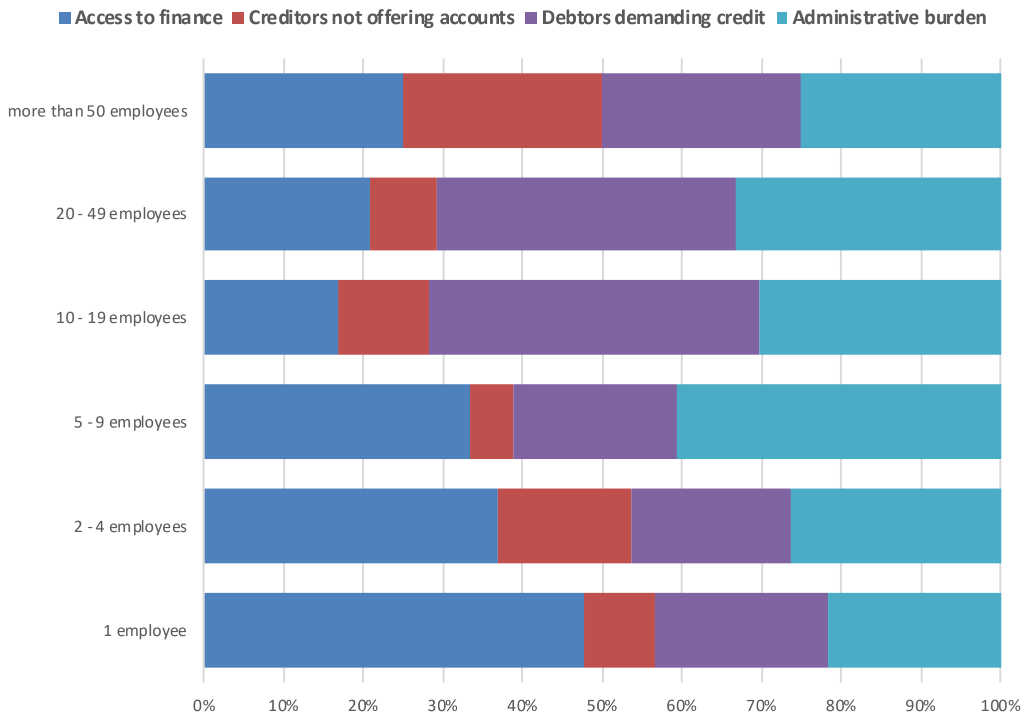
The study shows a large number of workers in the plumbing industry who did not complete matric. Interestingly enough, the number of workers with a matric qualification has increased to several times the number of workers with vocational qualifications. In general, Figure 19 shows very low levels of formal qualifications in the industry. It is not clear what the experience levels of these workers are, and whether they would qualify for recognition of prior learning (RPL) to ensure that they are placed on an upgrading pathway.

4.1.3 Finance and capital

Many smaller plumbing businesses are financed through personal collateral of the owners. This means that older white-owned companies might have an advantage over younger black-owned companies.

During the plumbing business owner survey, we investigated the major challenges constraining the growth and performance of the companies. The results are shown in Figure 20, and it is clear that of the four major challenges, three are related to finance.

Figure 20: Major challenges by firm size



Source: Plumbing Business Owners Survey (TIPS, 2019b)

Black plumbers are reported to struggle to gain access to funding for start-up capital and vehicle purchasing. This is especially so when smaller plumbers want to purchase a second-hand vehicle and they do not quality for finance, resulting in vehicles being purchased for cash. This most likely results both in cash flow problems as well as investment in cheaper and less reliable vehicles.

4.2 Advanced factors: knowledge, technology and institutional support

Advanced factors mainly relate to specialised infrastructure, technological institutions and the flows of knowledge in the system. While it is easy to see how knowledge can flow into a sector (like plumbing) through the formal education system, a lot of tacit and advanced knowledge that is more oriented towards problem solving is disseminated through other means.

During our research we detected the following enablers of advanced factors of production:

- The *Plumbing Africa* trade journal
- The PLUMBDRAIN AFRICA trade fair
- Equipment and material suppliers hosting technical briefings
- The IOPSA webinars and active YouTube channel which is open
- The SABS and SA Watermark standards

4.2.1 The Plumbing Africa trade journal

Plumbing Africa magazine is an acknowledged and widely distributed trade journal which is published by independent publishers on a monthly basis. It is bursting with information about standards, new materials, case studies, new specifications and other information of interest to the industry. Plumbers and industry experts said that they kept *Plumbing Africa* magazine because of the valuable content. The audited circulation of *Plumbing Africa* was 3 500 in February 2019.

The publishers only allow those registered with IOPSA, or who are SABS and regulatory compliant, to advertise in the magazine.

They have a very unique distribution method whereby smaller or informal plumbers can register with a merchant or a wholesaler to receive their copies at the front desks. The magazine has reported growing subscriptions from merchants based in townships. They have also focused on areas such as Diepsloot and Alexandria due to large public investments in water infrastructure and housing.

Due to the costs of procuring standards from the SABS, *Plumbing Africa* magazine covers standards and regulatory changes in every issue. They also have a popular name-and-shame column where plumbers can submit photos of poor workmanship.

4.2.2 The PLUMBDRAIN AFRICA trade fair

The PLUMBDRAIN AFRICA trade fair, co-located with Interbuild, is held every second year. This event is seen as Africa's largest construction and building services exhibition. The fair had its 50th anniversary in 2018. It is held at the Nasrec expo centre south of Johannesburg.

The following information was taken from the https://plumbdrain.interbuild.co.za website:

> Providing exhibitors an unrivalled marketing platform and a tangible return on investment, PLUMBDRAIN AFRICA is one of Interbuild Africa's most successful co-located shows.
>
> The PLUMBDRAIN AFRICA fair has a reputation for showcasing the latest innovations in products and services that adopt eco-friendly technologies, which help create sustainable changes in the industry. Seminars and workshops educate the audience about new products and solutions in the world of plumbing and provides insight into new quality standards in the industry and relevant updated legislation.
>
> PLUMBDRAIN AFRICA is the only dedicated plumbing, draining, sanitation, water, and sanitaryware exhibition in Africa. Covering all facets of plumbing, from commercial and industrial to standard domestic plumbing products and services.
>
> Live demos and hands-on training give exhibitors an edge to market their products to the industry effectively. The organisers encourage all exhibitors to create interactive stands for the professionals and trades to experience and understand the material fittings and technology that are on offer, coinciding with the mandatory standards that apply to plumbing and affording great plumbing practices the attention it deserves.

Exhibitors at PLUMBDRAIN Africa cover a broad spectrum of products and services, including:

- Pumps and pump technology
- Geysers and hot water systems
- Solar heating and cooling
- Pipes, fittings and thermoplastics
- Bathroom accessories
- Toilets, cisterns, urinals and WCs, portable toilets
- Showers, baths, basins, taps and mixers
- Waterproofing and leak detection
- Valves, cylinders and gutters
- Meters and metering
- Rainwater harvesting and heat pumps

According to the PLUMBDRAIN organisers, visitors to PLUMBDRAIN AFRICA include prominent decision makers in all areas of building and construction:

- Buyers
- Builders' merchants
- Contractors and draughtsmen
- Fire/security professionals
- Government officials
- Interior designers and land surveyors
- Property developers
- Quantity surveyors and specifiers
- Town planners
- Building contractors, subcontractors, inspectors and supervisors
- Civil engineers, consulting engineers and electrical engineers
- Plumbers, plumbing merchants and plumbing contractors

4.2.3 Equipment and material suppliers hosting technical briefings

Apart from the PLUMBDRAIN AFRICA annual trade fair, there is an important event where all major equipment and material suppliers exhibit.

Beyond this big event, suppliers and merchants regularly host demonstration and training events to demonstrate new equipment or to improve workmanship. IOPSA and the PIRB support these events if they transfer knowledge, new standards and approaches to the industry, but IOPSA and the PIRB are hesitant to endorse events that are too sales driven. Often, suppliers sponsor events and meetings in the plumbing industry and then they are allowed to display their products or demonstrate their technology before or after the meetings. However, concerns have been expressed about many vendors using events, meetings and fairs to promote products and materials that do not comply with local standards and regulations.

The importance of these events is shown in Figure 16, where the importance of supplier demonstrations and product-specific events can be seen. Similarly, Figure 17 shows the importance of product knowledge training.

4.2.4 The SABS and Watermark standards

Standards, regulations and technical performance specifications are powerful mechanisms to introduce new knowledge into an industry, provided the content of these technical documents is accessible to the users, equipment suppliers, clients and regulators. The regulations applicable to the plumbing industry is increasingly enforced. The results is that the demand for knowledge regarding quality, compliance, standards and performance is increasing, as all formal actors have to increase their own standards and compliance.

It is a legal requirement that all plumbing products must comply with a myriad of national standards[1]. This increases the costs to manufacturers and merchants, consumers and also plumbers as they have to navigate a wide range of standards, regulations and technical notes. For example, one of the most important updated standards is SANS 10254 for the installation, replacement and repair of electrical hot water systems. Due to the cost of this and other standards, IOPSA, the PIRB and *Plumbing Africa* magazine have put in a lot of effort to raise awareness of the updated standards.

The plumbing industry is very actively involved in technical working committees at the South African Bureau of Standards (SABS). In the December 2018 issue of *Plumbing Africa* magazine there is a four-page list of different standards and regulations relevant to the plumbing industry. The importance of occupational health and safety is shown in the plumbing owner survey in Figure 17.

From our meetings with industry experts, it became apparent that many experts are disillusioned with the SABS and the National Regulator of Compulsory Standards.

Due to the mistrust of how SABS stamps of approval have been awarded in the last ten years, the SA Watermark initiative was started under the auspices of IOPSA to make it clearer which products and materials complied with South African regulations. SA Watermark promises to offer plumbers a single point of reference to check whether plumbing materials are compliant with the various SANS standards. This service is expected to reduce the costs of plumbers to verify whether products are compliant, while also reducing the need for them to be acquainted with all the different regulations and standards.

4.3 Supporting or enabling industries

There is an active and diverse supplier and manufacturing network in South Africa. This is evident in advertisements in the plumbing trade magazines and the active participation of key suppliers in the promotion of better plumbing technology, quality and workmanship. It is also evident in the wholesalers' and merchants' stock that originates from South Africa.

The manufacturers are visible, and several export to demanding and sophisticated markets in Europe and the USA.

[1] A complete list of all products that are legally required to comply with their respective national standards is published in the following standards: SANS 10252-1, SANS 10252-2 & SANS 10254.

International manufacturers also have agents and official resellers in South Africa. Many of them participate in the PLUMBDRAIN AFRICA trade fairs and other events in support of the industry.

The retail and wholesale markets are also well established both in the urban and rural markets. Several construction suppliers have also opened branches in townships and in fast-growing areas. According to industry experts, several merchants, wholesalers and distributors target students and new entrants.

The supporting industries are directly affected by the performance and investments in construction, commercial property development and large public infrastructure projects. This sector has been under pressure over the last five years, resulting in retrenchments of formal employment in the construction sector and even the closure of some large construction companies. This means that some factories have cut back on their product lines, and increasingly depend on important materials and equipment from other countries.

