Impact of load-shedding on small businesses in the Township Economy 2023

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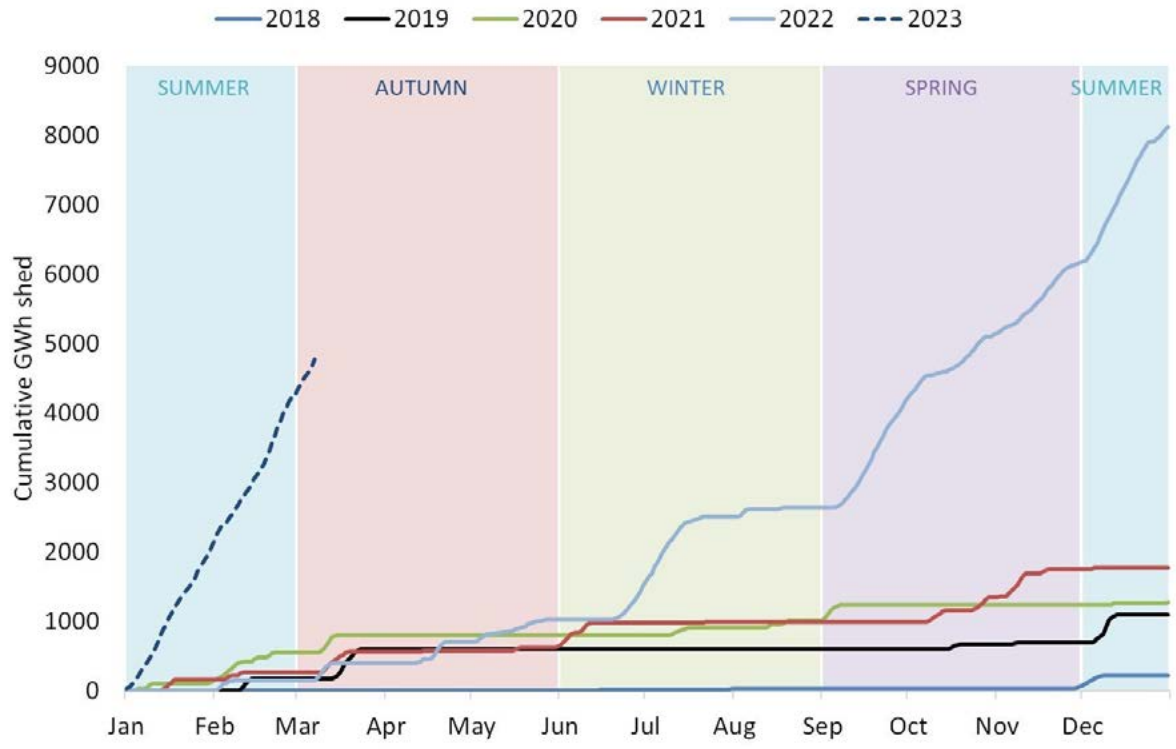
Contents

Foreword

South Africa has experienced load-shedding since 2007, and over the past 15 years the energy crisis has become more persistent and prolonged as supply falls behind demand, threatening to destabilise the national grid. South Africa has gone from exporting electricity to our neighbouring countries in 2001 to a state of being incapable of producing sufficient electricity for its own needs.

We have gone from 121 hours of load-shedding outages in 2014 to over 3 773 hours of load-shedding in 2022. So far, 2022 is on record as the most intensive year of load-shedding in South African history with over 157 days of persistent power outages. According to the Council for Scientific and Industrial Research (CSIR), December 2022, on its own, had more load-shedding than in any year before. 2022 also far exceeded 2019's stage 6 load-shedding. The 2023 outlook for load-shedding is even worse, and our Nedbank Group Economic Unit forecast that load-shedding is likely to persist over the next three years. The South African Reserve Bank is estimating that there will be over 200 days of load-shedding in 2023, which will have a severe impact on GDP growth due to the adverse effects load-shedding is having on businesses' ability to operate and especially in the small-business sector. Some experts are expecting South Africa to suffer over 250 days of load-shedding this year and that we can expect stage 7 and 8 load-shedding during this winter.

A graph published by the Bureau for Economic Research (BER) indicates that so far in 2023 energy shed from the grid – expressed as total gigawatt hours –is worse than it has ever been. The BER's data shows that the levels of load-shedding in just the first two months (and a few days into the third) of 2023 are already at the levels seen between January and October 2022.



Source: Bureau for Economic Research (BER)

Persistent power outages disrupt economic activity and weigh heavily on business and consumer confidence. In the 2023 Budget Speech, the Minister of Finance stated that 'the lack of reliable electricity supply is the biggest economic constraint'. In 2022, South Africa's real gross domestic product (GDP) increased by only 2%, declining sharply by 1,3% in the fourth quarter, due to consistent and intense electricity outages in the final months of the year. PwC estimates that power shortages cost the South African economy about five percentage points in lost GDP in 2022. The Minister of Finance further pointed out that load-shedding is 'threatening the survival of many businesses'. Many businesses experience decreased levels of production during power outages, which ultimately impact their bottom line.

Figure 1: The impact of load-shedding on the South African economy

(R900m) loss per day of **stage 6** load-shedding implemented = **5 percentage** points loss in GDP for 2022

Sources: PWC South African Economic Outlook 2023, South African Reserve Bank 2023

Small businesses remain the backbone of the economy, driving economic activity and creating jobs in the communities in which they operate. To remain operational, many small businesses have to find alternate ways to continue running operations, including investing in alternative sources of energy and, in doing so, incur additional operational costs. Load-shedding forces some small businesses to close shop for a large portion of the day, adversely impacting revenue and profits. The challenges are more pronounced for small businesses located in townships and rural communities where there is often a lack of information, limited access to alternative energy solutions, and affordability constraints.

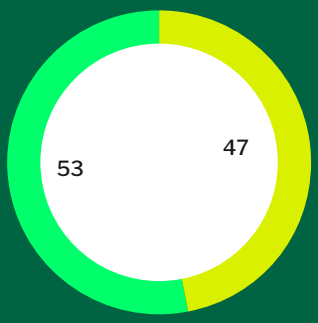
Given the significant impact of persistent load-shedding on small businesses, especially in township communities, Nedbank has partnered with the Township Entrepreneurs Alliance (TEA) to conduct a survey of more than 200 businesses across the country to evaluate the effects that load-shedding has had on small township businesses. The survey was conducted in February 2023, and all provinces were represented in the survey with 49% of all businesses operating across multiple sectors in Gauteng. In total, 53% of business owners were female and 47% of respondents were under the age of 35. We had businesses that have been operating for more than 10 years and those that started more recently post-Covid.

Profiles of the businesses that participated in the survey

Gender split

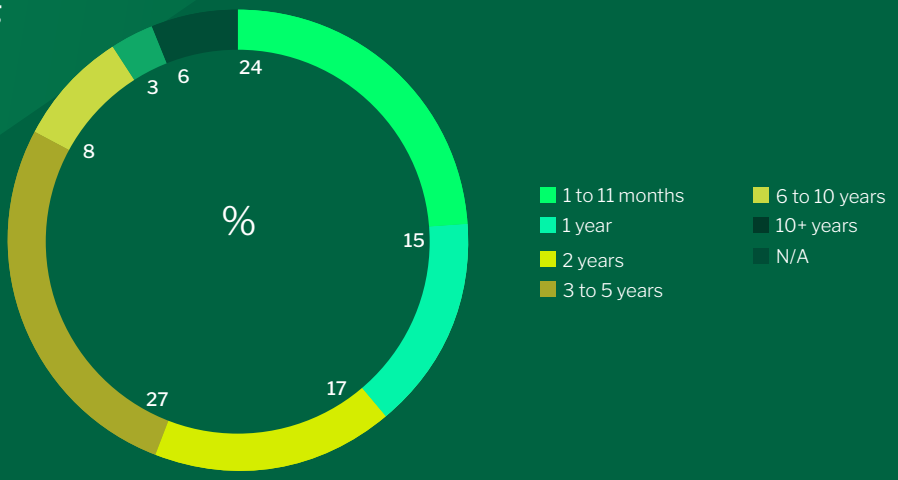
47% 53%

Age split



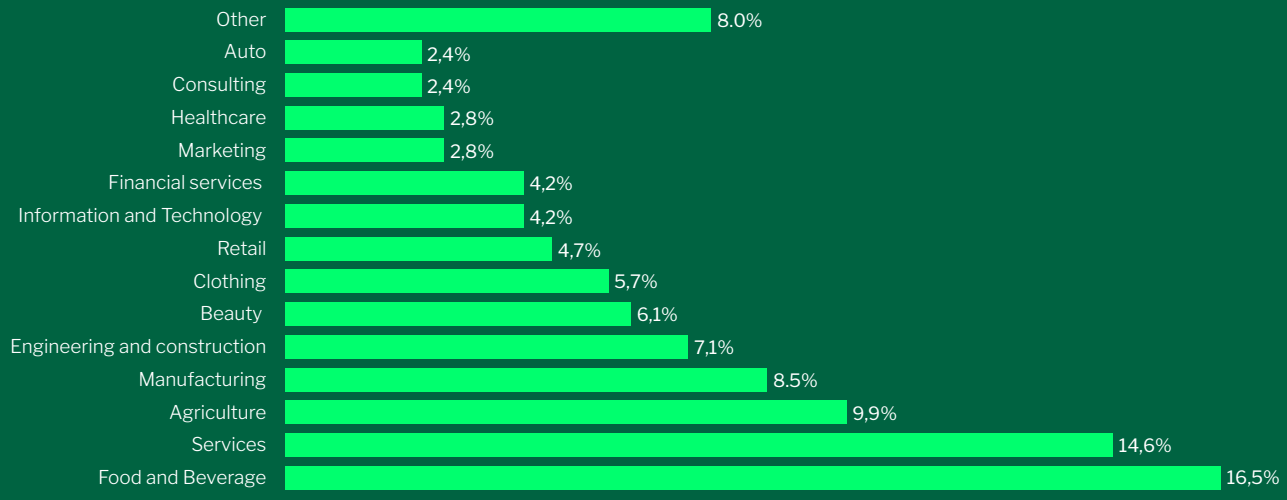
Though not asked in this survey, previous data indicates that almost 80% of the TEA base are registered, and almost all have a business account.

