

+IMPACT

Official publication of the Green Building Council of South Africa



0.3

RESILIENCE

In the face of current social, economic and environmental crises: can green buildings lever growth?

263

Striving To Create Liveable Green Spaces in Joburg

Johannesburg City Parks and Zoo's greening initiatives, such as planting and maintaining one of the largest man-made forests in the world, establishing parks and developing green ethos in communities, are creating a city where nature, bio-diversity and man can co-exist.

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EDITORIAL OVERVIEW FOR 2019*

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+IMPACT is provided at no charge to all senior executives and officials of GBCSA member companies and organisations, and to municipalities and related government departments.

ISSUE 0.4 – OCTOBER 2019

- ✦ Exploring the Cities of Tomorrow – Convention edition
- ✦ Interviews with key Green Building Council Convention speakers along convention themes
- ✦ Top-rated green buildings and green building interventions
- ✦ The relationship between smart green buildings and smart sustainable cities
- ✦ Exploring the spatial history of South African cities
- ✦ Transport – the backbone of city infrastructure
- ✦ Transformation in the green sector

*(subject to change)

CALL FOR CONTENT

GBCSA members are invited to submit stories about projects, design concepts, materials, research, and anything else that promotes a healthy sustainable built environment. Submit a 200 word description of your content idea with 1-2 images to: maryanne@positive-impact.africa

For advertising and sponsorship opportunities contact Thandiswa Mbijane
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“With buildings globally generating 1 in 3 tonnes of CO₂, green building practices can have a significant impact on combating climate change, and Green Building Councils all over are accelerating this transformation.”

A MESSAGE FROM THE CEO

2019 has reiterated to me that change is South Africa’s constant. Green Building Council South Africa was created in 2007 to show that local sustainable development was not only possible, but beneficial. Today our member base, encompassing the value chain throughout the construction sector, supports building green not just because it is increasingly financially prudent to do so, but because it is the right thing to do.

The inspiring Swedish teenager, Greta Thunberg, could not have phrased it any better: “It’s 2019. Can we all now call it what it is: climate breakdown, climate crisis, climate emergency, ecological breakdown, ecological crisis and ecological emergency?”

With buildings globally generating 1 in 3 tonnes of CO₂, green building practices can have a significant impact on combating climate change, and Green Building Councils all over are accelerating this transformation. Because we agree with Greta, it is an emergency.

To have a greater positive impact we broadened our scope beyond buildings, to precincts. Islands of green buildings in a sea of brown are helping, however South Africa’s urban areas are profoundly resource intensive. Designed for sprawling separation, our cities make us overly dependent on cars and, combined with our suburban-lifestyle aspirations and our energy-intensive living, our cities are highly-polluted and wasteful, with very high ecological footprints. Add that our electricity is some of the world’s dirtiest, we are set on a path of unsustainable urban development.

And we are not alone. Across the globe our level of demand on ecosystem services is more than two thirds what it should be, and in extracting more we typically degrade our environment. In other words, we are living off the planet’s natural capital instead of the interest of this capital – and it is leading to bankruptcy.

Which is why, former Energy Minister Jeff Radebe’s recent announcement to open up the playing field to more distributed generation and smart-grid systems is excellent news. Hopefully the required amendments can be made quickly to enable potentially hundreds of thousands of rooftop PV systems, biogas and other small-scale embedded generators, and unlock investment. Pairing this with energy storage solutions in a smart-grid system will be key and will greatly reduce the ecological footprint of South Africa’s built environment.

As Finance Minister Tito Mboweni declared during the tabling of the Carbon Tax Bill in parliament, “climate change poses the greatest threat facing humankind”, and, in order for South Africa to invest wisely in the future, we need to adapt to ensure resilience in a low-carbon economy.

Take up the challenge, turn the page, and witness the positive impact that sustainable development is creating for the whole value chain.

Dorah Modise

Green Building Council of South Africa



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THE GREEN BUILDING CONVENTION 2019

How will you contribute to shaping the cities of tomorrow? What kind of environment do we want our children to grow up in? What pressing issues can future cities help to solve? How does government and business need to adapt to make better cities a reality? All these questions – and more – will be addressed at the GBCSA's 2019 Convention, taking place 2 – 4 October in Cape Town.

Themed *Beyond: Shaping Cities of Tomorrow*, the convention is about taking the next step towards creating cities that are cleaner, healthier, happier places to live, work, learn and play. Internationally-acclaimed as well as local speakers will share the best, most current thinking on the topic, and the convention will feature five different programme tracks.



2 - 4 OCTOBER 2019
CAPE TOWN

12TH GREEN BUILDING CONVENTION 2019

1. The Built Track

This track will spotlight cutting-edge new and retrofitted green buildings and building systems from around the globe. What potential and possibilities will nature-inspired design, the circular economy, predictive analytics, machine-learning and artificial intelligence reveal for the high performance, regenerative, living built environment of the future?

2. The Leadership Track

Effective policy and leadership is the backbone of how the public and private sectors drive change. As we look to future-proof policies to respond to tomorrow's challenges, the convention provides an opportunity to examine policy development, policy in practise, integration and connectivity, sustainable leadership development, socio-economic considerations, as well as government and corporate policy examples that promote sustainability.

3. The Investment Track

In some investment categories of the South African property sector green building is mainstreaming, which was unheard of in the previous decade. Find

out what has brought about this growth spurt in green building and what the late adopters need to do in order to future-proof assets, increase return on investment and learn about how responsible investing is influencing the way buildings are constructed and operated.

4. The Value-Chain Track

From products to procurement and 5G to 3D, the value chain is being disrupted. In a digital world where a waste economy is emerging and everything has a carbon footprint, how are products and procurement methods adapting? We will explore what the built environment sector will need to take into consideration to prepare for the Fourth Industrial Revolution.

5. The Cities Track

In South Africa, cities deal with a lot of historical challenges, so how do we reimagine our cities to be inclusive, diverse and vibrant spaces reflective of a democratic economy? Join us as we take an in-depth look at cities: circular cities, sustainable infrastructure, urban planning and design, urban mobility and connectivity, public spaces and more. +

SIGN UP: www.gbcsaconvention.org.za

KEYNOTE SPEAKER JASON McLENNAN

Belgotex is proud to introduce Jason F. McLennan to Convention 2019 he is considered to be one of the most influential individuals in the green building movement today. McLennan's work has made a strong impact on the shape and direction of green building in the United States and Canada and he is a much sought-after presenter and consultant on a wide variety of green building and sustainability topics around the world. McLennan serves as CEO of the International Living Future Institute – a leading NGO that focuses on the transformation to a world that is socially just, culturally rich and ecologically restorative. He is also the founder and creator of the Living Building Challenge, widely considered as the world's most progressive and stringent green building programme.





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resilience

(n.) the ability to adapt and thrive in the face of adversity

I attended the GBCSA's first ever Green Building Convention a little over a decade ago. I remember the hype and the excitement. We had all heard about this elusive concept called "climate change" (which was much like our elusive understanding of mobile phones in the 90s) but now were starting to understand how much the built environment was contributing to this very real problem - the well-cited statistic is that buildings world-wide contribute to around a third of carbon emissions through their construction and operation, and consume half the planet's energy and resources. This is not directly a climate change problem (move over, naysayers), it is an anthropogenic one, and quite simply undeniable. I have heard various forms of these statistics cited so many times since then, it almost elicits an eye-roll. But I stop myself and remember that many don't yet understand that it means built environment professionals have a key role to play in leading the change. And I am encouraged to see this understanding rapidly changing at an ever-increasing rate as the years go by.

In those first few years, we were so excited about the idea of adding solar panels and wind turbines to our buildings, among other "green" gimmicks. "How is it that so many of our modern buildings are unhealthy to live/work in and do not have enough sunlight and fresh air?" we asked ourselves, adjusting our designs accordingly. But it soon became clear that "sustainability" itself was just another buzzword at the time, and the depth of understanding of what it really means to build green, was yet to grow.



"Resilience" came into conversations more and more. We spoke about future-proofing our buildings by designing them in such a way that they can stand up to the disruptions and crises that climate change brings. And then the crises actually came...

Most will remember well the first bout of load shedding we had in South Africa around 12 years ago. I had just started my first job as an architect and we thought it was somewhat of a novelty. It came and went, and we went back to our business as usual. But then the load shedding returned to haunt us time and time again over the years to follow. And what happened? Businesses energy-proofed their buildings by installing solar panels and the cost of solar PV plummeted, making the business case for PV-installation a strong one (see page 46 on microgrids). And then Cape Town experienced a water crisis in the summer of 2017/2018, and I found myself showering with a bucket (I still do). The reality hit home. We scrambled to decrease our daily water consumption as much as possible - we were buying time. Time until the rains came. And they did, in abundance. So, many put their buckets away and went back to using the same amount of water as before or drilled boreholes to save municipal water (as if wasting ground water is somehow okay). But some businesses went back to the drawing board and they looked for ways to reduce reliance on the municipal water grid (see page 68 about some net zero water projects).

