

UP

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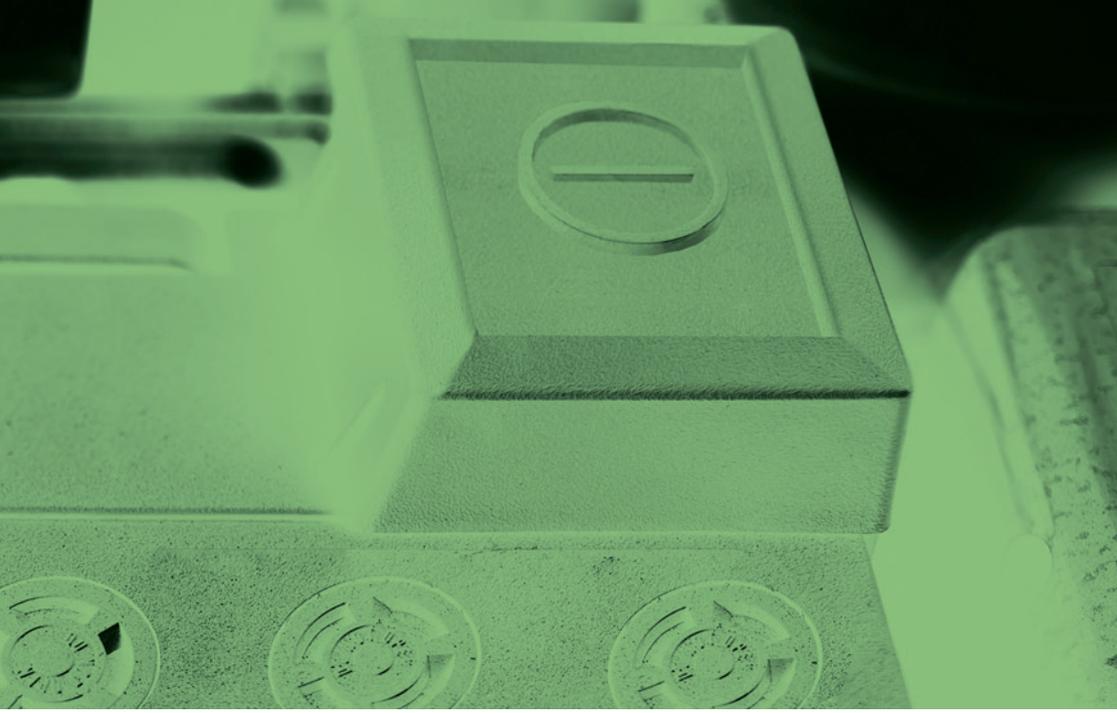
Kagiso Asset Management
Quarterly

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Metair - packing lead

Simon Anderssen - Portfolio Manager

Car-owners tend to think of their battery only when it fails to crank the engine, and most consider all batteries to be the same. Yet, beneath the homogenous shape and appearance of a car battery, subtle differences in construction and composition result in material implications for lifespan and performance.

Metair - packing lead

Metair is an investment company with two divisions.

Automotive Components comprises 10 standalone businesses that manufacture vehicle components for global auto original equipment manufacturers (OEMs) with operations in South Africa (Toyota, BMW, Mercedes-Benz and Ford). The **Energy Storage** division is made up of automotive battery businesses in South Africa, Romania and Turkey.

Although Metair can trace the history of its Automotive Components business to the dawn of vehicle manufacturing in South Africa, the Energy Storage business is today a larger contributor to revenue and profits (charts below). Examining the trends that impact on prospects for energy storage and unpacking the changes to South Africa's automotive policy supporting the components business, enables us to fully assess Metair's economic prospects in battery and component manufacturing.

The better battery?

The standard design for most automotive batteries is an assembly of lead plates immersed, or flooded, in an excess of electrolyte. Today, vehicle batteries are typically maintenance-free and do not require topping up with water as older batteries did.

'Start-stop' is a feature in modern vehicles that shuts down the engine when the vehicle is idling or not in motion - in pursuit of the manufacturers' requirement to reduce CO2 emissions.

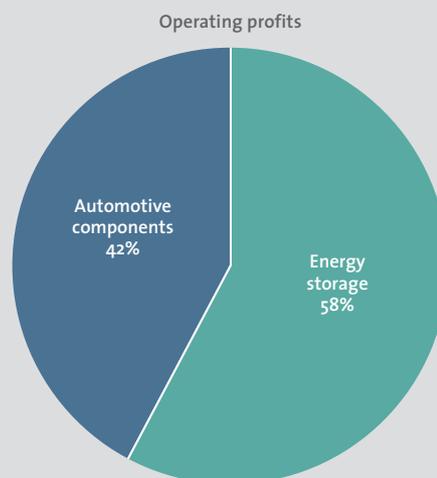
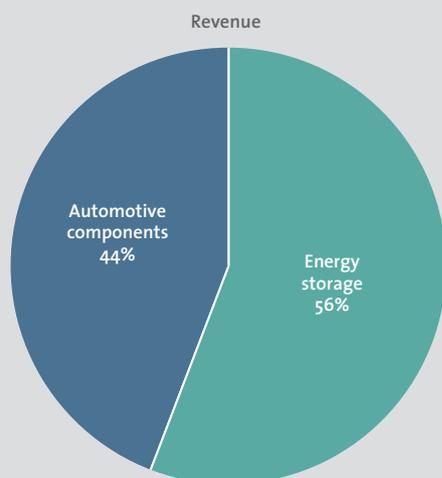
It requires a more advanced battery to cater for the significant increase in energy capacity needed to repeatedly restart the engine and to power ever increasing on-board electronics when the engine is shut down.

While the same environmental themes are strongly growing electric and hybrid vehicle demand and attracting significant media attention, the demand for lead-acid batteries is likely to increase over the next decade. This is because the majority of new and existing vehicles are powered by internal combustion engines (ICE) that require batteries. At the same time, the increasingly common 'start-stop' system is expected to become standard in the majority of new ICE vehicles, as indicated on the following page.

Absorbent Glass Mat (AGM) describes a lead-acid battery where the electrolyte is suspended in a silica-like gel. This is the preferred design for the more sophisticated 'start-stop' applications because of features such as faster charging, rapid high-load discharge and durability.

Between the extremes of 'flooded' and AGM lead-acid, lie a myriad of combinations of technical designs and chemical variations. These enable a battery intentionally specified for each vehicle and operating environment, in order to provide optimal performance and durability. Although a traditional

Energy storage vs components in contribution to operating profits



flooded battery may work when fitted in a 'start-stop' vehicle, it is likely to fail within a couple of months, whereas the appropriate AGM battery has a five year expected lifespan.

The quality of inputs and product assembly distinguishes comparable batteries between brands, including the purity of the lead used and the manufacturing technique of the lead plates. Furthermore, OEMs set minimum manufacturing standards across the industry to eliminate the risks to their brand. Their suppliers are therefore required to conform to higher quality standards to ensure safe and reliable parts.

The OEMs choice

Metair's South African battery business, First National Battery (FNB), supplies batteries to all of the global OEMs who assemble vehicles in South Africa, and a national network of 150 Battery Centre franchisees. The performance of Battery Centre explains that much of the disappointing trend in FNB profits over the last four years is due to:

- o a sharp increase in the number of competing imported batteries;
- o faster growth in smaller, entry level vehicles that utilise cheaper batteries; and
- o unsustainable commercial activity by a major competitor, ahead of its sale in 2016.

