

Shopping Clean

Retailers and Renewable Energy



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INTRODUCTION

Historically South Africa has benefitted from an abundant and cheap supply of electricity, largely due to low labour costs under the apartheid government and large reserves of coal. This has allowed South Africa to develop into a very energy intensive country that is almost entirely dependent on polluting and water-intensive coal. However, climate change - driven by the burning of fossil fuels - currently threatens all continents, living systems and communities and has been particularly evident in South Africa as the country experiences one of the worst droughts in over 30 years.

South Africa is also facing a crisis in its electricity system due to an unreliable supply, rapidly increasing costs and delays in the construction of two new mega coal-fired power stations (Medupi and Kusile), which has serious implications for the economy. Large-scale load shedding in 2014 seriously damaged and constrained the economy, leading to economic growth of only 1.5%.¹ Meanwhile, in the global arena renewable off-the-grid systems and distributed power are emerging as an increasingly important trend due to rising electricity costs, rapid technology advances and price improvements in alternative energy options.

The state utility Eskom currently owns and controls electricity generation, transmission and distribution in the country, with the price of electricity escalating above inflation year-on-year. Eskom, under the mandate of the Department of Energy, is currently not investing sufficiently in renewable energy for the country. In addition, the government's overall renewable energy target of 26% by 2030² is not ambitious enough, effectively putting a cap on renewable energy investments.

Renewable energy offers a real alternative to the current electricity paradigm, but at the moment investments are almost entirely limited to the country's Renewable Energy Independent Power Producers Procurement Programme (REIPPPP), and significant barriers to rooftop solar remain. The REIPPPP Programme, run by the Department of Energy, has been praised internationally as a major success story for renewable energy. However a number of artificial barriers and policy obstacles still exist, which are preventing renewable energy from reaching its full potential. This is particularly true when it comes to smaller-scale renewable energy investments.

Currently 85% of South Africa's electricity comes from coal,³ making the country one of the highest emitters of greenhouse gas per capita in the world. However, reports released by the Department of Energy have indicated that the solar radiation resource in South Africa is one of the highest in the world,⁴ providing a huge opportunity for solar

energy as a renewable source of electricity. Renewable, off-the-grid energy installations and distributed power systems are emerging globally as the solution to rising electricity costs as the technology advances and the cost of these systems decline. Since the start of the REIPPPP Programme in 2011 independent power producers have added 1,860MW of capacity to the power system, equalling 4% of the total installed capacity in the country, in just 2.5 years.² Renewable energy can add capacity to the grid much faster than anticipated by the South African government and much more effectively than current policy allows.

In order to fully benefit from the potential of renewable energy in South Africa, companies need to step out of their comfort zones and send clear signals to the markets by committing to an ambitious 100% renewable energy future. Companies can help drive the creation of a thriving market for renewable energy by committing to obtain 100% of their electricity from renewable sources within the shortest practicable timescales, and to actively lobby to remove the current barriers to renewable energy.

South Africa's retail sector plays an important role in society and has developed over time to meet the changing needs of the country. Retailers have a major role to play in shaping the commercial sector and ensuring a more sustainable growth path in the future. As such, this report highlights the important role that South Africa's five top retailers, Shoprite, Pick n Pay, Spar, Woolworths and Massmart (Group brands include Game, Game Foodco, DionWired, Makro, Fruitspot, Builders Warehouse, Builders Express, Builders Trade Depot, Builders Superstore, CBW, Cambridge Food, Jumbo Cash and Carry, Valumart, Liquorland, Trident, Rhino and Shield) should play in developing the renewable energy industry, by committing to a target of powering their operations with 100% renewable energy.

This report details the current state of renewable energy investments and commitments from each of the five retailers, as well as the range of actions required from the various retailers to achieve a 100% renewable energy target. Information was gathered from the retailers through an interview process and distillation of information that is publicly available through the Carbon Disclosure Project (refer to the box on page 26 for further information) and the retailer's annual sustainability reports. Based on this information the retailers have been ranked in this report on four key criteria relating to renewable energy which clearly indicates where they need to improve in the future in order to lead the way to a renewable energy future. These criteria are energy transparency, commitment to renewable energy, greenhouse gas mitigation, and lobbying for renewable energy.

ACHIEVING 100% RENEWABLE ENERGY BY 2050

Greenpeace International's report *Energy [R]evolution scenario 2015 - 100% Renewable Energy for All*⁶ details how 100% renewable energy is achievable globally by 2050, and is the only way to ensure the world does not suffer from the serious consequences of climate change. It also demonstrates that dynamic change is taking place in the renewable energy sector, and that renewable energy has become mainstream in many countries, while prices have fallen dramatically, making it much more affordable and creating jobs at the same time.

The renewable energy sector is growing exponentially, and proving it can transform power generation globally:

- Renewable energy contributed 60% of new power generation worldwide in 2014.

- This expansion has meant huge reductions in costs, so that solar photovoltaic (PV) and wind power is now cost-competitive with new coal in most regions.
- Within the next 15 years, renewables' share of electricity could treble from 21% today to 64%, which would mean that nearly two thirds of global electricity would come from renewable energy.

There are no major economic or technical barriers to shifting towards 100% renewable energy by 2050. It just requires that the perception of renewable energy as a real solution grows substantially, combined with the political will to make and support the change.



© Greenpeace / Philip Schedler. People's Climate Banner in South Africa, 2014.

SOUTH AFRICA'S ENERGY POLICY

South Africa has benefited from an abundant and cheap supply of electricity since the founding of the monopoly public utility, Eskom (the 'Electricity Supply Commission') in 1928. Low labour costs under apartheid, combined with South Africa's large reserves of coal, enabled Eskom to subsidise industrial development and to become a surplus electricity producer. The surplus ultimately resulted in Eskom exporting electricity to neighbouring countries and the utility is now the largest producer of electricity in Africa.

The apartheid government was principally concerned with security of supply in the face of increasing sanctions. During the 1950s the government focused on the production of synthetic fuels and nuclear energy.⁶ In the 1960s and 70s the South African government invested hugely in electricity generation which was mostly coal fired. By the eighties and the nineties economic growth had begun to decline but the supply of electricity remained constant. This resulted in excess capacity and in 1992 electricity capacity exceeded peak demand by 63% - another reason for low electricity prices.⁷ The combination of cheap and abundant coal and the low cost of electricity resulted in South African industries becoming hugely energy intensive, which means that there are significant energy efficiency gains that can be made. Eskom has an almost complete monopoly over the electricity system, and supplies at least 90% of the country's power. South Africa has an installed generation capacity of approximately 40,000 MW.⁸

Since the early nineties there has been rapid growth in electricity demand without the necessary growth in infrastructure, which is one of the factors that led to the recent electricity crisis.⁸ In 2008, South Africa experienced a massive power shortage which resulted in an unreliable supply of electricity as Eskom was forced to switch off parts of the electricity grid to lighten the load (load-shedding).

The electricity crisis in 2008 accelerated plans to construct two mega coal-fired power stations (Medupi and Kusile), but at the same time pushed the government to review its energy policies and promote generation of power by private enterprises.⁹ More importantly, the crisis was a step towards giving more serious attention to renewable energy, and the need to use energy more efficiently.

South Africa's main energy source has always been coal, which the country has had in abundance. The country also has large reserves of uranium and small reserves of oil and gas. As such, South Africa continues its dependence on polluting coal for the production of electricity. This means that the country's economy is highly dependent on fossil fuels, with significant hidden costs to people's health and impacts on scarce water supplies.⁹ Moderate amounts of nuclear, gas and hydro also contribute to the energy mix, although the government currently plans to invest in 9,600MW of new nuclear.⁸

Climate Change and a 100% Renewable Energy Future

The science is clear that climate change is already happening, and it is being caused by human activities (specifically the burning of fossil fuels like coal).¹⁰ In South Africa the impacts of climate change became a harsh reality in 2015 and have continued into 2016 with one of the worst droughts experienced in the country in 30 years. The drought threatening South Africa's water supply, food security and leading to a dramatic increase in food costs is caused by El Nino which is a naturally occurring cyclical weather phenomenon. However, climate change acts as a multiplier for extreme weather events making them more frequent, more unpredictable and much more intense.

We are already seeing the impacts of climate change on people and the planet: melting glaciers, floods, thawing permafrost, dying coral reefs, rising sea levels, changing ecosystems, record droughts, rising food prices and fatal heat waves are all occurring.¹¹ But it is still within our power to avoid the worst impacts of climate change if we take action now.

Climate change means that we cannot continue with 'Business as Usual', significant changes need to be made to avoid catastrophic climate change – and one of these changes is a shift away from coal and nuclear and towards renewable energy and energy efficiency.⁹ This is particularly relevant in South Africa where almost all of our electricity comes from coal, despite the country's abundant solar resources.

South Africa's top five retailers can help lead the way by committing to use 100% renewable energy. Installing solar panels across their network would reduce their electricity costs, reduce pressure on the electricity grid and help create a cleaner electricity system: a win for retailers and a win for the people who shop in their stores.

Government Response to the Electricity Crisis

The electricity crisis has seen the immediate need for the country to ensure that energy, specifically the electricity system, is brought back into balance. The Government's demand side management programme focuses on reducing the amount of energy required by consumers. This is a key focus area for energy efficient measures such as Compact Fluorescent Lamps (CFLs), efficient transport, solar water heaters, etc.

In terms of electricity supply, the focus here is ensuring that the amount of electricity that is available is enough to meet demand. Eskom is undertaking a 'new build programme', which is focused on building additional power stations and major power lines on a massive scale to meet rising electricity demand. Retired coal power stations have been brought back on line and Eskom is building two of the biggest coal fired power stations in the world (Medupi and Kusile). Medupi will have an installed capacity of 4,788 MW, and Kusile will have an installed capacity of 4,800 MW. These mega coal-fired power stations will significantly contribute to climate change and continue to push South Africa along a dirty energy path. Kusile will burn 17 million tonnes of coal per year, with estimated annual greenhouse gas (GHG) emissions of 37 million tonnes CO₂eq, increasing the country's total contribution to climate change by an immense 10%.⁹

The new build programme also includes a massively expensive nuclear expansion programme, as the Policy Adjusted Integrated Resource Plan makes provision for 9,600MW of new nuclear reactors to be built over the next two decades.

The South African government has also begun to give attention to increasing the relative share of renewable

energy in South Africa, with a focus on solar and wind power through the REIPPP Programme. The renewable energy sector will be a major source of green jobs and foreign investment in South Africa. However, the upscaling of renewable energy investments needs to be significantly increased, and much more certainty must be created in the market.

National Policies and Trends

Energy is a requirement for social and economic development, and therefore a lack of access to energy contributes significantly to poverty. A quarter of the world's population has no access to electricity and most of these people live in South Asia and sub-Saharan Africa.¹¹ Improving energy efficiency in Africa is closely linked to providing energy access to those currently without supply: today, more than 620 million people lack access to electricity, and nearly 730 million rely on the traditional use of biomass for cooking purposes.¹¹

Energy poverty is a global problem. However, South Africa is unique in that not only is the country a developing nation, but it must also deal with the legacy of apartheid where the majority of South Africans were denied access to basic infrastructure and services. Many people still live in informal settlements and have to use candles or paraffin which are not safe, and over the years this has led to many fires resulting in homelessness and death. The burning of biomass (such as firewood) and coal for cooking or heating as well as the use of paraffin has resulted in high levels of indoor air pollution.

At the same time, there has been significant growth in urbanisation in South Africa. It is estimated that approximately 58% of the population lives in urban areas. Informal settlements have been increasing steadily over the past ten years, and unconnected households are expected to grow as rural residents move to urban areas.⁶



© Greenpeace / Shayne Robinson. Activists Confront Eskom in Johannesburg, 2012.