Then waste came onto the radar when we discovered that it's estimated that there will be more plastic than fish in the ocean by 2050. Consumer pressure on retail companies has called for a ban on single-use plastics, but we need to completely change the way we produce and consume. The answer for me is not: use as much as you like as long you recycle. It is: use wisely, consume less, consume differently (even though it might be inconvenient). But an even more wide-spread problem is plastic pollution which really comes down to human (bad) behaviour. On page 58 we profile some projects that are addressing waste in leading ways.

We'd be short-sighted not to mention that South Africa's current economic status is just short of a crisis. It is encouraging to see in the GBCSA's latest cost of green report (see page 44) that the business case for building green is a strong one, which to me, shows that resilient sustainable design is what will future-proof our buildings and cities. On page 26 we discuss how nature can work in symbiosis with, and enhance, cities. Book your tickets for the 2019 GBCSA Convention, *Beyond: Shaping Cities of Tomorrow*.

It seems that crises beget innovation and action, and that they inspire resilience too. Sixteen-year-old Swedish teenager and climate change activist, Greta Thunberg said: "I don't want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. I want you to act. I want you to act as you would in a crisis. I want you to act as if the house is on fire, because it is." I've decided though, that I want to be hopeful too. +



Mary Anne Constable

Editor www.thepaperarchitect.com

Sharon McCutcheon - Unsplash

Resilience

Sustainable Strategy comes to life

Many corporate boardroom discussions revolve around bringing strategy to life, and creating a company that embodies its vision and values in a way that is tangible for everyone to see and experience. And yet not many achieve this in the way that Exxaro, one of South Africa's largest and foremost black-empowered resource companies, has through the development of their new head office, The conneXXion.

WORDS Nicole Cameron

Jogjee Botha from Elision Agency



Developed and owned by Growthpoint Properties on the prime Lakeside office site, directly opposite the Centurion Gautrain Station, the 5-Star Green Star-rated building occupies a notable scale, with five storeys of offices atop four levels of structured basement parking. This creates excellent visibility for the new ultra-modern landmark, the design of which envisions a culturally rich and expressive building, encouraged by the philosophy of *ubuntu*: “I am because we are”, says Adrian Maserow of AMA Architects. “The 18 500m² building aims to be generous in its spatial poetic and urban scale; its curvaceous form, and a seamless boundary experience with pedestrian pathways also links it to public transport. Through generous fluid spaces, the presence of the Highveld sky forms abstract cloud-like patterns reflected in the curves of the glazed ‘canvas’. The building’s layered, fluid form flows uniquely as a physically shared vision of connected spaces with rounded volumes.”

Maserow goes on to explain that the interiors of the building are designed to reflect rich earth patterns and geological veins, fissures and grains, seeped in the stone and timber interior surfaces. “Indigenous buildings in Africa are soft, tactile, handmade and crafted through their roundedness and fluidity, and this architecture reflects these qualities with its sweeping lines, guiding its users through a visceral experience.”

“The building is absolutely beautiful, both on the outside and inside,” says Marina Pretorius, who led Change Enablement for this milestone project at Exxaro. “It is uplifting and inspiring as a workplace. But more than that, it has been created to be an asset to the organisation, and it supports our diversified strategy and all the many changes that the company is

embarking on, in every way,” she adds. In 2016, Exxaro – traditionally a coal-producer – made the decision to venture into, among others, alternative energy solutions. While they still focus on the sustainable production of coal, they are expanding their strategy to look at the needs of the future, with innovation and consideration for carbon emissions reduction at the forefront. And that is represented in the building itself.

LEADING INNOVATION

Working with the development’s appointed green building professionals, Aurecon, the design team has incorporated several environmentally sustainable initiatives into the building, explains Louwna Joubert, the accredited professional for this project. Green measures include a performance-glazed façade, zoned lighting, energy-efficient building services and systems, water-efficient fixtures, rainwater harvesting, water-wise landscaping, low VOC interior finishes, abundant fresh air and natural light, as well as a hydro panel that generates water from air. It has dedicated parking for more fuel-efficient vehicles, such as hybrids, electric cars and scooters, as well as secure bicycle racks. Learning resource screens positioned in the public areas of the building show the real-time energy and water consumption of the building.

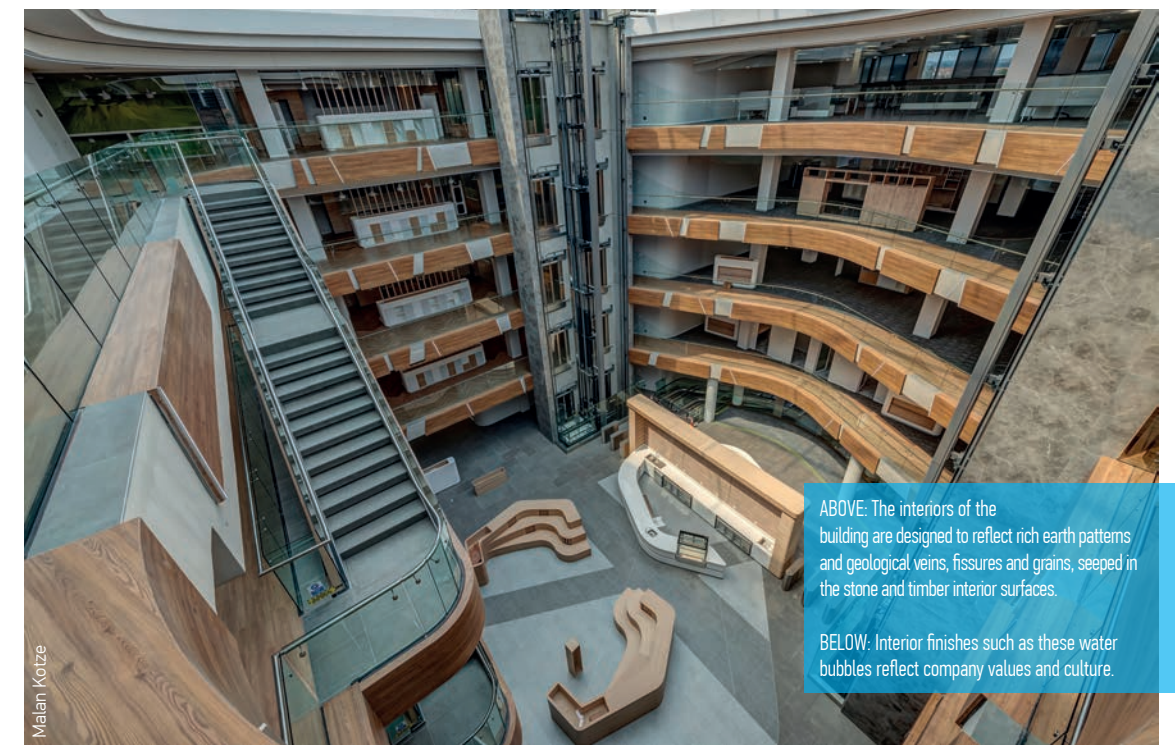
Even the bathrooms are innovative. The building features an on-site nutrient recovery urinal, the winning idea of the Greenovate Engineering Award in 2017. “This captured urine is then used in the production of fertiliser,” says Aurecon’s Yovka Raytcheva-Schaap. “This is not something that has been done in any other commercial building in South Africa and demonstrates



The building is a powerful new landmark in the Centurion corridor which is earmarked for further development.

Joggie Botha

Through generous fluid spaces, the presence of the Highveld sky forms abstract cloudlike-patterns reflected in the curves of the glazed “canvas”.



Malah Kotze

ABOVE: The interiors of the building are designed to reflect rich earth patterns and geological veins, fissures and grains, seeped in the stone and timber interior surfaces.

BELOW: Interior finishes such as these water bubbles reflect company values and culture.

“We design buildings to attract people to them; our designs must speak of community, the hope of its people and the technology that enables it.”
Gerald Pereira



Malah Kotze

an amazing use of waste.” She says that another innovation for local green buildings at The conneXXion includes the installation of sensors on the perimeter of the building to detect any underground domestic water pipe leakage. This ensures corrective action can be taken at the earliest intervention and water wastage reduced. “Another important differentiating factor was the early appointment of the facilities manager – to take part of the design development and commissioning of services. There are confirmed benefits in having this key appointment provide input into the systems being designed and understanding them from the beginning, rather than coming in at the end of the project,” Raytcheva-Schaap explains.

THE BIGGEST ASSET

It is perhaps as one proceeds through the welcoming triple-volume entrance and reception area, which opens onto an airy atrium soaring upwards through the core of five floors of efficient workspace, that the Exxaro brand values start to really shine through. “If our workplace is an asset, it is because our employees are our most

important asset, and so their wellbeing is of utmost importance,” explains Pretorius.