Internal factors are also accountable for part of the operational underperformance and may stem from the distraction for management, bought about by the group's acquisitions of Rombat and Mutlu in 2012 and 2013.

The prospects for battery demand in South Africa are attractive with several initiatives (including the re-branding of Battery Centre) underway to improve FNB's profitability. This, and the benefits of increased automotive production in South Africa, bodes positively for this business.

Mutlu is no turkey

2013 saw Metair acquiring control of Turkey's largest automotive battery manufacturer, Mutlu Aku, for R2.7 billion, through a combination of debt and R1.5 billion of new equity.

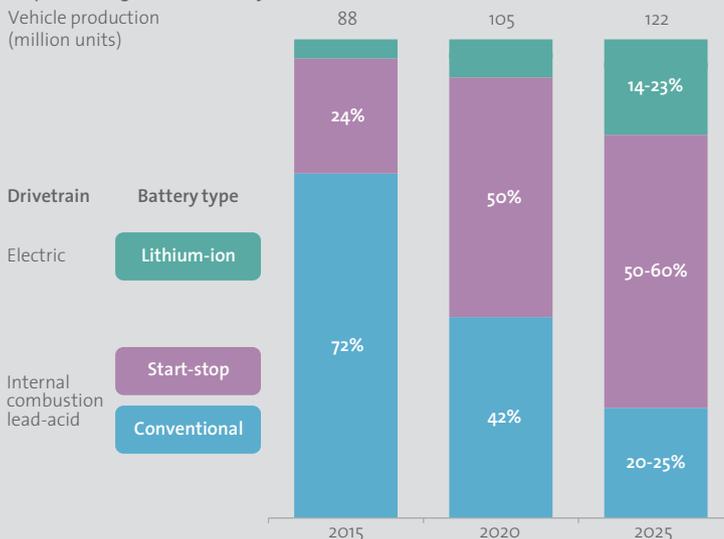
Turkey's proximity to Europe has enabled a 40% increase in vehicle production over the last five years, and Mutlu's sales volumes to OEMs have grown at nearly twice this rate. Additionally, consistent economic development over the last decade has led to growth in new car sales in Turkey, a leading determinant of future replacement battery demand.

Mutlu's contribution to Metair earnings has, however, been significantly challenged due to the Turkish lira having halved in value since December 2016. Causes include a combination of escalating political risk, slowing economic growth and steadily

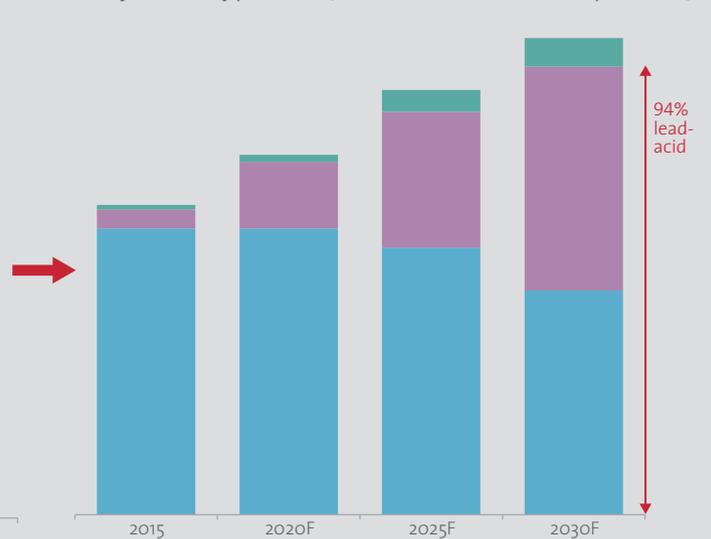
Start-stop adoption to accelerate growth and lead-acid batteries to remain dominant

Proportion of global car sales by drivetrain

Vehicle production (million units)



Projected battery production (includes new vehicle sales and replacements)



Source: IHS, Headline Automotive, Auto OEMs, Johnson Controls Power Solutions analysis

Metair - packing lead

increasing inflation in Turkey. Despite these headwinds, Mutlu has navigated the challenges remarkably well.

Since lead is the major input into a battery, we estimate that the business has further scope to pass on higher lead prices to customers. This is indicated below, where average selling prices have lagged the increase in the lira lead price, implying that costs have increased faster than revenue. Looking forward, we expect that Mutlu will continue to recoup more of this price difference, which in turn will enhance profitability.

The much smaller Romanian subsidiary, Rombat, has grown profits steadily on the back of growth into the local and export markets. We expect these profits to be stable in the near term.

South Africa has a 'Masterplan'

South Africa's automotive sector has received decades of government support. The most recent industrial policy, the Automotive Production and Development Plan (APDP) expires in 2020. It has been only partly successful with some important gains, but also serious failings. The APDP and its predecessor, the Motor Industry Development Programme (MIDP), were successful in growing domestic vehicle production. However, this simply reflects significant growth in the number of vehicles assembled in South Africa for export markets, without deepening local value chains or increasing local content per

vehicle. Production increased 14% during 2012 - 2017, whereas local value-add per vehicle lowered from 47% to less than 38%.

A significant pillar of support under the APDP is the Volume Assembly Allowance (VAA) - a mechanism in which OEMs receive credits based on the value of exports that offset taxes paid on imports. However, OEMs responded by inflating the level of rebates received through the export of high value vehicles comprising predominately imported components. This resulted in most OEMs being able to offset the majority of their import tax.

Compounding this failing is the application of ad valorem excise tax on vehicles, whereby vehicles that are imported and benefit from VAA import rebates may attract a lower ad valorem excise tax than a domestically produced vehicle. The outcome is a higher cost to the state, through forgone taxes, and an undermining of local content creation. Furthermore, it has resulted in a proliferation of imported model options that increase competition for the vehicles that are manufactured locally. These manufacturing plants become more reliant on export demand, and thereby more vulnerable to closure should the global parents re-allocate production to other facilities - ultimately, compromising the sustainability of the local industry.

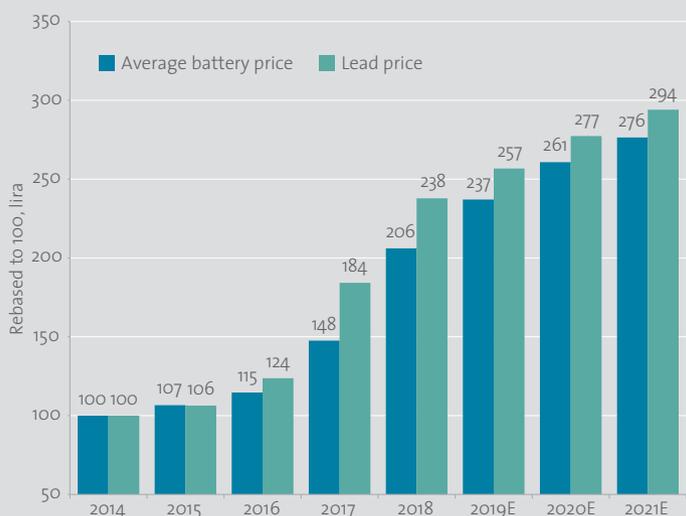
An extensive industry consultative process preceded the renewal of the APDP, which will run to 2035, culminating in the South African Automotive Masterplan (SAAM). Crucially, the new plan replaces the VAA with the incentive based solely on localisation levels. It will be a key lever to achieve SAAMs' 60% local content objective. This clarification of policy is spurring production growth by the existing OEMs and, based on announcements to date, we expect South Africa's output to grow between 20% and 25% over the next three years.