THE RETAIL INDUSTRY IN SOUTH AFRICA

The retail sector refers to the portion of a country's economy that sells goods and products to consumers for personal use, and encompasses a variety of shops from kiosks and small grocery shops to supermarket chains and large department stores. Retail sales are an important economic indicator because consumer spending drives much of our economy. Furthermore, the retail industry has an important role to play in the improvement of livelihoods for many South Africans as it has the ability to absorb unskilled workers and train them as cashiers in stores, to promote skills development and afford people the opportunity to obtain better employment.¹²

South Africa's diverse retail sector plays a critical role in society and has evolved over the years to meet the changing needs of South Africans. In the 2015 Global Powers of Retailing report, the country's top five retailers (Shoprite, Massmart, Pick n Pay, Spar and Woolworths) were ranked in the global top 250 retailers.¹³ The retail industry has benefited through the efficient distribution of goods to urban and rural areas, shopping centre development has also shifted from being concentrated in inner-cities to suburbs and townships.¹² The rapid construction of high-density housing in the surrounds of major urban areas has led to the demand for and increased developments of retail centres in these residential areas.¹²

According to the Urban Studies report from 2010, retail land uses constitute a significant part of the urban environment in all developed countries, as well as in a substantial and growing proportion of developing countries.¹⁴ In 2010 the retail sector represented 14% of the total Gross Domestic Product (GDP) of South Africa, and the annual sales from all retail facilities was over R534 billion.¹² GDP growth in this sector, as with the economy more broadly, has slowed over the past six years with this sector showing a 6.1% growth in 2011, but thereafter growth slowed to 4.5% in 2012, 2.5% in 2013 and 2.4% in 2014.¹⁵

The country's top five retailers are major stakeholders in the South African economy; they control or influence a large proportion of land within the urban landscape, and provide the main interface between retail goods and consumers. As such retailers have a major role to play in shaping sustainable growth in this sector, and one key focus area needs to be the transition to 100% renewable energy.

Retailers and Load Shedding

According to data produced by the World Bank¹⁶ the average per capita electricity consumption for South Africa is 4600kWh. This figure can then be extrapolated to determine the average household (two adults and two children) consumption annually in South Africa to be 8,000kWh (8MWh).

Due to the vast disparities that exist in South Africa in terms of living standards and household needs, it is important to note the discrepancies in terms of consumption patterns. For example, a household in Sandton consumes 10,800 – 14,400kWh annually whereas a household in Soweto consumes 3,000 – 4,800kWh annually.

The annual electricity consumption for each of the five top retailers in South Africa is compared to the average electricity consumption for households in Table 1 below. If Woolworths, for example, were to be 100% renewable energy powered, this would liberate enough electricity for 55,000 households in South Africa. Pick n Pay's electricity consumption is enough to power 65,000 households whilst Massmart and Spar could power 53,000 and 5,400 households respectively.

Arguably it is the responsibility of all major electricity users in South Africa to reduce consumption, and produce their own electricity from renewable energy sources thus decreasing pressure on the grid, and reducing the need for load shedding.

Table 1: The Number of Average South African Households that each Retailer's Current Annual Electricity Consumption could Power

	Total Annual Electricity Consumption	Number of Households (Estimate)
	523,682.94MWh	65,000 Households
	444,545.37MWh	55,000 Households
Massmart + Walmart 	436,876.40MWh	53,000 Households
	43,738MWh	5,400 Households
	No data available	No data available

¹ It is important to note that Spar has a different business model to the other retailers as the majority of their stores are franchised and the electricity consumption of franchises is not included in this figure, thus providing a very skewed view of Spar's overall electricity consumption.

RENEWABLE ENERGY IN SOUTH AFRICA: DRIVERS AND BARRIERS

Renewable off-the-grid energy installations, and distributed power systems have emerged as a global trend on the back of rising electricity costs, rapid technology advances and price improvements in alternative energy options. In South Africa, a further driver is the current and continued constraints of the electricity supply system, which is prompting an acceleration of distributed generation, including solar PV.²

The dominant renewable electricity source is now wind power, but photovoltaics are holding their own in the market and rapidly catching up. The significant cost reduction of solar PV rooftop systems is leading to grid parityⁱⁱ in almost all industrialised countries.⁵ Households and businesses can then produce their own solar power for the same or a lower cost than rates for grid electricity; onsite power generation – a term usually used for industry – now makes economic sense for the private sector.⁵ These decentralised technologies can be commercialised for domestic users to provide sustainable, low-carbon energy. Increased shares of distributed generation technologies require adapted energy

policies for “prosumers” – consumers who produce their own energy.⁵

According to the Department of Energy “the annual 24-hour global solar radiation average is about 220 W/m² for South Africa, compared with about 150 W/m² for parts of the USA, and about 100 W/m² for Europe and the United Kingdom. This makes South Africa’s local solar resource one of the highest in the world”.⁴

As demonstrated in Figure 1, solar energy is perhaps the most abundant, readily accessible renewable resource in South Africa and lends itself to both solar powered heating and electricity.⁴ In 2010 there were ± 1 619 formal shopping centresⁱⁱⁱ in South Africa ranging from 1 000m² up to almost 150 000m² thus representing a sizeable component of the urban landscape.¹⁴ The large surface area covered by retail space and the associated distribution centres, coupled with the significant solar radiation potential of South Africa, provides a clear opportunity to capitalise on renewable energy investments.

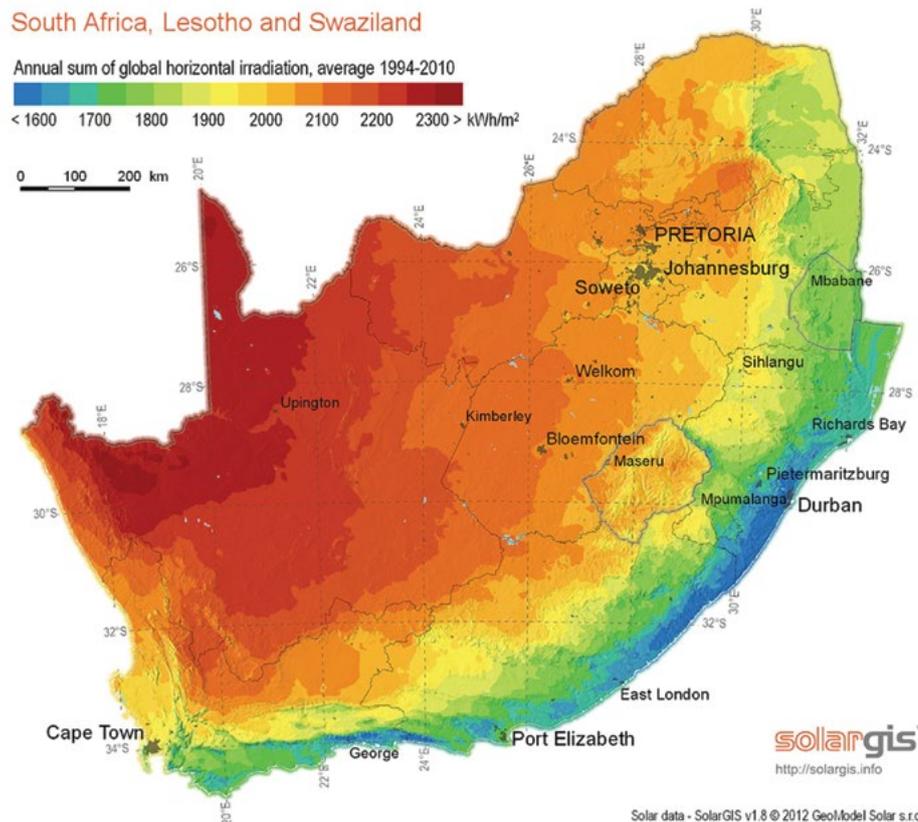


Figure 1: Solar Resource Map for South Africa, Lesotho and Swaziland¹⁷

ⁱ Grid parity occurs when an alternative energy source can generate power at a levelised cost of electricity that is less than or equal to the price of purchasing power from the electricity grid.

ⁱⁱ Shopping centres demonstrate a hierarchical arrangement with a low-order isolated convenience store (small grocery store) and a neighbourhood centre, both offering low order and a few higher-order facilities (variety of clothing and household stores). At a regional level the most specialised stores, as well as department stores are represented.

Taking Advantage of Solar Potential - Shopping Malls Begin to Invest in Solar

Renewable energy has been expanding rapidly on a global scale, but it is only over the past few years that solar investments have begun to pick up speed in South Africa. Nonetheless, some South African shopping malls are already beginning to reap the benefits of installing solar panels on their large rooftops – two examples are Clearwater Mall in Gauteng, and the V&A Waterfront in the Western Cape.

Clearwater Mall

In November 2014, the Clearwater Mall saw the installation of the first phase of their solar PV installation totalling 500kWp. Due to the success of this first phase an additional 1000kWp was added at the beginning of 2016. The system generates on average 2 500 000kWh electricity per annum, equal to the consumption of 347 average households, and totalling 10% of the mall's energy consumption.¹⁸

The energy yield from solar panels closely matches the electrical consumption curve of the shopping malls, and the bulk of electricity is used during the daytime, making solar panels the ideal alternate energy source.¹⁹

Hyprop Investments CEO, Pieter Prinsloo says¹⁹: “The additional 1000kWp will help mitigate the impact of continuously rising electricity costs, as well as shrinking Hyprop's carbon footprint, in line with the primary objectives of our environmental strategy.”

V&A Waterfront

In November 2015 a 7 500 m² rooftop solar system was installed at the V&A Waterfront in Cape Town. The solar installation will produce an estimated 1 640 000 kWh/y of clean solar energy. The daily output of the solar plant is equivalent to powering 310 average households, and totals between 7 and 24% of the V&A Waterfront's daily electricity consumption. The project was completed with no delays and within budget.²⁰

According to Engineering News,²⁰ V&A Waterfront executive manager of operations Colin Devenish believes that the solar installation clearly demonstrates what could be done to achieve 'integrated, clean energy in high-use properties', and says: “most importantly, it is about long-term energy savings and sustainable electricity generation that is going to work for 25 to 30 years.”

The following shopping malls have also already invested in solar PV installations: Waterfall Mall, Northgate Mall, Brooklyn Mall, Constantia Village and Bayside Mall.

A second independent study by the Council for Scientific and Industrial Research (CSIR)²¹ found that renewable energy from South Africa's first wind and solar (photovoltaic) projects created R4 billion more financial benefits to the country than they cost during the first six months of 2015. The study is an update and continuation of an initial study that was published in January 2015, which covered the calendar year 2014. The benefits earned were two-fold.

The first benefit, derived from diesel and coal fuel cost savings, is pinned at R3.6 billion.²¹ This is because 2.0 TWh (terawatt-hours) of wind and solar energy replaced the electricity that would have otherwise been generated from diesel and coal (1.5 TWh from diesel-fired open-cycled gas turbines and 0.5 TWh from coal power stations).²¹

The second benefit is the saving of R4.6 billion to the economy derived from 203 hours of so-called 'unserved

energy' that were avoided thanks to the contribution of the wind and solar projects.²¹ During these hours the supply situation was so tight that some customers' energy supply would have had to be curtailed ('unserved') if it had not been for the renewables. The avoidance of unserved energy meant that during 15 days from January to June 2015 load shedding was avoided entirely, delayed, or a higher stage of load shedding prevented thanks to the contribution of the wind and solar PV projects.

These direct cash savings on fuel spending to Eskom and the macroeconomic benefits of having avoided “unserved energy” must then be calculated in relation to the tariff payments to the independent power producers of the first wind and solar PV projects. They amounted to R4.3 billion from January to June 2015.²¹ Therefore, renewable energy contributed a total net benefit of R4 billion (or R2 per kWh of renewable energy) to the economy.²¹

Key Renewable Energy Drivers

Government Renewable Energy Goals

Government goals for renewable energy have been a key driver of renewable energy in many parts of the world, providing the critical conditions to drive investment in real energy solutions. In many areas of the world, governments are now moving to strengthen such goals, with Germany as the biggest economy with ambitious renewable energy targets as it aims to power the country with 80% renewable energy by 2050 under the Energiewende, or the German energy plan.