At The conneXXion, every detail has been attended to in creating a unique space where staff members can flourish. “The activity-based work design is a fundamental part of the interior design. Exxaro went through a participative process to identify what type of work employees typically engage in daily, and then created the appropriate spaces to facilitate those activities. The plaza is an informal meeting and pause area; it’s very visible and speaks to our culture of open and connectedness. The office hustle and bustle is centred around this area, with the design moving outwards towards more formal meeting and workshop areas, printing facilities and finally to the ‘hives’ which are the actual workspaces. Employees were engaged with throughout the journey and could collaboratively select certain features of their workspace design. The open staircases in the centre of the atrium promote physical activity, and the extensive verandah is located next to the café selling healthy food options and inviting employees to enjoy their meals away from their workspaces.”



This innovative urinal (left) captures urine and stores it to be processed into fertiliser. The idea won the Greenovate Engineering Award in 2017.



In addition to the GBCSA's Interior Fit-Out rating, The conneXXion has been designed according to the international WELL Building Standard, the first rating system to focus exclusively on the impacts of buildings on human health and wellness. Guiding project teams through the development of a custom scorecard, the concepts of air, light, sound, community, water, movement, materials, innovation, nourishment, thermal comfort and mind are prioritised, with each element including a number of features that need to be met in order for the standard to be verified. At the time of going to print, the team were gearing up for their verification process.

"Internationally, research has proven the case for green buildings, not only as a result of cost savings, but also, due to the significant increase in employee productivity," says Michiel Gerber, development manager at Growthpoint Properties. "The Growthpoint Thrive Portfolio is confirming the case in South Africa,

and is delighted to introduce this superbly located building to its portfolio, which is in tune with top commercial buildings in the world's most prominent urban centres."

While mid-year is the date for Exxaro to move its 600 employees into the building, they have been taking staff members in small groups to see the progress. Tshimo Kgomanyane, from Corporate Communications, explained her reaction to the building: "When I saw it I thought, wow, everything that has been communicated to us from leadership about the company's strategy, is right there. It is something we can see, feel and touch and it is so much more than just a stunning building."

"We design buildings to attract people to them; our designs must speak of community, the hope of its people and the technology that enables it, says AMA Architect's Gerald Pereira. "We are so glad that The conneXXion's architecture of merit is the physical expression of the dreams and ambitions of Exxaro." +



The conneXXion has many sustainable features, not least the extensive rooftop solar system which provides renewable energy to the building.

Joggie Botha

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As the **green consultant** for **Pran Boulevard** on Umhlanga Rocks Drive, we implemented a cooled-air HVAC system, water-efficient sanitary fixtures and water-wise landscaping. This resulted in the development receiving a 4-star Green Star rating.



A Catalyst for Green

The first commercial building to open its doors in a new green precinct in Dunkeld, Johannesburg, called Oxford Parks, is targeting a 5-Star Green Star Office Design rating. Despite its striking glazed silhouette, the building is fully bedded into the precinct through an integrated pedestrian realm – showing that “green” is more than just a single building, but also a neighbourhood goal.

WORDS Melinda Hardisty





As the impetus for the building sector to become more environmentally sustainable increases, it is becoming apparent that looking at individual buildings outside of their context is not nearly as effective as considering entire neighbourhoods and networks collectively. The old adage that we can do more together than we can apart is still relevant when it comes to individual buildings sharing infrastructure, services and network to becoming sustainable neighbourhoods that have a positive impact on their shared environments.

Oxford Parks is a new 300 000m² mixed-use sustainable precinct in Johannesburg. The developers are aiming to target a 4-Star Green Star – Sustainable Precincts certification but have not yet registered the project. dhk Architects was commissioned by the Oxford Parks Property Owners' Association to set up the urban design framework for the area and to develop the Dunkeld Public Realm Design Manual – a guide which seeks to ensure a high quality and comfortable pedestrian network is retained as other developers come on board and the precinct progresses.

Developing precincts in this way enables the forward planning and ongoing control and management that facilitates the sustainable operation of building networks in a shared environment. dhk explains that Oxford Parks will conform to the required rules and regulations of the GBCSA tool, including aspects of management, indoor environment quality (IEQ), energy, transport, water, materials, land-use and ecology, emissions, and innovation.

Phase 1 of the project, once complete, will include five buildings on a shared podium and parking basement. dhk is responsible for the entire basement

and podium as well as three of the five buildings; namely the new Life Healthcare headquarters, Arup's new offices, and a hotel. GLH are the architects for the balance of this phase, including the first building to be operational, the new commercial office block that is largely occupied by BP Southern Africa. Known as 199 Oxford, the building which is targeting a 5-Star Green Star Office rating, opened its doors in December 2018.

199 OXFORD TAKES THE LEAD

199 Oxford forms the south east corner of the precinct and is sliced into a sharp, angular shape by a pedestrian route that extends to Oxford Road and draws pedestrians into the heart of the scheme. GLH explain that the sleek, glass and natural stone exterior aims at being both modern and timeless, while also feeling open and accessible. The main elevation facing Oxford Road is mostly a clear, double-glazed façade



As green building principles extend into the public realm in alignment with market demand, developments like Oxford Parks are becoming significant catalysts for positive change and urban regeneration.

Solid Green Consulting



An artist's impression of the strong pedestrian axis off Oxford road, between 199 Oxford and the proposed hotel.

dhk Architects



An artist's impression of Oxford Parks in its leafy suburban context.

with a high-tech electronic blind system that tracks the sun and keeps the internal spaces comfortable throughout the day. Implementing strategies that benefit building occupants, such as prioritising thermal comfort, natural light and fresh air, usually translates to a higher level of performance and fewer staff sick days.

With regards to achieving its Green Star rating, emphasis has been placed on designing to reduce energy and water consumption at every level. Water saving fittings and fixtures have been installed throughout. High-tech irrigation systems that measure moisture and rainfall and adapt accordingly are paired with rainwater collection to reduce potable water waste.

PHASE 1 BUILDINGS

- Building 1: BP/Intaprop/Thebe – Targeting 5-Star Green Star Office
- Building 2: Life Healthcare – Targeting 5-Star Green Star Office
- Building 3: Tenant unknown – Targeting 5-Star Green Star Office
- Building 4: Hotel – Targeting 4-Star Green Star Custom Hotel
- Building 5: Arup Headquarters – Rating target unknown

A Watercourse Pollution Credit is also being targeted which requires storm water to be reused, and the overall runoff from the site into city storm water systems is to be reduced.



The future headquarters of Life Healthcare alongside the new 199 Oxford building.

dhk Architects



Occupation sensors, low-voltage light fittings, and state of the art HVAC systems are all carefully controlled and monitored by a BMS system so that energy usage can be measured and constantly improved. An energy model of the building was created in the design stages to ensure a high performance level was attained.

Before demolition and construction could commence, a Waste Management Plan (WMP), Environmental Management Plan (EMP), and a Hazardous Waste Management survey (on existing buildings) had to be prepared. Now that the building is operational, recycling is prioritised, with a shared waste facility in the basement.

A PEDESTRIAN PRECINCT

The innovation of the building cannot be separated from the fresh approach that is outlined in the precinct's design guidelines. The focus on pedestrians means that walking to and from the area and within, is easy, comfortable and pleasant to navigate. The precinct aims to capitalise on the existing energy of the Rosebank area – already a mixed-use hub with an ever-increasing focus on pedestrianisation, due both to the proximity of the Gautrain Station and its function as a central hub for other modes of public transport. With Illovo being another office hub, Oxford Parks is a natural connection between the two zones. In this way, the precinct aims to serve the surrounding areas as well.

The ground floor of 199 Oxford is largely given over to retail space in an effort to activate the street level and maintain the pedestrian focus that the precinct is designed around. The large, easily navigated paved areas and stairs, as well as building setbacks that provide cover for pedestrians, serve to further emphasise that this is a space focused on people, not motor vehicles. A large atrium space invites people in and serves both reception and lounge functions as well as access to vertical connections between floors.

Often a big concern in our city developments, safety



199 Oxford's pedestrian friendly street edge.

and security has been implemented without walls and fences that would hamper the free-flowing walking routes. This “soft security” strategy implements camera surveillance and security patrols but also utilises the old idea of “community surveillance”, where public spaces are easily visible to people living and working in the area.

Bethuel Motseta, from GLH Architects, says that one of the overall successes of the project as a whole, and therefore the individual buildings as well, is the “overwhelming drive of the precinct principles aiming at city integration”. This may not seem like “innovation”, since cities evolved as integrated networks for centuries before industrialisation created noisy, smelly factories and the advent of the private motor vehicle. The modern urban planning notion of separating zones of activity across a city only came about in the late 19th century. The idea of city nodes grouping certain industrial and commercial functions, and of people who worked in those spaces commuting home to a utopian, suburban environment, became popular. Cities were laid out with these distinctly separate zones, connected by large-scale networks of highways. The mixed-use urban fabric, and the human-friendly city environment was replaced by an environment of soul-less highways and energy chewing private cars. So, the new return to urban planning ideals of the past, but in a modern society, is actually innovative and forward thinking.