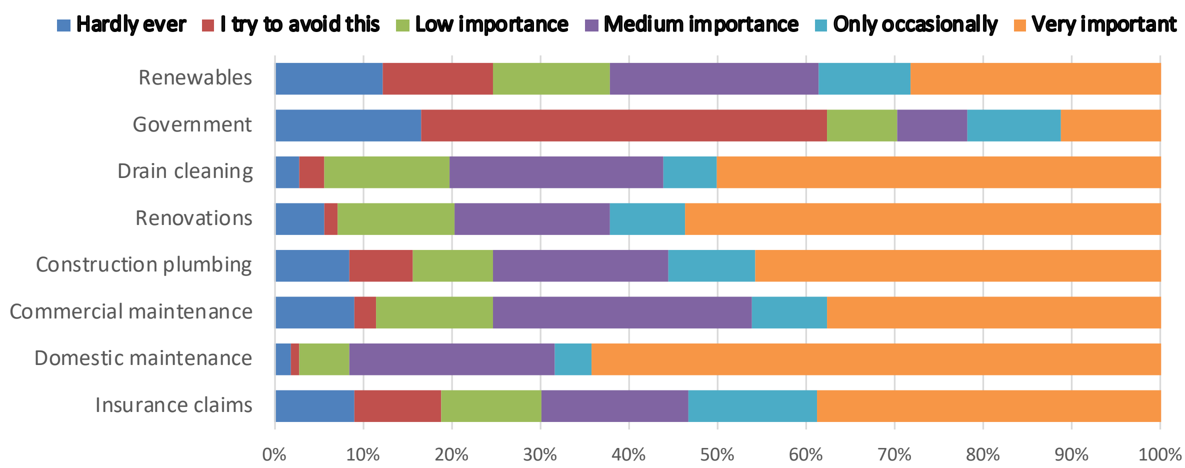
The government has targeted the localisation of the manufacture of solar water geysers, and a small cluster of manufacturers exists. However, many of the manufacturers of PVC or plastic-based materials face strong competition from Asia, and several factories have closed.

4.4 Demand conditions

Many plumbing businesses, especially the smaller companies, are in a cycle of boom or bust. They are either overloaded with work and under pressure to deliver work at low rates, or they are sitting in the office waiting for the phone to ring. Most plumbers find it hard to secure a stable pipeline of work. In the survey (see Figure 13), plumbers reported that access to markets was a key challenge for them.

During the plumbing business owner survey, the respondents were asked how important different markets were for their enterprises (see Figure 21). Not surprisingly, domestic maintenance, renovations and drain cleaning were the most important markets. Interestingly enough, almost half of the plumbing business owners tried to avoid government work.

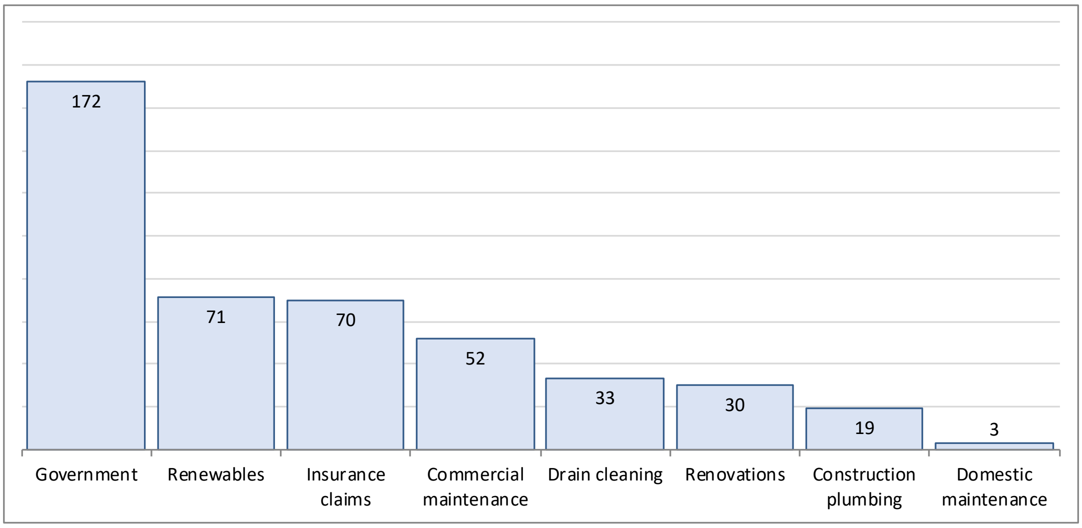
Figure 21: Importance of different markets



Source: Plumbing Business Owners Survey (TIPS, 2019b)

In the question to determine the most important market, there was an option also to select “not applicable”. The results of this option are shown in Figure 22. It can be seen that the government is by far the least applicable to the respondents, followed by renewables and insurance claims.

Figure 22: Type of clients not applicable to respondents



Source: Plumbing Business Owners Survey (TIPS, 2019b)

During the survey we investigated what kind of pressure different types of client placed on the plumbers. The respondents could choose between:

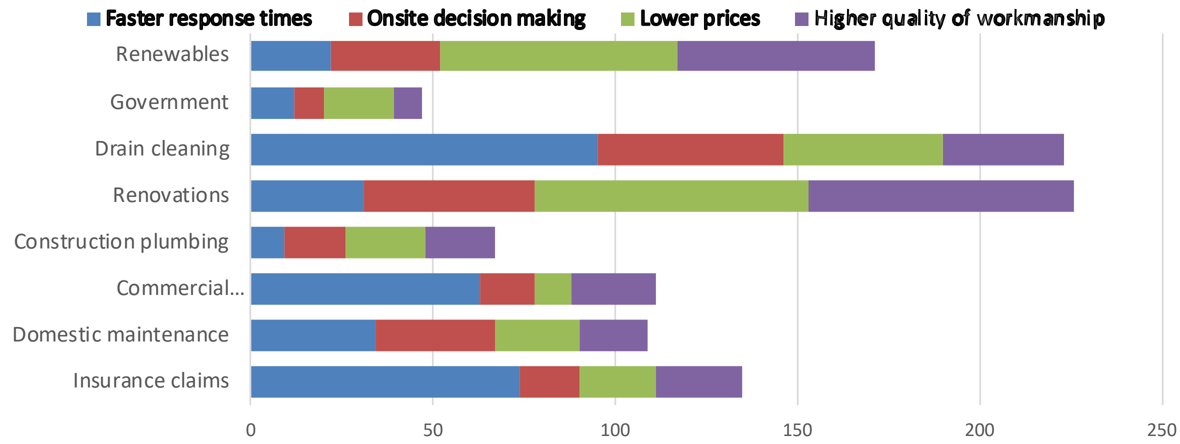
- Faster response times
- Lower prices
- Higher quality of workmanship

From generic strategy formulation we know that companies can typically follow two of these strategies at the expense of the third. For example, if clients want faster response times and higher quality of workmanship, it would be very hard to do this at lower prices. Or if clients want lower prices and higher quality, it would be hard to provide this fast.

To investigate distributed skills in the plumbing business, we included a fourth option: on-site decision making. This relates to the increased requirement for plumbers to be registered or licensed, to be able to provide on-site quotes and advice to clients, and to be able to issue certificates of compliance. The results of this question are shown in Figure 23 below.

Several interesting insights emerged from this question. Firstly, renewables appear to be more price sensitive than the researchers expected. Secondly, the low interest in servicing government is visible in the graph, but to our surprise construction plumbing was also quite low. As expected, drain cleaning demands a faster response and the highest on-site decision making. Renovations increasingly concern lower prices and higher quality of workmanship. Commercial maintenance is response sensitive, and so are insurance claims.

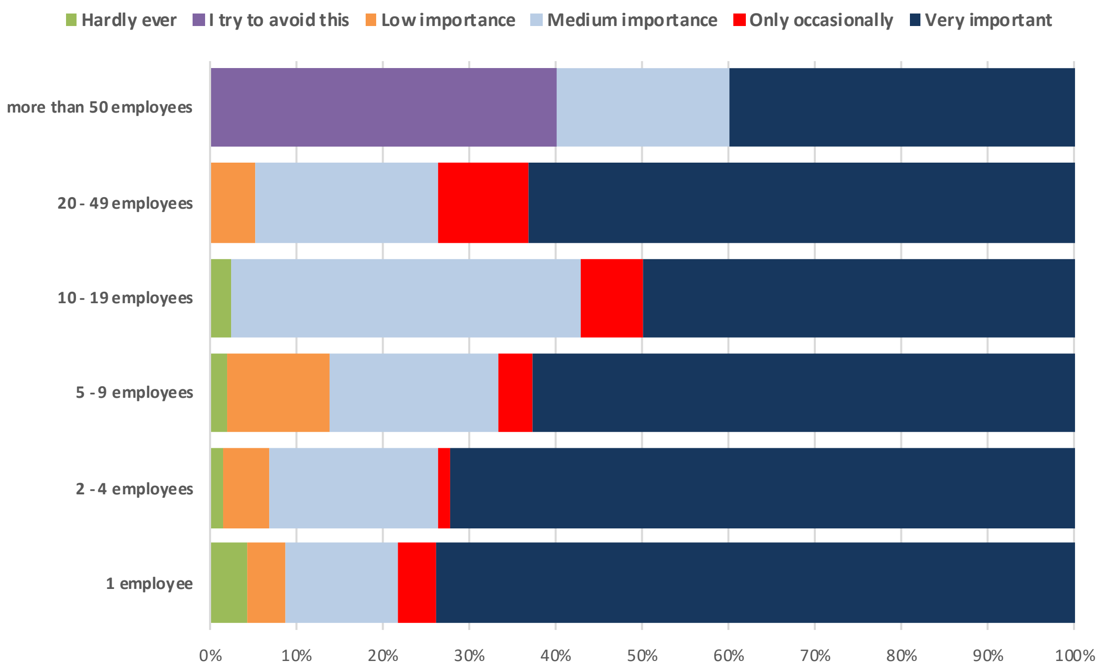
Figure 23: Demands by client type



Source: Plumbing Business Owners Survey (TIPS, 2019b)

Many of the plumbers, whether formal or informal, survive by serving domestic households. Figure 24 shows the size distribution of plumbing business owners who selected domestic maintenance as an important market. It is clear that smaller companies (below 9 employees) find this market very important, but as they grow this market becomes less important. Surprisingly, companies with 20-49 employees also target this market.

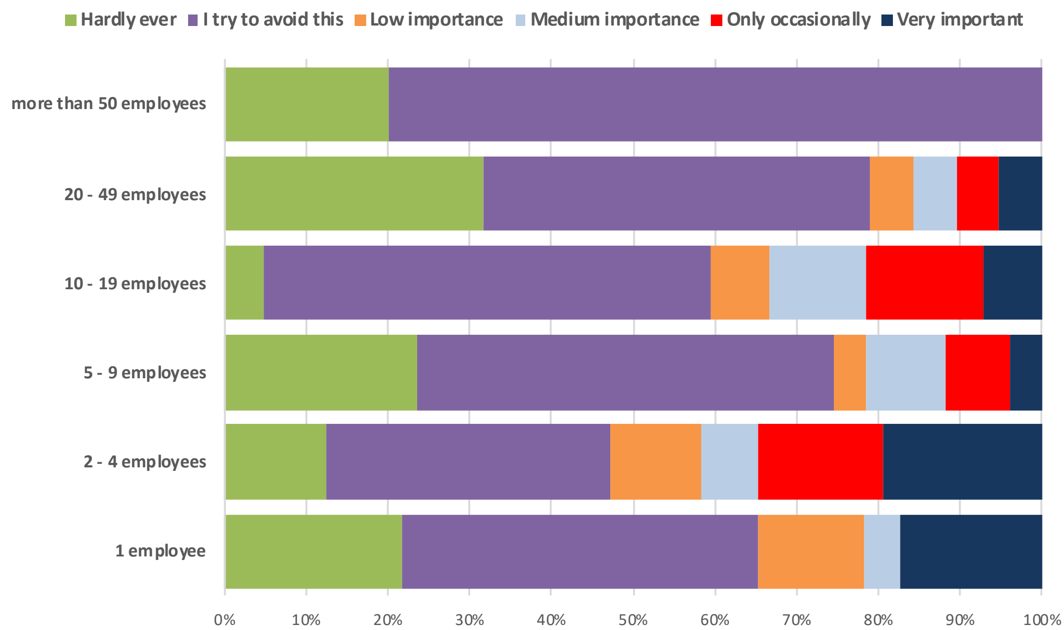
Figure 24: Importance of domestic maintenance by firm size



Source: Plumbing Business Owners Survey (TIPS, 2019b)

Figure 25 shows that across all firm sizes the largest proportion try to avoid the government as a client. However, there is a notable proportion of very small firms (less than 5 employees) who consider government work to be very important.