Metair's Automotive Components division already supplies many of the OEMs looking to expand output. This presents attractive options for growth as OEMs seek both supplier diversification and for local suppliers to benefit from the new APDP.

A large holding

Metair is a substantial holding across all our funds due to the evidently compelling prospects for both operating divisions which, in our view, are not reflected in the single-digit price earnings ratio that the market currently ascribes the share. **UP**

Average battery prices compared to the price of lead



Source: company reports



Old is the new young

Dirk van Vlaanderen - Associate Portfolio Manager

Keeping dry is an imperative in the beginning and in the twilight years of life. The design, comfort and fit of modern diapers (locally, more popularly referred to as nappies) have improved dramatically since the first commercial disposable ones produced in the 1970s. This has resulted in a global industry worth over \$60 billion with attractive growth prospects.

Old is the new young

We analyse the global opportunities for the baby and adult incontinence diaper markets and outline how Ontex, the largest European producer of private label nappies with a growing global presence in the category, is well positioned to benefit from market trends.

Booming market dynamics

The baby care and adult incontinence segments are two of the most attractive in terms of growth outlook in the broader personal care product market. Development in these categories is underpinned by long-duration structural trends of population growth, an ageing population, increasing urbanisation, rising income per person and the increasing penetration of the formal retail sector, particularly in emerging markets.

Baby care is expected to increase at 3.3% per annum for the next five years mainly due to growth in emerging markets where population expansion rates remain relatively high. As shown below, the two largest producers of branded nappies - Procter & Gamble, producer of the ubiquitous Pampers brand and Kimberly-Clark, the manufacturer of Huggies - account for 45% of the global market share. Other large branded regional players include Essity (Europe), Unicharm (Asia) and Ontex (Latin America).

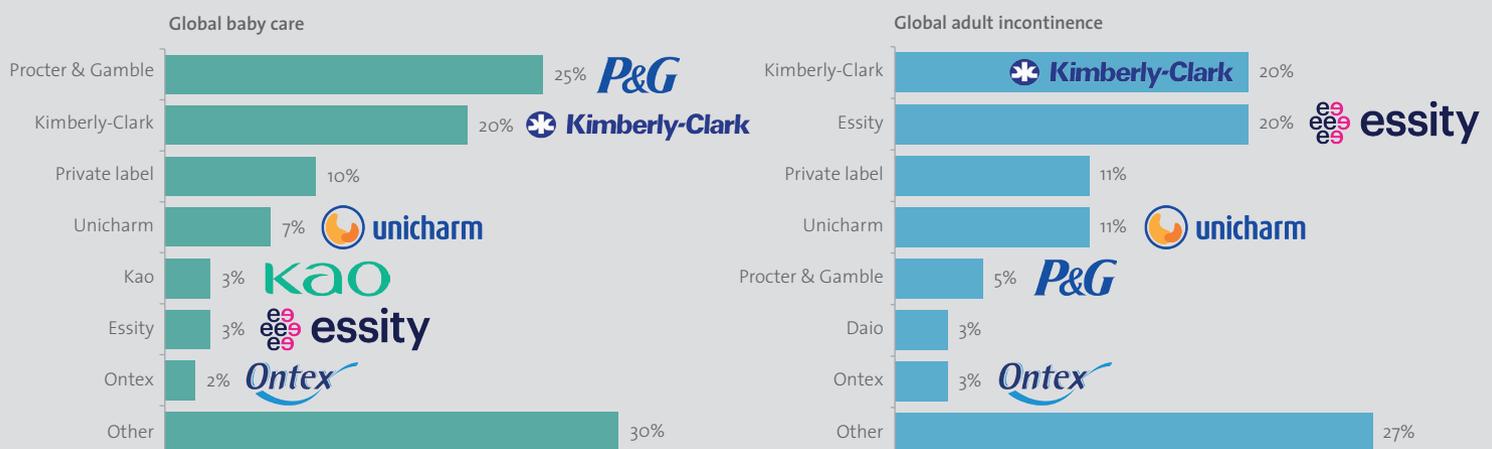
Private label brands contribute 10% to the global market and have been gaining significant share from the branded players over the last 15 years, particularly in Europe, off the back of the growth in the hard discount retail channel.

Innovation in the baby care nappies category has centred on improvements in materials to ensure greater absorbency (dryness) and comfort. In recent years, there has been a trend towards “baby pants” for toddlers, a convenient form of protection while potty training, which has extended the time children spend in the category.

Adult incontinence, although the smaller in absolute market size, is currently expected to grow at twice the rate of baby care, or 6.6% per annum. This is due to the ageing populations in emerging and developed markets. The global population of adults over 65 years of age is expected to grow by 3.5% per annum to 2030. Kimberly-Clark and Essity are the two largest branded players globally in adult incontinence products, with around 40% of the global market share between them.

Adult incontinence products are sold through institutional (hospitals and old-age homes) and retail channels. The retail channel is growing strongly as manufacturers continue to invest in brand awareness to help overcome some of the negative perceptions of the product and ensure greater availability.

Global baby care and adult incontinence retail diaper market shares (2017)



Innovation in the category has centred around absorption, comfort, and specifically, on creating a thinner and less conspicuous product without compromising on effectiveness.

Ontex uses Europe as a springboard to the world

Ontex began 30 years ago as a small, family-owned producer of adult incontinence products for the institutional healthcare market in Europe. Expansion into adjacent categories, such as baby care and feminine hygiene products, and various acquisitions across several geographies, has seen the shape and footprint of the group change dramatically over the years.

Prior to 2015, Ontex was mainly a European-based manufacturer of retailer-branded baby care, feminine care and adult incontinence products benefitting from the aggressive share gains that the hard discounter own-brands won at the expense of branded competitors. Today, Ontex is the largest producer of retailer brands across all three product segments in Europe - more than twice the size of its nearest competitor.

With significant scale and expertise in retailer brands in Europe, the group then expanded internationally into the branded space. Two large acquisitions in the branded baby care and adult incontinence segments - Mexico (2016) and Brazil (2017) - materially shifted the group's geographic exposure with 27% of revenues now generated in these two Latin American markets.

Ontex is currently the #1 player in adult incontinence products in Mexico and Brazil, and the #2 and #3 manufacturer in baby care in these markets respectively.