With its basement parking garages, the scheme aims to take the vehicle traffic below ground, freeing up the ground level for human connections. The ideal scenario is that fewer people will require private vehicles for their daily commute. The precinct is ideally situated near the Gautrain station, a major taxi rank, and metro bus stops, with future plans to bring the Rea Vaya bus system to Rosebank as well. There are also shops, restaurants, banks, schools, doctors, and many other services within an easy walk from the new office buildings, enabling people to run daily errands without their cars.

As the precinct develops, and several residential buildings are added, it is envisaged that people will be able to live, work and play within the same area. This huge reduction in private car travel will, of course, reduce environmental impact as well. Residential developments will increase the density of the area and allow more people to live nearer their place of work. Jennifer Johnson, of Intaprop, highlights that an “Inclusionary Housing [policy] has been adopted by Council [and] Oxford Parks will follow the requirements stipulated”. The policy, in broad terms, requires that a percentage of units in residential developments are required to be accessible to lower income residents. So the urban precincts of the future are not only looking to be more environmentally sustainable, but also socially more cohesive as well.

Precincts like Oxford Parks are pushing boundaries to create a new “green” city plan. They are looking beyond their own boundaries and asking what they can offer to their neighbours, while also challenging others to follow their lead. By pushing innovative and technological boundaries at every step, these schemes will only get better with each new development. ▶▶

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TRAILBLAZER IS STILL SETTING THE PACE

BP Headquarters, 19 Dock Road (V&A Waterfront)

BP Southern Africa is settling into their new Johannesburg home in the Oxford Parks precinct. However, this is not the first time they have chosen to prioritise environmental sustainability in their buildings. In 2000, BP launched their new Helios logo, named for the Greek sun god, evoking connotations of natural energy and nature. Their “beyond petroleum” brand position is recognised as being significantly different from the usual industry standards and stands on four pillars; “innovation”, “progressive”, “performance”, and “green”. Apart from petroleum, they have diversified into alternative energies, like wind and biofuel.

Environmental and social impact considerations are high priority when they embark on new projects worldwide and this extends to their choices of corporate office homes as well. In 2005 BPSA moved into their Cape Town headquarters at the V&A Waterfront. At a time when no official green ratings existed, the campus was still designed to be the building industry leader in terms of sustainability.

From the early stages of the design, resource use and the related environmental and socio-economic impacts were carefully considered in conjunction with a Resource Efficient Design (RED) brief, prepared by Arup (Pty) Ltd. Low energy consumption targets were set and at least 10% of the energy used had to come from renewable sources. To meet this requirement, thermal solar panels and photovoltaic cells were installed on the roof.

Water usage had to be limited to at least 20% below an equivalent conventional building, and this was at a time before the spectre of “Day Zero” gained public attention. Greywater and rainwater are harvested for use in ablutions, strict environmental and waste management plans were followed during the construction period, and once the building

became operational, staff members were trained to use new systems that helped them to reduce and recycle everyday waste.

High performance façade and skylight systems, in conjunction with specialised shading devices and light shelves, keep the interior spaces comfortable and place less pressure on HVAC systems. A Building Management System (BMS) manages climate control, and monitors electricity and water usage. This ensures the systems run optimally, alerting to maintenance requirements and highlighting areas where there is room for improvement. André Theys, Executive Manager of Operations at the V&A Waterfront, says these systems do “require a higher operating and maintenance regime but this is outweighed by the lower carbon footprint [and] lower water and energy costs”. The solar photovoltaic system is reaching its end-of-life stage and plans are in place to replace the system in the next financial year.

The building won the SAPOA Award for innovative office development in 2005. Ten years later, the performance of the building was assessed again and awarded GBCSA’s 4-Star Green Star rating for existing buildings. The V&A Waterfront, as a precinct, continues to strive to prioritise sustainable development. So, the BP building is in good company with several green star rated neighbours, including the first 6-Star Green Star Office V1 As Built rated building in South Africa, No. 1 Silo. Points awarded towards 19 Dock Road’s overall star rating achievement were not only derived from the building itself but also from the precinct’s approach to maintenance, waste minimisation, site management and landscape management. This highlights again how a shared vision and implementation makes it easier to achieve sustainable results in individual buildings. +



Previously the BP headquarters at the V&A Waterfront (now the V&A head office), this building was a green building before green buildings officially existed.

Mary Anne Constance



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Creating places and spaces for people to work, live and play

The Johannesburg Development Agency (JDA) is an area-based development agency, with a social, economic and environmental mandate to develop resilient, sustainable and liveable urban areas in identified transit nodes and corridors. They have been responsible for spearheading and delivering the City of Johannesburg's strategic projects since inception and have undertaken over 500 projects emphasising the renovation, innovation and re-imagining of the city's built environment and urban communities. This has been through a reinforced programme of placemaking and area-based development across city, precinct and neighbourhood scales.



Every area-based development undertaken by the JDA is supported by development facilitation functions in the pre-development and post-development phases to enhance the value added by the capital works interventions and improve the longer-term sustainability of the capital investment.

The JDA focus on working with stakeholders to enhance areas and address local challenges and needs in a sustainable way; ensuring that they draw on local knowledge of the development context and co-produce solutions that cultivate a sense of ownership, civic pride and citizenship.

The JDA implements capital projects across a variety of programmes aimed at achieving the following:

- Catalysing growth in areas with latent investment potential.
- Creating robust democratic public spaces that give dignity and choice to city users.
- Connecting people with opportunities to live, work, play, learn, and be healthy in the city.
- Co-producing solutions in partnership with local communities and stakeholders to meet local needs and mitigate challenges.

Some examples of some of the spaces the JDA has taken the lead in, include:

THE JABULANI NODE

The Jabulani node is fast becoming a symbol of how catalytic intervention and strategic capital investments in areas that have been previously marginalised, or have failed to attract private investment, can unlock development potential, stimulate local economies and

boost job creation and entrepreneurial activity. The development is entering Phase 6B and has become one of the City's signature projects for using transit-oriented development (TOD) to attract investment into an area, while improving the quality of life of local residents.

Phase 6B entails the development of a community and recreational environment for people of all ages consisting of a Jabulani Community Facility and a SAFA Safe Hub. The Jabulani community facility will consist of a multipurpose hall with a basketball court, changing rooms and tiered seating, a library, counselling facilities, offices and meeting rooms which aligns with the JDA's principle of creating public spaces which are creatively designed and are adaptable and support multiple uses and ensure their longer-term sustainability.

The SAFA Safe Hub element of the building will consist of changing rooms, internal and external entertaining spaces, a kitchen and coffee bar, workshops, computer/IT rooms, a training centre and other amenities. The SAFA Safe Hub is part of a national vision in creating a change in South African Football, in order to reach the goal of the national teams being consistently in the top 3 teams in Africa and the top 20 in the world.

Phase 6B's development will supplement the various developments that have taken place so far. These include Jabulani Views – the new residential apartments, Jabulani Mall, the acclaimed state of the art Soweto Theatre, as well as a 300 bed hospital, all of which are conveniently located next to the main BRT route running through Soweto and connecting with Johannesburg's CBD.



Metro Park, Newtown - The R16-million Metro Park was opened in the commercial and residential hub of Newtown, to offer a social and recreational space to inner-city workers and residents who do not have the luxury of green spaces. The park was recognised by the South African Landscapers Institute (SALI) as an excellent example of construction design at the annual South African Green Industries Council convention.

Jeppe Park Upgrade - The construction of Jeppe Park, a gathering place for families, social groups and a place to get healthy and fit, started in December 2017. The upgrade of Jeppe Park consist of natural, semi-natural, planted space set aside for human enjoyment and recreation for the protection of natural habitats - a space for health fitness. It features grassy areas, rocks, soil and trees to provide an intrinsic environmental space.

Westbury Transformation Development Centre (WTDC) - Once complete, Westbury Transformation Development Centre (WTDC) will boast the tallest green screen wall and incorporate green building elements such as double glazing and rain water harvesting.

The upgrade of the WTDC is an inspiration that will provide opportunities for social interaction and cater for different sporting codes as well. It will also have an early childhood centre and a number of retail opportunities will be identified, including a bakery and sewing room.

#ARTMYJOZI

Since 2017, the JDA has revived its commitment to art by launching the #ArtMyJozi campaign along the transit-oriented development corridors in Johannesburg. This is a co-design and co-production process of public placemaking through arts that engages local communities and artists in the enhancement of their neighbourhoods. It is aimed at the creation of functional placemaking elements (seating, lighting, play equipment, etc.), which all have a public use and are simultaneously reflective of local histories, local popular culture and a rich diversity of symbolism, to which other local communities can relate. #ArtMyJozi has developed a multi-stage creative journey along the corridors, consisting of creative exchange workshops, creative events in public, local production and design workshops. In Noordgesig, the #ArtMyJozi campaign has facilitated co-production within the JDA's design and implementation of the Noordgesig Social Cluster. These processes have now been translated into the implementation of functional placemaking features and a series of public art murals. Members of Noordgesig's artistic community who have been involved in the #ArtMyJozi process have also received training in how to run creative arts businesses in the future.