In South Africa more than 85% of the country's electricity comes from coal, thus a much greater ambition and commitment is required from the government to drive investment in renewable energy. According to the Integrated Resource Plan 2010 (IRP2010) the current Renewable Energy Independent Power Producer Procurement Programme aims to produce 17,800MW of electricity by 2030. Since the start of this programme in 2011, Independent Power Producers (IPPs) have added 1,860MW capacity to the power system (equalling 4% of the total installed capacity in the country) within 2.5 years.² This clearly shows that renewable energy can add capacity to the grid at a much faster rate than anticipated in the IRP2010, and that the current overall targets set by the South African government are nowhere near ambitious enough. Major expansion of the REIPPPP process, and increased renewable energy investments by Eskom, combined with an enabling framework and support for smaller-scale distributed renewable energy investments

(which together should aim to surpass the overall 17,800MW goal) must be undertaken with a long-term goal of ensuring 94% of South Africa's electricity comes from renewable energy by 2050.

Private Sector Renewable Energy Purchases and Investments

Voluntary corporate purchases of renewable electricity have been a critical driver of renewable energy investments, particularly in parts of the USA and EU that have a more liberalised electricity market, and give some form of supplier choice to electricity customers. In the USA the decrease in renewable energy costs, projected increase of fossil fuel costs, and new innovations in renewable energy financing have all contributed to rapid growth in voluntary renewable energy purchases.²²

The electricity system in South Africa is strongly controlled and regulated by Eskom, and the price of Eskom supplied electricity continues to escalate way above inflation year-on-year. In order to open up the electricity sector and send clear signals to the market, it is essential that companies within South Africa set ambitious renewable energy targets and procurement policies. Without these market signals there is little incentive to open up the renewable energy space and create more investment opportunities.



Barriers to Renewable Energy

Large-Scale Renewable Energy Investments

While the REIPPPP process has resulted in major growth of the renewable energy sector in South Africa, the bidding process is opaque, expensive, and is subject to extensive delays and ad hoc incremental increases, which creates uncertainty in the renewable energy sector and effectively puts a cap on renewable energy investments. The South African government urgently needs to remove the barriers to renewable energy, create an enabling (and stable) regulatory framework for rooftop solar, and remove artificial caps on investments in renewable energy.

Small-Scale Embedded Generation (SSEG)

SSEG, specifically rooftop solar, provides a real opportunity for individual households and companies to generate their own electricity through renewable energy. Regulatory rules for small-scale embedded generation which will regulate prices and tariffs associated with rooftop solar PV, and determine the process for registration and licensing rooftop solar PV installations in South Africa, have been severely delayed. Clear guidelines are required from the National Energy Regulator of South Africa (NERSA), on how to engage with private renewable energy generators wanting to put power into their municipal grids and how to cost the 'rental' of the grid by the seller and buyer, so that the full cost is taken into account.²³

The process to put these regulations in place was started by NERSA on the 25th of February 2015 but to date no regulations have been released. After an initial draft that was put out for public comment followed by public hearings hosted in Gauteng, the regulator has gone quiet. What was an open, transparent process with clear timeframes has been taken over by the Department of Energy and has become an opaque, delayed process that is happening behind closed doors. Getting the correct supporting regulations and policies in place to help grow and incentivise solar PV investments is critically important to ensure that the renewable energy market grows in South Africa.

Investing in renewable energy is just the first step forward. For renewable energy to truly take off in South Africa, it is important that companies take the next step, and actively lobby both local and national government to ensure that it is legal to produce their own power from solar PV, feed extra electricity into the grid and get paid for it as a long-term energy solution, which would make a significant contribution to opening up the market for individual households as well.

The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP)

In April 2015 with the closing of the fourth bid window in the REIPPPP process the total number of participating Independent Power Producers (IPPs) stood at 92, and brought the combined generation capacity that had been procured since the announcement of the first preferred bidders in late 2011 to 6,327MW.²

Of the renewable energy capacity procured 3,922MW (from bid windows 1, 2 and 3) are at various stages of construction or have commenced with commercial operation. By the end of June 2015, 37 IPPs had already started commercial operation, adding 1,860MW capacity to the power system (i.e. 4% of the total installed capacity in the country) within 2.5 years.² Construction lead times for completed projects have averaged between 15 months and two years, delivering operational capacity to the system within relatively short timeframes (particularly when compared to the long timelines for new coal or nuclear investments). The majority of REIPPPP projects have been delivered on time (or within a reasonable window) and within budget.

THE RETAILER LANDSCAPE IN SOUTH AFRICA

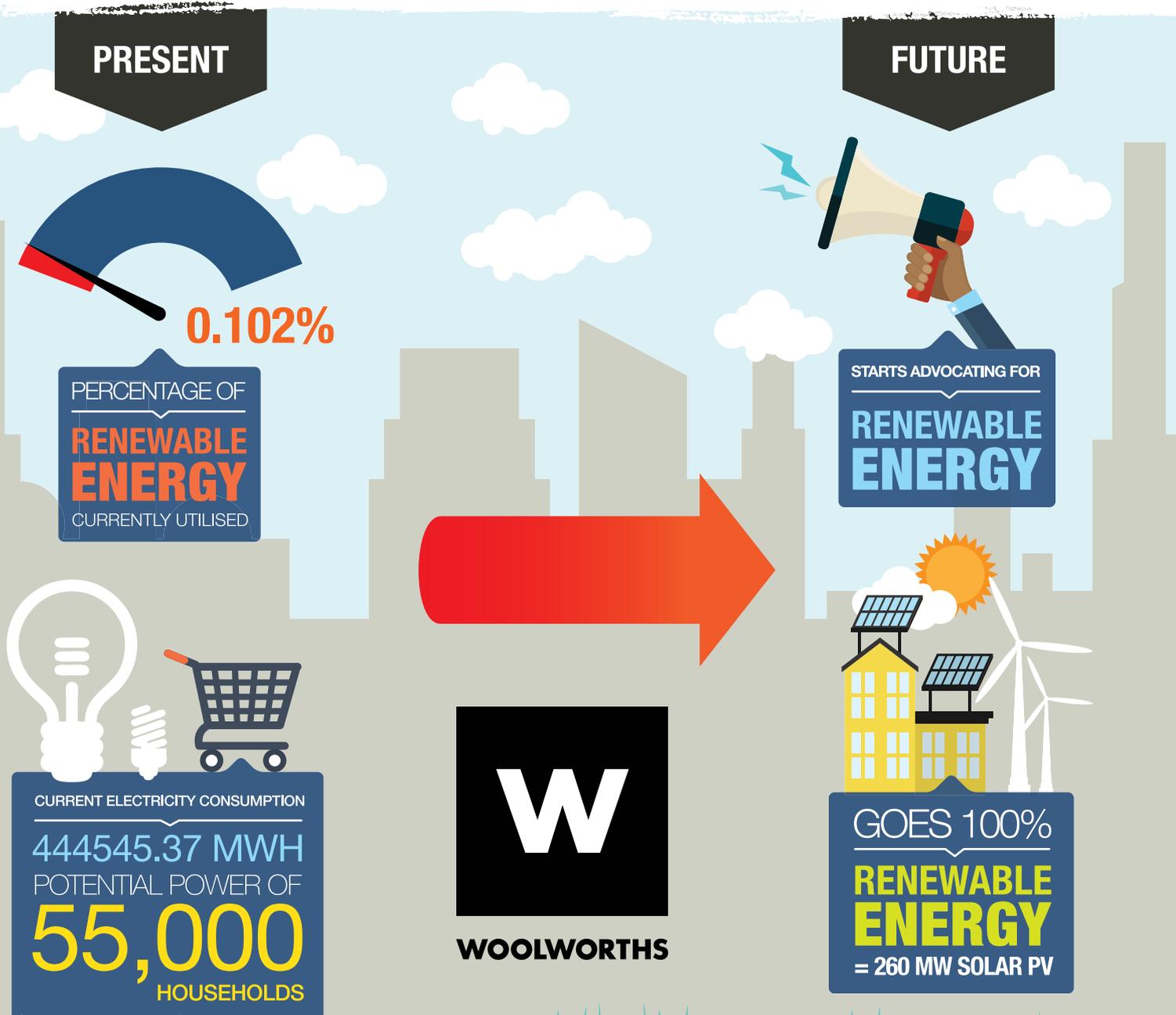
The South African economy is increasingly a consumer-driven economy, much like the United States where consumer spending accounts for two-thirds of the GDP. The retail sector has managed to overcome the worst of the recession thanks to the resilience of South African consumers and the improving spending power of the emerging middle class, albeit at a slow pace.¹²

Woolworths Holdings Limited

Woolworths Holdings Limited (WHL) is a South African-based retail group founded in 1931 and listed on the Johannesburg Stock Exchange since 1997. The

WHL Group consists of three operating subsidiaries, Woolworths Proprietary Limited (Woolworths), Country Road Limited (Country Road Group) and David Jones Limited (David Jones) which was acquired with effect from 1 August 2014.²⁴ Woolworths Financial Services Proprietary Limited (Woolworths Financial Services) is a joint venture with Barclays Africa Group, which has the controlling interest in Woolworths Financial Services. It owns over 400 retail outlets and caters to the high-income segment.²⁵ It is one of the top 40 JSE-listed companies and had a market capitalisation of R100.5 billion at 28 June 2015. Approximately 40% of revenue is derived from Australasian operations.²⁴