Figure 25: Importance of government work by firm size



Source: Plumbing Business Owners Survey (TIPS, 2019b)

4.5 Government and NGO support

Figure 25 shows that generally speaking the government (at all levels) was not an important market for most plumbers. However, the government plays roles other than only being a client. The government, especially at local level, is an important investor in infrastructure, a regulator of by-laws and trainer of learners. The War on Leaks in the Western Cape is an example of local spheres of government working on improving water provision and combatting leaks. This programme also trains the youth in water infrastructure maintenance.

Different government departments have either worked with the plumbing industry, or in some cases have bypassed the plumbing industry. For instance, some of the initiatives to improve water infrastructure have not worked with the official industry bodies but have in many cases directly targeted unemployed youth as beneficiaries. Due to the myth that the entry levels into plumbing are low, many public sector programmes target plumbing as an easy entry point. However, by crowding more young people into the market, informality is simply supported as the formal sector is not growing fast enough to absorb all the people trained in short courses on selected topics.

Beyond the government, there are a range of non-governmental organisations that are directly and indirectly working with the plumbing industry. Organisations such as Harambee, the NBI and JET education have all targeted plumbing as an important job creator. Harambee and the NBI are partners of GIZ/SD4GE in improving the role of the private sector in the dual system. It is reported that students supported by Harambee are more sought after due to the workplace preparation that Harambee does.

In the past, Eskom and the Department of Energy targeted the beneficiation of locally produced solar geysers.

4.6 Cross-tabulation of plumbing business owners' results

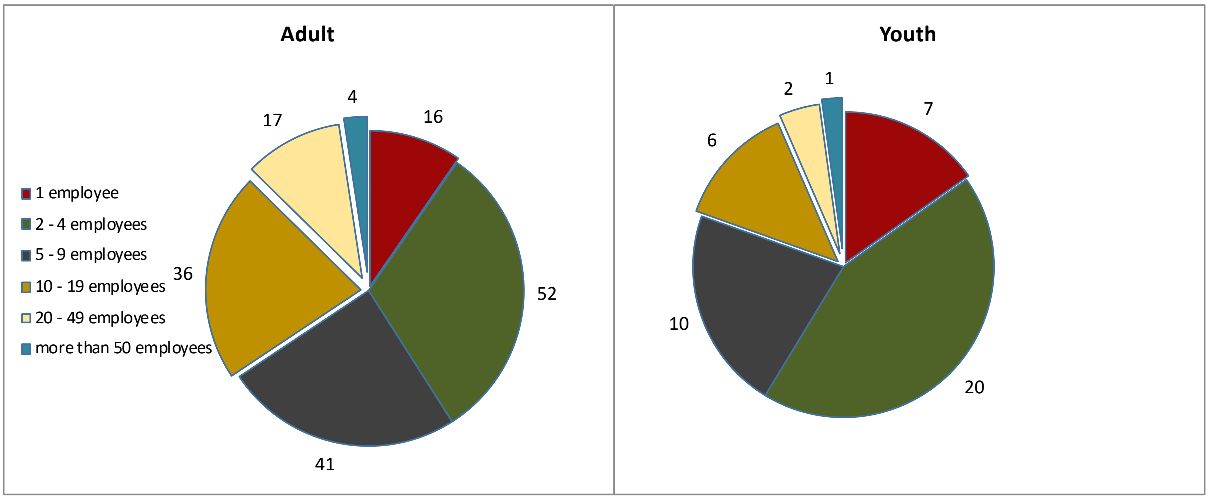
By cross-tabulating the responses to different questions, the data becomes more granular. We can shift from working with averages and frequencies to more differentiated archetypes. These archetypes give GIZ/SD4GE, IOPSA, the PIRB and other industry-supporting organisations a better idea of how to customise services, skills programmes and partnerships.

As part of Work Package 3 of GIZ/SD4GE Terms of Reference, opportunities to support the transformation of the plumbing industry should also be identified.

4.6.1 Owner age does not much affect company size

The business owner survey was done for respondents according to wage age group. By using the South Africa classification of adults being older than 34, and youth as younger than 35, the size of companies was assessed based on the age of the owner. It shows that most company sizes do not matter so much when it comes to adult and youth-owned enterprises. Figure 26 shows that 2 to 4 employees is the modal company size among the respondents whether they are below or above 35 years of age.

Figure 26: Comparison of plumbing company size by owner age

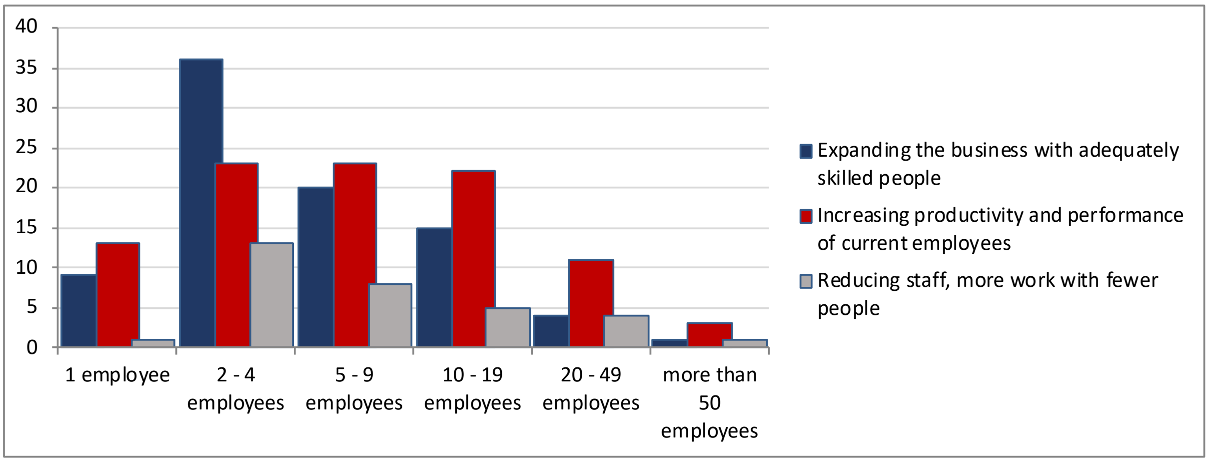


Source: Plumbing Business Owners Survey (TIPS, 2019b)

4.6.2 Different sized companies have diverging priorities

Figure 27 shows the different priorities of the owners by the different size groups. The recurring theme that emerges is that business owners with 2 to 4 employees prioritise expanding their businesses with adequately skilled people, while in businesses with 5 to 9 employees and upwards the priorities shift to increasing productivity. However, even in the 2 to 4 employees group there are still many employers who are thinking of reducing staff and doing more work with fewer people.

Figure 27: Priorities of different sized plumbing companies



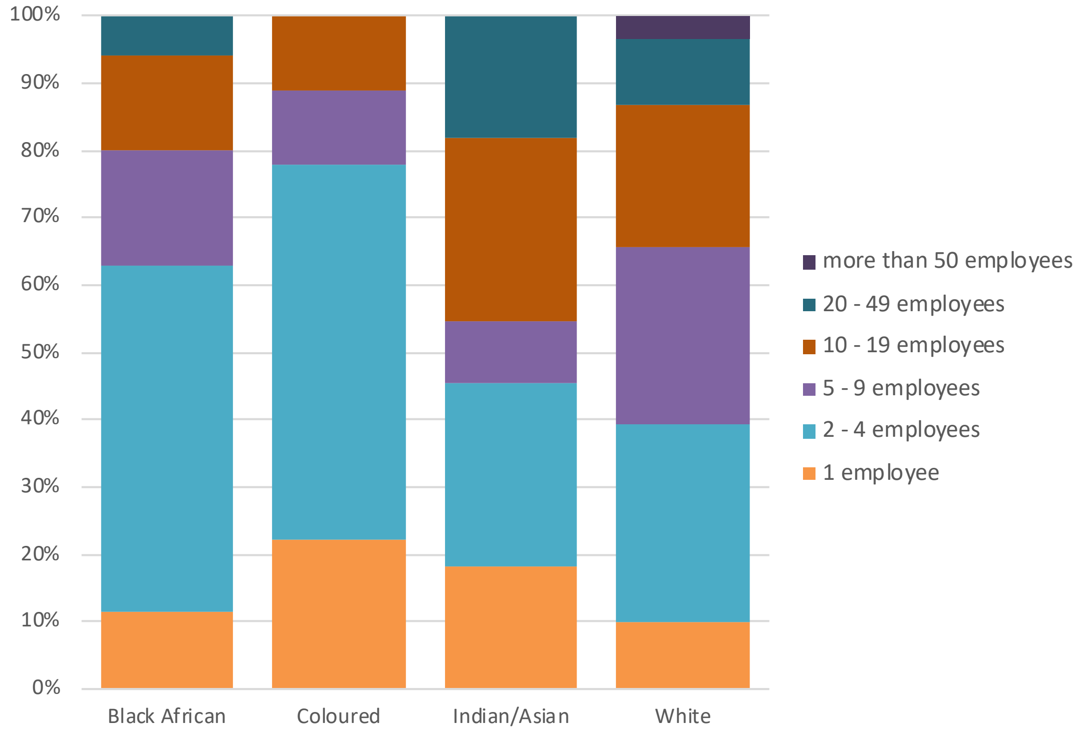
Source: Plumbing Business Owners Survey (TIPS, 2019b)

In general, we found that the larger the companies become, the more likely they are to prioritise improving productivity of existing staff. Companies in the 2 to 4 size range are also more likely to want to increase productivity by reducing staff. The implication could be that as they employ more skilled people they may be inclined to reduce the lesser skilled staff.

4.6.3 Ownership race affects priorities

By looking at the strategies of the different sizes of companies in Figure 28, it can be seen that among black and coloured owners, the largest proportion of firms have 2 to 4 employees. There is a more equal distribution of company sizes among white owners. It is clear from this graph that not all white company owners are necessarily trying to build larger companies. The total number of Indian/Asian respondents was too low across the spectrum, but from the small sample that we have we can see that companies with 5 to 9 employees in size are smaller.

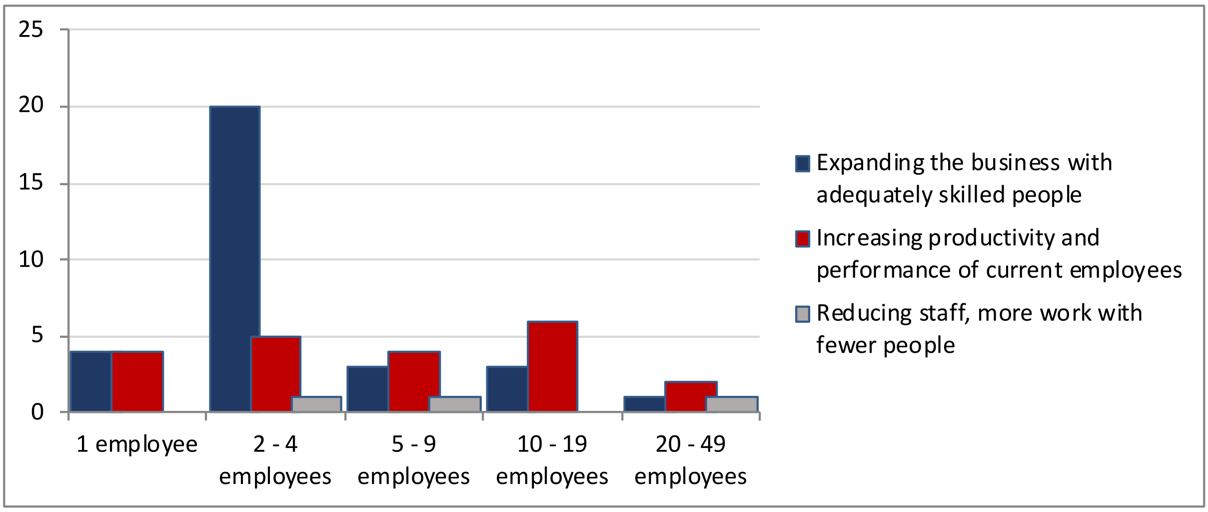
Figure 28: Plumbing company size by race



Source: Plumbing Business Owners Survey (TIPS, 2019b)

By analysing the priorities of black, Indian and coloured company owners by firm, we can see a clear difference in priorities of firm owners when comparing companies with 2 to 4 and 5 to 9 employees (Figure 29). It would appear that 4 or fewer staff members is a critical size, with a clearly different priority from the 5 to 9 employees group. At a staff size of 10 and upwards another pattern can be distinguished from the 9 and below group. We see that with companies with more than 4 employees their strategies are mainly focused on increasing the productivity and performance of their existing workforce. It is not unexpected that smaller companies are more interested in expanding their business by adding adequately skilled people.