How many years the business has been operating



The graph below depicts the national split of sectors in which the participating businesses operate. The largest sectors are food and beverage, services, agriculture and manufacturing; this distribution also mimics the dominant businesses within the Township Economy.

The business sectors covered in the survey



As financial experts who do good, Nedbank – working closely with TEA, a trusted partner that cares about township businesses – wants to be part of the solution to this critical issue facing our country. Active citizenry is in our DNA. Our aim is to quantify the extent of the impact of load-shedding on small businesses, to unpack the drivers behind the impact, as well as draw insights to help develop solutions that will keep the lights on and the businesses running. A very big thank-you to the entrepreneurs who participated in this survey, and everyone involved in the production of this report.

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01 Executive Summary

The African Energy Chamber (AEC) states that load-shedding costs South Africa over R4 billion a day. Most small businesses are highly reliant on electricity for operations, and load-shedding is forcing them to cut production time and driving up business operating costs, thereby impacting profitability.

Recent headlines across mainstream media outlets are dominated by the devastating impact of load-shedding on small businesses, ranging from 'Stage 6 load-shedding – the small business killer' to 'Load-shedding is worsening the country's unemployment and mental health crisis'. Similarly, small businesses in the township economy are facing a myriad of challenges due to persistent load-shedding. It was against this backdrop that Nedbank and TEA gathered the views of over 200 township small-business owners to reveal the truths faced by small business in township communities, and to identify tangible solutions for entrepreneurs in the township economy.

Did you know that over 60% of township small businesses surveyed mentioned that they are currently doing nothing to address the impact of load-shedding on their business? In a country with an unsustainably high unemployment rate, poverty and income inequality, we found that 66% of township small businesses have shed jobs because of load-shedding. Operating costs continue to climb across multiple sectors as small-business owners are forced to incur extra costs to mitigate the impact of frequent power outages by investing in alternate solutions, while also experiencing reduced production levels leading to squeezed margins and reduced profitability.
The majority of businesses exploring alternate energy solutions are currently using generators, however solar is the most preferred alternate power solution for the township small-business market though most mentioned they don't know where to start in exploring the solar solution. Township businesses have always been known for their hustling resilience, continuously exploring alternatives to address challenges they face, however, with the continuous impact from lockdowns and the July riots, load-shedding is starting to take a massive toll on business owner's mental health. We discuss these insightful findings in this report and how small businesses can navigate the effects of load-shedding through alternate energy solutions, become more resilient, and remain going concerns into the future.

Figure 1: Summary of key insights from the survey

Over **60%** of township small businesses stop operations during load-shedding

Almost **66%** mentioned they have shed jobs because of load-shedding

Increased operating costs, lost revenue and declining margins

Solar is the most popular alternative, though most businesses dont know where to start looking for this solution

Threat of **mental health** and **hustling resilience** impact on business owners if load-shedding continues

02 Impact of load-shedding on small businesses in the Township Economy – five key insights

Our research findings show

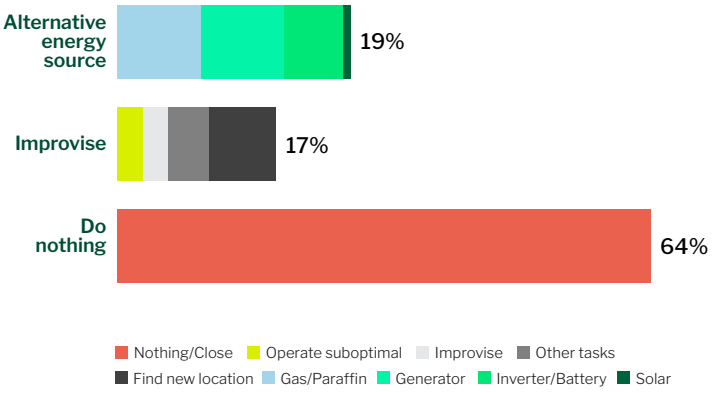
5 KEY *insights*

pertaining to how load-shedding is having a significant impact on township small businesses across the country.

2.1 Impact on operations

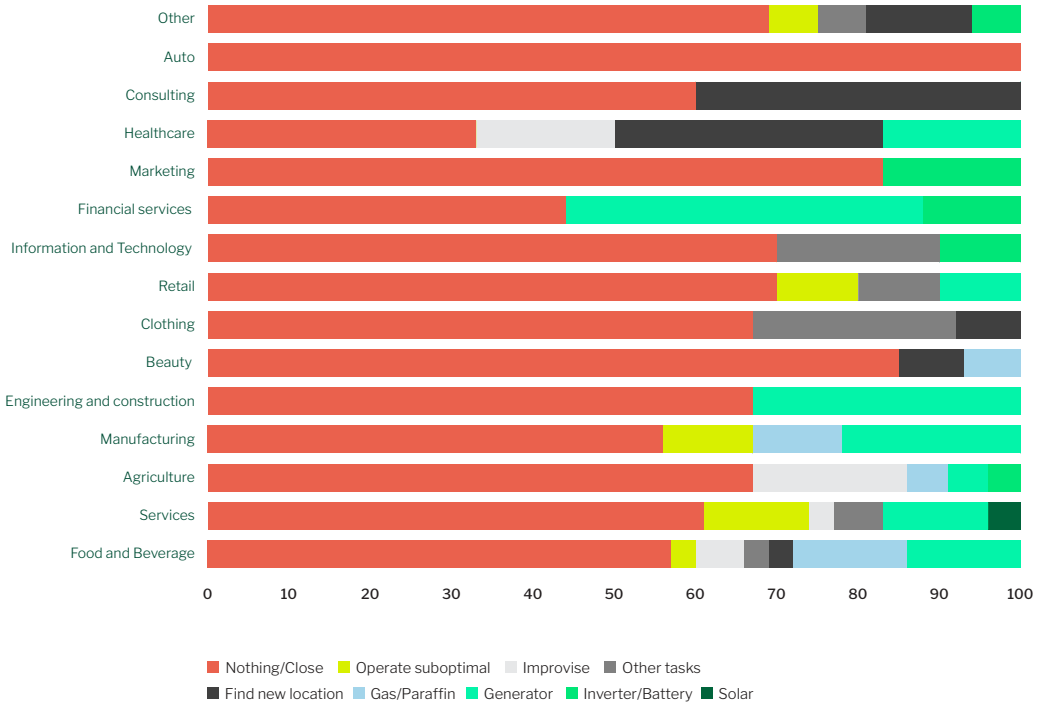
Over 60% of township small businesses stop operations during load-shedding

What do township small businesses do when load-shedding hits?



Many township small businesses are heavily reliant on electricity to operate. When asked what they do when load-shedding happens, we found that 64% of businesses stop operations during load-shedding and simply do not operate until the power returns. Only 17% of businesses improvise (by improvise we mean find hacks to operate without using alternate sources of energy, for example by finding alternative business venues, performing other tasks, or rescheduling appointments), while 19% use alternative sources, such as generators, inverters or backup batteries, gas, paraffin, or solar.

What do the different business sectors in the township do when load-shedding hits?



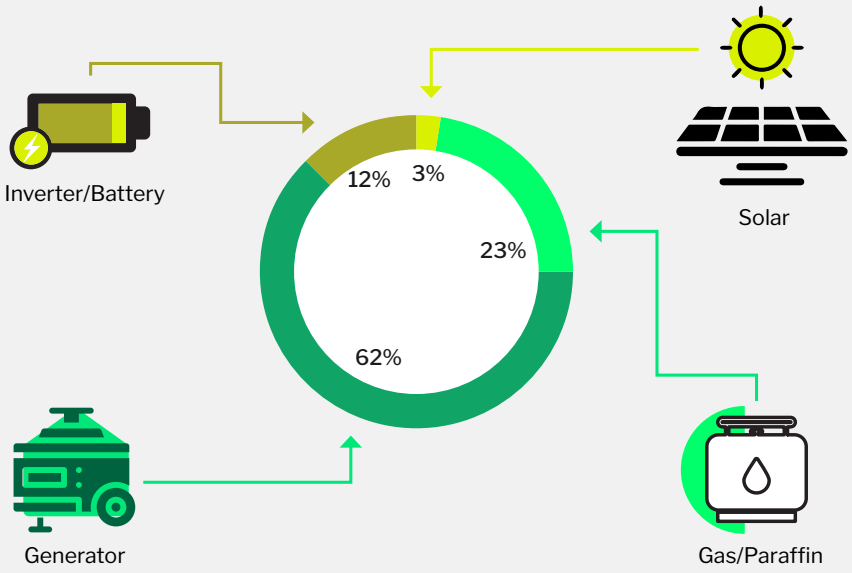
Healthcare and financial services seem to have more alternatives that can be considered than any other sectors. Healthcare seems to be flexible about finding alternate locations to continue running the business during load-shedding. The financial services sector uses the most generators, followed by the engineering and construction sector.

Businesses that improvise (17%). These businesses mostly do administrative work during load-shedding, align their business operating hours with the load-shedding schedule, communicate daily load-shedding times to clients to keep them informed, and go where there is electricity by leveraging load-shedding apps, such as EskomSePush to find alternative locations nearby that have power when their business area has load-shedding.

Businesses that use alternative sources of power (19%). These businesses mostly ensure that their alternative power solutions are aligned to the industry in which they operate.

According to the survey, generators are the main alternative source of power currently in use, most of which are diesel-based, raising concerns about the environmental impact of the solution if adopted by most businesses. Respondents noted, however, that the initial cost to buy a generator is high. Additionally, generators are not an optimal source of power, as petrol and diesel (on which they run) are expensive, and lead to high operating costs, low capital availability for the business and are harmful to the environment due to high gas emissions. Production outputs are also affected through using generators. The survey further showed that, despite having access to load-shedding schedules to pre-plan for power outages, business owners are generally despondent due to a lack of knowledge on where to seek alternatives and many have insufficient cash resources available to invest in popular solar power solutions.