Figure 2: Woolworth's Pathway to Emerging as a Renewable Energy Champion

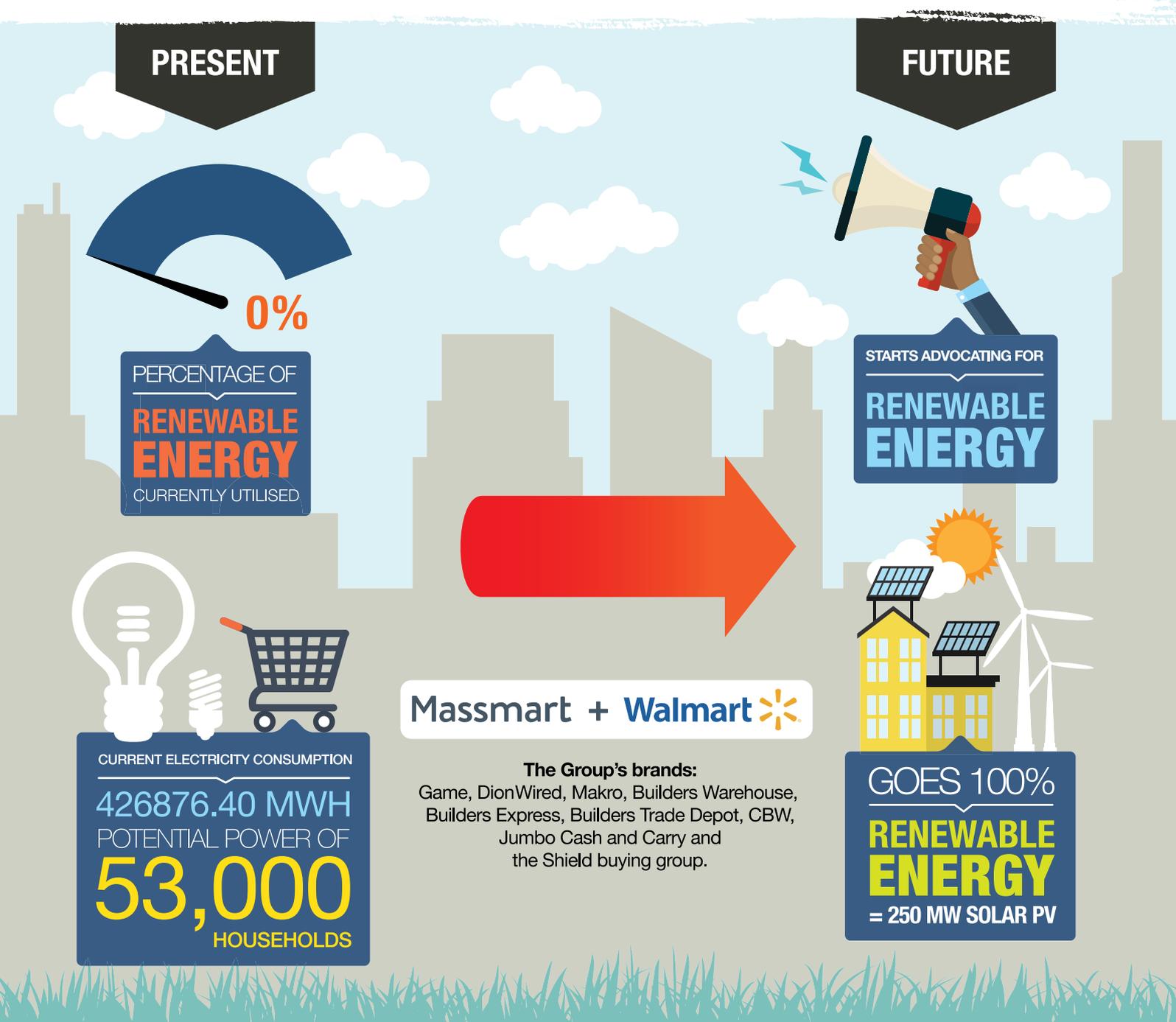


Massmart Holdings Limited

Massmart Holdings Ltd. is the third largest distributor of consumer goods in Africa and also one of the leading retailers of general merchandise and other goods. Massmart is a retailer and wholesale distributor, with 359 stores in South Africa and 33 stores in sub-Saharan Africa. Group brands include Game, Game Foodco, DionWired, Makro, Fruitspot, Builders Warehouse, Builders Express, Builders Trade Depot, Builders Superstore, CBW, Cambridge Food, Jumbo Cash and Carry, Valumart, Liquorland,

Trident, Rhino and Shield.²⁵ Massmart's merchandise includes food, liquor, general merchandise, home improvement goods and building supplies catering to a broad consumer base ranging from the lower-income to high-income groups.¹⁴ Notably, the USA retail giant Walmart's bid to acquire a controlling stake of 51% (\$2.3 billion deal) in Massmart was recently approved by South Africa's Competition Tribunal.²⁶

Figure 3: Massmart's Pathway to Emerging as a Renewable Energy Champion

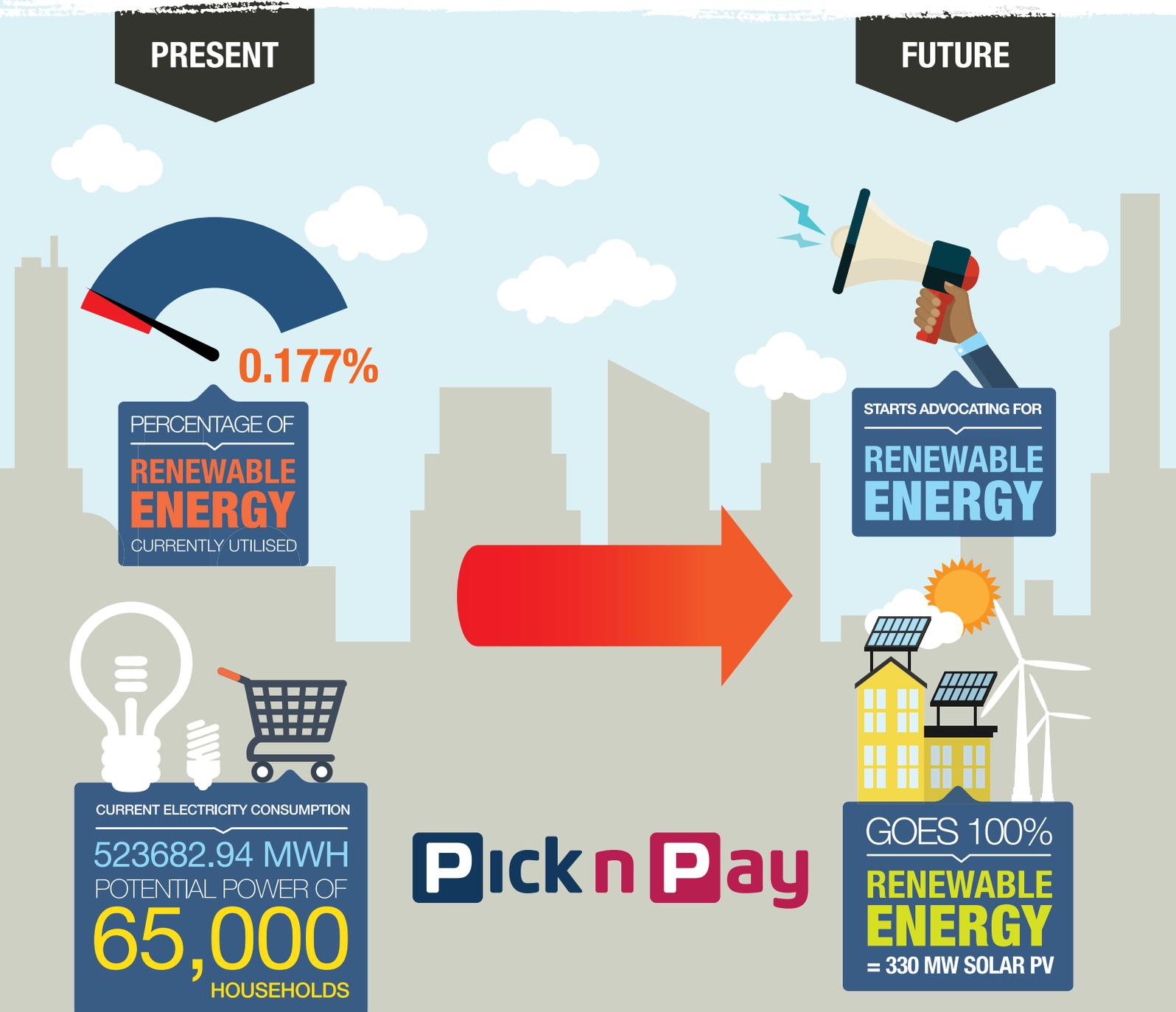


Pick n Pay Stores Limited

Pick n Pay Stores Limited is the second largest retail chain in South Africa and was listed on the JSE in 1968.²⁷ Founded in 1967, this family-controlled retail business operates in South Africa, Southern Africa and Australia via its Franklins stores. Its retail formats include larger supermarkets, hypermarkets and family

franchise stores, with hypermarkets being the largest. This retailer caters to the middle-income class of consumers.¹² Pick n Pay has 1,076 stores, having opened 111 stores in the 2014 financial year.²⁷

Figure 4: Pick n Pay's Pathway to Emerging as a Renewable Energy Champion

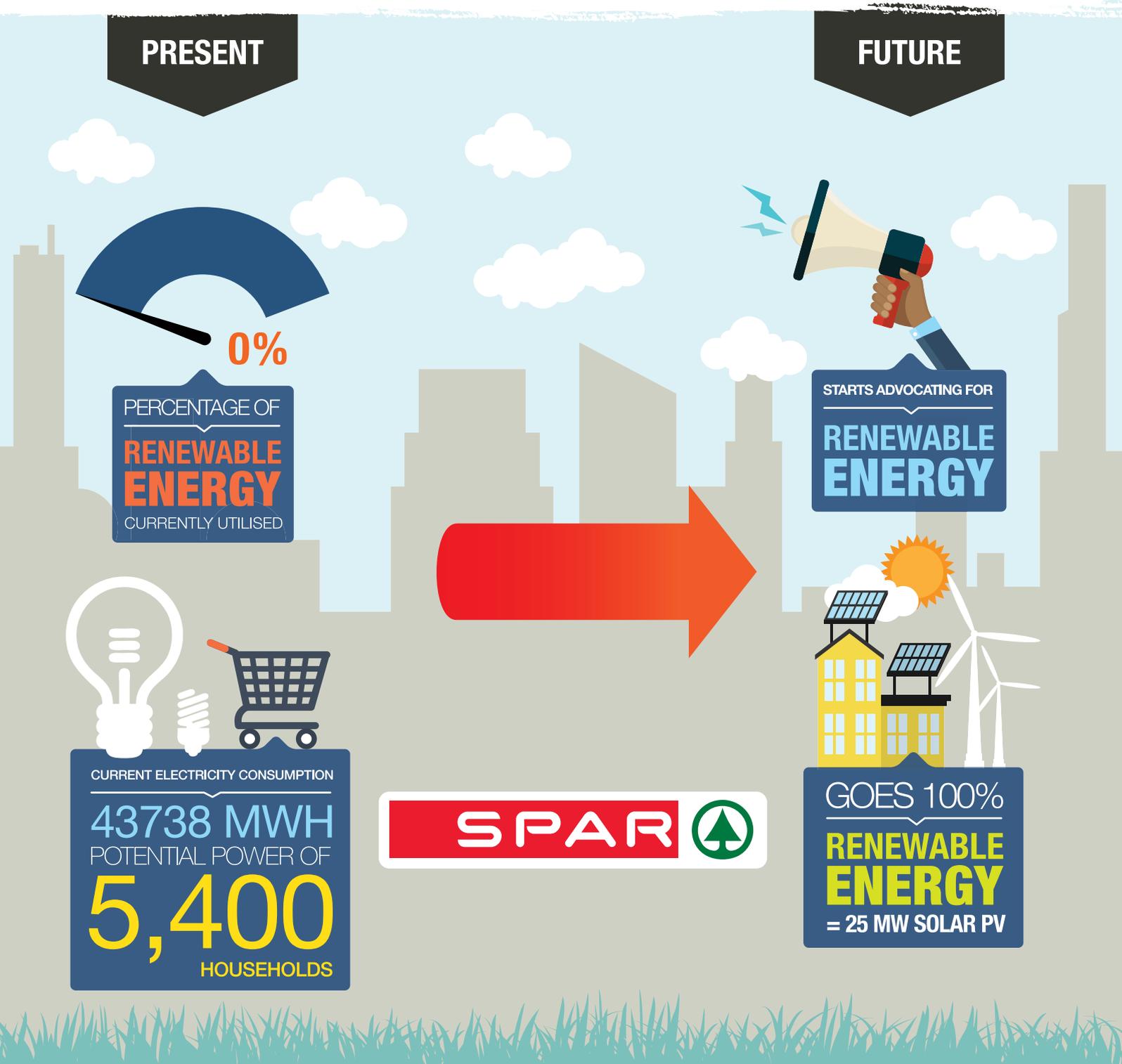


Spar Group Limited

The Spar Group Limited was formed in 1963 and listed on the JSE in 2004, and today operates seven distribution centres.²⁸ The distribution centres supply and service 1,864 independently owned Spar, TOPS at Spar, Build it, Pharmacy at Spar and SaveMor stores in Southern Africa.²⁵ The group has a presence in South Africa, Mozambique, Zimbabwe, Swaziland,

Botswana, Lesotho, Namibia and Angola – and recently in the Republic of Ireland and South West England. Goods are distributed to the stores by a fleet of trucks and trailers, which are owned by the Spar Group. Spar has a “voluntary trading” model, which supports franchisees in taking full advantage of sourcing specific goods from local traders, as well as utilising Spar’s trading power.²⁸