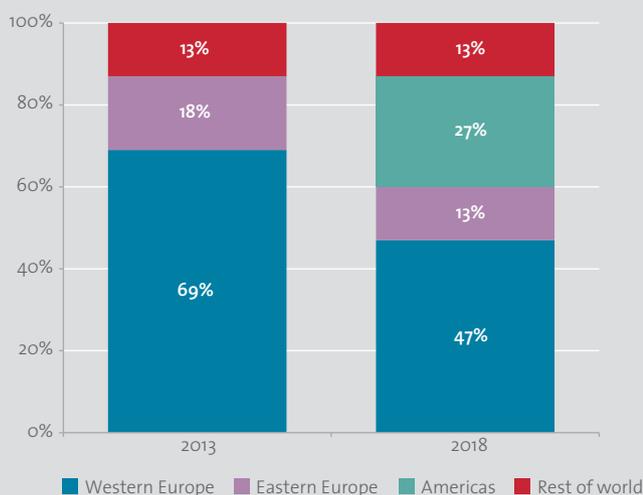
As indicated below (left), Eastern Europe now accounts for 13% of revenue where Ontex is strongly positioned in Poland, Turkey, the Czech Republic and the Balkans. The rest of the world division makes up 13% of revenue where Ontex has strong positions in baby care: Ethiopia (#1 position and 45% market share), Pakistan (#2 position and 12% market share) and Algeria (#3 position and 19% market share).

A perfect margin storm

The last two years have seen significant pressure on Ontex's profitability, with operating profit margins (profitability of the company before interest and taxes) contracting from 10.4% down to 7.7% in 2018 (left chart on following page). The primary reasons for this are:

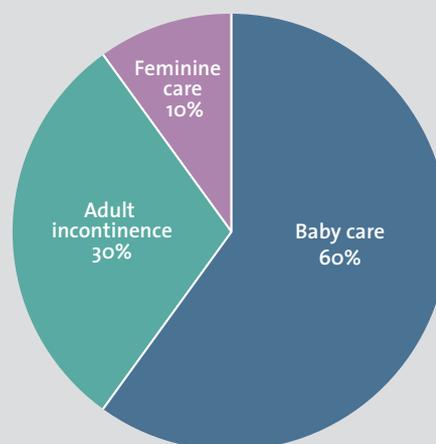
- **Input costs:** After a fairly benign input cost environment for several years, 2017 saw the start of rampant inflation in the majority of Ontex's main inputs (below right), which increased on average by over 20% in US dollars.
- **Adverse foreign exchange rates:** With most input cost denominated in US dollars, the sharp devaluation of some emerging market currencies (especially the Brazilian real

Ontex revenue by region



Source: company presentations

Ontex revenue by product type (2018)



Source: company presentations

Old is the new young

and Turkish lira) and the relative strength of the US dollar versus the euro, has resulted in a further margin squeeze. Ontex has struggled to raise prices sufficiently in local currency to offset the currency weakness.

- **Brazilian troubles:** After acquiring Hypermarcas' hygiene division in Brazil in 2017, the economy began to struggle and, combined with competitive pressures, resulted in the baby care market showing negative growth. At the same time, Ontex discovered that profits had been overstated by the previous owner. While a turn-around of the business is underway, we estimate that Brazil has resulted in group margins being 1% lower than they otherwise would have been.

Despite significant group cost savings programmes and price increases to offset these pressures, margins still contracted to 7.7% in 2018 and are likely to do so further to 7.0% in 2019 (below left). We do, however, expect the Brazilian margins to recover over time and for some of the cyclical input cost pressures to reverse. This, combined with the Transform2Grow programme discussed below, should see Ontex margins normalising significantly higher in the years ahead.

Taking Ontex to the next level

The company recently announced a new strategy - Transform2Grow - which will be implemented over the next three years.

It seeks to:

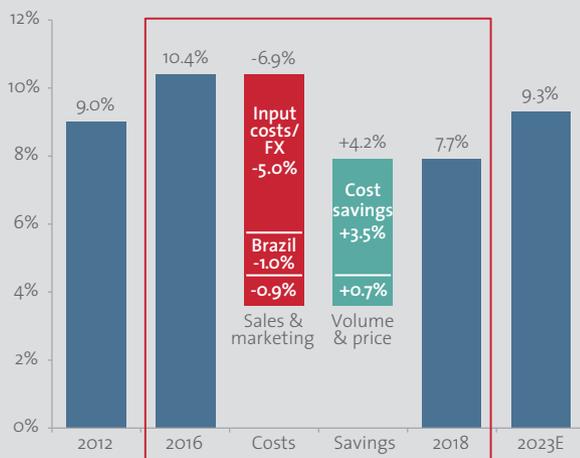
- **Boost operational efficiency** - by optimising the existing manufacturing footprint through factory rationalisation and cost savings. Further improvements to transport, warehousing and procurement will lower costs and reduce working capital.
- **Improve commercial capability** - by focusing capital expenditure and resources on high-growth segments (baby pants, adult pants and light incontinence products), sharpening the focus on innovation and leveraging group-wide skills.

The plan is expected to deliver an incremental 1.25% - 1.75% to operating profit margins by 2021 and underpins the margin recovery we expect to see from the business in the next few years.

Investing in the demographic dividend

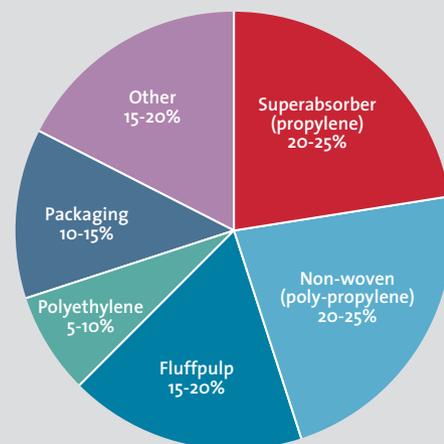
The structurally favourable demographic trends support an increasingly robust demand for baby care and adult incontinence products and Ontex is well positioned to continue to benefit from this growth. While margins are currently low, we see a path to recovery through the self-help measures discussed, resulting in significantly higher earnings and shareholder returns. As such, we own Ontex shares on behalf of our clients. **UP**

Ontex margin pressures and outlook



Source: company reports, Kagiso Asset Management estimates

Estimated breakdown of input costs (2016)



Source: Deutsche Bank, company data



Altran's virtuous cycle

Aslam Dalvi - Associate Portfolio Manager

Engineering research and development (ER&D) outsourcing is the rendering of non-physical engineering services for a fee. This business model is similar to that of other consultancy businesses, such as Accenture and Capgemini, but far more specialised.

Altran's virtuous cycle

Altran, the world leader in engineering solutions and ER&D, has markedly differentiated themselves through their global delivery strategy and is well positioned to benefit from supportive industry drivers.

The innovation investment

Global research and development (R&D) spend is estimated at around \$1.5 trillion, with the automotive, telecommunication, semiconductor and consumer sectors being the largest spenders.

For businesses, R&D spend is a critical investment as it leads to innovation, which in turn delivers growth and long-term competitiveness. R&D expenditure by the top 1,000 global companies has grown by an estimated 5% per annum, since 2005 (chart below).

The ER&D outsourcing opportunity is estimated to be around \$250 billion or 15% of total R&D spend. This has grown at a healthy 9% per annum over the last two decades due to the increasing R&D intensity and R&D outsourcing by companies (chart on following page).