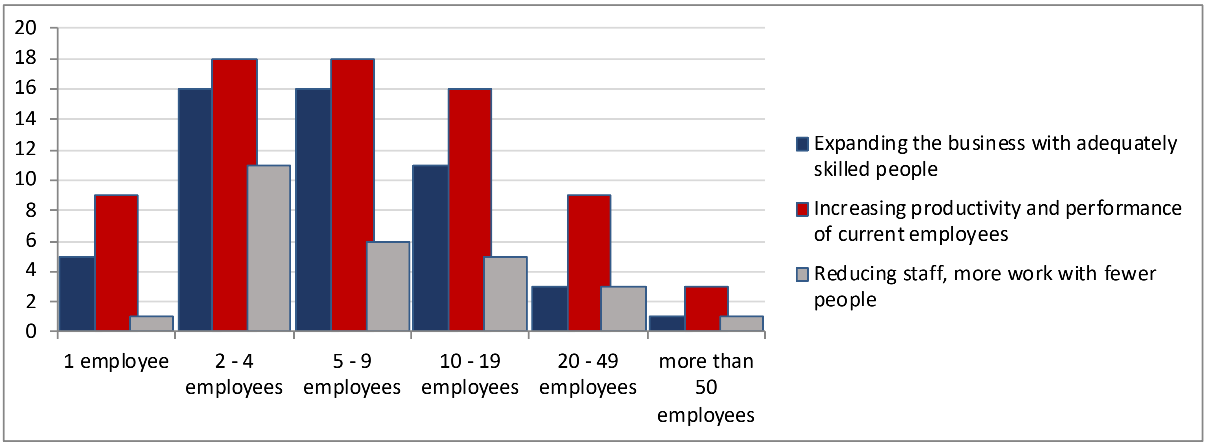
Figure 29: Priorities of black, Indian and coloured plumbing business owners



Source: Plumbing Business Owners Survey (TIPS, 2019b)

When considering the priorities of white-owned companies (see Figure 30), we see that throughout all the company sizes the priority is more to increase the productivity and performance of existing workers. This could indicate a stronger preference for short courses, online resources and on-the-job training.

Figure 30: Priorities of white plumbing business owners



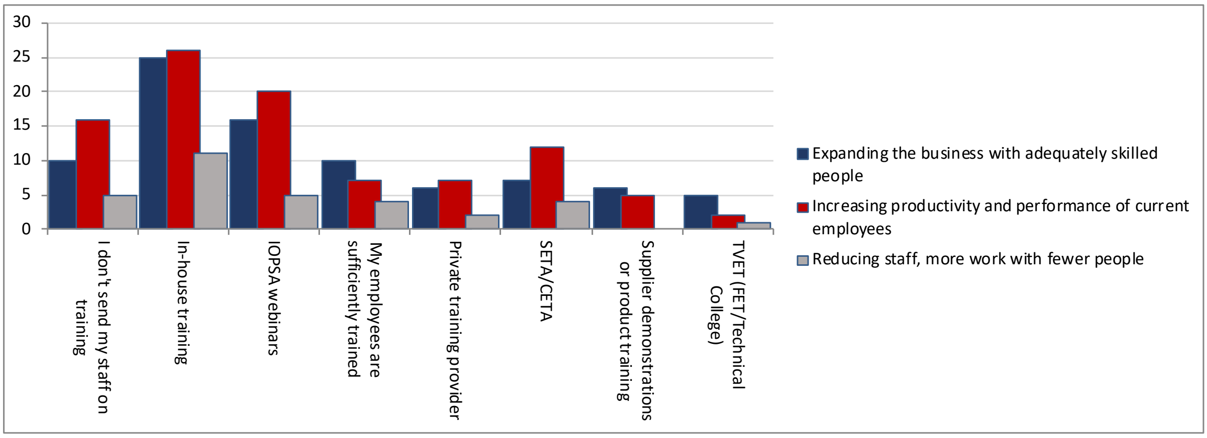
Source: Plumbing Business Owners Survey (TIPS, 2019b)

4.6.4 Company priorities are reflected in past training preferences

We tried to determine whether company priority had an effect on training preferences. The respondents were asked what their preferred form of skills development of their staff was. Figure 31 shows that of almost all the widely known ways of increasing skills in the industry, the preference was for increasing the productivity of existing workers. The exception was where owners felt their staff were already sufficiently trained, and therefore opted for adding additionally skilled staff to their companies. This graph could also be interpreted as saying that employees who are sent as students to train (perhaps as apprentices) by a company would also fit the strategy of the company better. However, under the current economic conditions this could also be questioned, as many companies still wish to reduce their staff.

In-house training had the highest number of responses, indicating that for all three kinds of generic strategy, training employees on the job had a high preference.

Figure 31: Company priority and past training preferences



Source: Plumbing Business Owners Survey (TIPS, 2019b)

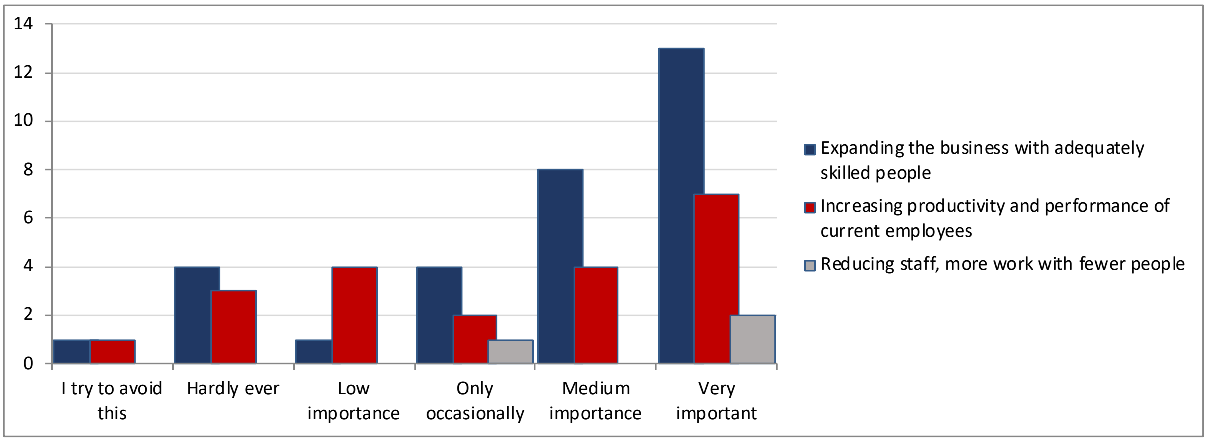
It can be concluded that there is a much higher preference for on-the-job or in-house training than to send staff to any formally accredited training programmes irrespective of the training provider format. This is especially important as companies become larger.

4.6.5 Different markets shape business priorities

We wanted to see how markets or client types affected business strategy and priorities. The insurance industry's muscling down the rates of plumbers is a bone of contention in the plumbing industry, and we expected this to show in the results.

By looking at how the different races responded to the price pressure from the insurance sector, we found that black, Indian and coloured companies that ranked this market as of high importance responded by prioritising the expansion of the business with adequately skilled people (Figure 32).

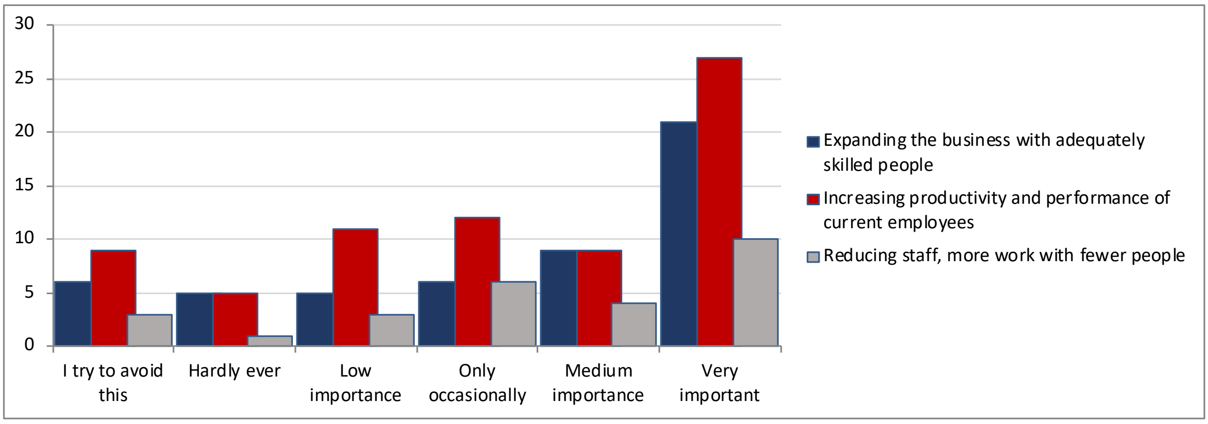
Figure 32: Black, Indian and coloured priorities in the insurance market



Source: Plumbing Business Owners Survey (TIPS, 2019b)

White-owned companies that ranked insurance as a very important market responded by prioritising productivity improvement of existing staff. Those that indicated that insurance was of medium importance indicated expanding with adequate staff and increasing the productivity of existing staff as equally important priorities (Figure 33).

Figure 33: White priorities in the insurance market



Source: Plumbing Business Owners Survey (TIPS, 2019b)

When considering other markets, such as domestic maintenance, we discovered that in general the black, Indian and coloured company owners always prioritised the addition of adequately skilled people, whereas white owners always prioritised an increase in productivity.

5 Recommendations from the plumbing owner survey

Based on our industry diagnosis, we developed recommendations based on the industry diagnosis which we address to IOPSA and the PIRB, and thereafter to GIZ/SD4GE.

5.1 To IOPSA and the PIRB

The public sector is still an important employer of plumbers. Targeting plumbers employed in the public sector could be a good entry point and could further strengthen the position of IOPSA. Our estimation is that as many as 10% of self-declared plumbers in South Africa are working in government service.

We recommend targeting larger metropolitan municipalities in their different capacities:

- As regulators and registrars of plumbers
- As employers of plumbers and providers of opportunities for apprentices
- As potential hosts of regional IOPSA networking activities beyond Gauteng and the Western Cape.

The smaller plumbers need some signposts to organisations and networks that can provide them with generic and more specific business, human resources and legal support. This can be negotiated with organisations such as the Small Enterprise Development Agency, or perhaps even with banks. We found that the Master Builders Association offers a manual and limited support to small and emerging contractors[2], and wondered whether this would be an idea for IOPSA to pursue.

Informality is a huge issue in the plumbing sector. A distinction should be made between "informal" as in not compliant with basic laws, and informality as not formally part of the activities of IOPSA and PIRB.

The current estimated informality of unregistered and non-tax paying plumbing activity is very high and non-compliant. Pathways to formality are in the interest of IOPSA and the PIRB, and must be carefully designed to crowd in actors in the industry. However, this support would have to go beyond the technicalities of a plumbing enterprise and would have to include some very basic business support as well.

The second kind of informality is formally registered companies that are providing services that includes plumbing, but that are not connected to IOPSA, PIRB or the plumbing industry. These companies are able to undercut fully compliant plumbing enterprises as they do not comply with standards and regulations. Their behaviour undermines attempts to professionalise the industry and it subdues investment by existing formal. There are a large number of plumbing companies in the formal sector that do not yet belong to IOPSA. Perhaps a class of membership that recognises memberships in other related industry associations can be used to boost the industry representation. The annual membership fee of IOPSA may also be an obstacle for many smaller plumbers to join.

IOPSA should continue to invest in video material and webinars, as these are valued by the business owners.