Generators are the main alternative source of power currently in use

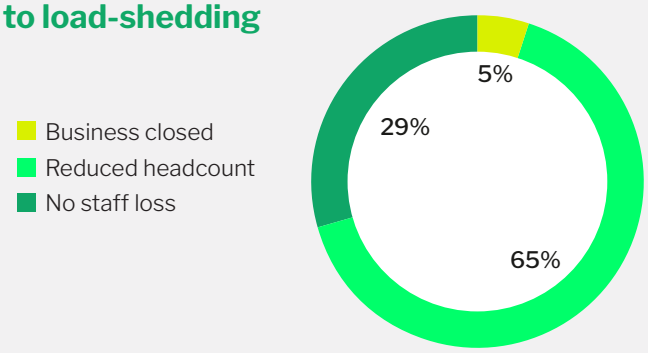


We will unpack the different preferences by sector later in the report.

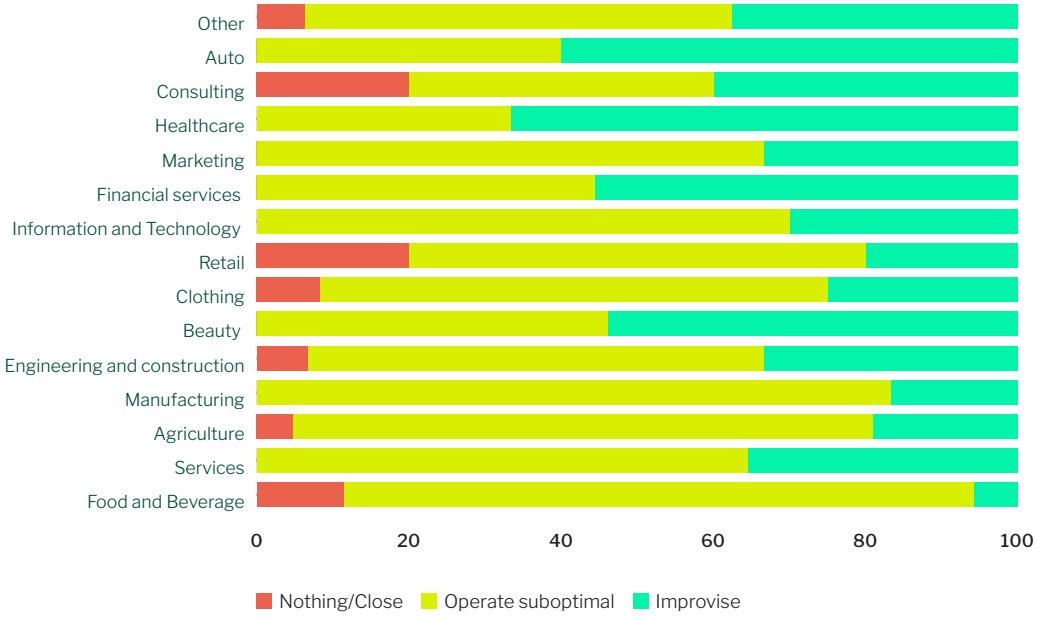
2.2 Impact on employment levels

66% of businesses shed jobs: In a country with an unemployment rate of around 33%, we found most township small businesses experiencing financial losses to the extent that 66% had to retrench employees to remain operational, and just over 5% closed down entirely. This trend was reflected across all sectors, with the food and beverage sector most severely impacted.

Staff losses due to load-shedding (in total)



Staff losses due to load-shedding (per sector)



Biggest sectors to shed jobs

TOP 4 *sectors* that shed more jobs due to load-shedding (% of businesses that have shed jobs)

Food and Beverages	Manufacturing	Agriculture	IT services
83%	83%	76%	70%

Food and beverages industry

The biggest category of those surveyed was the **food and beverages industry** (17% of the total sample). About 57% of this percentage – comprising bakeries and food retailers (including retailers selling frozen products like ice and ice cream) indicated that they could not do anything during load-shedding. The majority of these businesses have been operating for less than five years. The biggest impact on them, other than losing business, is throwing away spoilt food, baking mixes or melted ice creams. This is the sector that has lost the most employees due to load-shedding. Some businesses can delay deliveries to clients and align production times with their load-shedding schedules; this has, however, impacted production output and the quality of their products as they sometimes need to rush production to finish before load-shedding. The majority of the 47% of businesses who have alternatives are using gas equipment like stoves, ovens and fridges; typical businesses are chisanyamas that use braai stands or fire; or have generators with high running costs. Some are forced to move their stock around, especially those needing refrigeration to preserve it. One solution raised was a shift to mobile trailer restaurants, so that business owners can move their businesses to where there is power and be able to serve clients.
In terms of alternative power solutions for this sector, the preferred options are gas equipment, inverters, generators, and solar.

The shedding of jobs in the township agricultural sector is consistent with SA GDP data that shows a contraction of 7,3% in 2022.

Manufacturing

Similar to the food and beverage sector, respondents within manufacturing mentioned that they had to shed jobs due to load-shedding. Almost 30% of manufacturing businesses have been operating for more than six years (60% of these have been operating for more than 18 years). Based on the survey feedback, this sector seems to be the most affected. Some of the coping mechanisms have been the following

- To switch to manual manufacturing, which is less efficient and requires more staff. Due to cost, however, these businesses cannot afford more staff and, ultimately, the existing staff work long hours producing fewer products.
- To negotiate reduced salaries with existing staff members.
- To achieve a balance between maintaining the same retail prices and recovering increased costs. Businesses using generators have increased production costs and decreased production output, which presses them to increase retail prices, although they risk losing clients as a result. Most businesses claimed to spend close to R11 000 in additional costs per month, with the highest being R500 000.

Some of the verbatim feedback we received from respondents in the manufacturing sector include the following:

> **Four hours of load-shedding is bad, which means we can only work five hours. All our equipment operates on electricity, such as sewing machines, compressors, wood cutters and other machinery. Orders get delayed, or clients cancel orders.**
>
> Furniture manufacturer from Johannesburg

I have had clients that cancel their orders because it now takes longer to finish things. We have had to change our policies to avoid that but our competitors are now gaining momentum and I can't fund extra equipment as I'm refunding clients a lot.

Manufacturer from Mdantsane

In the face of the load-shedding impacts, some business owners within the manufacturing space believe innovation and a revised business model could be the solution going forward. Many of these business owners, however, do not know where to start in exploring these options, and also have limited cash resources to look into new things. We have included some of the comments from owners in this respect.

I need different packaging to be able to prolong and preserve the shelf life of my product.

Dairy products manufacturer from Katlehong

Load-shedding is requiring me to remodel my business in its entirety. I would have to introduce a product that requires little electricity.

Manufacturer from Katlehong

In considering alternative solutions, most business owners preferred solar because of the high costs of operating generators. One of the business owners went further to elaborate that they require a *'a solar roof with a loan over 20 years at 1% (interest rate) so they can operate'* during load-shedding to minimise the cost of transitioning to solar . This just shows how dire the situation is and the pain being felt by most within this sector. This is one sector that is well positioned to benefit from the solar-related tax rebates introduced by government on 1 March 2023.

Agriculture

This sector is mostly characterised by agroprocessing, poultry farming and vegetable farming. Most agriculture businesses have been operating for fewer than four years. Some of the respondents were already closing down operations when the survey was conducted.

Some of the impacts:

- Inability to run incubation equipment in poultry operations and a resultant lack of egg and poultry stock.
- Reducing orders taken to only what can be produced with limited power availability.

I used the eEskom schedule so I could start processing my product. The problem is that it take 12 hours to get to the final product and there is load-shedding in between, affecting my production phase.

Agriprocesser from Nongoma

I sit and wait because the incubator does not have back up power

Poultry business from Midvaal

We lose our crops on the hydroponics system

Vegetable producer from Johannesburg South

I run a Broiler Chicken Farm and when load-shedding hits, I usually light gas for the chickens or make an 'mbawula' but it has since become ineffective. I have lost 600 chickens due to load-shedding.

Broiler producer from Polokwane

The once off setup cost of alternative sources of power ranges between R50 000 to R500 0000 per month for township small businesses depending on the size of the business and the type of alternatives being considered. The most preferred alternative power solutions for this sector are solar and generators, with solar being more popular.

IT services

This sector comprises mostly internet cafes and printing services – most with fewer than two years of operation. These are businesses that started after the Covid-19 lockdown and are already ranked in the top four sectors (by number) that had to retrench staff. Though services can still be offered if the business has an alternative power solution, most services require network availability, which is also affected during load-shedding. As a result, most cannot operate during power outages. Their hope is that network operators will find solutions to enable network availability during load-shedding, as this is an obstacle that businesses cannot overcome alone, and network availability is critical for internet cafes and printing services. For alternative power sources in this sector, most businesses prefer solar.

However, there were other sectors that shed the fewest number of jobs.

Those with higher percentages of
'NOT LOSING STAFF' were in **4** ***categories***

Healthcare

67%

In Healthcare – the data recovered from businesses in this sector has been skewed by businesses who provide health and beauty services under the larger umbrella of 'health', but do not, in fact, provide healthcare services in accordance with the parameters of our survey. Healthcare businesses ranged between two and 18 years old. To deal with load-shedding, some indicated that they move their vaccines to alternative places, and others use cooler boxes to store the vaccines to preserve them. As alternative solutions, most businesses in this sector preferred battery-powered equipment or gas fridges.

Auto

60%

In Auto businesses that did not lose staff were mostly driving schools and car accessory providers that were running lean operations of between two and five employees. Those who had to retrench staff typically had between six and 10 employees and reduced their staff count by between 25% and 50%. Most businesses within the Auto sector could not operate during load-shedding and had to close shop until power returned. Their preferred solutions are mostly battery-powered equipment or inverters.

Financial services

56%

In Financial services, the businesses that did not lose staff are mostly accounting, bookkeeping and tax-advisory businesses and most have been operating for more than five years. If they do not close shop during load-shedding, they will use power banks and petrol generators as alternatives. Most, however, close shop because of limited network availability. Their preferred solutions are battery-powered equipment and generators. Those that offer services to other small businesses are feeling the impact as they are losing business because their clients cannot afford their services.

Beauty

54%

In Beauty, many businesses did not lose staff as they were mostly hair-dressing salons, as well as skin and personal care industries and did not have staff. During load-shedding these businesses would typically close shop or wait for power to return. Those that did not close mentioned using paraffin stoves or finding an alternative place to operate. Their preferred solutions to help them cope are mainly using gas stoves, generators, or solar power.