Nurturing the need for engineering partnerships

The steady growth in this ER&D outsourcing over the last decade results from:

Growing engineering complexity amid rapidly changing end markets - the pace of technological change is accelerating

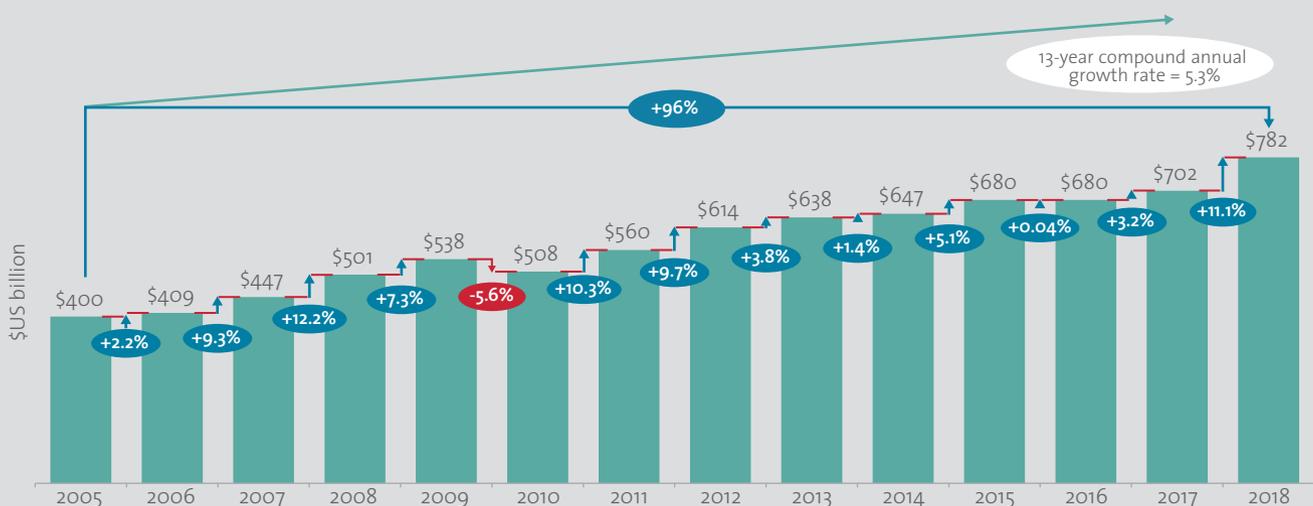
resulting in multiple forms of new technology being incorporated into products. The motor industry, for example, is undergoing a fundamental shift with R&D spend accelerating to support the move to electric-drive trains, autonomous driving and digital connectivity in cars. This is, however, a finite resource and companies are shifting spend to ensure delivery of the best returns to shareholders. Outsourcing providers often have more scale in certain niche areas, allowing them to deliver the same service at a much lower cost than a company can replicate in-house.

Challenges in recruiting the necessary skills - including the motivation and retention of these skills. Data from UNESCO highlights that around 80% of engineering graduates are from Eastern Europe or Asia, while the main R&D hubs for many large corporates continue to be in developed Europe or the United States. This mismatch in the supply of, and demand for, talent has seen medium size companies rely more heavily on outsourcing providers that offer a global network of engineers.

Leading the pack

Altran differentiates itself by focussing on highly specialised services, its global reach and unmatched scale. The group's range of services spans the entire research and development cycle, with services offered in innovation, design, development, prototyping, testing and production (chart on page 12).

Top 1,000 R&D spending



Services are delivered to clients through in-country engineering teams operating from global delivery centres, each focused on highly specialised and niche engineering services. With operations spanning 11 industries, Altran is considered the leader in the aerospace, defence, electronics and telecom industries.

In a market with many small and regionally focussed players, Altran's scale is unmatched. It is more than double the size of its closest competitor from a revenue, breadth of services and asset base perspective. The company employs over 40 thousand highly skilled engineers, 50% more than its closest competitor, allowing it to offer a wider range of services at the lowest possible cost.

Altran is also deeply embedded in client organisations, forming a critical part of a company's product and R&D supply chain. As research and product development is typically a multiyear process, the more entrenched the relationship, the greater the key competitive advantage for the business.

Their depth of knowledge of client processes and products makes it difficult for companies to switch to alternative service providers. This is evidenced by the fact that Altran has remained the ER&D outsource partner across its top 10 clients for well over two decades.

Global delivery model creates an enduring edge

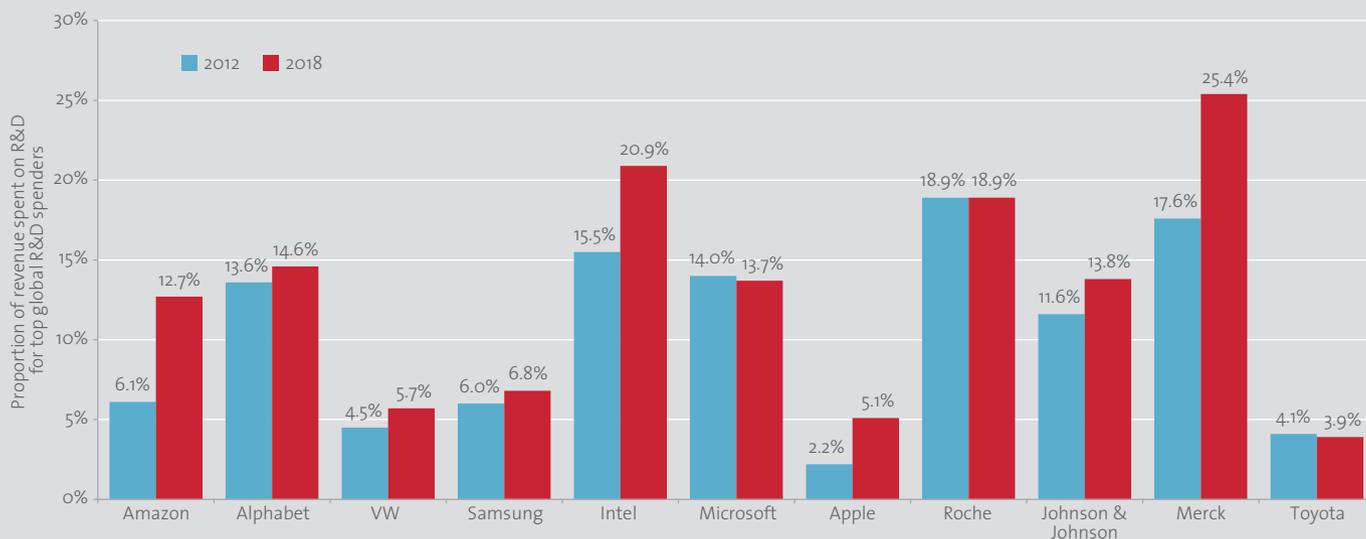
A unique feature of the ER&D market is that most ER&D companies tend to be regionally focused as large corporate R&D centres have historically been located in a single region or country. In 2014, Altran realised that a new model was needed to solve the challenges associated with scale and skills.

2015 saw the company starting to build large engineering centres that have since proven to be a defining competitive advantage for the group. Altran currently has seven global niche delivery centres, with plans to expand to 15 over the next three years.

These centres are unique and attractive environments in which to work, with each focussing on a single leading edge engineering field. This has enabled Altran to entice highly experienced engineers from all over the world who are looking to work on the latest technologies, and attracting young engineers looking for experience - ensuring a steady pipeline of talent.