At the moment, the different levels in the designations of the PIRB are still mainly sequential and uniform, providing a very narrow pathway for upgrading and differentiation. While this is a really straight forward upgrading path for the profession, we doubt whether this creates enough room for sub-categories of specialists to emerge. However, the PIRB is correct in stating that differentiation makes sense once plumbers have reached an acknowledged and recognised formal qualification. We recommend that more industry-recognised "signals" of competence be developed to allow for more job differentiation and to support specialisations once the basic qualifications are completed. This signalling of competence must be much shorter and quicker than a formal qualification. If at all possible, the further qualifications or areas of specialisation should not be too sequential.

IOPSA and the PIRB has already committed to conducting an industry survey every year. We strongly support this initiative and hope that IOPSA and the PIRB can use some of the questions that were used in this survey. Building a time-based database will be very important for strategic decisions and service design going forward.

IOPSA can also consider supporting initiatives such as a benchmarking exercise to stimulate competition and cross-firm learning.

[2] https://www.masterbuilders.org.za/our-services/support-to-emerging-contractors

Several plumbing companies already have in-company trainers, and an important way to disseminate learning to the industry would be for IOPSA and the PIRB to find ways to support the development of these mentors.

5.2 To GIZ/SD4GE

More focus is needed on shorter skills programmes and training events, online or media-based education. If possible, GIZ/SD4GE should find a way to support the efforts of the PIRB and IOPSA to professionalise the industry beyond just education support. GIZ/SD4GE is well connected and able to assist the industry organisations with their own testing systems, and to work better with the public sector bodies involved in the qualifications frameworks, career paths, certification schemes and accreditation issues.

The plumbing business owner survey highlights the importance of videos, webinars and on-the-job training to equip existing employees to achieve higher levels of productivity and performance. It is important to help employers to upgrade their workforce so that new entrants can enter at the lower ranks of the system.

A priority of plumbing business owners at this point in time is to find ways to improve the productivity and performance of existing staff. We believe that as productivity, performance AND qualifications improve, the demand for better qualified graduates will also increase. The more PIRB registered plumbers who can issue certificates of compliance, the more plumbers at lower designations will be needed.

However, many plumbing businesses are also struggling to grow and absorb graduates because they are undermanaged. There is an expressed need for more business, site supervision, costing and other management training programmes. Owners must be supported to manage the competing demands of better technical work AND more productive management and administration.

The downturn in the construction sector combined with subdued household expenditure is weighing heavily on the plumbing sector. The result is intensified competition, lowering of rates and an under-investment in skills. But these are all short-term responses. In the longer term, highly qualified and competent plumbing artisans will still be needed. Finding ways to make is easier for existing staff to further their qualifications is very important. Yet, finding ways of improving the flow of young people through the education system into employment is also still very important. The trust and cooperation between the public VET institutions and the private sector must be restored, and the pipeline must be carefully monitored and curated to make sure the right candidates enter and pass through the system.

6 Conclusions

The industry analysis added value by looking at industry-level issues, mainly by engaging with the formal industry organisations and their supporters, and the perspective of plumbing business owners through a survey. The survey investigated many of the open questions raised by IOPSA and the PIRB, and also probed deeper into questions that arose from the high-level statistics that TIPS had analysed.

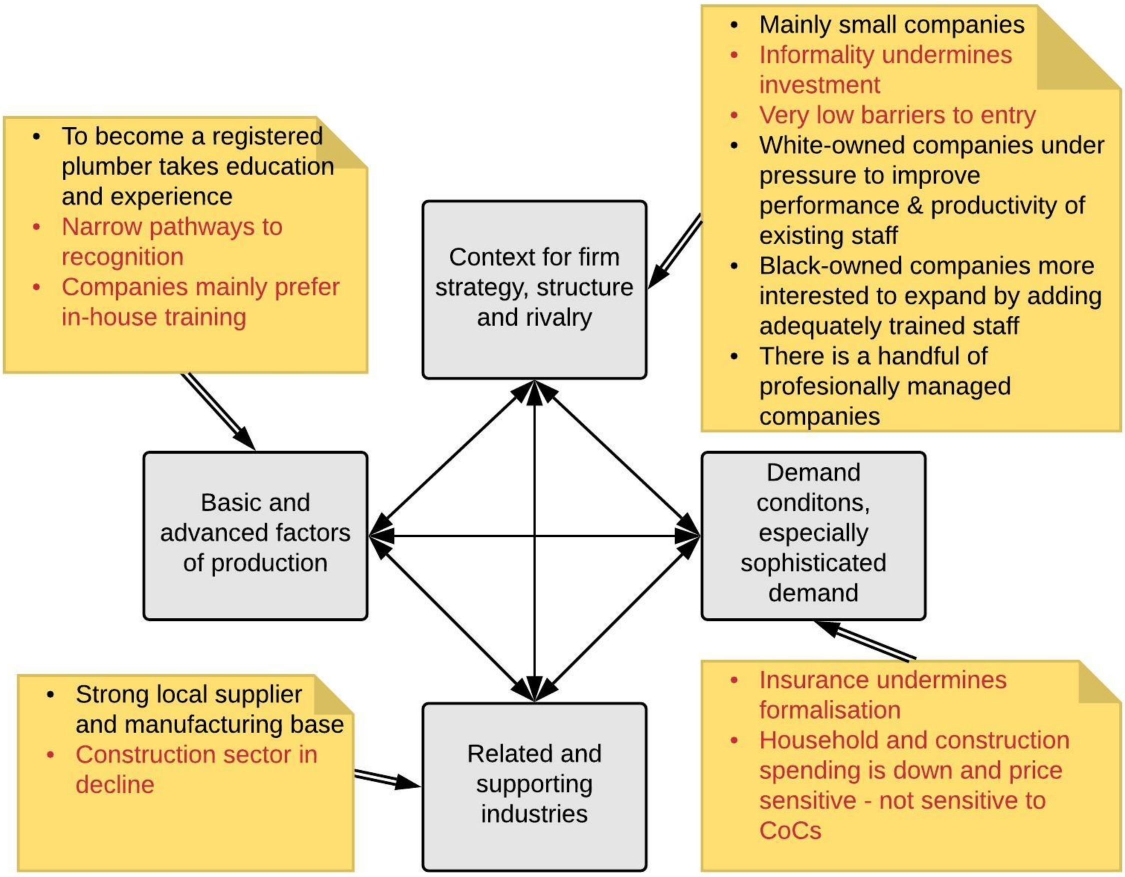
The plumbing industry is in the process of professionalising. While training new entrants adequately is important, the industry analysis shows that improving the productivity and performance of existing staff is even more important. The pressure to improve the qualifications and performance of existing staff is a result of the changes in legislation and the introduction of certificates of compliance for hot water systems.

However, there are more than 100 000 self-identified plumbers in the informal sector. Many of these plumbers probably started their careers in the construction and building sector, where workers were trained on the job to do basic or perhaps even more advanced plumbing work. The huge number of informal plumbers affects the ability of incumbent plumbers to invest in their companies and their staff, because their rates and investments are being undermined. Very few plumbers have been able to integrate the costs of more professional conduct into their business models. Most licensed plumbers cannot pass on the costs of issuing certificates of compliance to their customers, largely because the market does not yet value the quality signal of the certificate of compliance. The informal sector and unregistered plumbers are driving the rates of plumbers down, while the competition in the sector is going up. That creates conditions conducive to plumbers agreeing to do jobs that they are either not licensed to do, or they do not issue the certificate of compliance as required by the regulations.

The health of the construction sector, which hinges on the overall investment climate and health of the broader economy, has a huge effect on the plumbing industry and the desire of plumbing business owners to expand their staff and invest in training in all forms.

We have summarised our assessment of the plumbing industry in Figure 34. It shows that the industry is being undermined by informal, unregistered and untrained entrants. The industry is further facing pressure created by large clients, such as the insurance industry, not yet supporting the efforts to improve the regulation of the sector.

Figure 34: The Diamond of the plumbing industry in South Africa



7 Supporting upgrading and transformation

Originally, the scope of this research concerned townships. However, during February 2019 this research scope was reassessed and revised by GIZ/SD4GE. The results signalled towards topics on informality, transformation and upgrading of the plumbing industry.

The first section briefly covers some of the initial findings before the revision of the research scope. Next, the transformation of the plumbing industry is discussed.

7.1 The challenges facing informal enterprises in townships

In the original TOR, the focus was on township entrepreneurs in selected areas. The challenges of economic development of South African townships are massive and binding. In recent years several large, funded projects have been implemented to identify enterprises in townships and to find ways to strengthen entrepreneurship and township economic development. Despite the political support and the availability of funding, the results have been mixed.

The South African National Treasury's City Support Programme, supported by the World Bank, has done important research into the challenges faced in township economic development. Several other organisations have also done important work in this field.

One of the leading South African experts on this topic, Kate Philip, published a book on her research on the topic. The following passage draws from her work.

Kate Philip (2018a) explains that although informal enterprises form part of the wider small enterprise sector, they have different, or additional, problems and obstacles to address. Philip argues that generally, analyses of constraints on small enterprises focus on aspects such as skills, regulatory issues, crime and a lack of access to capital and credit. The focus is often on internal weaknesses of enterprises and/or on the characteristics of the entrepreneurs. Philip points to the work of Eddie Rakabe (2018), who reports that township enterprise owners see their main problems as being external to them, e.g. a lack of government support or water connections, finance and business space – rather than their own capabilities.

The work of Fourie (Fourie, 2018), Philip (Philip, 2018a) and Rakabe (2018) points to the highly concentrated nature of the South African economy, which results in many households having access to the formal economy. This pushes informal activity in townships towards activities that are under-provided or hardly sustainable as it remains dependent on disposable household income. Elsewhere Philip (2018b) reports that with formal manufacturing and retails sectors that are so efficient being so accessible, the ability of small-scale manufacturing to serve the township markets is undermined. That leaves mainly retailing, where products are bought from the formal retail chains and sold on in convenient locations at a small margin.

In areas often considered marginal to the economy, such as townships, informal settlements and former Bantustan areas, communities are still largely poor. These are the areas where unemployment is highest and where small enterprise activity – formal or informal – is often envisaged as offering an opportunity for entrepreneurship and employment generation. Yet in such environments the impact of competitiveness on market opportunities can be quite harsh.

The prognosis for the services sector is somewhat different. The patterns of spatial inequality that characterise the urban landscape mean that there are often significant distances between townships and informal settlements and the commercial and business centres. For informal businesses that provide personal and other services, the distance to commercial centres can create a competitive advantage for services that are provided locally – for reasons of convenience as well as travel costs.

Obstacles to accessing higher-end markets and the formalisation dilemma

To a large extent the opportunity to tap into higher levels of disposable income requires access to markets that are external to townships and similar areas.

However, moving beyond local markets usually means a shift to business-to-business transactions with a formal retailer, or as part of a value chain. For producers, this shift is likely to be a necessary condition for volume growth and potentially job creation. Philip argues that business-to-business transactions also introduce a complication. Transactions undertaken at arm's length involve higher risks of exchange.

In South Africa, breaking into markets outside the local area often means transacting not only across spatial distances, but also across the social distances of class and race. Spatial and social distances also typically mean that networks, trust and relations of reciprocity are absent, particularly in the beginning. A client considering a transaction will look for signifiers that the supplier is a "real" business, able to deliver agreed quantities on time, against agreed specifications and to agreed standards. Often, as in the case of supermarkets, this involves certification of compliance with complex public and private standards. This limits the scope for informality and often requires a huge step-change in both business sophistication and formalisation for a small and/or informal enterprise.

The statutory aspects of formalisation are a small part of a wider imperative to adopt business practices that signal the ability to engage in – and honour – business-to-business transactions. While formal registration as a business, registration for income tax and compliance with labour regulations may be necessary, these legal formalities are rarely sufficient. To convert an enterprise from informal to formal requires more than just registration. Formal businesses must be able to enter into transactions on a level playing field, which involves contracts, warranties, conformance to standards and legal recourse to consumers if expectations are not met. Formal companies must offer warranties and ensure effective delivery of services, and they must be able to manage the resources at their disposal efficiently. Employees of formal enterprises must be registered with the appropriate tax, insurance and other boards. Tax and payrolls must be managed and basic laws regarding workers' rights, safety and transport must be complied with. Entrepreneurs typically learn about these softer issues at work before they start their own enterprise, which means that younger persons without much work experience would find it hard to prosper except in instances where their upbringing and social networks allows them to start out with less experience.