The JDA maintains that the key to sustainable development lies in its efforts to always seek to engage the public in a meaningful way at every stage of development. This includes doing public participation in the planning stage, consultations with communities and affected parties during design stage, and value-adding activities involving community members in projects such as the peoples' history, heritage exhibitions and public art projects that tell the story of the neighbourhood. This is the secret to cultivate a sense of ownership, civic pride and full utilisation of their development projects. +

PARTNERING FOR GREEN PLACES AND SPACES

While the revamping of existing parks, and establishing of new ones is chiefly a function of Johannesburg City Parks and Zoo (JCPZ), the JDA has been playing the role of a major partner in upgrading and creating a number of new parks. These include:

Cities working with nature

The international Extinction Rebellion protests show the misnomer “climate change” is getting personal. As our cities rapidly expand, so does our appetite to extract value from the ecosystems supporting our fragile standard of living. Yet taking advantage of nature’s benefits to our urban lives is what will maintain our lifestyles, while also making better greener cities.

WORDS Alan Cameron



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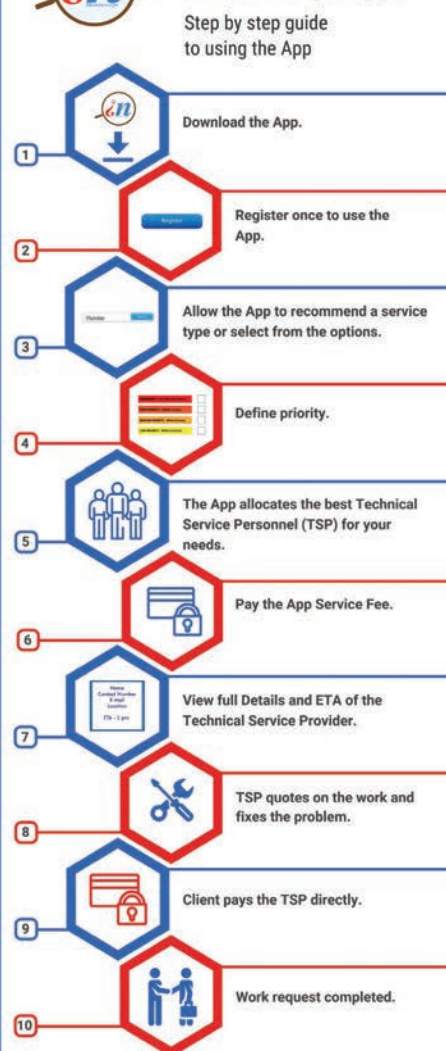


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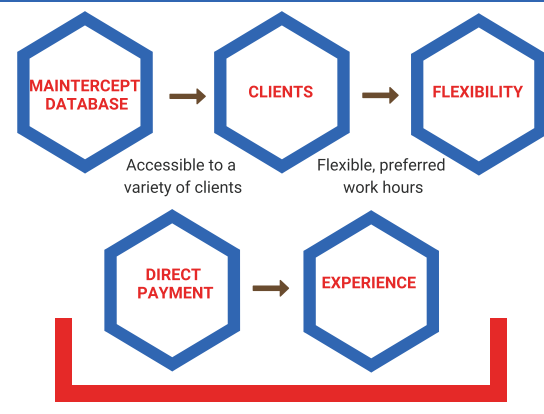
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A single tree can have a cooling performance of up to ten standard air conditioners by exhaling water vapour through their leaves, according to the US Department of Agriculture. By cooling the environment, trees help reduce the normally higher temperatures of urban areas, and so make them more comfortable to live in.

Civilisations have always been critically dependent on what we now term, ecological services. These services provide our food and water, regulate our climate, support life on earth, as well as non-material benefits such as aesthetic inspiration. Naturally, they are complementary. Among other benefits, trees provide food, support local ecosystems, reduce air pollution, aid stormwater control, improve water quality, act as carbon storage, and provide shade.

"The shade from trees is crucial to promote pedestrianisation," says Werner Mulder, head of sustainability at Attacq. "Up to a third of urban traffic between peak hours is caused by internal city traffic and drivers looking for parking. What if they don't have to park because they have walked from their office to their meeting place?" But for people to walk, the areas must be clean, safe and shaded. "Spaces must be comfortable to walk in. That's why you see so many trees in Waterfall City," he adds.

advocates Mulder. Encouraging commuters to only "park once", when they arrive at work, reduces the required road space.

Yacov Zahavi, a renowned transport specialist, found that commuters were often comfortable with only one hour of total travel per day. This personal travel time budget can be seen in the size and shape of urban nodes, many of which remain "one hour wide" by virtue of their use. By example, Cape Town's notorious congestion levels helped suppress decentralised-Clairemont's vacancy rates of R220m² A-Grade office space to 3% during Q2 2018. In Waterfall City, an active pedestrian culture will enable it to comfortably increase its density levels. "And investors see fewer cars on the roads as a sign of space for more developments," adds Mulder.

Increasing population densities is key to South Africa's cities becoming more environmentally sustainable. After all, the bigger, more biodiverse our green spaces are, the larger the load carried by ecosystem services and the greater the financial benefit to its ratepayers.

ECOSYSTEM SERVICES SUPPORT CITIES' FUNCTIONING

"People want to live in a safe environment, enjoy a good quality of life and make a sustainable living. Cities around the world have recognised that healthy and functioning ecosystems within and around urban areas contribute meaningfully towards these desires," says ICLEI Africa's Dr Ernita van Wyk.

Ecosystem services become even more impactful at a city-wide scale. Our 6.5 billion-person planet will support an extra 2 billion urban dwellers within 21 years. Half of which will join our urban poor. "Is our land and urban space able to absorb this growth?", asks Richard Foreman in his book *Urban Ecology Science of Cities*.

WALKING: LIGHTER, QUICKER AND CHEAPER

Using ecosystem services to encourage walking is saving Attacq, owners and managers of Waterfall City (a new commercial hub in Gauteng), hard capital and ongoing costs. "It's the pricey parking on the third subterranean level that we now don't have to build and the business case for ground floor retail space that is strengthened by passing pedestrian traffic,"



Once a crime hotspot, The Wilds in Houghton, Johannesburg, was transformed into an inspiring indigenous park, which now benefits the city's residents.

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“It is found that programmes that facilitate positive interactions with nature foster the development of community identity, bring people from different backgrounds together, increase social inclusion and build stronger communities.”

“We are witnessing two big changes: easily visible urbanisation, and the downgrade of natural systems, only noticed when our freshwater dries up, biodiversity plummets, climate changes, soil thins and unpolluted spaces disappear,” he says.

Until 2021, Stats SA expects Gauteng and the Western Cape to respectively grow by 574 and 170 people each day, and most will settle in Johannesburg and Cape Town.

In the 1960s, Rachel Carson’s book, *Silent Spring*, documented the case against indiscriminate pesticide use and environmental apathy. Today our car windshields do the same, showing far fewer insect splats than in the past. This small, daily reminder reveals the scale of disturbance we cause our ecosystems.

Is this pesticide use, or any unsustainable development practice justifiable? It seems the Latin quote: “*Quod me nutrit, me destruit* [What nourishes me, also destroys me]” is not only a tattoo Angelina

Jolie has below her navel, but a sentiment seen in the shortsighted attitude involved in rezoning and developing green spaces to increase the rates base or clear a crime hotspot. After all, how can our cities and citizens properly benefit from the ecological services green spaces provide if we allow them to shrink in size and number?

“It’s naïve to think that we can afford to disregard nature’s benefits in how we live,” says Mark Saint Pol, director at Square One Landscape Architects. “There is something about the human condition that loves nature, it is known as biophilia.”

GREEN SPACES GIVE HEALTH, AND BIND COMMUNITIES

Far beyond our simple enjoyment of it, it is found that access to healthy green spaces with abundant biodiversity is directly linked to improved health for individuals and communities. Studies show both short- and long-term health benefits are available by spending time in nature, including an improved immune system, quicker recovery from illness, help in treating depression, and reduced stress. And, interestingly, the more diverse the ecosystem, the greater the benefits received.

“Playing outdoors advances cognitive development, ability to learn and absorb information, assists with physical development, development of imagination and ability to explore. They find that access to active self-directed play in nature is fundamental to healthy childhood,” says van Wyk, citing World Urban Parks’ research findings. ▶▶



Green Point Urban Park in Cape Town is a natural gem built over a portion of the Green Point Common (which also contains the 2010 FIFA World Cup Cape Town stadium and a golf course, among other recreational facilities). The park has transformed this once wasteland into a public urban sanctuary.

Mary Anne Constable



Square One Landscape Architects

Merriman Square on the Cape Town Foreshore is an example of an “urban sanctuary” within the hustle and bustle of the urban city centre. In exchange for developmental rights above an important but outdated urban square, Redefine Properties appointed Square One Landscape Architects to redesign this public open space. Within the square, sustainable urban drainage systems become the structuring elements for public place-making while facilitating convenient pedestrian movement and connections to the public transport network.