The scale and efficiency of these global centres is unmatched in that they allow Altran to spread the cost of highly sought after and expensive engineers across several clients. The company is therefore able to deliver the lowest cost to serve

R&D intensity for top 10 global R&D spenders



Source: OECD estimates based on OECD Main Science and Technology Indicators Database

Altran's virtuous cycle

clients versus their competitors, resulting in steady market share gains and new client wins.

These centres of excellence have created a powerful virtuous cycle for the company as new clients have meant the addition of new, cutting edge projects - in turn attracting more highly skilled engineers. This increases scale, enabling a lower cost to serve clients, and ultimately, further market share gains.

A unique investment opportunity

Altran has delivered robust performance over the last five years, with revenue growth of 10% per annum since 2012, benefitting from increasing R&D spend by clients and market share gains. Overall profits have grown at 18% per annum, largely as a result of the operational leverage from the global delivery model, which allows the company to spread the fixed cost of engineers across many more clients.

The growth outlook for the company remains exciting. On the back of supportive industry trends and further investment into global engineering centres, Altran recently announced its medium-term plan, targeting a doubling of profitability over the next five years.

In November 2017, Altran announced their acquisition of Aricent, a US based ER&D player and the global leader in the

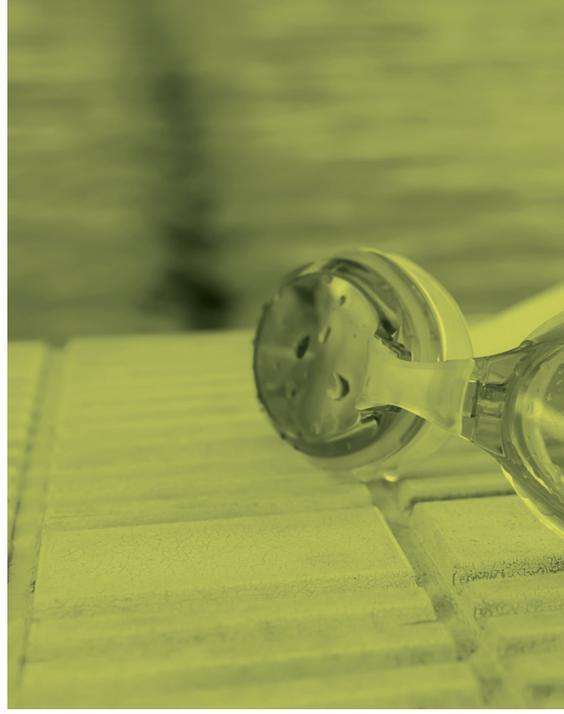
software engineering and semi-conductor outsourcing industry. With little overlap between the two companies from a geographic and services point of view, the deal provided Altran with expertise in new engineering fields. With it came the opportunity to increase the scale of these services, as it has done so successfully with its own business, by building additional global delivery centres.

In July 2018, only a few months after the closure of the deal, Altran announced that they had uncovered false purchasing orders at Aricent. The three months following this saw Altran's share price plummet over 50% as investors feared the company may have overpaid for Aricent and was to be saddled with an unmanageable debt burden.

Our research highlighted that the fraud was small in relation to Aricent's current profit base, ultimately having no impact on Altran's existing business, which continued to benefit from positive industry trends and the global delivery strategy. This view proved correct as Altran continued to grow and the share re-rated accordingly. In June 2019, Capgemini announced it would buy Altran for euro 14/share - a large premium to our estimate of the company's intrinsic value. **UP**

Altran's broad exposure across industries is a key differentiator

Automotive	Aeronautics	Space, Defence & Naval	Rail, Infrastructure & Transportation	Energy	Industry & consumer goods	Life Sciences	Communications	Semi-conductors & electronics	Finance & public sector	Software & internet



The economics of polyethylene

Abdul Davids - Portfolio Manager
Nicole Maduray - Associate Analyst

The current cost of Sasol's US polyethylene plant has almost reached an astounding \$13 billion. Yet, Sasol remains confident in its position to benefit from the increasing demand for polyethylene amid the raging war against plastic.

The economics of polyethylene

Polyethylene is the most common form of plastic, used widely in the making of shopping bags, toys, shampoo bottles, computer components, pipes and a variety of other household, laboratory and industrial products. The demand for polyethylene is rising with a global acceleration in consumer spending and manufacturing activity, despite increased scrutiny and environmental regulation.

Let's get cracking

Sasol, the integrated chemicals and energy company, with operations in Southern Africa and the United States, recently announced the fourth increase in the capital cost of its ethane 'cracker project', or polyethylene plant. Based in Lake Charles, Texas, the project has been substantially delayed and the cost thereof has ballooned to just under \$13 billion from an initial estimate of \$5.8 billion. The \$13 billion represents a substantial portion of Sasol's market value at its current share price.

The construction of Sasol's US polyethylene plant began in 2014, comprising an ethane cracker and six on-site downstream chemical manufacturing plants, categorised as base and performance chemicals (chart below). The polyethylene plant will be capable of producing 890,000 tonnes of low density polyethylene (LDPE) and linear low density polyethylene (LLDPE) - collectively called base chemicals - and 570,000 tonnes of

performance chemicals, per year. Persistent growth in the US shale gas industry has resulted in huge increases in the availability of ethane gas - a key feedstock for polyethylene plants (crackers). Sasol's investment in the US follows a wave of similar investments by multinational chemical companies, such as Total, Shell, BASF, Dow and others.

Making plastic

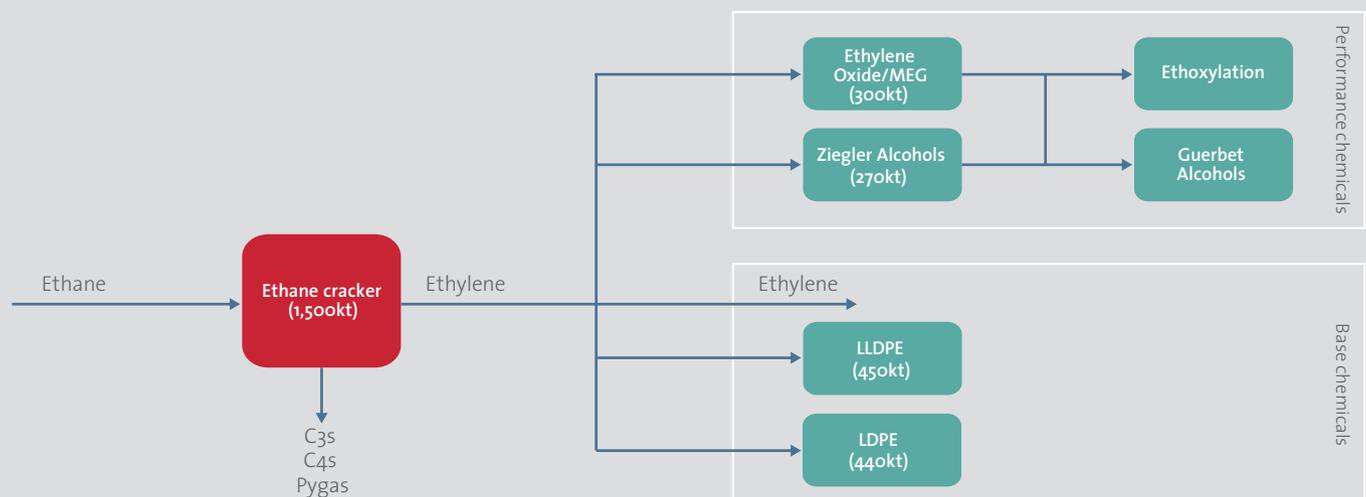
The Lake Charles plant will transform shale gas into polyethylene through a process called 'cracking'. This involves separating ethane from shale gas and then heating the ethane to extreme temperatures (in the region of 850°C) to break apart the molecular bonds that hold the ethane molecule together, thereby 'cracking' it (chart below). The resulting compound is ethylene gas, which then undergoes a chemical reaction called polymerisation, where the simple compound ethylene is converted into a complex chain of molecules to produce polyethylene.