7.2 Transformation in the plumbing industry

Transformation is not only about company ownership, although this is an important measure. Transformation is also about giving voice, and not to assume that everyone has the same options, the same pathways or the same priorities.

7.2.1 Archetypes of plumbing owner business profiles

The results of the plumbing business owner survey and the industry diagnoses are discussed earlier in of this report. However, it was decided to conduct a deeper analysis to better understand how a more nuanced view of issues faced by plumbers could be presented. Our research shows that there are important differences between larger and smaller plumbers. It revealed that 4 employees is a critical point, and that company strategies change from 5 employees upwards towards a focus on the productivity of existing staff. The analysis also shows that most plumbers avoid certain client types (government and renewables) and how important the construction sector is.

In Section 4.6 of the report, several cross-tabulations were done on the data to identify opportunities for transformation in the plumbing sector. The aim of this analysis was to drill deeper than the averages to better understand the priorities and needs of different racial groups, demands posed by different markets, different company sizes and more.

The results show that black, Indian and coloured business owners have different priorities than white companies. The analysis reveals that insight based on averages is not very useful, and that developing more nuanced archetypes is possible.

Before we discuss the archetypes and the results of the cross-tabulations, we give a short report on the current status of structural change in the plumbing industry.

7.2.2 Structural change in the plumbing industry

The PIRB reports that of its registered plumbers, 26% are black. A challenge to improving this number is that registration depends on a formal qualification. A key instrument is the recognition of prior learning (RPL) and the PIRB qualifications frameworks to enable more black people to proceed to higher levels of recognition in the plumbing industry. The PIRB and IOPSA are currently working on a project to improve the RPL system to address this bottleneck.

IOPSA has started to ask its existing and new applicants for their BEE certificates. IOPSA reports that there are increasing numbers of companies at the higher tiers of BEE certification.

IOPSA has drafted a transformation policy for the plumbing industry (see Annexure 3.1). The transformation activities are shown on the IOPSA website (see Annexure 3.2). However, the transformation policy itself is not available from the IOPSA website. During 2018, IOPSA established a voluntary transformation committee to drive and coordinate the transformation activities of the industry. The committee already provided feedback to the IOPSA board in February 2019 on their initiatives and results (see Annexure 3.3).

One of the recommendations from the transformation committee is to host more meetings in the townships. In the past, most IOPSA meetings were held in formerly white areas. IOPSA has engaged with plumbing cooperatives in some predominantly black areas to try and figure out how it can support these structures.

However, IOPSA needs to find ways to get structures to work in areas beyond the large metropolitan areas. While it is understood that being a volunteer is a big burden in terms of commitment, especially when a company is still relatively young, IOPSA must find a way to get these provincial structures going somehow.

7.2.3 Insights from the fieldwork

From our fieldwork we could sense that the lack of active participation of black plumbers on committees and voluntary activities was an obstacle to closer collaboration with government. IOPSA and the PIRB are aware of the challenge and are already addressing transformation through their committees and in their daily work. IOPSA and the PIRB are proactive in their efforts to develop pathways for black, coloured and Indian plumbers to progress in the industry. It must not be assumed that black plumbers will participate in these structures in the same way as more established white plumbers participate.

The industry bodies need assistance from the range of development programmes and meso organisations that are working with the industry. In the past, development projects have also not promoted or urged students and beneficiaries to join the PIRB and IOPSA. IOPSA and the PIRB are often consulted as stakeholders and not treated as developmental partners.

From a gender perspective, the plumbing industry is still mainly dominated by men. There are some identified obstacles for women, such as toilet facilities in many workplaces. However, with materials and tools becoming lighter and easier to use, physical strength is not as important as it was in the past. Contracts in the construction sector are mainly of a fixed duration, and there are reports of pregnancy being a challenge – thus younger women are most likely to be discriminated against.

Many white-owned plumbing companies are small, family owned and financed through personal collateral. There is little funding for the transformation of smaller white-owned family businesses. We are also not so convinced that a family-owned plumbing business would be a good investment for a black person with capital.

For many black-owned companies, the lack of collateral remains a major obstacle to growth and expansion. The lack of collateral means that the whole business and its equipment, vehicles and materials must be financed through the cash flow. The challenge is that many plumbing businesses have weeks where demand is low, leading to a liquidity crisis.

When looking at the owner survey data, it is interesting to note that at a certain size of company (from 9 employees and upwards), black and white businesses are hampered by very similar factors. Although the sample size was too small for black companies with more than 49 staff, our results showed that they had the same priorities and perspectives as white owned companies. However, it was also striking that while black-owned companies appeared willing to employ more people with appropriate qualifications, white-owned companies throughout rather prioritised improving the productivity of existing staff over employing additional people.

There are from what we can tell very few programmes aimed at helping start-ups in technical trade businesses, nor are there acceleration programmes or micro-franchise options available. These initiatives will enable smaller plumbers to thrive, while depending on their support structures to help them with, for instance, legal templates, administrative guidance, marketing support and access to suppliers. The plumbing business owner survey showed that many plumbers are hampered by administration, financial management and many business management issues. This could be a damper on growth, and therefore support to develop materials, standard templates or more business management guidance should be addressed.

The industry is trying to transform itself with very little formal external assistance. For instance, **the dti** offers incentives and support to encourage and support industry transformation. TIPS offered to connect the PIRB and IOPSA with the relevant contact persons at **the dti** so that this opportunity could be explored.

With regard to business and training support for the plumbing industry, the BEE supplier development spend of larger companies and clients (such as insurance companies) could be used to develop programmes to provide business and technical support to black-owned or start-up plumbers.

There are initiatives under way to extend certifications of compliance and regulations. GIZ/SD4GE can work with IOPSA and the PIRB to develop and prioritise workforce preparation or upskilling programmes. This will help to address bottlenecks in the current plumbing career paths, and at the same time provide opportunities for informal workers and businesses to formalise.

7.3 Competitive pressures on different archetypes of plumbers

The analysis of the plumbing owner survey is presented and discussed in the previous chapter of this report. From the text it is hard to develop a picture of the different profiles of different entrepreneurs.

Porter's five forces is a simple way to assess the competitive pressures on, and advantages to an enterprise. This same framework forms the basis of most business plans. Porter's five forces assess the ability of enterprises to:

- Deal with the threat of new entrants
- To bargain and negotiate favourable terms with suppliers and creditors
- To bargain and negotiate favourable terms with customers and buyers
- Deal with the threat of substitute products or services to disrupt the enterprise
- Recognise the intensity and nature of rivalry or cooperation between enterprises.

As the high-level study revealed the extent of the challenge of informality, we decided to add another factor, namely "Pressure to comply with regulations and laws", as many smaller (informal) plumbers are price competitive because they do not comply with regulations.

By analysing the results of the survey with the use of pivot tables, we were able to formulate the following profiles. It should be noted that these archetypes are still using averages combined with the subjective assessments of the researchers.

When assessing the competitive external forces on the cross-tabulation data, we were surprised to find four groups of very distinct external pressure constructs from the responses received. The data reveals that small black and white plumbers often choose very different markets and very different business strategies. However, when the company grows to about 9 employees, black-owned and white-owned plumbing businesses start competing on the same level against smaller and larger plumbers. These different archetypes are further reinforced by factors such as the age of the company, the maturity of management and the systems used in the enterprise, as well as the ability of older company owners to access credit and to negotiate favourable terms with clients and suppliers.

We decided to visualise the following four different archetypes:

- Informal plumbers
- Small white plumbers
- Small black plumbers
- Medium to large (corporate) plumbers

7.3.1 Informal plumbers

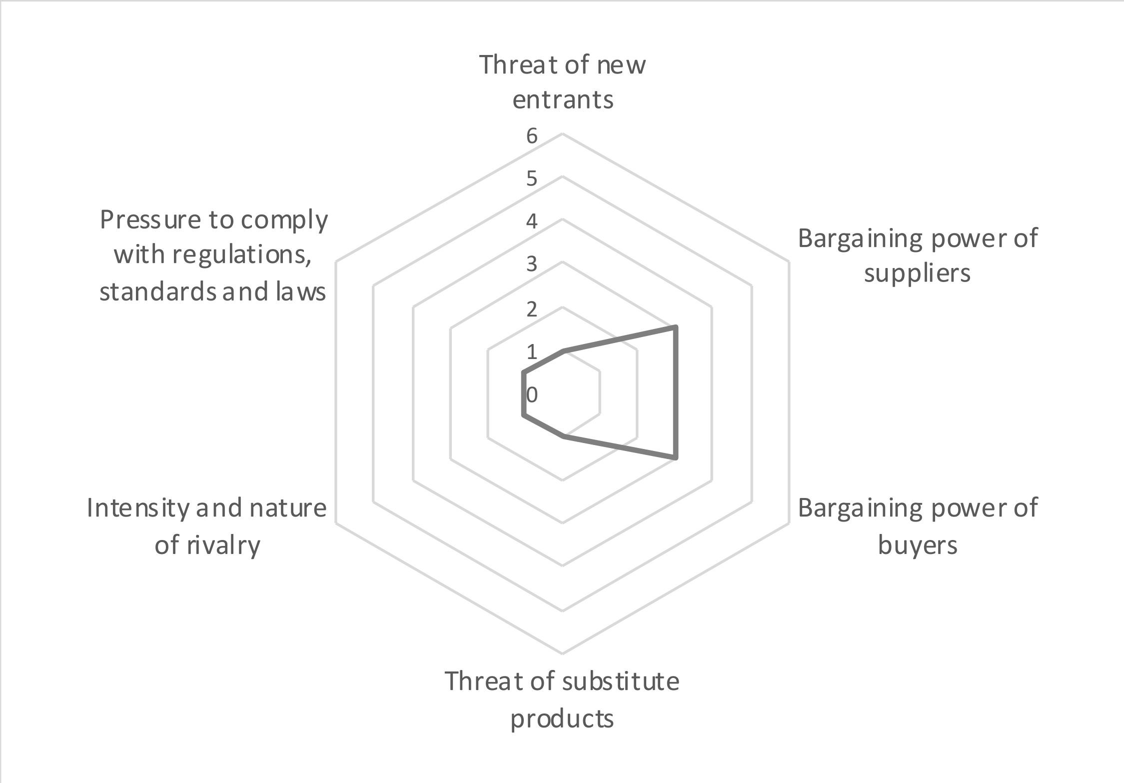
As the business owner survey did not include any information on informal plumbers, we constructed this archetype from the TIPS work package 1 report. The informal plumbers are a mixed group of educated and uneducated, experienced and inexperienced, white and largely black people. They have differing levels of formalisation, with some even employing others. The competitive pressures on informal plumbers are shown in Table 2 and in a radar graph form in Figure 35. There is a good chance that many informal plumbers are also informal painters, electricians and builders.

Table 2: Competitive pressure on informal plumbers

Force	Influence	Factors
Threat of new entrants	Low	Informal plumbers are not competing against other informal plumbers.
Bargaining power of suppliers	Medium	Mainly buy materials for cash or get clients to buy materials. Dependent on client transport. Limited tools.
Bargaining power of buyers	Medium	Clients can choose to do work themselves. Payments in cash or in kind.
Threat of substitute products or services	Low	Informal plumbers do the kind of manual work that cannot be substituted by technology or alternatives. They are also able to easily switch to other construction-related work based on demand.
Intensity and nature of rivalry	Low	Informal plumbers do not really have staff, and they exit easily if they get better work.
Pressure to comply with laws and regulations	Low	Although meeting the requirements is very high, most informal enterprises are flying beneath the radar. This gives them a competitive advantage as their costs and

		commitments to their staff and clients are low. Enforcement is almost impossible.