2.3 Impact on profitability

Increased operating costs and lost revenue and declining margins: From a financial perspective, we found that all sectors have incurred additional costs to keep running their businesses during load-shedding. Extra costs were incurred mostly to buy fuel for generators, purchase rechargeable equipment, replace wasted (spoilt) goods and damaged appliances. Since the onset of sustained load-shedding, businesses surveyed are losing, on average, just over R11 000 in revenue per month because of load-shedding, though it varies across sector. Even within the same sectors, there are many variables that drive and determine revenue that it was difficult to unpack further .

In the survey, we quantified the impact of not taking action versus improvising versus using alternative power sources on revenue.

In this regard, we found the following:

There we examples of businesses who did nothing because doing something would have cost them more. The additional costs of improvising were relatively low when compared to using alternative sources of energy and not taking action; and while generators were the most preferred alternative source of energy, they also had the highest additional cost.

Additional costs incurred differ per business sector (averages per month)

	Average additional cost
Food and beverage	R6 356
Services	R6 697
Agriculture	R10 047
Manufacturing	R10 812
Engineering and construction	R16 607
Beauty	R2 577
Information and Technology	R1 708
Clothing	R2 889
Retail	R3 923
Financial services	R8 655
Healthcare	R6 854
Auto	R10 375
Events and entertainment	R10 000
Marketing	R1 962
Logistics	R14 875
Consulting	R6 000
Wholesale	R5000
Crafts	R500
Other	R10 375

Businesses in the food and beverage sector – like township restaurants or catering businesses – use the most gas and paraffin to keep cooking on gas and paraffin stoves during load-shedding. There are many nuances, however, even within the food and beverage sector. Certain businesses that sell ice cream and flavoured ice within the township community, where a gas and paraffin stove would not be a suitable solution, would benefit more from a gas-powered fridge.

The actions taken by each business sector depends on the scale and type of business they are in. There are businesses that cannot survive operating during load-shedding because the power required to run their equipment would cost more than it would cost to power basic laptops, printers, lights, and other office equipment. In the survey, we came across examples of business sectors where not taking action is less expensive than improvising during periods of load-shedding, ie revenue lost is less than what it would cost to improvise.

Review on the average revenue loss impact on the businesses by sector (averages per month)

	Average revenue loss
Food and beverage	R11 581
Services	R12 238
Agriculture	R18 135
Manufacturing	R20 294
Engineering and construction	R9 077
Beauty	R7 083
Information and Technology	R11 246
Clothing	R2 750
Retail	R9 339
Financial services	R2 500
Healthcare	R8 333
Auto	R13 300
Events and entertainment	R4 255
Marketing	R5 000
Logistics	R3 333
Consulting	R1 880
Wholesale	R2 000
Crafts	R35 000
Other	R8 333

Cost of doing nothing | Cost of doing something

CASE STUDY **Manufacturing sector**

#1: Township businesses in the manufacturing sector operating from home or in rented spaces – where the cost of running the machinery they require during load-shedding is high – would rather do nothing. For example, these could be large format printing businesses with heat presses, workshops with high-power-consuming equipment, gate manufacturing businesses, large farms or tyre wholesalers.

#2: There are businesses where doing nothing is better than trying to find alternatives, like IT services, which are mostly internet cafes that rely on network availability. If the mobile network is down, even if they have inverters or solar power, they still cannot do business, so finding an alternative place to work during load-shedding could be a better option, where there is access to a network.

There were also examples of businesses where the cost of not taking action will be higher than the cost of making a plan. This is mainly because the necessary measure required to guard against losing revenue is relatively small and does not cost any money.

Cost of doing nothing | Cost of doing something

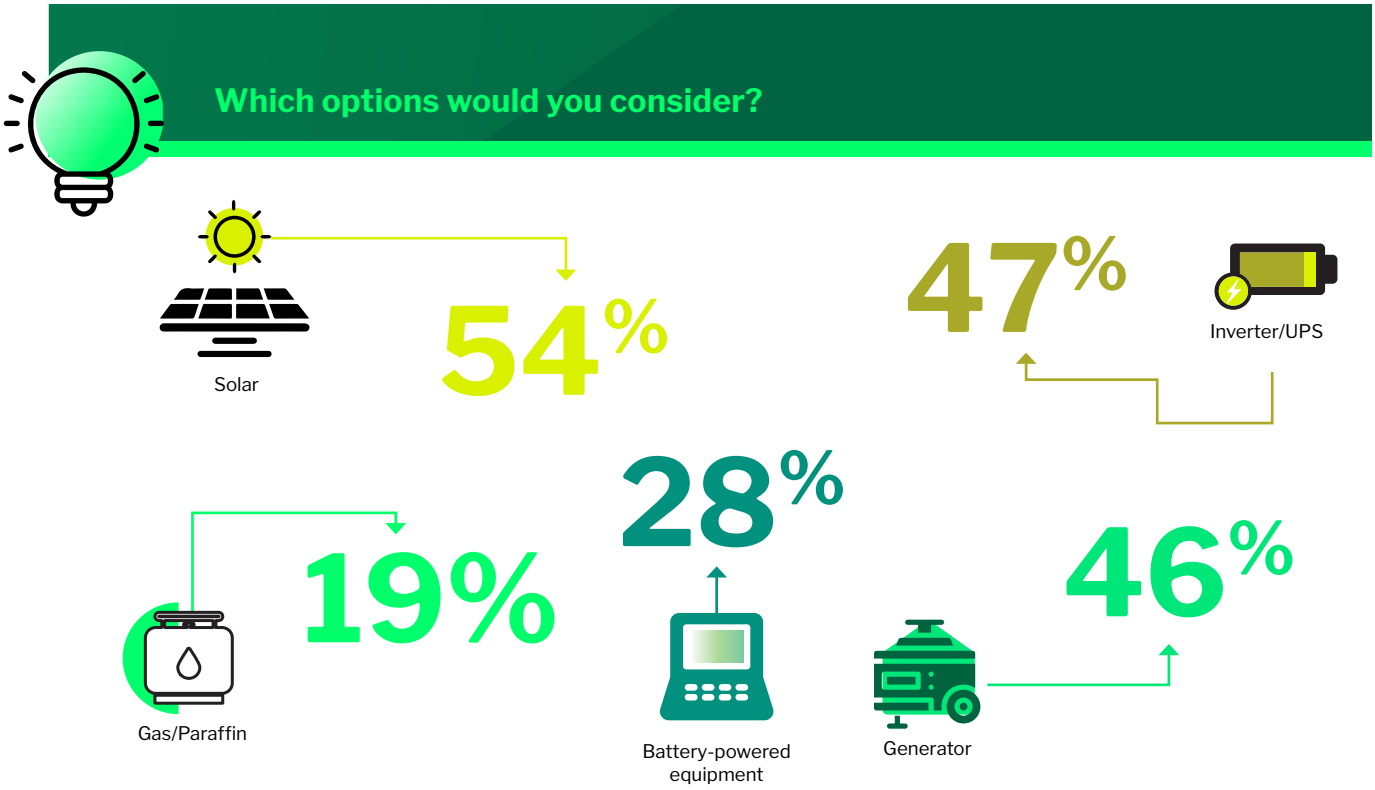
CASE STUDY **Services and small-scale retail sector**

Businesses within the services space or small-scale operations such as internet cafés, accounting businesses, consulting businesses, training businesses, retail (spaza shops) and kota shops (assuming that they all use gas), would rather improvise or seek an alternative power solution because investing money in an alternative solution is more effective than losing that revenue entirely. These businesses are more likely to access alternative power solutions such as UPSs, generators or inverters, as these are priced at an affordable entry cost.

Businesses are encouraged to do a cost-benefit analysis to ensure that the costs incurred to improvise or use alternative power sources do not result in long-term negative effects on their revenues and business profits. In the long run, the negative effects will accumulate and will impact on the ability of the business to keep running, often resulting in business owners needing to retrench staff and eventually closing their businesses.

2.4 Preferred solution not fully understood

54% of businesses preferred solar: When township business owners were asked what alternative sources of power they would consider, 54% mentioned solar followed by inverters or UPSs. At a sector level, solar is considered the most beneficial in agriculture, engineering and IT. By contrast, inverters are mostly favoured in consulting, auto and retail, while battery-powered equipment is considered in healthcare, retail and auto. Interestingly enough, of the businesses surveyed, only one respondent had solar power installed. This is a business in the environmental services sector, which deals with sewer and refuse removal.



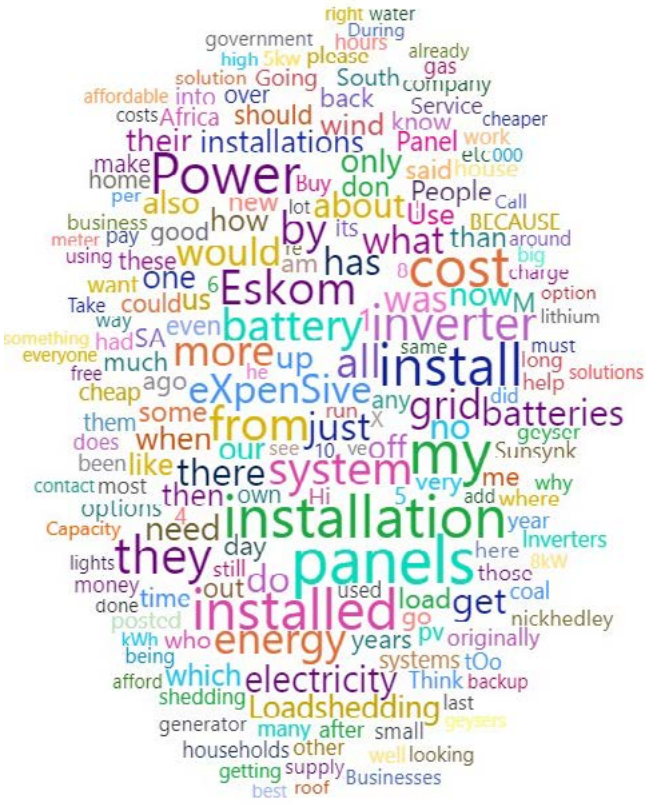
Overall, it was interesting to notice that township small business owners would prefer to shift from using a generator as the currently most used alternative to using solar power.