Figure 5: Spar’s Pathway to Emerging as a Renewable Energy Champion

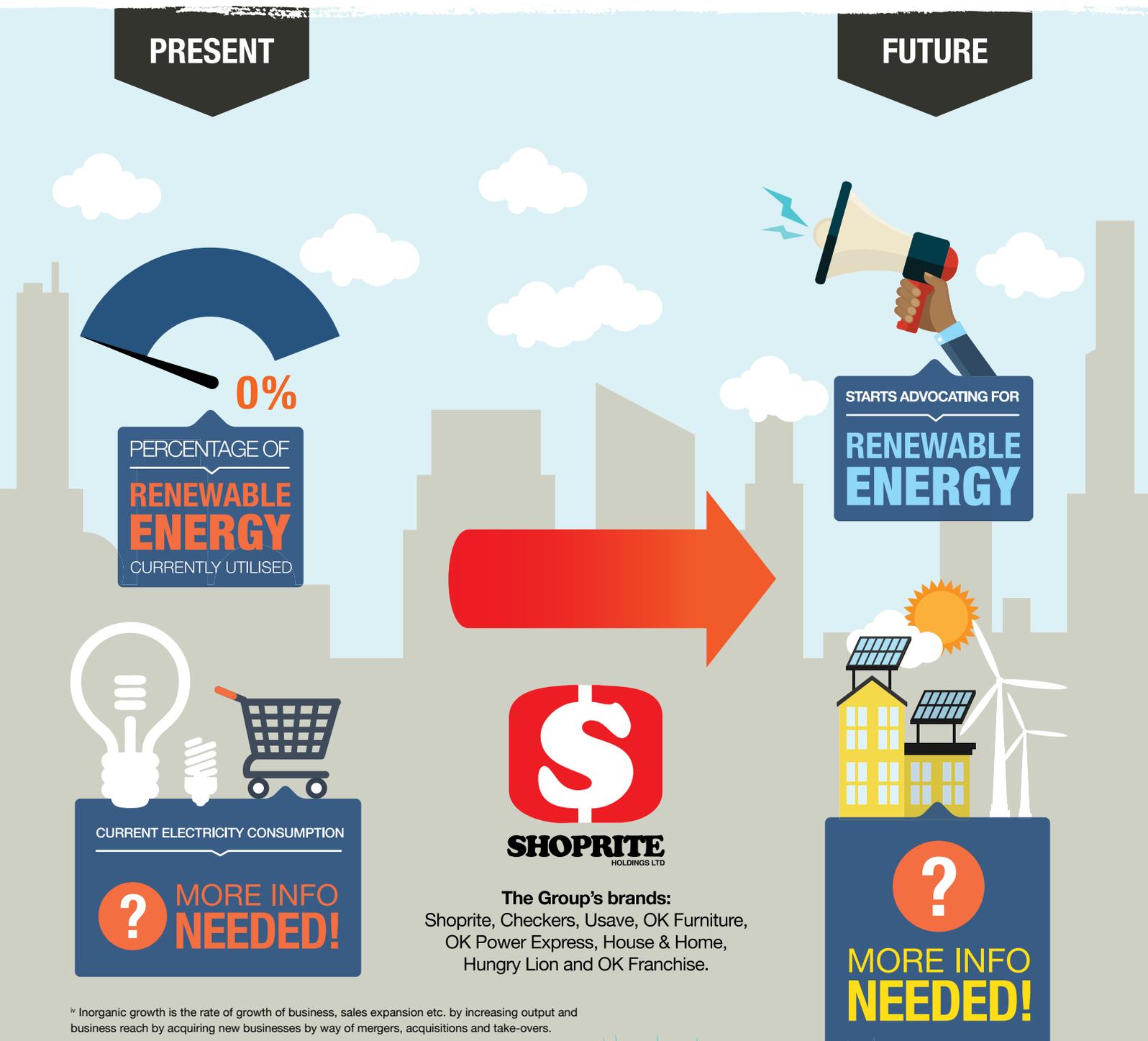


Shoprite Holdings Limited

Shoprite Holdings Limited, the largest food retailer in South Africa, was founded in 1979 with the acquisition of eight Cape Town-based supermarkets for R1 million.²⁵ Over the years, the company has followed an inorganic growth model^{iv} and other expansion strategies such as franchising. The retailer now operates over 1,800 stores in South Africa and

Southern Africa.²⁵ With a market share of around 34%, this retail giant caters to the middle- and lower-end consumer markets.²⁵ Shoprite Holdings portfolio includes Shoprite, Checkers, Usave, OK Furniture, OK Power Express, House & Home, Hungry Lion and OK Franchise.²⁵

Figure 6: Shoprite's Pathway to Emerging as a Renewable Energy Champion



^{iv} Inorganic growth is the rate of growth of business, sales expansion etc. by increasing output and business reach by acquiring new businesses by way of mergers, acquisitions and take-overs.



© Greenpeace / Nicolas Fojtu. Solar Installation in South Africa, 2010.



© Jeffreys Bay Windfarm, 2015.

RANKING GUIDE

In order to assess the progress that has been made in terms of aiming for a 100% renewable energy future, Greenpeace Africa has ranked these five retailers on four key metrics (energy transparency, commitment to renewable energy, greenhouse gas mitigation, and lobbying for renewable energy). Each retailer was then allocated an overall score out of ten. It is important to note that no one retailer is doing particularly well in terms of renewable energy commitments or plans at this stage.

In compiling the information in this report, Greenpeace Africa contacted all companies featured here and asked for information regarding their head offices, distribution centres and retail outlets. Specifically this information focused on their energy commitments, energy efficiency and mitigation efforts, and renewable energy deployment and advocacy. Where clear and consistent information was not provided by the company, Greenpeace Africa utilised various sources of information available to the public^v (please refer to Appendix 1 for more information). It is important to note that Pick n Pay and Shoprite have not taken the opportunity to engage with Greenpeace Africa to date.

The five retailers ranked represent the five largest retailers by market share in South Africa. Pick n Pay is one of the largest mass grocery retail companies in Africa with a 30% market share in South Africa.¹² The Shoprite group of companies is also one of Africa's largest food retailers, with a market share of 30% in mass grocery retail.¹² The Spar Group is the third largest mass grocery retailer by market share, with a share of approximately 26%.¹² Woolworths is the fourth largest mass grocery retailer, with 11% market share.¹² Massmart has 1% of the market share as a mass grocery retailer but further consists of nine wholesale and retail chains with a number of brands under the Massmart umbrella.¹²

Table 2 shows that none of the retailers are doing particularly well when it comes to the overall ranking. Woolworths is leading the way with an overall score of four out of ten, and is the only retailer that has taken the critical step of making a commitment to achieve a 100% renewable energy target by 2030^{vi}, but has not yet provided Greenpeace Africa with a detailed plan as to how they will achieve this target. Because this plan is not yet in place, it is also unclear if this is the most ambitious target that Woolworths can set or if 100% renewable energy could be achieved in a shorter timeframe.

Woolworths and Pick n Pay currently have solar PV installations that contribute a small percentage of renewable energy to their overall operations. In addition, both Woolworths and Massmart have identified pilot solar PV projects for distribution centres and stores respectively that will be rolled out in 2016 and will help to inform their energy planning and renewable energy ambition going forward.

None of the retailers are engaged in active lobbying for the barriers to renewable energy to be removed, which is an essential step if a 100% vision is to be achieved, and has heavily impacted on their scores. Woolworths and Massmart are leading the way in terms of energy transparency as they have comprehensively distilled their energy consumption and carbon emissions information and made it available to the public through their websites. Shoprite received the worst score possible due to the fact that they have a complete lack of transparency with regards to company energy information and have not engaged with Greenpeace Africa to provide information.

Retailers and a Commitment to 100% Renewable Energy

South Africans interact with retail stores on a weekly if not daily basis, and the choices that these stores make often have major implications for our pockets. In a country dominated by skyrocketing electricity prices and an inadequate and unstable electricity supply, companies who invest in substantial solar PV installations can reduce electricity consumption from Eskom, which reduces pressure on the grid, while also reducing their long-term electricity costs and contributing to growing the green economy in South Africa.

It is only in the last few years that we have seen a substantial growth in renewable energy investments in South Africa, but most of the current projects are large-scale and privately owned. There are significant benefits to producing electricity close to where it will be used, because this reduces losses that happen during electricity distribution. An ambitious commitment to becoming powered 100% by renewable energy would mean that South Africa's top five retailers could play a leading role in championing smaller scale renewable energy investments across their nation-wide network, which would also help make it easier for ordinary South Africans to invest in solar panels in the long run.

^v The relevant sections of this report were made available to all five retailers prior to release.

^{vi} This target is information that Woolworths has shared directly with Greenpeace Africa. This target had not yet been officially announced at the time of printing this report, and will be included as part of Woolworth's revised targets for their Good Business Journey.

Table 2: Renewable Energy Ranking for South African Retailers

	 Overall Score out of 10 ^{vii}	 Energy Transparency	 Commitment to Renewable Energy	 Greenhouse Gas Mitigation	 Lobbying for Renewable Energy
	4	C	C	D	F
	3.5	C	D	D	F
	3	D	D	D	F
	1.5	D	F	E	F
	0	F	F	F	F

To achieve a score of ten out of ten retailers would need to submit comprehensive information to the Carbon Disclosure Project (CDP) with regards to energy consumption and the source of energy consumed at various facilities, as well as a breakdown of the amount of electricity consumed at each significant facility. A strategy, with short-term and long-term goals, would need to be submitted detailing how they plan to achieve 100% renewable energy as part of a broader energy plan. Retailers would furthermore need to show their commitment to renewable energy by setting an ambitious target for achieving a 100% renewable energy vision. An aggressive approach to energy efficiency and the associated reduction in greenhouse gas emissions is required from retailers with ambitious targets.

South Africa has developed as an energy intensive country and this means that there are many easy wins in terms of

energy efficiency; retailers must therefore go beyond these easy wins to obtain a score of ten out of ten. In order to achieve a 100% vision for renewable energy, retailers must become advocates for renewable energy and actively lobby government to remove the current barriers to renewable energy in South Africa.

Woolworths Holdings Limited

Current Renewable Energy Investments

Woolworth's total energy usage for all their corporate stores, international (Mauritius), head office buildings and distribution centres is 444,545,370 kWh.²⁴ During 2014 Woolworths upgraded the solar panel installation at their head office, and during 2015 the installation provided

^{vii} Each letter represents a score out of 10 in descending order with A being the highest achievable score of 10 and F being the lowest score of 0.

^{viii} Group brands include Game, Game Foodco, DionWired, Makro, Fruitspot, Builders Warehouse, Builders Express, Builders Trade Depot, Builders Superstore, CBW, Cambridge Food, Jumbo Cash and Carry, Valumart, Liquorland, Trident, Rhino and Shield.

254,369 kWh of electricity which equates to roughly 10% of total electricity consumption in the head office.²⁹ During 2014 Woolworths Financial Services purchased 200,000 kWh of City of Cape Town Green Electricity Certificates from Darling Wind Power (refer to the section on Renewable Energy Credits on page 32 for an explanation of Green Electricity Certificates).

Energy Efficiency

Woolworths has reduced their relative electricity usage by 40% across stores and by 31% in corporate buildings, against targets of 40% and 35% respectively.²⁴ This has been calculated using 2004 as the base year. Woolworths has introduced sustainable building design and energy efficiency into their new building developments decisions, and where necessary, a longer payback period is recognised in order to accommodate efficiency and other sustainability considerations.²⁴ As per their 2015 CDP submission Woolworth's states that Climate Change and energy issues have influenced the choice of location for new stores as well as selection of suppliers as part of an effort to reduce emissions, it is not however clear how and in what ways this is taking place.²⁴

Planned future Renewable Energy Investments

A pilot project is currently being planned for one of Woolworth's distribution centres in Midrand. The planned installation will be 2MW of solar PV providing between 26-34% of the centre's energy needs per annum.²⁴ The first phase of this installation will be completed by June 2016.

Current Targets

Woolworths has met its strategic sustainability commitments that were set for the period of 2007 – 2015.²⁹ The commitments for the next phase of the Good Business Journey indicate that Woolworths will halve their energy impact by 2020 and source all their energy from renewables by 2030. Woolworths now needs to set in place the short-term and long-term targets and strategy that will form part of their electricity plan to achieve this 100% commitment.