Figure 35: Competitive pressure on informal plumbers



7.3.2 Small white plumbers

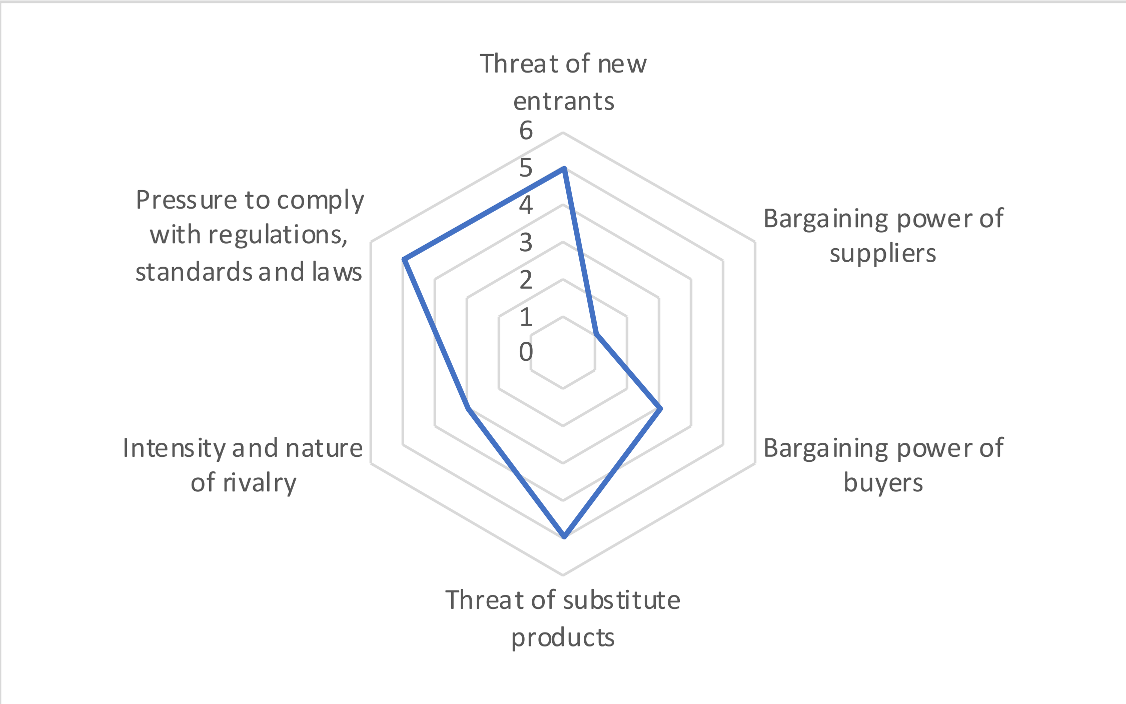
Small white-owned plumbing businesses face far more competitive pressure than the informal plumbers. Our assessment of their competitive pressures is shown in Table 3 and in a radar graph form in Figure 36. They are under constant threat from new entrants and are also increasingly losing bargaining power with their clients due to BEE compliance requirements. Their strategic response is to specialise in certain domains, markets or technologies. For many white-owned plumbing businesses, the ability to meet professional standards and to issue certificates of compliance is a competitive advantage. They have often been in business for a long time and are able to expand their business more easily. Many small white plumbers are small by choice. They focus on improving the productivity of their existing staff while at the same time reducing their head count where possible.

Table 3: Competitive pressure on small white plumbers

Force	Influence	Factors
Threat of new entrants	High	Threat of informal plumbers and plumbers with higher BEE scores.
Bargaining power of suppliers	Low	Many white-owned plumbers have credit facilities and accounts with suppliers. They are able to add vehicles and teams depending on their workload.

Bargaining power of buyers	Medium	Many white-owned plumbing businesses are avoiding government tenders and insurance business. They seem to be mainly focused on building customer relations and loyalty. Plumbers are specialising to make themselves more valuable.
Threat of substitute products or services	High	Price-sensitive clients demand lower prices and shift to plumbers who can respond faster or cheaper.
Intensity and nature of rivalry	Medium	The main priority is to improve the productivity and performance of existing staff. Regular cooperation in construction and industrial work (network ties).
Pressure to comply with laws and regulations	High	White-owned plumbers are under pressure to comply with BEE regulations and with increasing professional standards, which clients are willing to pay for. The ability of white plumbers to issue certificates of compliance is an advantage.

Figure 36: Competitive pressure on small white plumbers



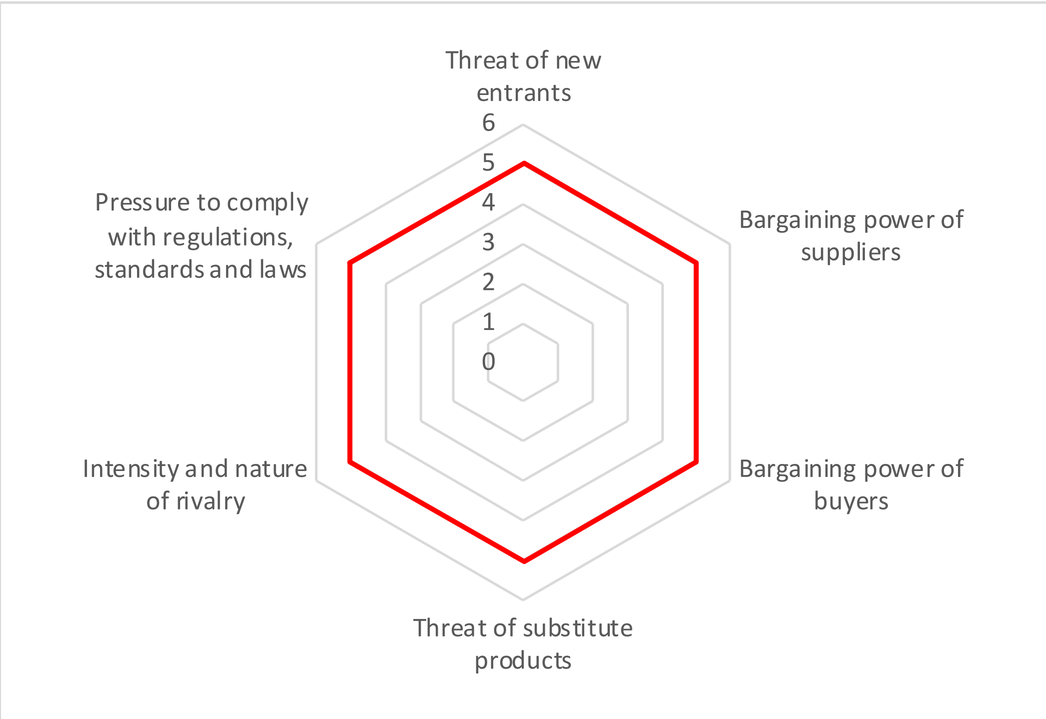
7.3.3 Small black plumbers

Table 4 shows the increasing competitive pressure that small black plumbers are under. The same results are visualised in Figure 37. Firstly, black plumbers are under threat of new entrants, who also include their own staff. They are often in a weak position to negotiate with suppliers and creditors. Even black plumbers with high BEE credentials are under pressure to offer lower prices as clients and buyers play them off against each other. The black plumbers are under pressure from substitutes if they are not able to expand their vehicles and teams to meet demand, and the nature of the rivalry is also high. The administrative and legal barriers on black plumbers are also high, especially for those black plumbers who have to bid in consortia. Most black plumbing business owners indicated that they preferred to add more qualified staff to their workforce than to upgrade the skills of their existing teams.

Table 4: Competitive pressure on small black plumbers

Force	Influence	Factors
Threat of new entrants	High	Informal plumbers operate freely. Black plumbers can start a business easily.
Bargaining power of suppliers	Medium	Large suppliers can decide who to give credit to.
Bargaining power of buyers	High	Insurance and construction clients prescribe rates and terms. Must respond fast or business is moved to the next available plumber. Tendering for government business is cut-throat and there is no loyalty.
Threat of substitute products or services	High	More established companies with more vehicles and better response times get more work.
Intensity and nature of rivalry	High	Market is very price and speed sensitive. Hard to recruit staff with right qualifications that enhance the business.
Pressure to comply with laws and regulations	High	With the increased number of black plumbers entering the market place, the ability to "prove" BEE compliance and to meet professional standards are high.

Figure 37: Competitive pressure on small black plumbers



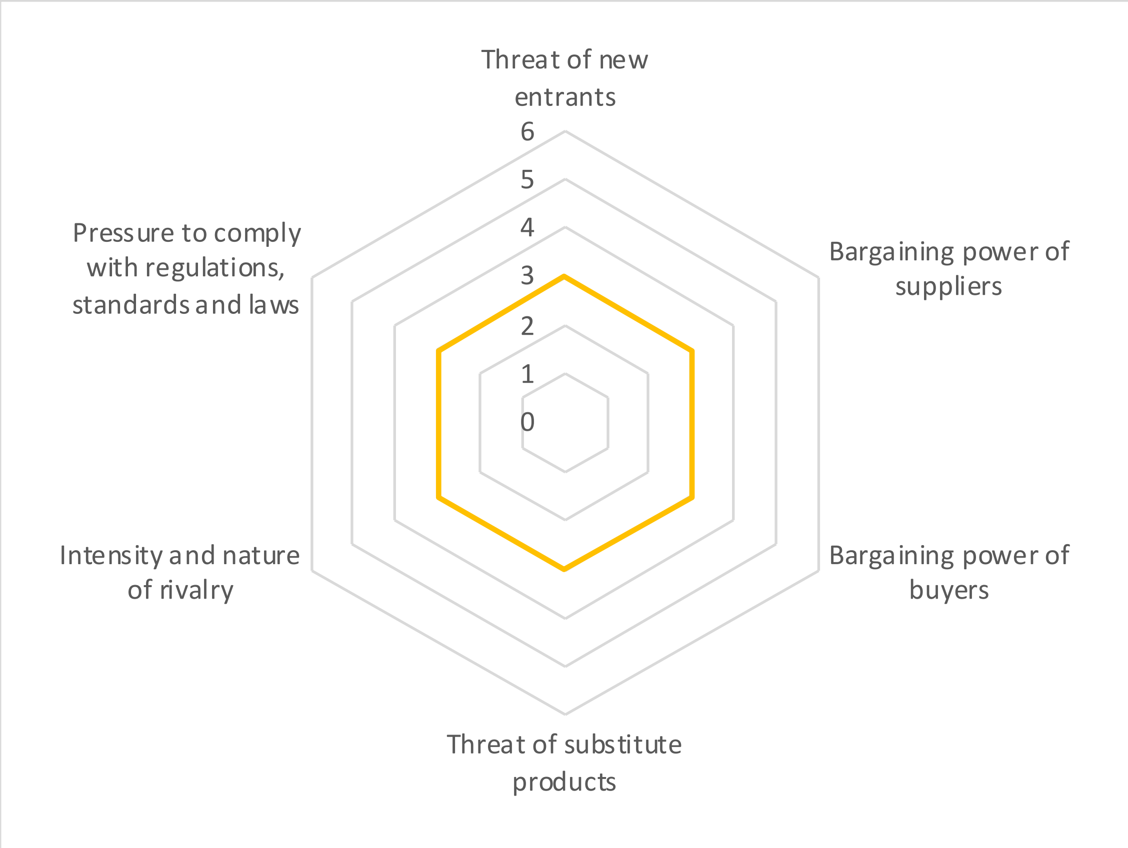
7.3.4 Medium to large (corporate) plumbers

The medium to large plumbers operate at a scale that is hard to copy (see Table 5 and the radar graph in Figure 38). Their businesses were built up over time and they have developed internal management and functional expertise that allow them to manage multiple teams, often in multiple locations. They are able to negotiate credit with suppliers, and their equipment and material suppliers seek them out to encourage them to try new technologies. Due to their depth and reach, they are able to negotiate more favourable terms with their corporate clients. While they can lose some business to cheaper (smaller) plumbers, their clients often depend on their professionalism and project management capabilities. They are able to negotiate contracts with their suppliers and their clients, and they often have in-house skills development, project management, quality assurance, call-centre and marketing functions.