Navigating solar costs and installation advice

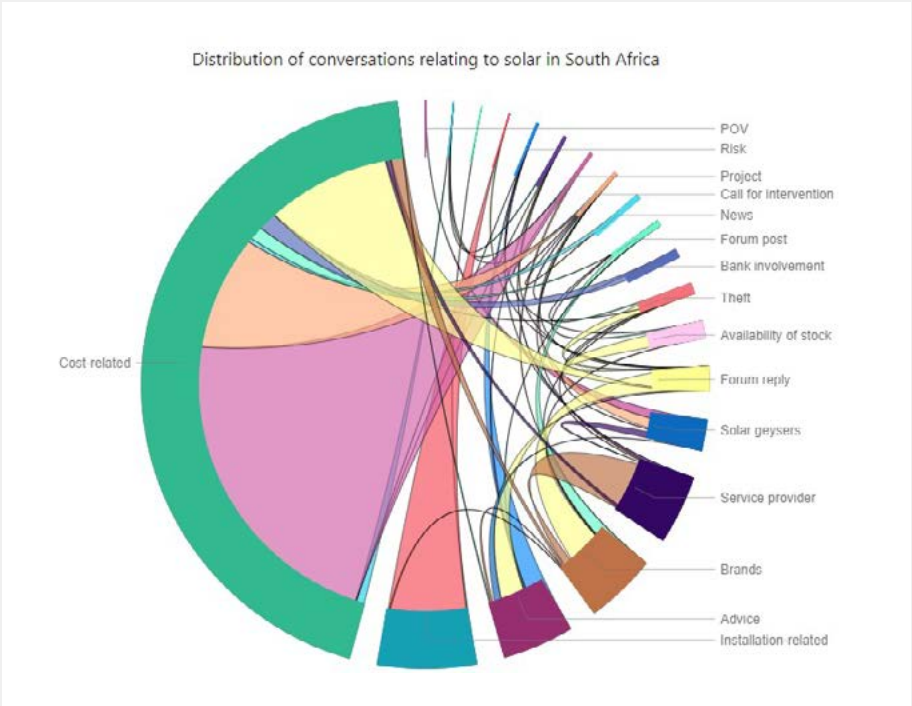
To further understand client considerations related to solar, we analysed 4 000 social-media posts and online discussion forums. We identified two dominant conversations around navigating solar costs and installation advice. Solar is high on the agenda for many online customers. Subtopics were focused on consumers reaching out to forums to ask for advice on typical costs, models and large-scale projects that have been undertaken as well as government interventions to fast-track implementation or provide incentives that are able to push back power to the grid. Various perspectives were shared relating to successful and unsuccessful installations, with consumers on a drive to save funds to install solar and go off the grid.

Furthermore, social-media insights showed that much education and advice is still needed on the various solar power solutions available in the market. Stock availability also came to the fore, with the risk of theft due to the visibility of panels, also being noted. In addition, the social-media posts and discussion forums reiterated that a very small component of banks was providing affordable financing of solar solutions. Reputable service providers versus fly-by-nights were also highlighted, with risks associated with the latter also coming to the fore. Given the high risks associated with poor solar installations, social-media posts pointed to the importance of leveraging accredited solar installers to manage the upfront needs analyses, assessment, quotation and certified installation. Therefore, it is important for township businesses to be supported with the requisite advice on affordable financing for solar as well as a reliable database of accredited solar installers.

Costs and installations dominated conversations on social-media and online forums



Analysis of 4 000 social-media posts showed the main conversations about solar are cost-related, followed by conversations seeking installation information and advice.



2.5 Impact on mental health and hustling resilience

Most businesses in the township economy are resilient, which is a characteristic they have shown over many years, with the recent sequential events – Covid-19 lockdowns, July riots, intensified load-shedding and looming water-shedding. Sudden changes in resources available to business owners, such as safety, electricity and water can induce a state of scarcity, which has been strongly linked to mental health. Scarcity mindsets can alter an individual's decision-making, attention, and cognitive functions. Primarily, this occurs by tunnelling the business owner's attention towards the source of scarcity (in this case, electricity shortages) and away from other vital business operations or self-care. As a result, creativity may decrease, productivity unrelated to load-shedding may suffer, and risk-taking may increase. This additional burden can significantly impact the mental health of business owners.

In the survey, business owners reported that they are worried that, having survived all other pandemics, they might not survive this phase and the impact thereof. Most do not have the luxury of affording services that could help them deal with the ongoing stress levels caused by the continued obstacles. There is an urgent requirement to find solutions to support business owners in minimising the effects of the ongoing economic pressures.

Our small businesses are really affected, especially ours in the rural areas. We were struggling with water, now its load-shedding.

Agriprocessor from Nongoma

A lot of people are starting to give up on their businesses because of load-shedding, more especially small businesses. We are not making any money. Most of us we are losing hope as it feels like we are fighting a losing battle.

Farmer from Moretele

We are young black South Africans trying to build something for ourselves and our families, but we are negatively impacted by things such as load-shedding and Covid-19 and we receive no assistance or support from the government, which is really not fair.

Laundromat from Pietermaritzburg

When I started my business, it died because of the Coronavirus and now load-shedding has killed another one. I wish we had an affordable solution that is easily accessible.

Sales consulting business in Katlehong

Many businesses, including my own, are on the precipice of closing down after having struggled through all the Covid-19 restrictions. There has been a great loss of income of the community as a whole – that means that they have less disposable income.

Dog groomer from Hermanus

03 Alternate energy solutions

When small businesses are considering alternative power solutions, it is important to first achieve a mental and behavioural shift. This involves business owners embracing new ways of doing business and educating themselves about the different alternatives available. This step can be overwhelming for business owners, who often encounter challenges in gathering information and navigating the multitude of technical details, intricate decision factors, and the vast array of available solutions. In the solar space alone, not only are small businesses presented with all kinds of solar PV installations as alternative solutions, however, there is also a wide variety of portable solar solutions that are more accessible to the small business segment of the market. This choice overload can result in delaying action (for example, the high percentage we saw who do nothing during load-shedding) or the selection of suboptimal solutions. Change is, however, possible. We first saw this type of societal and business shift when the Covid-19 epidemic forced business owners to restructure business operations, corporate culture, interpersonal communications and office space distribution. Society quickly adjusted to the 'new normal' and to social distancing to prevent the spread of the Coronavirus. We also educated ourselves on new terminology such as quarantine, PPE, pulse oximeters and the like. Similarly, when digital banking was first introduced in the banking sector, clients had to shift their mindsets and behaviours to move away from transacting at bank branches. The same type of mindset shift and behavioural shifts will be required as we look at possible solutions to deal with load-shedding.

3.1 Case studies on alternate solutions explored

In the survey, we came across a number of business cases providing practical power solutions well-suited to township small businesses in different sectors:

CASE IN POINT #1: Beauty services

A business based in Umlazi township that provides beauty services in the township community mentioned that they have opted to go to their clients' offices or houses. They further added that based on the equipment they use, they usually utilise battery backup and a generator for electrical items that need an element.

CASE IN POINT #2: Pet grooming services

A Port Elizabeth-based township business that provides pet grooming services has alternated some of their services and opted to use gas and a generator to remain open for business during load-shedding.

CASE IN POINT #3: Spaza shop

In Ladysmith, a spaza shop closes early, due to safety concerns when operating when it is dark. Some solutions used by the spaza shop include either a 12v battery that has a small solar panel to run the lights, a UPS or a small generator.

CASE IN POINT #4: Sneaker cleaning shop

A Lawley-based sneaker cleaning shop struggles with network connectivity and running drying fans during power outages. This business uses a battery or generator to run the fans and because it is not running continuously this results in power savings.

CASE IN POINT #5: Kota shop

A Kota shop based in Pretoria uses a generator to operate during load-shedding. While this is a great solution as they run electrical items that are high in power consumption, their next-best alternative option is usually using gas as a source of power.

CASE IN POINT #6: Broiler chicken farm

A small-business owner runs a broiler chicken farm and when load-shedding hits they usually light a gas for the chickens or make an 'mbawula'. Sadly over time, this solution has become ineffective and to date they have lost 600 chickens due to load-shedding.

CASE IN POINT #7: Clinic

A township-based clinic owner has opted to move the vaccine fridge from the clinic to their home. Consequently, every day they carry a small cooler box with vaccines from their house to the clinic.