Renewable Energy Advocacy

According to the 2015 CDP submission made by Woolworths, it is "committed to engaging with National governments, inter-governmental organisations and civil society organisations to develop policies and measures that will provide an enabling framework for the business sector to contribute effectively to building a low-carbon economy".²⁴ However, no specific information was provided as to how Woolworths has achieved this to date.

Energy Transparency

Woolworths voluntarily provides information to the CDP Climate Change programme which is listed on the CDP website and publicly available. This information is also verified by a third party audit firm. The 2015 Good Business Journey report furthermore provides a good summary of carbon emissions between 2012-2014, energy efficiency measures and targets and proposed initiatives; this report is available in the public domain. Woolworth's position statement on climate change is also available through their website.³⁰



© Woolworths Holding Limited. Woolworths Solar Installation, 2015.

Massmart Holdings Limited

Current Renewable Energy Investments

To date Massmart has not made any investments in renewable energy and is currently exploring pilot project options, these pilot projects are anticipated to come online in the second quarter of 2016.

Energy Efficiency

Under the Massmart group various Business as Usual (BAU) targets have been set with 2010 as the base year.²⁶ Builders Warehouse has committed to being 12% more energy efficient by 2020, while Game and Makro have set energy efficiency targets of 9% and 13% respectively.²⁶ Overall, Massmart's goal is to be 10% more energy efficient by 2020.²⁶ To date Massmart has reached an overall energy efficiency of 18.76%, which means that they are overshooting their goal of 10% which indicates that the group needs to set more ambitious targets going forward.

Planned Future Renewable Energy Investments

Massmart has identified three potential solar PV pilot projects; which include a 150kva PV plant proposed for Builders Warehouse, a 700kva plant for installation at Makro Woodmead store and a 520kva plant for Makro Carnival Mall store currently under construction. These projects are expected to come into operation during the second quarter of 2016.

Current Targets

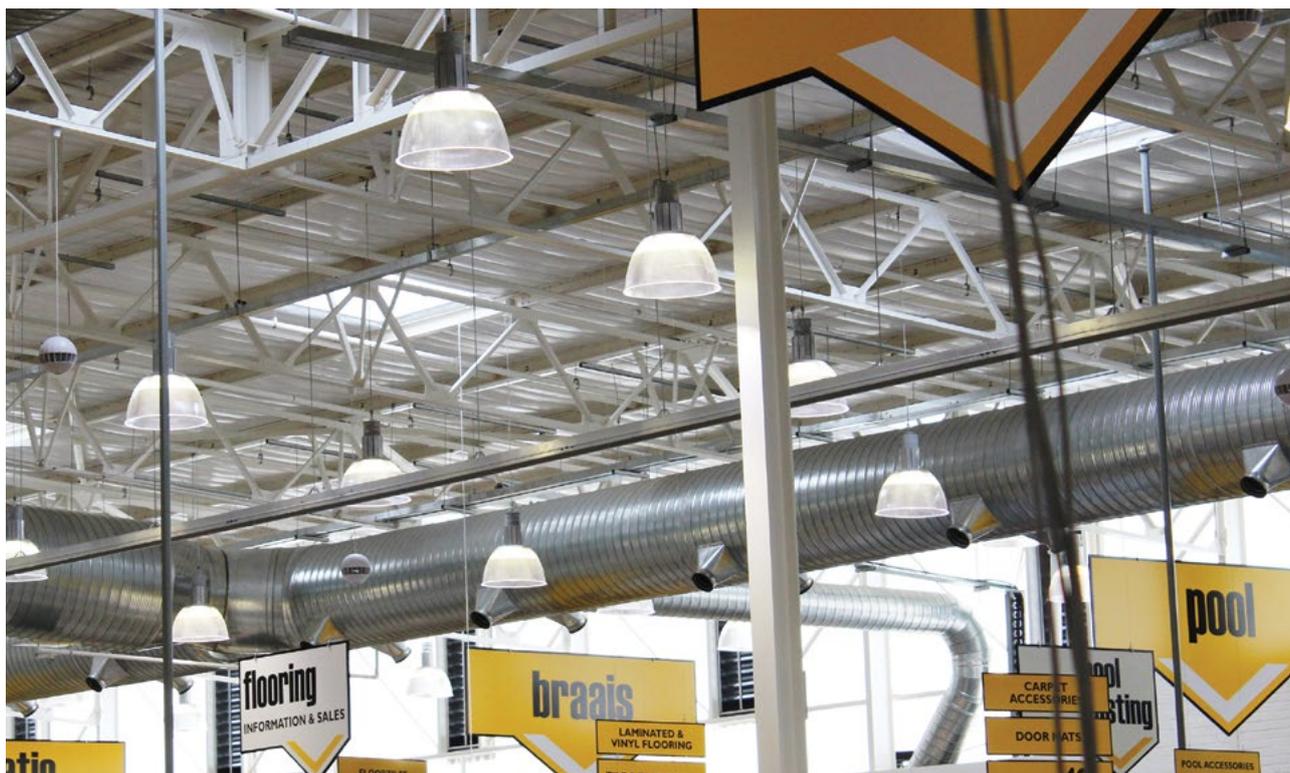
The targets that are currently in place for Massmart as discussed in the section above are set for the year 2020. Massmart has however overshoot these targets thus suggesting that the group needs to re-evaluate and set more ambitious targets for the future. As discussed above, Massmart has three planned solar PV installations that will be operational in the second quarter of 2016, these pilot projects must be utilised to develop ambitious targets for renewable energy throughout the Massmart group.

Renewable Energy Advocacy

Massmart does not currently advocate directly on energy issues with the South African government, but supports energy efficiency initiatives and engages with the National Business Initiative (NBI) on climate change and energy policy.²⁶

Energy Transparency

Massmart submitted information voluntarily to the CDP Climate Change programme in 2015. This information has been verified by an independent auditing firm and is publicly available through the CDP website. This information was included in the Annual Accountability Report for 2014,³¹ updated information on carbon emissions and energy consumption is further provided through the Massmart website.³²



© Massmart Holdings Limited. Energy Efficiency Measures, 2015.

Pick n Pay Stores Limited

Current Renewable Energy Investments

Pick n Pay's 2013 Sustainability report³³ indicated that it was undertaking a pilot project at one of their distribution centres in the Western Cape. The Phillippe Distribution centre was retrofitted with solar PV cells that are used for battery charging and external lighting and signage, the installation is 300kWp. There has been no further mention of the roll out of renewable energy investments in the 2015 report.³⁴ The State of Renewable Energy in Southern African Cities report²³ lists, in addition to the Phillippe installation, a 150kWp solar installation at the Longsmeadow distribution centre in Johannesburg and a 100kWp solar installation at the Hurlingham store in Johannesburg. These installations are however not referenced in the CDP submission and could not be verified directly with Pick n Pay.

Energy Efficiency

Electricity use per square meter has been reduced by 32% since 2008 through the introduction of energy efficiency measures.²⁷ During the past financial year Pick n Pay completed a voltage optimisation retrofit at one store to test viability further. As per the 2015 CDP climate change submission²⁸ Pick n Pay is in the process of retrofitting refrigeration plants with a number of technologies that help reduce refrigeration energy consumption by about 30%. During the past financial year Pick n Pay completed this retrofit at one store.

Planned Future Renewable Energy Investments

This is currently unclear from the information that is publicly available.

Current Targets

Pick n Pay has set a number of targets that they plan to achieve by 2020. These include: reducing carbon emissions intensity by 15%, measured against a 2013 baseline,²⁷ reducing absolute emissions by 5%, measured against a 2013 baseline,²⁷ and achieving overall energy efficiency improvements of 40%, measured against 2008 as a baseline.²⁷

Energy Advocacy

Pick n Pay does not advocate directly with government on energy issues. Their position on climate change is consistent with the NBI and they comment on draft legislation through the NBI.²⁷

Energy Transparency

Pick n Pay has voluntarily engaged with the CDP and submitted their 2015 report to the Climate Change programme. Pick n Pay's information has been verified by a third party auditor and is available to the public through the CDP website. Pick n Pay has synthesised this information into a concise summary in their 2014 Integrated Annual Report³⁵ including information on energy efficiency and carbon emissions as well as targets going forward.

Energy Efficiency and Retailers in South Africa

To achieve 100% renewable energy, an ambitious exploitation of energy efficiency is required. Intelligent use, as opposed to abstinence, is the basic philosophy for electricity usage in the future. Globally the most important energy saving options are improved heat insulation and building design, super-efficient electrical machines and drives, and replacement of old style electrical heating systems by renewable heat production (such as solar collectors).⁵ According to studies conducted as part of the Energy [R]evolution 2015, one of the industries that is globally consuming the largest proportion of energy and with high energy efficiency potential is the iron and steel industry, best practice indicates that this industry can become 20-30% more efficient.⁵

In the retail sector in South Africa there is currently a mixed bag of energy efficiency measures being carried out. Examples range from easy wins such as energy saving light fittings and bulbs, and more efficient air conditioners to more complex interventions such as installing the most efficient refrigeration technologies, replacing electric geysers with solar water heaters, and sustainable building design. The level of ambition has also varied with some retailers aiming for and achieving reductions of 30% and others aiming too low with targets of as little as 12-15%.

For most businesses in South Africa energy efficiency is an easy win due to the fact that historically we are a very energy intensive country.³⁷ This can largely be attributed to the very low cost of electricity in our past, however this is rapidly changing and thus driving the move to more efficient business practices. In order to achieve the 100% renewable energy vision as set out by Greenpeace it is essential that retailers go beyond the easy wins, set ambitious targets and implement new technologies to help achieve maximum efficiency.

In the future a standardised, ambitious target for energy efficiency needs to be agreed to and set by the various retailers. All retailers should participate in open-source sharing of energy efficiency design and equipment specification to enable further learning and improvement within the sector.

Spar Group Limited

Current Renewable Energy Investments

To date the Spar group has not been focusing on renewable energy investments. Spar is in a fairly unique position in the retailer space as the majority of their stores are franchised, which means that they are able to make suggestions to franchisees but they are under no obligation to follow recommendations from head office.

Energy Efficiency

Spar group has put a number of energy efficiency initiatives in place including technology changes that focused on replacing old lights with energy saving light fittings and bulbs, motion detectors and timers, and reducing the consumption of air conditioning units through the installation of new technology and timers.²⁸ A programme focusing on identifying and implementing the most efficient refrigeration technologies within Spar facilities was also implemented.²⁸ An additional programme focusing on replacing electric geysers with solar water heaters is currently underway.²⁸

Planned Future Renewable Energy Investments

In 2016 Spar plans to undertake a pilot project involving a renewable energy installation, however no information was available as to the size of this installation or timelines for implementation. The cost of electricity and unreliability of supply has been identified as a major risk to franchisees and a key factor leading to franchises failing.

Current Targets

Spar has a five year environmental plan in place from 2013 to 2017 that aims for a 20% reduction in energy usage by 2017, with 2013 as the base year.²⁸ As per the 2014 Integrated Report, Spar had achieved a 25% reduction as of September 2014³⁶ thus indicating that the five year plan shows a lack of ambition and more ambitious targets are required going forward.

Renewable Energy Advocacy

The Spar Group's CEO sits on the board of the Consumer Goods Council of South Africa (CGCSA). Through the CGCSA, Spar advocates for environmentally friendly systems in the retail sector that will help reduce emissions causing climate change.²⁸ Spar is a member of NBI and uses this platform to make comments on climate regulations.²⁸ Spar does not currently advocate directly on renewable energy policy.

Energy Transparency

Spar has voluntarily submitted information to the CDP climate programme for 2015, this information has not however been independently verified by an audit firm. This information is publicly available through the CDP website.

Certain elements of this information have been distilled into the 2014 Integrated Report however more work should be done to include data on carbon emissions, and the retailer needs to prioritise updating this information in the 2015 report that is currently not available to the public.