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What is more, a community's ability to adjust to challenges and ride out external stressors and disturbances because of social, political and environmental change is, logically, also linked to health and rich ecosystems. It is found that programmes that facilitate positive interactions with nature foster the development of community identity, bring people from different backgrounds together, increase social inclusion and build stronger communities. This is being seen in Communitree's work where crowd-sourced volunteers plant verges, traffic islands and other peripheral public spaces with indigenous fynbos to strengthen biodiversity between ecological hotspots in Cape Town.

Landscape ecologist, Richard Forman, describes the urban area as a mosaic of natural systems and advocates their connection via continuous links of "patches and corridors" that enable a city to grow around the existing natural systems.

CITIES DOING IT FOR THEMSELVES

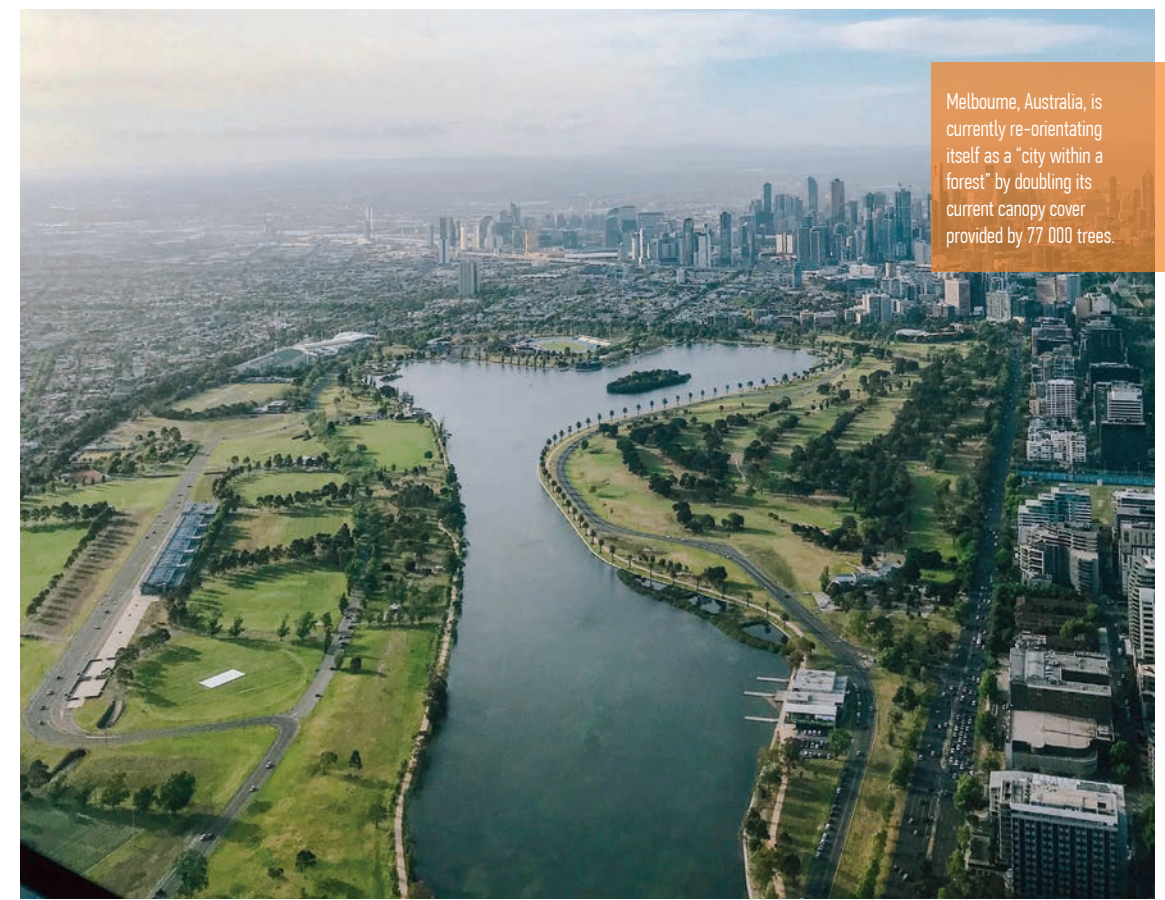
In eThekweni, a 2017 World Bank report valued the Durban Metropolitan Open Space System (D'MOSS) to be worth R42bn to local municipal authorities each year, with a total asset value of between R48-62bn. Started in 1982, D'MOSS is a spatial layer interconnecting open spaces across 94 000 hectares of green corridors, helping soil to form, controlling erosion, supplying water, regulating the climate, creating cultural and recreational opportunities as well as providing raw materials for craft, building, food production, pollination, nutrient cycling and waste treatment.

In a similar manner, the extensive tree canopy of Johannesburg and parts of Tshwane encourage ecological corridors and enable the benefits of a heavily wooded area. Studies show trees remove thousands of tonnes of air pollutants each year. Residents benefit enormously. Conversely, the cost associated with outdoor pollution is substantial. In the UK, the annual mortality burden from exposure to outdoor air pollution is equivalent to around 40 000 deaths. These costs add up to more than R366bn every year.

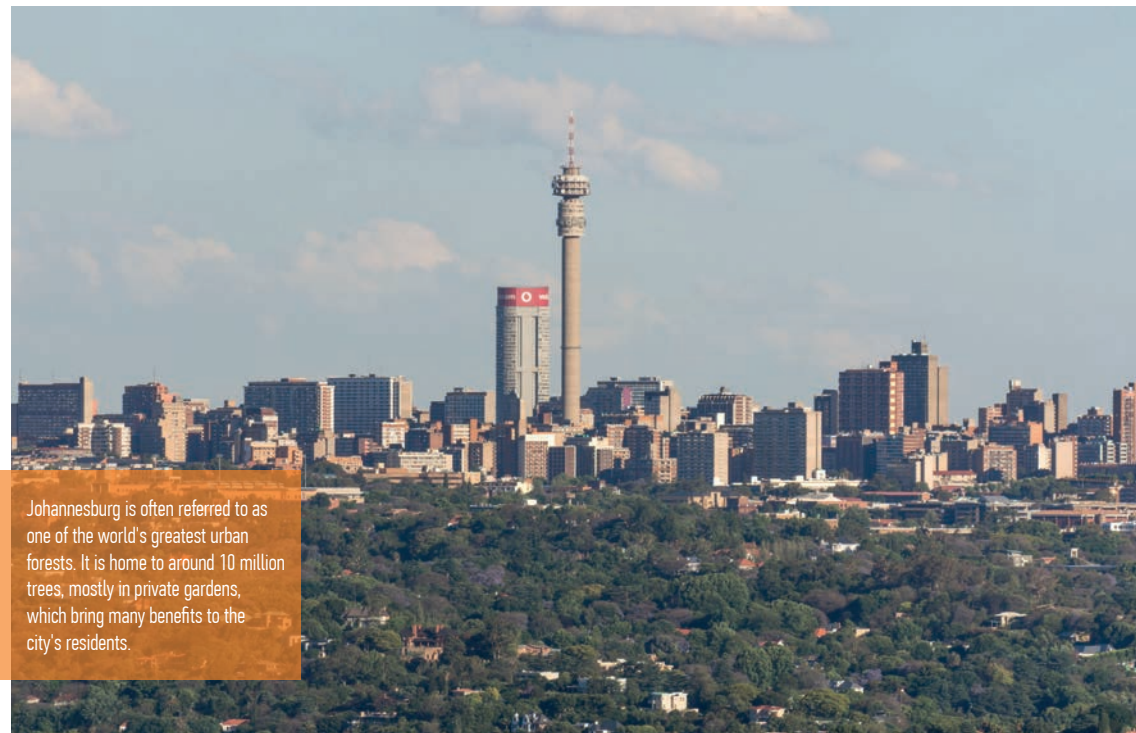
Saint Pol points to Melbourne, Australia, which is currently re-orientating itself as a "city within a forest" by doubling its current canopy cover provided by 77 000 trees. In part, this is to mitigate against its urban heat island effect becoming more extreme, as it is currently 7 °C above the norm, and impetus is added when considering a business-as-usual climate change scenario would contribute an average 3.4 °C rise in global temperatures. "By considering our city as a wider ecosystem, there is the opportunity to actively foster connections amongst people, plants, animals and the landscape," says a report examining the importance of functioning ecosystems in the Greater Melbourne area.

Wuhan's Nanganqu Park is a popular large public open space of 3.8km², re-engineered after disastrous flooding affected the Chinese city. As a "sponge site" it absorbs rainfall using rain gardens, grass swales, permeable pavements, ponds and wetlands; channeling it into storage tanks.

In Bangkok, Chulalongkorn Centenary Park is built to retain water run-off from a 100-year flood. It can hold more than a third of the dams on Table Mountain combined, is almost 4000m³, and creates a 1.3km-long



Melbourne, Australia, is currently re-orientating itself as a "city within a forest" by doubling its current canopy cover provided by 77 000 trees.