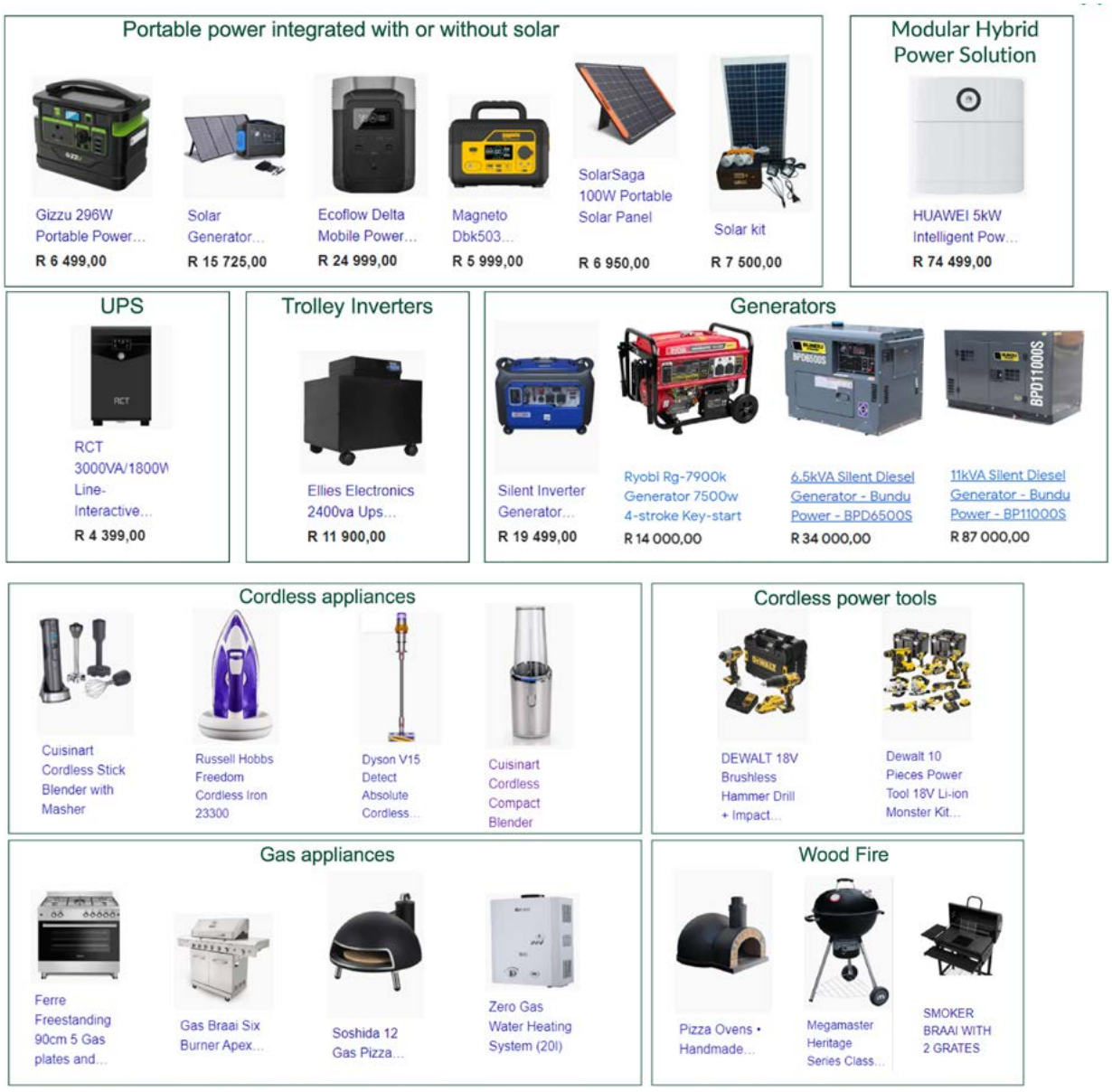
We engaged with energy experts who provided their opinion on the potential solutions that are currently available in the market for small businesses. Below we unpack the opinions shared by energy experts:

3.2 Portable power solutions

A high-level view of how some of the solutions could assist small businesses based on the insights gained from research, include those businesses that need an entry-level solution at reasonable once-off costs could consider some of the below solutions depending on how much electricity they use (NB – please note prices are based on the timeline when the research was conducted and may change with time- this is just indicative to get a sense of the spend). Refer to the graphic below:

These portable power solutions will work well for those businesses that are mobile, as they are easy to transport and can be charged ahead of time. For businesses like internet cafes, and some services businesses like accounting and tax, the solution they could consider during the lower stages of load-shedding, would be an uninterruptible power supply (UPS), which is a type of power supply system that contains a battery to maintain power to provide power to electronics in the event of a power surge or outage. Key aspects that should be considered are outlets on the UPS (multiple outlets that can be connected at a go); capacity or runtime of the UPS, which ranges from 90 minutes to four hours (important to understand especially with the different load-shedding stages to know how long the UPS will last); lastly, energy-saving features of the UPS. This basic understanding will assist with knowing how long the alternate solution will last and how to better prioritise.

Some of the examples of portable solutions (*not exhaustive, just for illustration)



3.3 Solar PV solutions

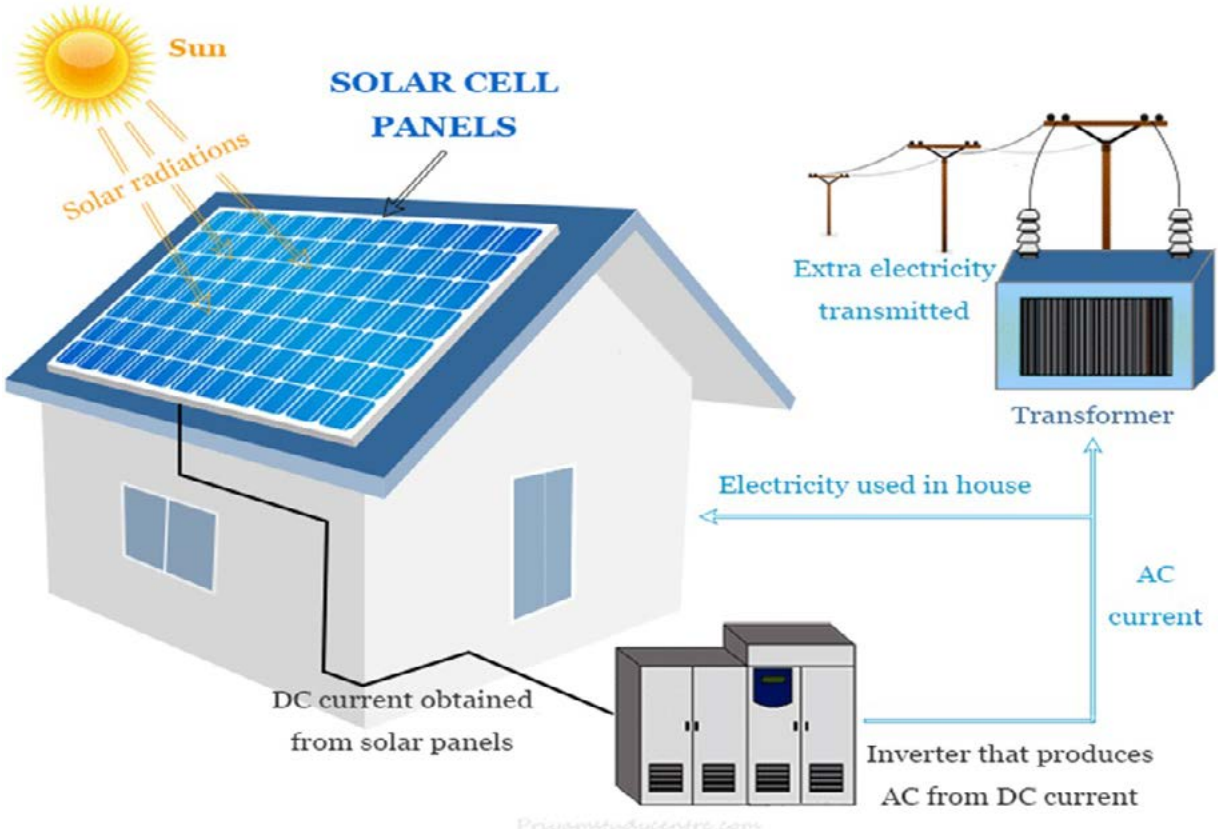
For those considering solar as an alternative, below is the Basic 101 guide on what to consider.

CASE STUDY **Hohm Energy South Africa**

Just as an introduction, let's define what is solar and how does it work?

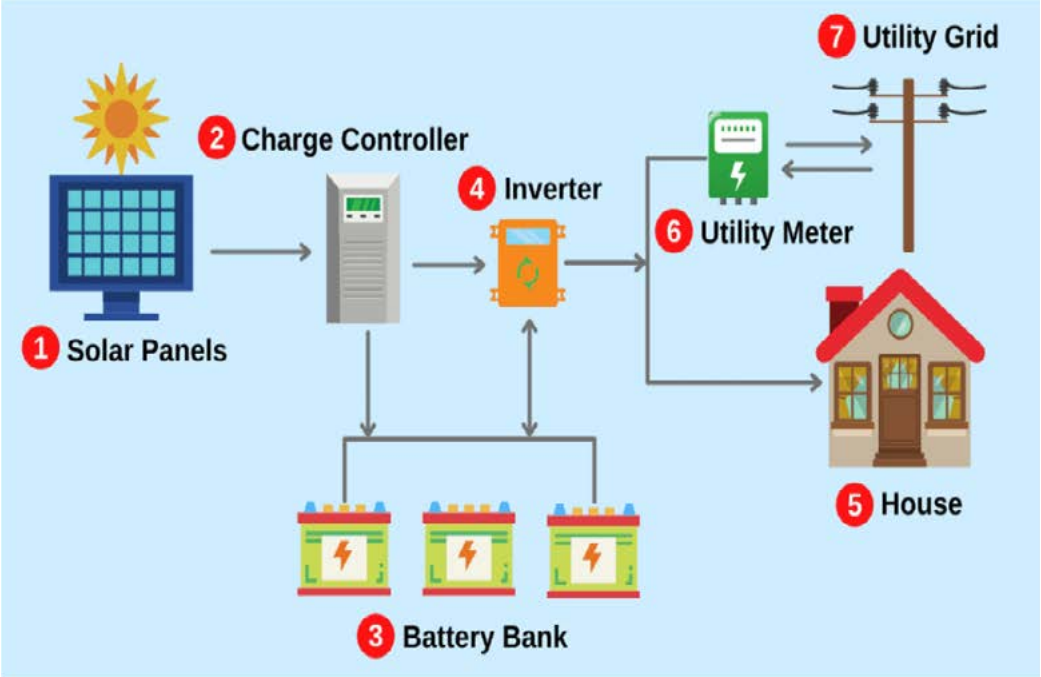
- In essence, and at its basic level, solar power works by converting energy from the **sun** into **power**
- There are two forms of energy generated from the sun for our use: **electricity and heat**
- Both forms are generated through the use of **solar panels**, which range in size from residential rooftops to 'solar farms' stretching over large areas
- When the sun shines onto a solar panel, energy from the sunlight is absorbed by the PV cells in the panel, which creates electrical charges that move in response to an electrical field in the cell, causing electricity to flow
- Solar panels are usually made from silicon installed in a metal panel frame with a glass casing and when photons, or particles of light, hit the thin layer of silicon on the top of a solar panel, they knock electrons off the silicon atoms
- This photovoltaic **(PV)** charge creates an electric current (specifically, **direct current or DC**), which is captured by the wiring in solar panels. This DC electricity is then converted to **alternating current (AC)** by means of an **inverter**
- **AC** is the type of electrical current used by us when we plug appliances into normal wall sockets for daily use

The picture below illustrates how solar works:



CASE STUDY **Hohm Energy South Africa** continued

Your solar system has seven components and it is important that you understand them, as outlined below:



1. **Large solar panels** are put onto your roof at home or at your business that takes the sun's rays and converts them into direct-current (DC) electricity.
2. **Charge controller:** Regulates the voltage and current coming from the PV panels going to the battery and prevents battery overcharging and prolongs the battery life.
3. When you add **batteries for energy storage,** you will be able to have power even when the grid is down. As time progresses, when you have excess energy you will be able to feed your stored electricity back into the grid to sell to your utility by a process called net metering, or becoming a virtual power plant (VPP).
4. These panels connect up with **an inverter** that converts the direct current (DC) into usable alternating current (AC), just like the AC adaptors we use to charge our cell phones, TVs or computers, which we can use to power our home or business.
5. **Your business/house:** The electrical appliances that connect to the PV system such as lights, radios, TVs, computers and refrigerators, etc.
6. **Utility/Smart meter:** Used for energy management and metering systems.
7. The solar system's inverter connects to **your electrical network/grid** at your home or business and integrates with your utility's grid. You get the best of both worlds – electricity from your solar system when the sun is shining and from the grid when you need it, which means you always have electricity.