Shoprite Holdings Limited

Current Renewable Energy Investments

According to the Shoprite Holdings Ltd Integrated Report for 2015³⁸ the group is undertaking the installation of solar PV panels on 60 buildings through strategic partnerships. The report does not however provide any details as to the location, size and capacity of the installations.

Energy Efficiency

The 2015 Integrated Report further describes energy efficiency measures that have been put in place through retrofitting 750,000 lamps and 85,000 control systems across Shoprite stores with more energy efficient equivalent lamps and control systems.³⁸ The report does not supply information with regards to energy efficiency targets that have been set, targets that have been achieved to date or how effective the retrofitting has been.

Planned Future Renewable Energy Investments

No information is currently publicly available.

Current Targets

The 2013 Sustainability Report indicated that the group had not at the time completed a full carbon footprint assessment and consequently had not set any specific reduction targets.³⁹ The report did however state that they planned to graduate to full disclosure and the setting of reduction benchmarks in the future.³⁹ The 2015 Integrated Report still does not make it clear what targets Shoprite has put in place. Shoprite did submit climate change information to the Carbon Disclosure Project in 2015, for some reason Shoprite has however elected to not make this information available to the public.

Energy Advocacy

No information is currently publicly available.

Energy Transparency

As per the above section on current targets Shoprite has submitted information to the CDP in 2015 but has elected to not make this information available to the public. Limited information is available in the Integrated Report for 2015 but no information is provided on carbon emissions and reduction targets.

RANKING GUIDE - THE KEY CRITERIA

Energy Transparency

South African consumers need clear, reliable information to be able to evaluate the energy choices and carbon footprint of the retailers they utilise. It is important to note that there has been significant improvement in transparency and reporting over recent years with many retailers voluntarily taking part in the CDP.

To evaluate a company's progress towards becoming 100% renewable energy powered, two levels of detail are essential: (a) baseline data on annual energy consumption,

energy mix and greenhouse gas emissions, including location-specific information for all significant facilities, and (b) details on the nature of any on-site generation or market purchases of electricity made directly or on the company's behalf. Whilst all of the retailers discussed above have submitted information to the CDP, much more work needs to be done around the provision of location-specific information.

Carbon Disclosure Project (CDP)

The CDP⁴⁰ Climate Change Programme requires companies to disclose information related to climate change on an annual basis. The premise of the CDP is that evidence and insight is vital to driving real change. The CDP uses the power of measurement and information disclosure to improve the management of environmental risk. Of relevance to this ranking guide are the following commitments required under the Climate Change Programme:

- 1 Commit to adopt a science-based emissions reduction target.** Companies making this commitment will be working toward this goal by agreeing to set an emissions reduction target that is aligned with climate science to limit the increase in global average temperature to below 2°C.
- 2 Commit to procure 100% of electricity from renewable sources.** Businesses can drive the creation of a thriving market for renewable power, a game-changer in reducing emissions, by committing to procure 100% of their electricity from renewable sources within the shortest practical timescale.
- 3 Commit to report climate change information in mainstream reports as a fiduciary duty.** Companies can lead the way on closing this information gap by including climate change information in their corporate reports.
- 4 Commit to responsible corporate engagement in climate policy.** Consistent, positive business engagement with policymakers on climate issues will be a crucial factor in achieving a global agreement in response to climate change.
- 5 Commit to put a price on carbon.** As the international community moves toward implementing the global Paris agreement, there is increasingly recognition that putting a price on carbon is an essential part of any strategy to combat climate change.

Renewable Energy Commitment

Internationally many companies have made the commitment to be powered by 100% renewable energy. These long-term commitments send a powerful signal to the market that greater access to renewable energy and the desire to grow sustainably is of growing importance to the business sector. Given the significant growth in energy demand globally, these commitments send clear messages to electricity utilities that if they want to do business with renewable energy-committed companies, they must be able to offer a renewable energy product and must therefore adapt their energy mix to reflect these demands.

To ensure they have maximum impact, long-term commitments by companies must include: (a) adequate

energy transparency; (b) interim targets and (c) a clear renewable energy strategy to ensure companies are maximising their impact.

In the South African retailer space there are currently minimal and inadequate commitments to renewable energy. Much of the focus to date has been on energy efficiency, which is the lowest hanging fruit particularly in light of the current electricity price increases, with certain retailers only now beginning to undertake pilot renewable energy projects. Retailers need to increase their ambition in terms of long term commitments to becoming 100% renewably powered in combination with interim targets.

Companies Embracing the 100% Renewable Energy Vision

IKEA®

“IKEA Goes Renewable”⁴¹ means the company will produce more renewable energy than they consume throughout IKEA buildings and operations. IKEA is installing solar panels on 120 of their stores and warehouses. In addition, they have wind farms in six countries. The solar panels and the wind farms currently in operation or construction generate the equivalent to 27% of the electricity needed to run their operations. IKEA also wants to use less energy and compared to 2005, the energy efficiency of stores has improved by 10%, and distribution centres by 33%.

Walmart

Walmart aspires to be supplied by 100% renewable energy and as such has put the following commitments in place for 2020:⁴² scaling up renewable energy investments through the procurement of 7 billion kilowatt hours (kWh) of renewable energy globally by December 31, 2020; and accelerating efficiency by 2020, by reducing the energy per square foot intensity required to power their buildings around the world by 20% against their 2010 baseline.

It is important to note that Walmart has been criticised for falling short of meeting their renewable energy targets. Having a target is a good first step but meeting these targets is essential to avoid greenwashing.



© Greenpeace / Justin Sholk. SAIREC Renewable Energy Banners Action in Cape Town, 2015.

Greenhouse Gas Mitigation

As outlined in the box on page 24 titled “Energy Efficiency and Retailers in South Africa” up until now, energy efficiency has been an easy win for retailers. What is required going forward is standardised and more ambitious targets for energy efficiency which, coupled with renewable energy investments, will lead to a reduction in Greenhouse Gas (GHG) emissions. It is also essential that retailers disclose and set targets for operational GHG emissions.

Companies must present certified disclosure of GHG emissions in the public domain through the Carbon Disclosure Project. Disclosure must include emissions from their own operations (scope 1 and 2) and business travel (scope 3). Companies also must commit to reducing their own emissions by 30% by 2020.

Strategy for Increasing Renewable Electricity Supply

Transitioning our retail space to achieve a 100% renewable energy commitment will certainly not happen overnight. Though it is possible in some markets for a company to write a cheque for enough paper renewable energy credits to allow it to claim to be a 100% renewable company, such claims are in name only, and unlikely to have any impact on the supply of electricity powering its facilities.

Those companies interested in actually transforming their electricity supply and supporting more green electricity on the grid for everyone must avoid shortcuts. To help companies make the right choices in terms of renewable

electricity supply, the following three key principles in evaluating options for securing a renewable supply of electricity should be followed:

Additionality

Retailers should ensure that their renewable electricity commitment is directed in a way that it will have a real impact, supporting the addition of new renewable electricity onto the grid that displaces dirty electricity demand.

Sustainable Sources

Retailers need to ensure that the source of renewable electricity is truly renewable, and provide details about what it considers renewable to customers and stakeholders (refer to the box titled ‘Know Your Energy Choices’ on page 29).

Local

Related to the additionality principle, companies should work to have their renewable electricity supply come from as local a source as feasible, to drive greater investment in renewable energy by the utility (in South Africa this would be Eskom) in the same area of the grid in which a company’s facilities have added demand in order to displace demand from local fossil fuel generation sources. For example a distribution centre located in the Western Cape should procure electricity directly from a locally sourced wind farm to offset the need for electricity produced from the Koeberg Nuclear power station.



© Greenpeace / Shayne Robinson. Raising a Wind Turbine in Durban, 2011.

KNOW YOUR ELECTRICITY CHOICES

Nuclear



Nuclear power plants create unacceptable risks to the environment and human health and are an expensive diversion from the deployment of renewable energy and energy efficiency, which are required to stave off the worst impacts of global warming. The South African government's current proposed new nuclear build programme is misguided as it will provide electricity too late to resolve the current energy and climate crisis and at far too high a cost.

Solar Photovoltaics (PV)



Solar PV technology involves the generation of electricity from sunlight. Photovoltaic systems contain cells that convert sunlight into electricity. Inside each cell there are layers of a semi-conducting material, and light falling on the cell creates an electric field across the layers, causing electricity to flow.⁵ The intensity of the light determines the amount of electrical power each cell generates. A photovoltaic system does not need bright sunlight in order to operate. It can also generate some electricity on cloudy and rainy days from diffuse sunlight.⁵ A total of 2,292MW solar PV capacity has been procured in the five South African REIPPPP bid windows, contributing more than a third of the total procured renewable energy capacity.² Solar PV projects were delivering 960MW into the grid by June 2015.²

Wind Power



Wind energy has grown faster than all other electricity sources in the last 20 years, and turbine technology has advanced sufficiently that a single machine can have a capacity of 7 megawatt.⁵ Wind power was anticipated by both the IRP2010 and independent researchers as the technology most likely to contribute significantly to the South African energy mix because of technology maturity and established global capacity.² Across the five REIPPPP bid windows, 3,357MW was procured, presenting a third of the capacity planned by the IRP 2010 and 53% of the procured portfolio.²

Hydropower and Pumped Storage



In South Africa, we have a mix of small hydroelectricity stations and pumped water storage schemes.⁴ Large-scale hydropower projects can have significant environmental impacts as large pieces of land are flooded, disrupting ecosystems, displacing communities and interrupting farming practices.⁵ Well-planned and managed small-scale or micro hydro power projects have much less impact on river ecosystems, and have the potential to provide a scalable baseload power source.⁵

Geothermal



Geothermal energy is a consistent and renewable source of power in areas of the world where it can be found. It provides significant and growing electric generation in countries like the US, Iceland, and Indonesia.⁵ In 2014, 620MW of new geothermal power were added globally, with developing countries like Kenya and the Philippines leading the way.⁵ Currently the cost of geothermal energy in South Africa is prohibitively expensive and would need to be strongly incentivised to become feasible.⁵

Concentrated Solar Power (CSP)



Concentrated Solar Power technologies produce electricity by concentrating direct-beam solar irradiance to heat a liquid, solid or gas that is then used in a downstream process for electricity generation.⁴³ CSP simply provides an alternative heat source. CSP uses direct sunlight, called beam radiation or direct normal irradiation (dni), which is sunlight not dispersed by clouds, fumes or dust in the atmosphere.⁴³ This sunlight reaches the earth's surface in parallel beams for concentration. Suitable sites need to get a lot of this direct sun - at least 2,000 kilowatt-hours (kWh) per square metre annually and the best sites receive more than 2,800 kWh/m²/year.⁴³ In these regions, one square kilometre of land is enough to generate as much as 100-130 gigawatt hours (GWh) of solar electricity per year using solar thermal technology.⁴³

Biogas



Biogas can come from many sources; methane from landfill sites and anaerobic digestion of farm waste or sewage sludge are the most common.⁴ The environmental benefits of biogas vary widely depending on the source. Biogas technology is currently underdeveloped in South Africa even though it has the potential to make a significant contribution to the energy mix.⁴

Biomass



Large-scale biomass used for electricity generation can create significant environmental problems, as the source of biomass is likely to come from unsustainable sources. An example of a biomass project in South Africa is the recently announced 25MW project to be erected at Sappi Ngodwana Mill in Mpumalanga as part of the REIPPPP.² Biomass for this project will be supplied from local plantations, which brings into question the sustainability of this project.

POWERING RETAILERS WITH RENEWABLE ENERGY — HOW TO GET THERE

Market Solutions

Globally companies are increasingly recognising the financial, environmental and reputational benefits of powering their operations with renewable energy. There are a range of different options for how to procure electricity from renewable sources: some companies are buying wind energy via long-term contracts, while others are installing solar farms on or near their property. Some companies have subscribed to a utility green tariff programme, while others are lobbying regulators for more options. These and other options have different impacts, offer different benefits, and are not mutually exclusive. The right pathway depends on the details of a company's footprint, and must be closely aligned with the principles of additionality, attachment to local demand, and sustainability.