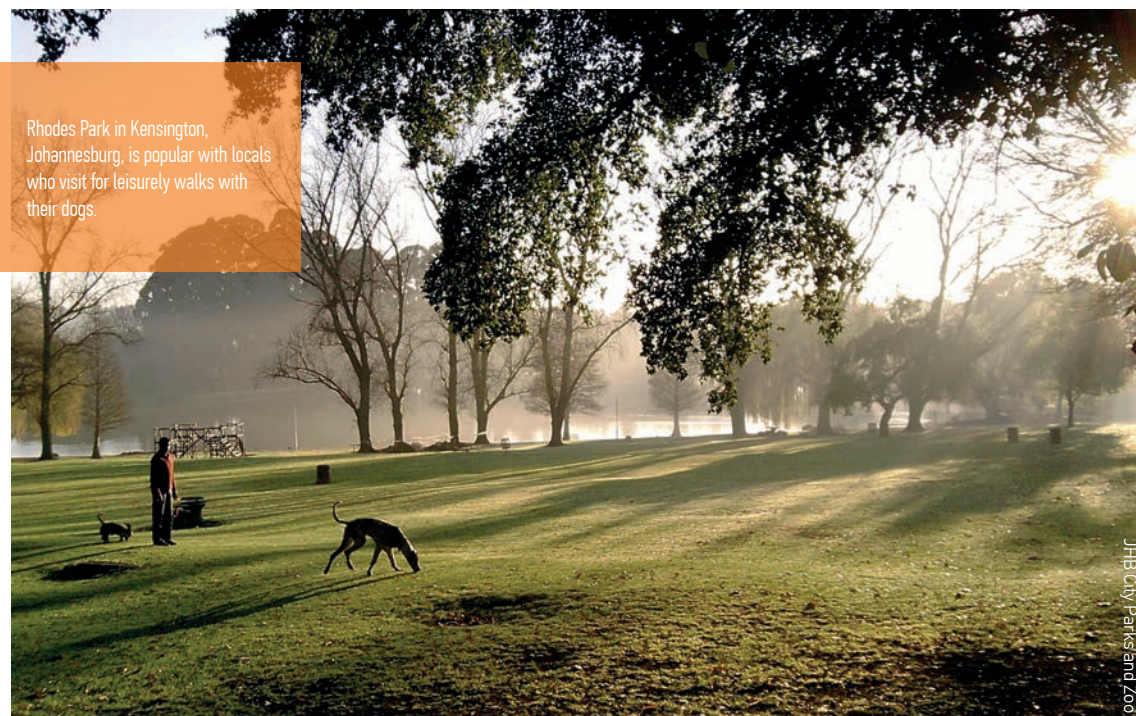


Johannesburg is often referred to as one of the world's greatest urban forests. It is home to around 10 million trees, mostly in private gardens, which bring many benefits to the city's residents.

urban forest in the middle of the city featuring wetlands and sloped green roofs that guide excess rainfall into retention ponds. Once completed, several new pedestrian paths were created along nearby streets.

Global climate events are prompting municipalities to better use the opportunities that public open space gives to expand green infrastructure, protect and strengthen ecosystems and diversity and provide ways for people to immerse themselves in nature. +

Interested to know more? See these links:
CitiesWithNature: www.citieswithnature.org
Biophilic Cities: www.biophiliccities.org
Terrapin Bright Green: www.terrapiinbrightgreen.com



Rhodes Park in Kensington, Johannesburg, is popular with locals who visit for leisurely walks with their dogs.

JHB City Parks and Zoo

“
**Our 6.5 billion-person planet
 will support an extra 2 billion
 urban dwellers within 21 years.
 Half of which will join our
 urban poor.**”

Johannesburg's tree canopy

The proximity of healthy, beautiful parks and mature trees directly affects property value, says Cebo Mhlongo, Johannesburg City Parks and Zoo Manager: Environmental Protection Unit.

Green space and good views raise the price of properties, specifically distant views, water and mature trees, according to verified studies. This increased price is due to Hedonic Value – the value we place on the pleasure we get from an experience or product.

Community real estate values go up when people enjoy the environment more, and want to be there, and municipalities benefit as this is reflected in the increased tax base. A 2009 US study found that foliage increases land value, and is especially apparent in built-up urban areas, where it estimates a 5% premium on properties within 150 metres of a park. This also provides benefits at scale, for example, New York's Central Park adds an approximate 20% market value to those properties on blocks closest to the park compared to those just one block away, and 44% compared to those two blocks away. Bryant Park (also in New York City), previously dirty and dangerous, reopened in 1992 and by 2015 enabled surrounding property owners to charge rents 12.5% higher than similar buildings within a few blocks – and the resulting 20-25% higher than average property values contributes at least an extra R476m each year to tax revenue.

Greening improvements involving smaller parks is known as biophilic urban acupuncture, and a 2008 study found properties across New York City within 300 metres of community gardens realised a R7.3m net tax benefit over 20 years.

“Public open space allows us to enjoy the outdoors and our minds observing nature. Look at how FNB responded to the fact that there is limited green space nearby Bank City. They have created their own artificial garden area lined with trees in the Joburg CBD – and it is well used,” notes Mhlongo.

Universally, trees also add value to homes and neighbourhoods. “Mature, well-kept trees are typically associated with affluent neighbourhoods. A side effect of that is that the more trees there are in an area, the more value buyers tend to perceive in its homes,” adds Tony Clarke, MD of the Rawson Property Group. Looking



at two Cape Town suburbs, Kirstenhof averages about five trees per home, while Newlands boasts between 7-8 trees.

Johannesburg's Jacaranda trees can trace their roots to Argentina from where they were first imported in 1880 and by 1896 an entrepreneurial Johannesburg farmer William Nelson had grown 30 million trees and shrubs for general distribution. When he planted 106 kilometres of trees along the streets of the newly established suburb of Kensington it took his team six months, and it was the first time in South Africa that trees were planted on such a large scale. “Trees are one of the few things that we can buy that increase in value in time,” observes Matt Cullinan, director at MCA Urban and Environmental Planners. Over a lifespan of up to 200 years, this is abundantly evident in the Jacarandas' contribution to Johannesburg.

“Johannesburg's trees make a significant contribution to cleaning the air that we all breathe. While their benefits include air filtering, cooling the air around them, reducing noise, slowing storm water runoff, and mitigating the urban heat island effect, trees also make our city more walkable and beautiful. And with more walking, more socialising takes place – and these physical and mental health benefits contribute in no small way to the effective functioning of the city as a whole system,” concludes Mhlongo. + www.jhbcityparks.com

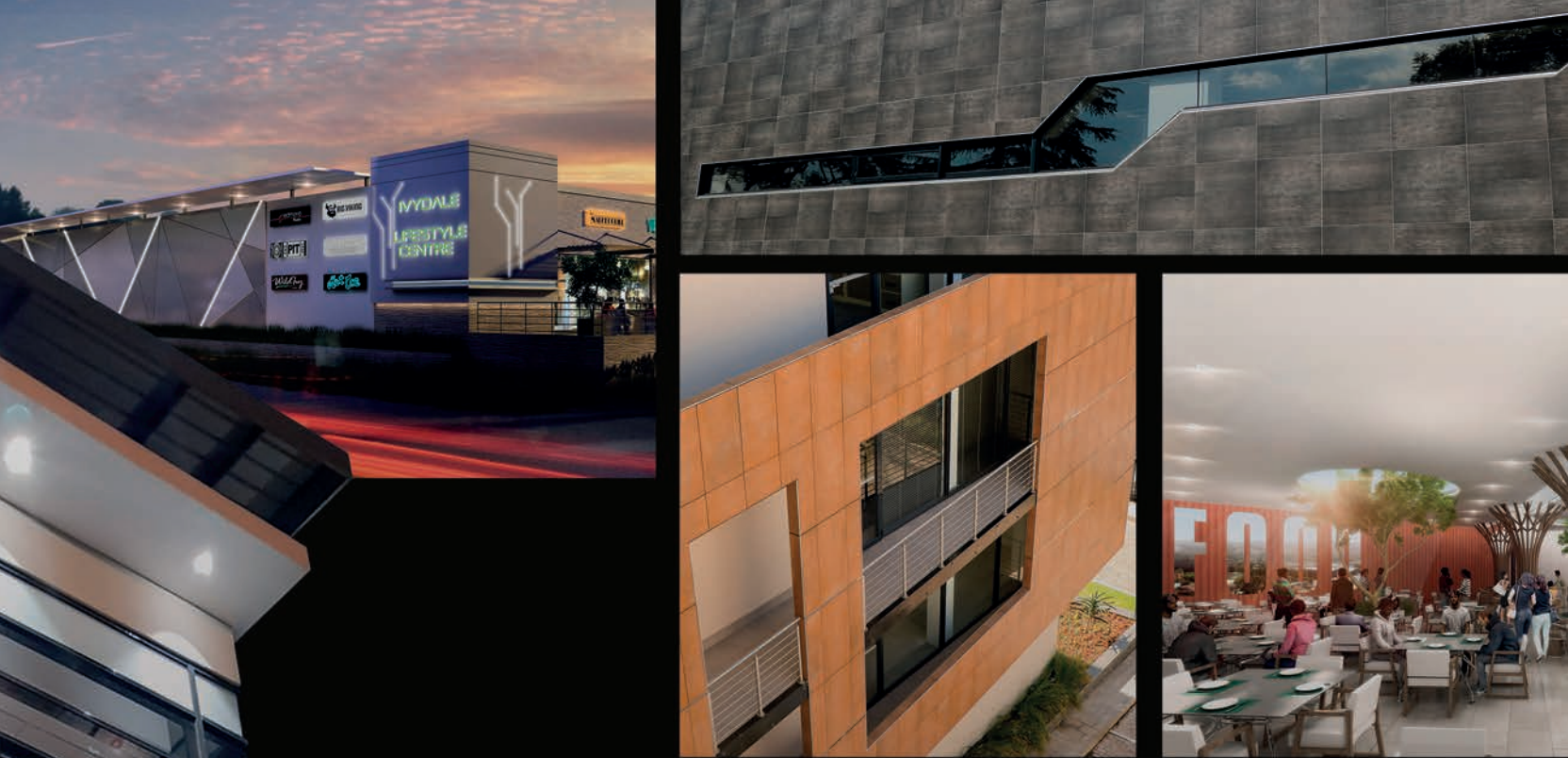
“
**Joburg's interconnected green
 network increases the price of
 nearby properties, without a doubt.**”