Guidelines to consider when deciding what solar system to get:

- **Determine your power consumption demands**
  To figure out how to size your solar system, take your daily kWh energy requirement and divide it by your peak sun hours to get the kW output. Then divide the kW output by your panel's efficiency to get the estimated number of solar panels you'll need for your system.
- **Size your PV modules**
  Different sizes of PV modules will produce different amounts of power.
- **Inverter sizing**
  An inverter is used in the system where AC power output is needed. The input rating of the inverter should never be lower than the total watt of appliances. The inverter must have the same nominal voltage as your battery.
- **Battery sizing**
  The battery type recommended is a deep-cycle lithium battery. Deep cycle batteries are specifically designed to be discharged to low energy level and rapidly recharged or cycle-charged and discharged day-after-day for years. The battery should be large enough to store sufficient energy to operate the appliances at night and on cloudy days.
- **Solar-charge controller sizing**
  Select the solar-charge controller to match the voltage of your PV array and batteries and then identify which type of solar-charge controller is right for your application. Make sure that your solar-charge controller has enough capacity to handle the current from the PV array.

Understanding the above aspects will assist small businesses with being informed on what to ask for when they buy solar panels from retailers or eCommerce platforms like Avo, or if they engage suppliers differently to help them install the panels. It is important to ensure you find an accredited installer, which we will discuss later in the report.

Alternatively, there is an option to engage platforms that connect consumers with vetted renewable solar providers like Hohm Energy (www.hohmenergy.co.za) or LTM (www. ltmenergy.co.za) and many others that exist across the country, as they can provide you with a reliable, legal and trusted solution to procure renewable, clean energy for your business from your existing grid-connection.

They can manage the process for you from A to Z to ensure you receive the best offers on clean energy from a pool of energy providers. Though they attract an initial service fee, it will give you peace of mind that you have approached the installation in the right way, especially for sectors like manufacturing and agriculture, where the upfront investment will be significant. When considering solar energy, it is important to use quality products and an accredited supplier who will deliver the highest quality and professional service standards irrespective of the option. It is important to note that when you rent a building, you need to get approval and consent from the owners before you can consider installing solar PVs. This will be a challenge for most businesses as we picked up from the research and other desktop research that most township economy businesses either rent space or use shared spaces.

This also provides an opportunity for those who are keen to enter the alternate energy provision space, especially within townships where the supply is very limited, to get the right accreditation, partner with the right solution providers and to tap into a new business opportunity. There is also an opportunity to train new accredited installers, especially the youth within townships to increase the supply of installers, as there is currently a shortage of these skills.

Hopefully this section consolidates and democratises information on the alternative options available out there, and has provided a view on where to start and what questions to ask when considering which alternative solutions will be suitable for different businesses across sectors, as there is no one-size-fits-all. The intent of this e-session was to explore as many possible alternative solutions to provide basic foundation to know how and where to start. These have been the frequently asked questions every time we engaged small businesses on where to get the information on where and how to start, and a basic understanding of what is actually available and the estimation costs associated.

3.4 Funding options

Nedbank can contribute meaningfully to the lives of everyday South Africans by assisting them in achieving affordable energy security, while assisting global efforts to reduce greenhouse gas emissions. Given the fact that costs of looking for alternative options has been one of the key outcomes of the research and also from insights pulled from analysis common themes when talking about solar as shown under section 2.3, we will explore some of the funding options that Nedbank provides in partnership with several players to make these alternate solutions available. As a bank that cares, we have identified two Nedbank-approved suppliers, Hohm Energy and LTM Energy Solutions who have been vetted, accredited and recognised by the South African Photovoltaic Industry Association (SAPVIA). And we will continue exploring more partners to ensure we align with and meet client needs.

Deals on Avo by Nedbank (an award-winning super app: e-commerce platform)

Avo by Nedbank offers hundreds of alternative and clean energy solutions to meet the needs of a variety of clients (households, small businesses etc) and budgets. The extensive range includes complete solar system components (panels, inverters, battery storage, UPS, lighting, etc) and even solar water pumps and solar-powered security cameras, to name a few. Items are available across quality tiers. Avo by Nedbank has partnered with reputable supplier companies to bring these essential solutions and exclusive discounts to our vast registered customer base.

You can visit www.avo.africa to explore more deals and offers.

This platform also offers funding in the form of loans to be able to afford these solutions for those who are cashflow-trapped. We have seen a significant uptake of solar products on Avo since March 2020 when it was launched.

At Nedbank we offer multiple options, both around supply and funding of alternate energy solutions

Insights on client-buying behaviour on Avo by Nedbank

~900

products purchased on AVO

In total, **96%** of clients bought products on deal specials.

R21 500

average purchase value

Highest average value of products sold are during periods of load-shedding.

The above indicates that clients are constantly looking for deals and/or discounts when looking for solar solutions with the top three products being rechargeable LEDs, interactive UPSs and surge protectors.

Product sales breakdown

Product group	(%)
Rechargeable LED	58
Interactive UPS	13
Surge protector	11
Inverter	5
Gas products (cylinders/braais)	4
Diesel generator	3
Solar-charge controllers	2
Powerbank	1
Solar system	1
Battery power	1
Other (clothes dryer; trigger lighters)	1

Though a solar system is still one of the least frequently purchased solutions, we are starting to see a pick-up in sales around solar systems and the value for purchasing.

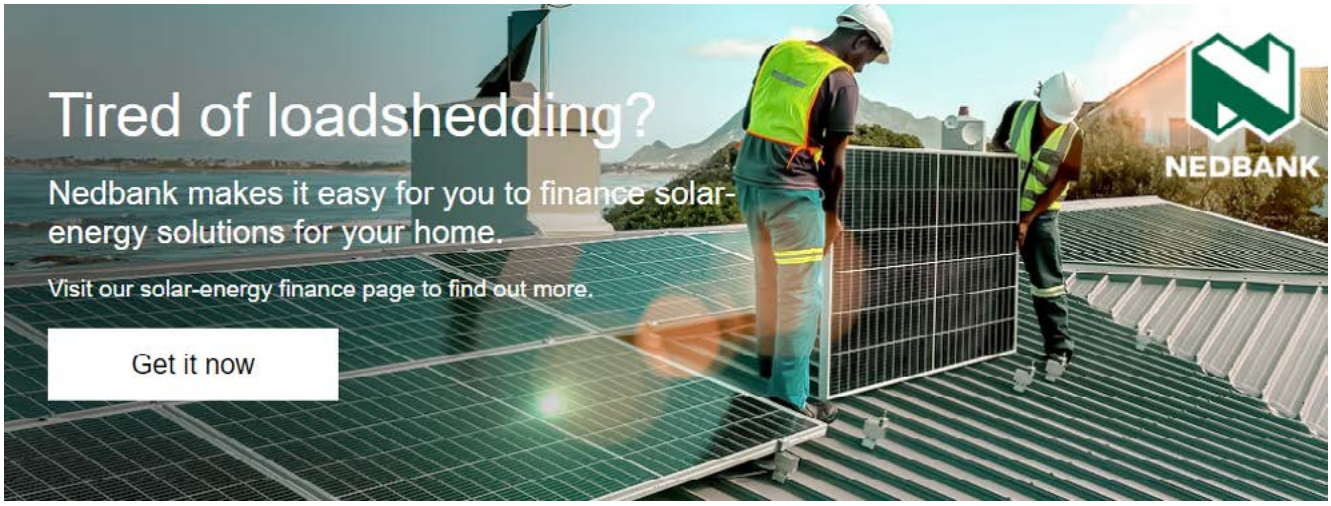
Highest Purchased product

5kWp solar system

@ R145 600
(Full solar solution)

Solar-energy asset-based finance offering (similar to the process you will follow when buying a car, using a loan)

Similar to how people normally buy cars, they go to dealers to look for the car they want to buy. Then they contact their bank to get a loan, where creditworthiness and affordability assessments are conducted for a loan to be granted. The same process will apply for solar. Clients may apply for solar-energy asset finance over a period of up to 72 months at a competitive interest rate. This is a recently introduced funding option as we endeavour to provide clients with alternate solar-funding options based on their needs.



Nedbank home-loan linked solar finance solution

Individuals can apply for a re-advance on their home loan or a further loan from Nedbank. A re-advance allows access to the portion of the home loan amounts that have been repaid over time. It is easier to tap into an exiting bond than to try and apply for new or alternate funding. If the individual's home loan account is held with other banks, they may switch the loan to Nedbank in order to access the home-loan-linked solar finance solution. It takes less than two days from application receipt and approval to supplier payment. The benefits of solar-energy finance are extensive – the minimal increase on an individual's home loan instalment will be offset by a decrease on their monthly electricity bill, the reduced impact of electricity tariff hikes, and a lower carbon footprint.

Nedbank is actively exploring various options to provide convenient and affordable solar finance offerings to small businesses. As a leader in alternative energy solutions, as evidenced by the success of our leading solar finance CVP in the consumer space, we believe that our expertise in the energy market will give us leverage to provide tangible solutions to small businesses who have largely been left out of solutions offered so far in the market. Below are the options on alternate solutions we offer to clients through partnerships and different financing models to meet the different needs of clients.