On-Site Investment

On-site or near-site deployments of renewable energy are the most straightforward to assess for their impact, since on-site renewable energy investments are inherently additional and local. However, given the energy requirements of various processes, on-site renewable installations such as solar may only be able to provide a relatively small percentage of the total facility electricity demand. In South Africa retailers are increasingly exploring on-site renewable energy options as a response to rising electricity prices and a shortage of electricity supply from Eskom. Security of supply and reducing electricity costs are key as Eskom continues to drag its feet in providing renewable energy options.



© Greenpeace / Nicolas Fojtu. Solar Installation in South Africa, 2010.

Power Purchase Agreements (PPAs)

Secure long-term (10-20 year) power purchase or utility contracts between companies and renewable energy developers have served as an important driver for the financing of new renewable energy projects globally. By providing a guaranteed buyer of both the underlying electricity and the Renewable Energy Credits^{ix} (“bundled” renewable electricity), the company serves as a committed and credit worthy purchaser of the energy. This commitment allows the renewable energy developer to secure financing, driving additional renewable development. For the company, long term PPAs can deliver a guaranteed price of electricity, providing protection against future increases in the price of traditional grid power.

There are certain challenges to this model in South Africa as Eskom currently controls PPAs with renewable energy developers and tries to prevent agreements directly between companies and renewable energy developers through punitive pricing. As per the case study below alternative approaches are entering the South African market that allow for willing-buyer, willing-seller scenarios. Increased demand for renewable energy from companies in South Africa is required to send a clear signal to the market that these alternatives need to be rolled out on a broader scale and made available in all parts of the country.

An Alternative Approach – Amatola Green Power Willing Seller, Willing Buyer Model

The current electricity industry in South Africa and the REIPPP Programme are structured around Eskom as the single buyer of electricity (as per the single buyer model prevailing in the country). However the development of a unique business model, trading in electricity facilitating a ‘willing-buyer, willing-seller’ model, has emerged in the last decade.

Amatola Green Power (Pty) Ltd is the only private sector electricity trading company which has been issued with a Trading Licence by NERSA to buy and sell renewable energy within the “Voluntary Market of Willing Buyer and Willing Seller”. Its license for trading in electricity was issued by NERSA in 2009 and renewed at the beginning of 2014 for a further 15 years.⁴⁴

Amatola has developed partnerships with municipal structures to enable the development of this unique business. The Nelson Mandela Bay Municipality has signed an agreement which will allow the municipality to unlock their Green Economy plan bringing investment to the value of R3,4 billion, creating 203MW of new solar and wind energy projects, and the addition of secured salaries and wages into the local economy creating much needed investment and jobs for the next 20 years.⁴⁵

An initial constraint to this model was the wheeling rate as charged by Eskom. Wheeling rates are the charges paid by customers to Eskom for the electricity to be transferred (or ‘wheeled’) across the country, which were initially too expensive for the business model to be economically viable. Under the new Nelson Mandela Bay Municipality programme wheeling rates have been negotiated with Eskom in 2012 and allow for the purchasing price of their green electricity to remain competitive.⁴⁴ Amatola further offers very negotiable tariffs, customers pay between ZAR 0.80 and ZAR 1.40 per kWh while generators are remunerated between ZAR 0.62 and ZAR 1.05 per kWh supplied.⁴⁴

Amatola has developed an accreditation system based on international standards that will allow companies to account for and report on verified greenhouse gas emissions reductions resulting from the electricity produced.⁴⁵ This alternative model is currently limited to one company at this stage, however it demonstrates the potential for a voluntary market, especially in partnership with local governments, to further develop renewable energy in South Africa.

^{ix} Renewable Energy Credits (RECs) represent the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source.

Renewable Energy Credits (RECs) Only Purchases

Renewable energy credits (RECs) are products created when renewable energy is generated, and used to confer the environmental attributes of the renewable energy to the REC owner. In other words once a company has paid for renewable energy from a producer and then owns the RECs they can claim the environmental benefits such as a reduction in Greenhouse Gas emissions. In many markets, companies can buy and sell these credits, unbundled from the electricity itself. Many of these credits originate from projects that have been in existence for many years, and the minimal additional revenue generated from their sale does little to drive additional renewable generation capacity, or displace demand for dirty sources of electricity.

An example of a project of this nature in South Africa is the Darling Wind Farm, from which the City of Cape Town sells Green Electricity Certificates (GECs). This effectively allows buyers to claim the benefits of the renewable energy. Due to the fact that this project has been in existence since 2008 it has little impact on the renewable energy market and GECs purchased from the City of Cape Town do not drive demand for new renewable energy investments.

If companies do buy unbundled REC or GECs as they are called by the City of Cape Town, they should at a minimum buy credits that demonstrate strong additionality, and are in close proximity to the facilities they wish to claim are renewable. Before doing so, they should also evaluate what opportunities there may be to make more direct investments in renewable energy or push utility and government policymakers to add more renewable energy

to the grid and increase the options for customers of all types to have the ability to choose a clean electricity supply.

Utility Green Energy Tariffs

Companies aiming to procure renewable energy might prefer to have electricity utilities simply offer them a 100% renewable energy product, avoiding some of the transactional costs of third-party deals, as well as the obstacle that such deals aren't legal in many countries. In certain parts of the world, utilities have begun to respond to this demand by offering what is commonly referred to as "green tariffs" or rate structures that sell 100% renewable energy to large customers.

Lobbying for Renewable Energy

In South Africa, any company's ability to invest in 100% renewable energy will remain severely limited without policy changes. Even in more liberalised markets it is to the benefit of companies to advocate for policies that will support renewable energy investments more broadly, thus narrowing the ground they will need to cover to become powered with 100% renewable energy.

Companies must become strong and active advocates with the regulators and policymakers who ultimately have the power to change markets in ways that will allow companies to achieve their renewable energy goals.



© Greenpeace / Michael Götz. Solar Energy Training in South Africa, 2010.

CONCLUSION

Renewable energy provides a real opportunity for South Africa to move away from a developmental path based on polluting coal and expensive nuclear power. This report clearly outlines how retail companies in South Africa have made a start in the transition to 100% renewable energy. However there is a great deal left to do, and significantly greater commitments and investments are required to achieve this ambition. Voluntary participation in the Carbon Disclosure Project, investments in energy efficiency, and plans for renewable energy pilot projects are nonetheless all good signs.

Ultimately companies like the five key retailers listed in this report have the power to kick start a thriving renewable energy market in South Africa by committing to obtain 100% of their electricity from renewable sources within the shortest practical timescales. At the same time these companies can benefit from reducing their electricity costs over the long-term and significantly increasing their sustainability levels. This will send a clear signal to the market demanding renewable energy options, thus accelerating the transition to a renewable energy future, which will have a knock-on effect to also help remove the barriers to household investments in rooftop solar.

It is also important that companies such as these five retailers become strong renewable energy advocates with both the regulators and policymakers, who ultimately have the power to change markets in ways that will allow companies to achieve their renewable energy goals, and South Africans to break their reliance on Eskom's dirty, unreliable and increasingly expensive electricity. A key starting point here would be to lobby for a fair, supportive and effective regulatory framework for rooftop PV in South Africa.

This ranking guide makes it clear that the five leading South African retailers have begun to take steps towards a renewable-powered future, but the current levels of ambition are undoubtedly inadequate, which means that there is significant room to improve. Retailers in South Africa urgently need to commit to a 100% renewable vision, clearly articulate how they will achieve this vision in the short and long term, and make the required investments.

Recommendations

- Retailers must commit to an ambitious 100% renewable electricity target.
- Retailers must clearly define how they will reach this electricity target by developing short and long-term targets as part of a broader energy plan.
- Retailers must ensure that their renewable electricity commitment is directed in a way that will have a real impact, supporting the addition of new renewable energy onto the grid.
- Retailers must ensure energy transparency by providing comprehensive and detailed information on electricity consumption and greenhouse gas emissions, including location-specific information for all significant facilities, and ensure that this information is publicly available in an accessible format.
- Retailers need to set a standardised and ambitious target for energy efficiency for their sector, and should participate in open-source sharing of energy efficiency design and equipment specification to enable further improvement in the sector.
- Retailers must become champions for renewable energy by actively lobbying government to remove the barriers that currently exist to renewable energy. It is essential that enabling and supportive policies are in place to achieve a 100% renewable electricity vision.

APPENDIX 1: METHODOLOGY

In compiling the information in this report, Greenpeace Africa contacted all five retailers featured here and requested information regarding their head offices, distribution centres and retail outlets. Specifically this information was focused on their energy commitments, energy efficiency and mitigation efforts, and renewable energy deployment and advocacy. Where clear and consistent information was not provided by the company, Greenpeace Africa utilised various sources of information available to the public, this information was then made available to companies for comment in advance of publication.

The source material discussed above is as follows:

- Submissions by companies directly to Greenpeace Africa.
- Public submissions by companies to reporting entities or stakeholder publications.
- As reported by the media.

Greenpeace Africa would welcome the opportunity to incorporate more detailed data to inform our analysis. As companies provide better data Greenpeace Africa will incorporate this into updated evaluations and encourage other companies to follow suit.

Energy Transparency Methodology

Companies are evaluated on the scope and level of detail made publicly available with regards to their energy consumption at their corporate offices, distribution centres and retail outlets. This information should facilitate stakeholders and customers to evaluate the energy-related environmental performance and impact at corporate, product, and retail level. Public information includes information from a company's website, annual reports, and submissions to the CDP.

Renewable Energy Commitment Methodology

Companies are assessed on the strength of their commitment to powering their business with renewable energy, including infrastructure siting criteria and investment decisions that enable the development of the company's footprint to maximize the use of clean sources of energy, and avoid an increase in demand for coal or nuclear power to meet the growing demand for electricity from their operations. High scoring companies demonstrate:

- Adoption of a 100% renewable energy commitment
- Renewable energy procurement guidelines that prioritize high impact methods of powering with renewable energy that demonstrate additionality, proximity to demand, and sustainability, as opposed to purchase of unbundled renewable energy credits or carbon offsets.

- A clean energy policy to prioritize infrastructure investments or procurements that rely primarily upon renewable energy as a source of electricity and discriminate against coal and nuclear power to meet infrastructure electricity demand.
- Consistent patterns of major infrastructure investment decisions that increase or shift electricity demand to renewable sources of electricity.
- Commitment to eliminate coal, nuclear and gas energy from powering company infrastructure.

Greenhouse Gas Mitigation Strategy Methodology

Companies are evaluated on the strength of their strategies and measurable progress to mitigate the demand for dirty energy generated by their infrastructure. The effectiveness and strength of a company's mitigation strategy is measured along the following guidelines:

- Companies with absolute emission reduction goals will be rated higher than those companies who adopt an intensity-based target.
- Companies must present certified disclosure of their own operations (scope 1 & 2) and business travel (scope 3).

Renewable Energy Deployment & Political Advocacy Methodology

Companies are evaluated on the strength of their measurable progress and commitment to renewable energy investments, as well as actions taken to advocate for ambitious policies at all levels of government that encourage wide-scale renewable energy generation and use. In reporting their renewable procurement, companies should follow the guidance.

High Scoring Companies also Demonstrate:

- Efforts to meet electricity demand with the direct installation of renewable energy, and reduce emissions through higher efficiency will receive the highest marks.
- Investments in clean energy supply and local energy efficiency mechanisms. Greenpeace Africa ranks those investments higher than the purchase of offsets and renewable energy credits to reach established environmental goals.
- Proof of long term commitment to renewable energy electricity through local renewable energy developers.

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Greenpeace has been working in Africa to end environmental destruction and fighting for the right of Africans to a healthy environment since the early 1990s. Our campaigns focus on climate change, halting the destruction of tropical forests, supporting ecological farming and preventing the degradation of marine ecosystems.