LDPE and LLDPE are the two main forms of polyethylene that Sasol will produce, making up around 60% of its end product. The long-term outlook and production economics for plastic, or polyethylene, are therefore important considerations for Sasol.

A place for plastic

In its various forms, polyethylene has a vast range of applications. Specific polyethylene compounds are categorised according to

Sasol's ethane cracker (2015)



their densities (the relationship between mass and volume) and the complexity of their molecular structure. Both LLDPE and LDPE have low densities with their molecular structures consisting of chains of molecules in branched patterns (similar to the shape of a tree trunk with many branches). These characteristics mean that they are lightweight (low density) with the ability to be flexible and stretch, while remaining remarkably strong (branching). Importantly, the stability of these plastic polymers provides versatility and aesthetic appeal - they are durable, recyclable, hygienic and resistant to corrosion.

LLDPE and LDPE are most commonly used to manufacture plastic shopping bags, flexible containers, films and bottles. They are the ideal packaging material to suit a variety of modern applications, especially food packaging, where they are used extensively.

In industrial applications, LLDPE and LDPE are appreciated for their remarkable chemical and physical qualities. They are resistant to heat and corrosion, can be made transparent, and their low density and resulting light weight augments their versatility. These attributes are beneficial in the production of a wide range of resins, adhesives and coatings, for example: electrical insulation, flexible water piping, computer components and laboratory equipment.

The plastic debate

In recent years, the global war against plastic has gained momentum with a focus on reducing single-use plastics like straws and shopping bags. Undoubtedly, disposable plastics are the primary visible pollutants of our oceans, bringing widespread destruction to marine life and coastlines. This increased awareness has seen gradual changes in consumer behaviour with the introduction of viable alternatives, including fabric shopping bags and paper straws.

Since 1994, certain countries have placed restrictions on the use, or sale, of single-use plastic with over 120 countries enforcing some form of plastic bag legislation. South Africa introduced a plastic bag levy in 2004 in an attempt to reduce the number sold, to aid in combatting the plastic pollution epidemic.

While the reduction of single-use plastic is necessary to preserve and protect the environment, an outright ban or shift away from other types of plastic may not be as beneficial to the environment as one might imagine.

A lighter load

A 2011 study conducted by the UK government's Environment Agency indicated that the carbon footprint of a non-recycled paper bag is three times greater than that of a conventional plastic shopping bag made from polyethylene. The study calculated that a cotton shopping bag needs to be used 131 times before the environmental impact resulting from transporting and manufacturing these bags is equivalent to the single use of a plastic shopping bag.

The emissions released in the production of polyethylene are approximately two to three times the amount produced during the manufacturing of paper and cardboard. However, a plastic item can weigh a fraction of that of a similar product made from alternative substances. The benefit of polyethylene's low density, and subsequent light weight, is one of the reasons it compares favourably with alternatives. Lightweight plastic products and packaging render lighter loads for trucks and planes, therefore lowering emissions caused during transportation. While the environmental cost of single-use plastic pollution is high, the emissions released through their production is often significantly less than that of the alternatives (chart to left).

Per product comparison of emissions released (2013)

Product	Carbon footprint (kg CO ₂ equivalent per product)
Plastic shopping bag 	2.1
Brown paper bag 	5.5
Cotton tote bag 	271.5

Source: Environment Agency UK

The economics of polyethylene

Aside from not providing the same scale of characteristic benefits that polyethylene products offer, plastic alternatives (paper, cardboard, cotton and glass) are often more complex to produce, with limited raw material availability, carrying a higher price tag.

Additionally, plastic benefits the environment by reducing waste. In the food industry, plastic packaging plays a key role in the prevention of waste, purely by keeping food fresher for longer. When food is wasted, so too are the resources that contributed to making it - water, fertiliser and arable land. Wasted food ends up in landfills, emitting greenhouse gases that harm the environment.

Apparent demand

As illustrated below, polyethylene demand shows historic growth with global demand at 80 million tonnes six years ago, increasing at a rate of 4% per annum to around 100 million tonnes today. With the average cracker supplying 900,000 tonnes of polyethylene and demand forecast to continue growing at this rate, supply needs to grow by roughly four crackers per year to keep up with the increasing need.

Despite the undeniable fact that there will be ongoing measures to reduce waste created by single-use plastic products, the outlook for the demand for polyethylene is evidently positive. This is expected to grow globally at 3-5% each year for the

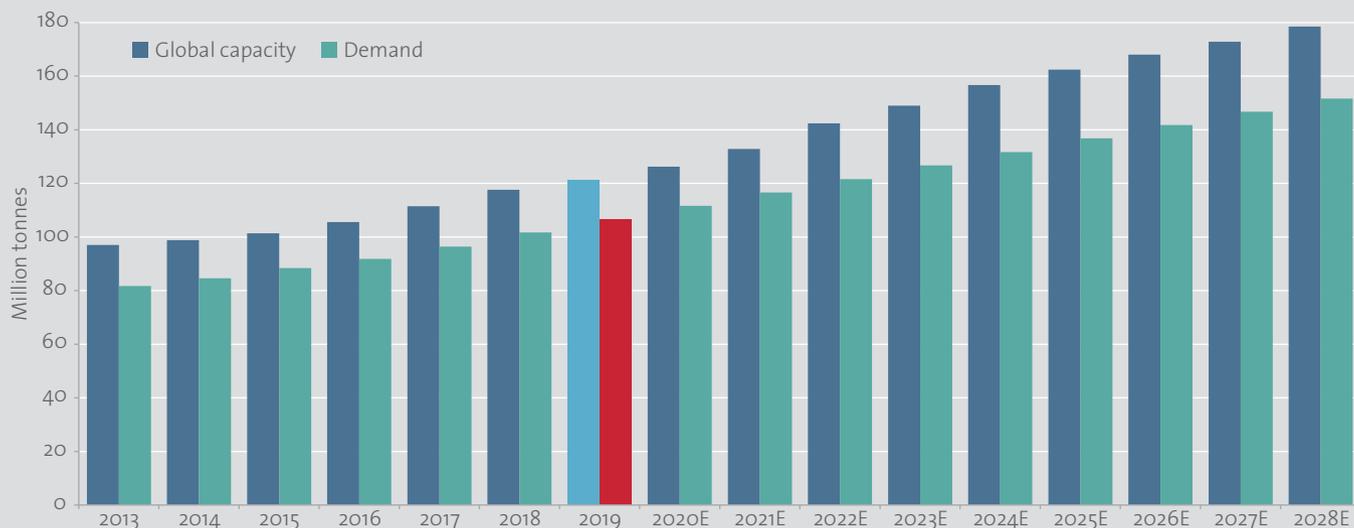
next five years, supported by an increase in consumer spending and industrial manufacturing. Populations in developed and emerging markets are consuming larger quantities of processed goods packaged in plastic containers, bags and films - all made from polyethylene.