Examples of alternate solar solutions offered by Nedbank through different funding models

Hybrid Configuration (Small)

6kW | 5.1kWh | 6.4kWp Hybrid System

Component	Description	QTY	OEM Warranty
Inverter	Solplanet 6kW Hybrid	1	10 yrs
Battery	Magneto 5.1kWh LiFePO4	1	10 yrs
PV Modules	Longi 455Wp Mono	14	12 yrs

Kit Price: R158,696.03 excluding vat

Inverter	6 Kilowatt
Battery	5.1 Kilowatt-Hour
Solar Panel	6.4 Kilowatt-Peak
Price Excl VAT	R 158 696.03
Price Incl VAT	R 182 500.43
Finance Period	72 Months
Monthly Base Instalment	R 3 556.05

Hybrid Configuration (Medium)

6kW | 10.2kWh | 8.2kWp Hybrid System

Component	Description	QTY	OEM Warranty
Inverter	Solplanet 6kW Hybrid	1	10 yrs
Battery	Magneto 5.1kWh LiFePO4	2	10 yrs
PV Modules	Longi 455Wp Mono	18	12 yrs

Kit Price: R204,267.65 excluding vat

Inverter	6 Kilowatt
Battery	10.2 Kilowatt-Hour
Solar Panel	8.2 Kilowatt-Peak
Price Excl VAT	R 204 267.65
Price Incl VAT	R 234 907.80
Finance Period	72 Months
Monthly Base Instalment	R 4 577.21

Hybrid (Large)/Off Grid Configuration

8kW | 10.2kWh | 10kWp Hybrid System

Component	Description	QTY	OEM Warranty
Inverter	Magneto 8kW Hybrid	1	5 yrs
Battery	Magneto 5.1kWh LiFePO4	2	10 yrs
PV Modules	Longi 455Wp Mono	22	12 yrs

Kit Price: R247,504.85 excluding vat

Inverter	8 Kilowatt
Battery	10.2 Kilowatt-Hour
Solar Panel	10 Kilowatt-Peak
Price Excl VAT	R 247 504.85
Price Incl VAT	R 284 630.58
Finance Period	72 Months
Monthly Base Instalment	R 5 546.07

Off Grid Configuration

12kW | 19.2kWh | 13.6kWp Hybrid System

Component	Description	QTY	OEM Warranty
Inverter	Magneto 12kW Hybrid	1	5 yrs
Battery	Magneto 9.6kWh LiFePO4	2	10 yrs
PV Modules	Longi 455Wp Mono	30	12 yrs

Kit Price: R350,267.15 excluding vat

Inverter	12 Kilowatt
Battery	19.2 Kilowatt-Hour
Solar Panel	13.6 Kilowatt-Peak
Price Excl VAT	R 350 267.15
Price Incl VAT	R 402 807.22
Finance Period	72 Months
Monthly Base Instalment	R 7 848.76

04 Ecosystem play

Holistically, for South Africans to address the supply constraints on power, many different stakeholders need to come together to ensure that the supply of alternative sources of power is equal to the increased demand. The current take-up of rooftop solar is estimated at less than 5% of the total market. However the higher levels of load-shedding and new tax incentives for businesses are driving up demand for solar PV installations, but the local market is already facing equipment supply shortages. Local companies rely on imports for solar equipment and this results in longer lead times for installations and solar supply in the country. The limited supply of imported products is a key constraint to installation capacity. Also seasonal supply constraints nationwide are experienced by most solar equipment suppliers and producers. We need to boost the local production capacity for solar equipment to reduce our reliance on imports, and to participate in bulk buying of imported solar solutions to drive down costs, and to ensure we move up the ranks of prioritisation when assessed by exporters. Furthermore, the lack of requisite skills and knowledge is hampering many solar PV projects in the country. In South Africa there is a shortage of accredited solar installers; currently solar installation capacity is only able to satisfy an estimated 16% of total demand for solar roof installation nationwide. SA needs more training and accreditation of approved installers.

There are different role-players offering solutions and interventions to mitigate the effects of ongoing load-shedding on small businesses in South Africa. The two key areas to address are:

Demand **Greater than** **Supply**

South African government interventions

South Africa has recently appointed a new Minister of Electricity, Kgosientsho Ramokgopato, to deal with the energy crisis. From 1 March 2023, businesses can reduce their taxable income by 125% of the cost of an investment in renewables. There are no thresholds on the size of the projects that qualify, and the incentive is available for two years to stimulate investment in the short term. Changes to the Bounce Back Loan Guarantee Scheme have been proposed to incentivise renewable energy, rooftop solar, and address energy-related constraints experienced by small and medium enterprises. Government will guarantee solar-related loans for small and medium enterprises on a 20% first-loss basis. National Treasury will launch the Energy Bounce Back Scheme in April 2023.

Big South African corporates

Interventions by big South African corporates include strengthening their renewable energy strategies to go off the grid, which will also have positive impacts on gas emissions, climate change and sustainability of business. In addition, in early March 2023, a South African business group, Business for South Africa, secured commitments of R100 million to capitalise the Resource Mobilisation Fund in support of efforts to end load-shedding and reform the energy sector. This also includes the ability of South African corporates to get together to explore alternate ways to secure a supply of solar systems to close the gap between demand and supply where demand is currently outweighing supply, therefore delaying the transition to cleaner energy.

SAPVIA

There are a number of organisations that offer solar installation training and accreditation for solar installers in South Africa. The South African Photovoltaic Industry Association (SAPVIA) is a not-for-profit industry association that aims to promote the increased deployment of Solar PV technology in South Africa. They have developed a quality framework to ensure that solar PV installations are done responsibly and sustainably. SAPVIA is playing a crucial role in ensuring that installations standards are of a high quality and comply with municipal and national electrical regulations. Currently SAPVIA has just over 170 members, operating across the entire PV value-chain. The PV GreenCard is an industry-led quality label that is inclusive in nature and becomes the key to ensure a high standard of quality for small-scale Solar PV installations. It is recommended that a PV GreenCard should be issued with every small-scale Solar PV installation by suitable qualified installers. The most important aspect of the PV GreenCard is peace of mind that your Solar PV installation complies with industry and international best practice and installers meet minimum internationally bench-marked quality and safety standards. For solar installations, small businesses are encouraged to access a database of qualified and verifiable solar PV installers via the PV GreenCard website.

Banks

Banks play a critical role in supporting the greater use of renewable energy, providing finance for solar power solutions as well as much-needed advice and expertise. Nedbank as a purpose-led bank is committed to using its financial expertise to do good by contributing to the well-being and growth of the societies in which we operate, and we realise that it is very difficult to operate a successful business in an unsuccessful society. The lack of reliable electricity supply in South Africa is having a devastating effect on individuals and businesses across the country, and we have long been a core part of the solution. Already being the leader in renewable energy finance, having arranged 42 transactions in renewable-energy projects to date giving us exposures of R26 billion and with our ground-breaking solar finance CVP which is available to all, including non-Nedbank clients in the consumer space, we have already taken significant steps to provide alternative solutions to load-shedding in South Africa.

Nedbank has long recognised the imperative to provide meaningful support and enablement to township communities, which are essential economies in South Africa. Among many other initiatives in the township economy, we have been creating positive impacts through our partnership with TEA, offering TEA Kasi Business Workshops to township business owners across South Africa and equipping them with the necessary business skills, tools and financial support to succeed. As persistent load-shedding continues to present mounting challenges to township businesses, Nedbank is working closely with all key stakeholders across the ecosystem to find solutions that will help to scale up solar financing in the country. Nedbank is also taking a leading role in driving a national conversation by sharing our insights in this report and seeking to provide alternative solutions for township small businesses to navigate through the adverse effects of load-shedding.

05 Tangible next steps for township small businesses

For township small businesses that have cash resources available to purchase alternative power solutions

- There are many alternative solutions available in the marketplace. Be diligent, do your research and only buy quality products from accredited suppliers.
- Take your time and gradually invest in alternative solutions that meet your specific business needs; you do not have to do everything at once.
- Look into community-based sharing solutions, such as moving to shared office space that is equipped with a generator during load-shedding. Businesses with similar characteristics can share energy-generation solutions such as mobile battery storage units, portable generators and solar panels to reduce operational costs and keep businesses going.
- There are many affordable portable solar solutions, but it is important to evaluate your power-supply needs in terms of usage, which is unique to every business depending on specific size and industry.
- Consider credit options, such as the solar-finance offering by Nedbank.

For township businesses that have limited funds available to purchase alternative power solutions

- Think creatively around how you restructure your business model; minimise unnecessary expenditure to limit waste and streamline production.
- Plan around load-shedding: leverage time management and plan business activities around load-shedding. Perform tasks that do not need electricity during load-shedding such as delivering goods to customers or, if your business uses machinery, plan to use machinery when power is available.
- Talk to other business owners in the same industry as yours to collaborate and innovate. Remember, you are not alone.

06 Conclusion

In conclusion, there are a multitude of alternate power solutions available for the small-business segment of the market. As financial experts who do good, we encourage all township small businesses to start small by investing in the minimum viable solution that works best for their specific business type and size. Where possible, small-business owners should seek a solution that can grow as their business grows. For example, investing in a solar solution with two solar panels can be suitable for now and, as the business operations and energy requirements increase, they can supplement the solution with additional solar panels, instead of needing to replace the entire system. No one size will fit all businesses; every business must understand what they need, and think about where they want to be in five years from now. Businesses should think outside the box and stay tuned in on the latest alternative power solutions available in the market – everyone is focused on finding alternatives to keep their businesses going during load-shedding, so be plugged in. There is also a need for significant shifts in mindsets especially among small businesses in dealing with load-shedding. Small-business owners can talk to their business bankers for advice on how to navigate through this time – either solutioning, financing or flagging financial stress that can be managed ahead of time.

07 Acknowledgements

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Mothibedi Rantloane (Head: Strategy)	Sibusiso Molimi (Training Facilitation, Data & Learning)
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Herman Smit (Executive: Behavioural Economics)	

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