Table 5: Competitive pressure on medium to large (corporate) plumbers

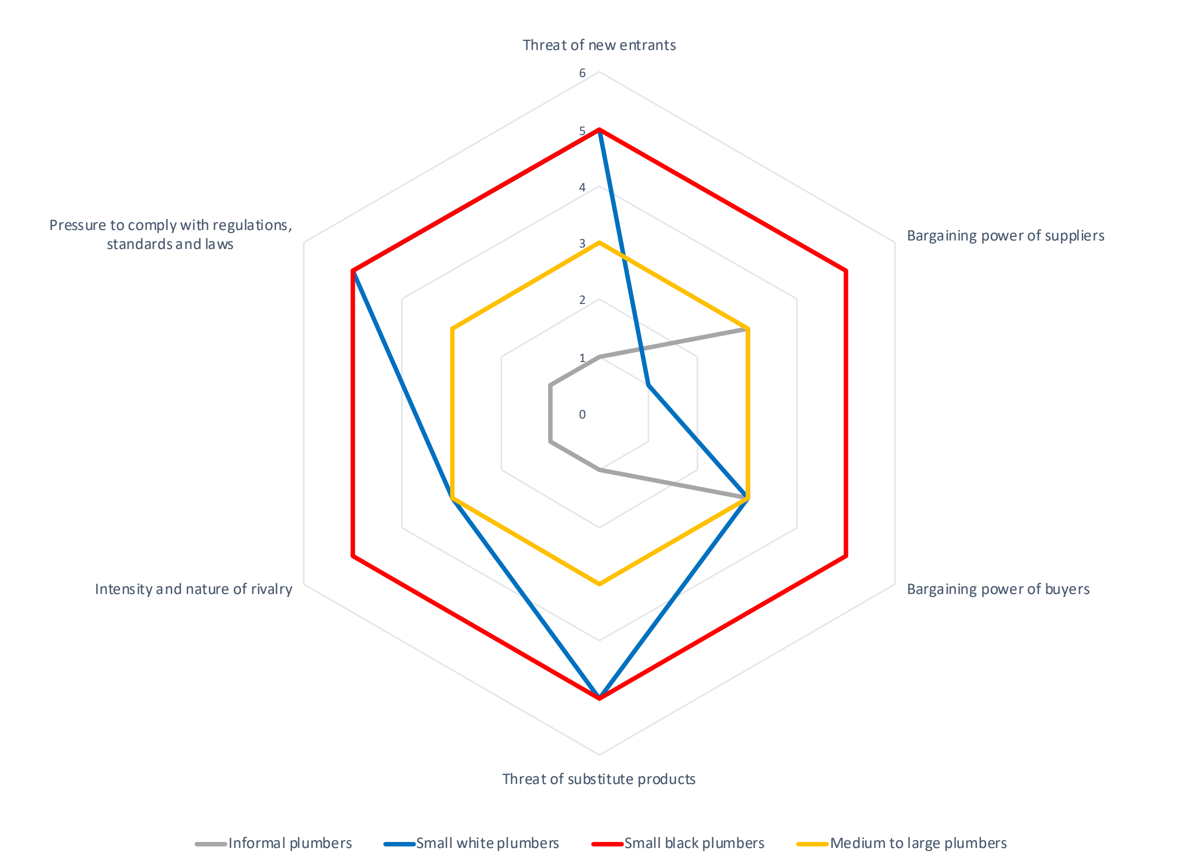
Force	Influence	Factors
Threat of new entrants	Medium	Multiple branches, multiple teams, longer-term contracts with commercial clients. Internal call centre, cost control, asset management and specialists.
Bargaining power of suppliers	Medium	Negotiate discounts, delivery, stock. Internal ordering, accounts with suppliers. Equipment and material suppliers train staff.
Bargaining power of buyers	Medium	Due to distribution and depth, they are able to negotiate rates and terms with clients.
Threat of substitute products or services	Medium	While they can lose business to cheaper or more local firms, their branding and professionalism make them secure.
Intensity and nature of rivalry	Medium	They are able to form contractual relationships with clients or suppliers.
Pressure to comply with laws and regulations	Medium	These plumbers have administrative and operational capability that makes compliance and achieving standards easier. In fact, the regulations and standards count in their favour as they create an obstacle for their competitors.

Figure 38: Competitive pressure on medium to large (corporate) plumbers



The four tables for the different archetypes can be visualised using a radar graph as shown in Figure 39. In this graph the low competitive pressure on the informal plumbers is visible in the centre of the graph, while the competitive pressure from many different angles on small black plumbers can also be seen. This graph shows that medium to large plumbers have reached a point where they are under less competitive pressure because they have developed in-house management and specialised functional capacities, but it must not be assumed that this was an easy state to reach.

Figure 39: Comparing the competitive pressure on different plumbing archetypes



We have collected enough data to develop more and more of these profiles. However, to develop more archetypes it would be ideal to have more responses. It is risky to create an archetype of certain company sizes or market orientation when there are simply too few responses.

7.4 Recommendations to support transformation

We believe that transformation of the formal industry will already change if IOPSA/PIRB can draw in more of the informal/un-registered plumbers. In the previous section it was shown that the informal plumbers are undermining investment in skills and other areas of the businesses. We believe that informality is also undermining the more capable small black plumbers.

The results of the cross-tabulations show that averages can be misleading. The archetypes and differentiation of pathways and upgrading options between different kinds of plumbers are important. For instance, it should not be assumed that all black plumbers are a) informal, b) not so professional, c) struggling to raise finances. Our fieldwork revealed some very successful black plumbers who, although based in black townships, operated across Gauteng. At the same time, it should not be assumed that all white plumbers are doing just fine and that they are able to look after themselves.

In Section 7.3 of this report we attempted to create competitive pressure profiles based on averages. The challenge with these profiles is that when the data set is broken up into smaller and smaller archetypes, the low number of responses for certain fields could be misleading. However, the competitive force illustrated that informal plumbers are facing little competitive pressure, probably with the exception of the pressure of staying alive. It is our assessment that smaller black plumbers are facing far more competitive pressure than their white counterparts, while medium to large plumbing operations have their competitive threats under control. All of this could change if the economy does not pick up soon.

The informality in the plumbing trade is extensive. While there will always be operators who choose to remain informal, finding ways to reduce informality and enable professionalism is important. Becoming a registered plumber depends on formal qualifications but finding ways of recognising or promoting sub-specialisations and focus areas is also important. It is preferable to find ways of recognising competent people. Perhaps it would be possible to support the PIRB to develop a broader and more diverse range of pathways that will allow competent people to be recognised so that they can also signal their specialisation to the market.

One way to overcome the barrier to transformation is to focus on the recognition of prior learning. This can be supported by short courses to move people through the ranks.

Many plumbing business owners are in need of business, administration, financial and other non-technical support. Short courses to help business owners improve productivity and business performance should be introduced. The competitive pressure analysis reveals pressure points where IOPSA might be able to assist. For instance, many smaller plumbers are struggling with credit with suppliers. At the same time, many smaller plumbers are being bullied by larger clients. Perhaps better contracting terms can be developed and shared with smaller plumbers. We believe that small plumbers need some business support to ensure that they stand a chance to become more professional and profitable in the short and the longer term.

Finding ways to incentivise IOPSA to reduce their membership fees for emerging contractors is important. However, reducing the membership fees would have to be offset by other revenue and funding streams.

Lastly, the work of the IOPSA transformation committee and the executive of IOPSA in support must be commended and further supported. Simple steps could involve publishing the transformation policy on the IOPSA website. Further steps would have to be taken to ensure that transformation does not develop into a separate issue, but that it is treated as a cross-cutting theme such as improving professional standards and other topics.

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SKILLS DEVELOPMENT FOR A GREEN ECONOMY (SD4GE)

The Skills Development for a Green Economy Programme (SD4GE) supports a structural change towards more employment-oriented dual TVET approaches in South Africa.
It supports the:

- The cooperation of private and public stakeholders to promote dual training approaches
- The implementation of dual training approaches – e.g. the dual system pilot project (DSPP), the centres of specialization (CoS), and dual short courses
- The strengthening of the capability of personnel involved in the implementation of dual training approaches: lecturers, in-company mentors and TVET college management.

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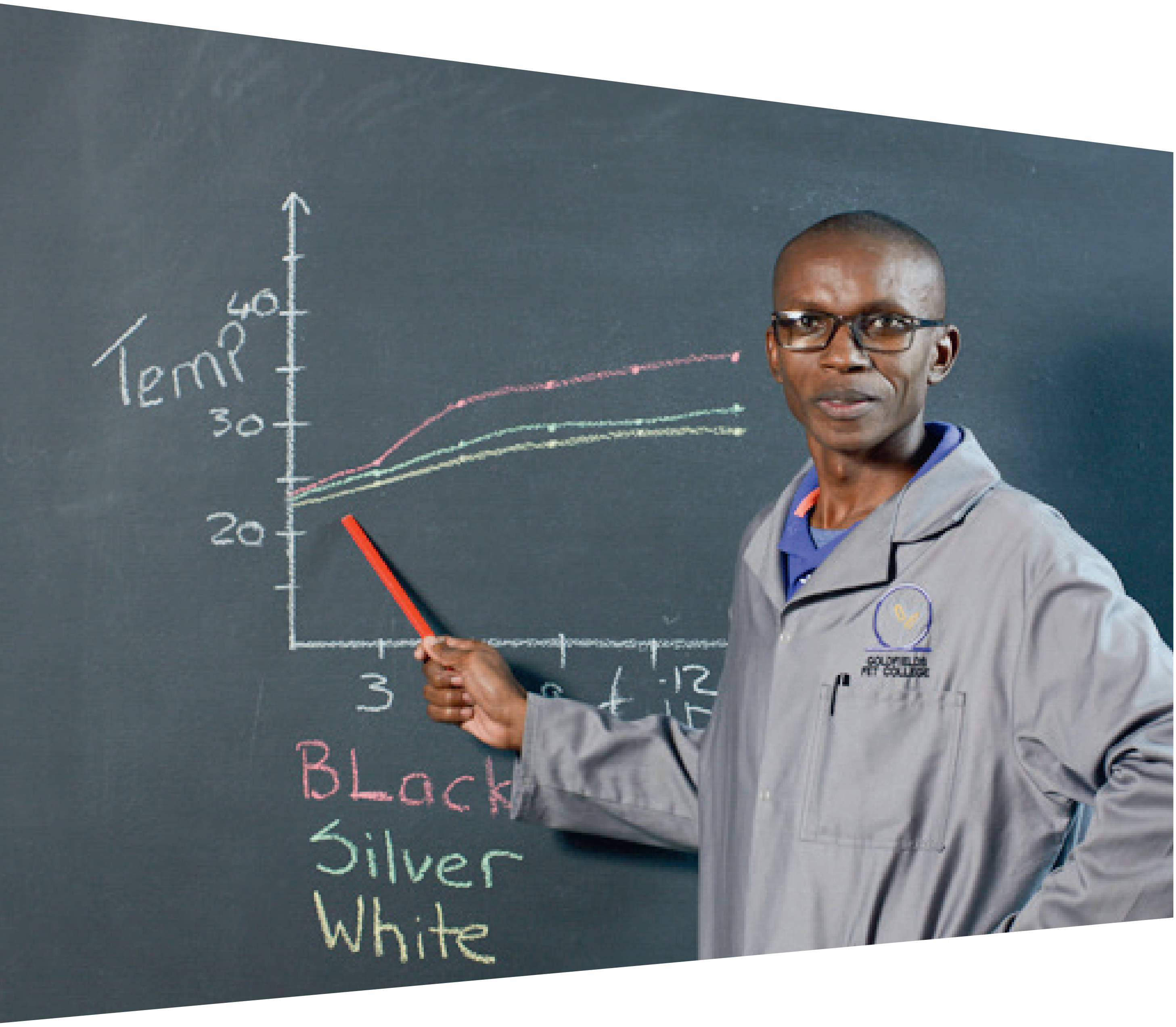
INDUSTRY ANALYSIS



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