While project delays and capital cost increases have substantially reduced the economic attraction for investors, Sasol is well positioned to benefit from the increasing polyethylene demand.

The key differentiator

In addition to the production of 890,000 tonnes of polyethylene, Sasol's Lake Charles cracker project will produce around 600,000 tonnes of performance chemicals in mono ethylene glycol (MEG) and Ziegler Alcohols (ZAG). Sasol believes that these performance chemicals offer a more diverse and differentiated product slate than most of the other cracker projects being constructed on the US Gulf Coast. This will allow them to participate in numerous higher-value markets, many of which are insulated from traditional chemical cycles with superior profitability potential. The inclusion of these performance chemicals units in the Lake Charles plant will enhance the overall profitability of the project and enable Sasol to reward long-suffering shareholders with increased dividends in the future. **UP**

Polyethylene supply and demand (2019)



Kagiso Asset Management Funds

Performance to 30 June 2019	1 year	3 years ¹	5 years ¹	10 years ¹	Since launch ¹	Launch	TER ²	TC ³
Unit trust funds⁴								
Equity Alpha Fund	10.1%	7.2%	4.5%	12.3%	16.2%	Apr-04	2.03%	0.44%
SA Equity General funds mean	1.2%	2.6%	2.9%	10.5%	12.6%			
Outperformance	8.9%	4.7%	1.6%	1.8%	3.6%			
Balanced Fund	9.1%	7.4%	5.8%	-	9.0%	May-11	1.56%	0.47%
SA Multi Asset High Equity funds mean	3.2%	4.0%	4.9%		8.3%			
Outperformance	5.9%	3.4%	0.9%		0.7%			
Protector Fund	10.5%	8.7%	6.3%	7.9%	9.8%	Dec-02	1.57%	0.39%
CPI + 4%	8.9%	9.5%	9.8%	10.1%	10.5%			
Outperformance	1.6%	-0.8%	-3.5%	-2.2%	-0.7%			
Stable Fund	13.1%	8.3%	7.4%	-	8.5%	May-11	1.51%	0.48%
Total return of CPI+2% pa	6.9%	6.8%	6.3%		5.9%			
Outperformance	6.2%	1.5%	1.1%		2.6%			
Institutional funds⁵								
Managed Equity Fund (SWIX)	12.5%	6.6%	3.6%	12.3%	11.3%	Sep-06		
FTSE/JSE SWIX All Share Index	1.2%	4.3%	5.4%	13.5%	11.5%			
Outperformance	11.3%	2.3%	-1.8%	-1.2%	-0.2%			
Managed Equity Fund (Capped SWIX)	12.9%	-	-	-	7.3%	Jan-17		
FTSE/JSE Capped SWIX Index	1.1%				4.2%			
Outperformance	11.8%				3.1%			
Domestic Balanced Fund⁶	13.7%	7.9%	5.0%	10.3%	8.5%	May-07		
Peer median	1.8%	5.1%	5.2%	11.5%	9.0%			
Outperformance	11.9%	2.8%	-0.2%	-1.2%	-0.5%			
Global Balanced Fund⁷	10.9%	9.2%	7.1%	-	9.6%	Jul-13		
Peer median	1.9%	5.2%	6.1%		8.8%			
Outperformance	9.0%	4.0%	1.0%		0.8%			
Bond Fund	11.9%	10.9%	-	-	9.6%	Aug-15		
BESA All Bond Index	11.5%	9.9%			8.6%			
Outperformance	0.4%	1.0%			1.0%			
Money Market Fund	8.4%	8.5%	8.1%	7.2%	7.9%	Jan-04		
Alexander Forbes STeFI Composite Index	7.3%	7.4%	7.1%	6.6%	7.4%			
Outperformance	1.1%	1.1%	1.0%	0.6%	0.5%			
Sharia unit trust funds⁴								
Islamic Equity Fund	5.3%	8.7%	5.1%	-	11.1%	Jul-09	1.43%	0.23%
SA Equity General funds mean	1.2%	2.6%	2.9%		10.5%			
Outperformance	4.1%	6.1%	2.2%		0.6%			
Islamic Balanced Fund	4.4%	6.6%	4.5%	-	6.8%	May-11	1.49%	0.16%
SA Multi Asset High Equity funds mean	3.2%	4.0%	4.9%		8.3%			
Outperformance	1.2%	2.6%	-0.4%		-1.5%			
Islamic Global Equity Feeder Fund	-	-	-	-	Not yet available	Jan-19		
Global Equity General funds mean								
Outperformance								
Islamic High Yield Fund	-	-	-	-	Not yet available	Mar-19		
Short-term Fixed Interest Index (STeFI)								
Outperformance								
Highest and lowest monthly fund performance	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest
Equity Alpha Fund	4.2%	-5.5%	6.6%	-6.0%	8.2%	-6.0%	10.3%	-6.0%
Top 40 Tracker Fund	5.3%	-6.7%	7.6%	-6.7%	7.8%	-6.7%	10.3%	-6.8%
Balanced Fund	3.9%	-4.8%	4.8%	-4.8%	5.5%	-4.8%	-	-27.8%
Protector Fund	3.3%	-2.6%	3.3%	-2.6%	3.4%	-4.2%	4.8%	-4.2%
Stable Fund	2.5%	-1.3%	2.5%	-1.3%	3.8%	-3.5%	-	-
Islamic Equity Fund	3.6%	-3.9%	5.3%	-3.9%	7.3%	-4.6%	-	-
Islamic Balanced Fund	3.6%	-2.8%	4.0%	-2.8%	4.6%	-3.0%	-	-
							11.9%	-9.0%
							14.4%	-27.8%
							-27.8%	-4.8%
							9.5%	-5.3%
							4.0%	-3.5%
							8.1%	-4.9%
							8.2%	-5.4%

Footnote and disclaimer follow overleaf.



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Footnote:¹ Annualised (ie the average annual return over the given time period); ² TER (total expense ratio) = % of average NAV of portfolio incurred as charges, levies and fees in the management of the portfolio for the rolling three-year period to 30 June 2019; ³ Transaction costs (TC) are unavoidable costs incurred in administering the financial products offered by Kagiso Collective Investments and impact financial product returns. It should not be considered in isolation as returns may be impacted by many other factors over time including market returns, the type of financial product, the investment decisions of the investment manager and the TER. This is also calculated on the rolling three-year period to 30 June 2019; ⁴ Source: Morningstar; net of all costs incurred within the fund and measured using NAV prices with income distributions reinvested; ⁵ Source: Kagiso Asset Management; gross of management fees; ⁶ Median return of Alexander Forbes SA Manager Watch: BIV Survey; ⁷ Median return of Alexander Forbes Global Large Manager Watch.

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