The Cost of Green

Considering South Africa's unstable politics, energy and water crises, and a less than enabling economic environment; it's not surprising that the property industry is feeling the effects. We ask the question: Can green buildings trigger growth in South Africa's embattled construction sector?

WORDS Gillian Gernetzky



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ARCHITECTURE

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Koen and Associates Architecture is a multi-disciplinary practice which provides architectural project management, quantity surveying and construction services. As a company we evolve in tandem with the built environment and South African economic landscape. Founded in 2011, with the drive to create sustainable and innovative architecture of excellence, Koen and Associates Architecture aims to enrich the human experience through architectural developments.

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South African construction giant, Group 5, filed for bankruptcy protection in March 2019, joining a growing list of struggling construction firms. However, with South Africa being recognised as one of the global leaders in green buildings, could this growing sector be the trigger for new growth and improvement in the industry?

According to the latest Green Building in South Africa: Guide to Costs and Trends Report: 2019 Edition released by the Green Building Council South Africa, the Association of SA Quantity Surveyors and the University of Pretoria, green cost premiums in South Africa have decreased significantly to an average of

3,5% from 2015-2018, compared to 5,2% from 2009-2014, showing maturity in the green building industry.

At the same time, the annual MSCI Green Property Index for 2018, which compares the performance of Green Star Certified Prime and A-grade offices with their non-green certified counterparts, found that the total return on Green Star-certified buildings was 11.6% compared to 8% on non-certified buildings. The index also found that the vacancy rate is significantly lower in Green Star-rated buildings, at just 5% compared to 11.1% in conventional buildings. SAPOA research indicates that Green Star certified properties demand a rental premium of 13.6% for P- and A-grade offices.



82 Grayston achieved a 4-Star Green Star certification under the Existing Building Performance tool in June 2017, making it one of the first buildings to be certified under this tool. It is part of Growthpoint's Thrive Portfolio, which has unquestionably proven the cost benefits of electricity and water savings. The office park is in Bryanston, Johannesburg.



Anslow Phase 2 is 4-Star Green Star-certified as both a new building and under the Existing Building Performance tool. It is also part of Growthpoint's Thrive Portfolio. The office park is in Bryanston, Johannesburg.



The magnificent 15 Alice Lane in Sandton, Johannesburg was developed by Zenprop Property Holdings and Growthpoint Property and achieved a 4-Star Green Star certification in September 2017.



Cape Town's V&A Waterfront, Africa's greenest precinct and largest tourist attraction.

Mark Williams

So building green makes good business sense, but can it help to stimulate a sector that is facing so many other challenges?

Danie Hoffman, programme leader for Quantity Surveying at the University of Pretoria, says that these statistics should stimulate developers interested in new developments to pursue green buildings, especially when one considers that building green also future proofs the asset. "Water and energy will become scarcer and more expensive in future, more so in our urban environments. A building that is very efficient in both commodities will exponentially increase its competitive advantage over conventional, code-compliant buildings."

Mark Noble, development director at the V&A Waterfront, agrees: "The recent water and electricity shortages have been a rude shock to the industry. Basic services which, until recently were deemed to be available 'on tap', have been shown to be the scarce resources that they are, and the green building philosophy is very much one of understanding and respecting these scarce resources."

Noble adds that the V&A Waterfront precinct has experienced a significant upswing in the demand for sustainable buildings from the market, across all sectors. "Companies, employees and consumers are demanding that businesses adapt and respond to the changes to our environment. The recently issued UN Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Report

and the single-use plastics campaign are providing more evidence that we need to change the ways in which we produce and consume, and the markets are responding to this. Our industry needs to rapidly adapt to the changing needs of the market and the next generation of office workers, home owners, shoppers and hotel guests."

As is the case in the disruption that is currently happening in other sectors – such as the rise of online shopping, home-sharing platforms, co-working spaces and micro apartments – green building is creating



What holds much more potential to stimulate construction and make a significant green impact, is the 95% of buildings making up the existing building stock. If a sizable percentage of those older buildings can be renovated and refurbished to green standards such as Green Star, the effect will be much more dramatic.

Danie Hoffman



opportunities for the future. "There is the potential for growth and it is incumbent on the role players in the industry to innovate and adapt to meet the evolving market demands," he says.

Rudolf Pienaar, chief development and investment officer of Growthpoint (the JSE's largest property investment holding company), and a director of the World Green Building Council, concurs. "It is clear that all major responsible companies now demand a green building when considering new space, as do all international tenants – in order to comply with their ESG ratings. Accordingly, the market at large has shifted significantly in that most substantial developers are developing green buildings, and professionals are highly-skilled and able to design green buildings that construction companies are equipped to implement today."

However, there are not enough new buildings being built to provide a significant stimulus for the construction industry, even if all new buildings are built green.

"What holds much more potential to stimulate construction and make a significant green impact, is the 95% of buildings making up the existing building stock. If a sizable percentage of those older buildings can be renovated and refurbished to green standards such as Green Star, the effect will be much more dramatic," says Hoffman.

Interestingly, a large portion of Growthpoint's more than 80 Green Star-rated buildings are 4-Star Green Star-rated existing office buildings. Pienaar notes that the savings in operating costs and utilities far outweigh the costs incurred to certify these buildings.

Noble agrees that existing buildings are where the economies of scale lie. "We've run a process at the Waterfront over the last few years to retrofit energy and water-efficient fittings and systems in our buildings so that sustainability is now a standard in the precinct. Feedback has been very positive as the changes have greatly assisted in both reducing costs and providing a layer of resilience through the recent water and electricity shortages."

All parties believe that a substantial increase in green retrofits requires more government legislative support to incentivise compliance and sanction non-compliance.

Grahame Cruickshanks, managing executive of market engagement at the GBCSA, says that there is wide acceptance internationally that government regulatory support, such as incentives and penalties, is one of the requirements for promoting green building, along with informed stakeholders, and technical support and competence. "In South Africa, there are a number of regulations already in play that broadly address limited



The recent water and electricity shortages have been a rude shock to the industry. Basic services which, until recently were deemed to be available "on tap", have been shown to be the scarce resources that they are, and the green building philosophy is very much one of understanding and respecting these scarce resources.

Mark Noble



At 147 000m², 1 Discovery Place in Sandton, Johannesburg is South Africa's largest new build 5-Star Green Star building. The building is a joint venture between Growthpoint Properties Limited and Zenprop Property Holdings and is home to Discovery's global head office.

Growthpoint



parts of green buildings – such as the SANS 10400 XA and SANS 1544 energy performance certificates, and the 12L Income Tax Allowance on Energy Efficiency Savings. Currently in draft are the Draft Carbon Tax Bill, Draft Carbon Offset Regulations and the Draft Climate Change Bill. The latter will set mandatory carbon emission limits for sectors and companies, and a national carbon tax later this year.”

Cruickshanks adds that there is definitely a move in most legislation ideals towards creating more water-sensitive and waste-wise cities and towards emitting less carbon. He also notes that there is a strong drive

through the C40 Programme for all new buildings to be net zero by 2050.

At present Cruickshanks says there is room for more buildings to be certified in the public sector and that there are clear moves in the right direction. “The Public Works Green Building Policy launched in 2018 will have significant impact on the certification of new and existing public sector buildings. And the National Department of Public Works recently approached the Agrément South Africa agency to assist with plans for rolling out extensive green technology and materials for all new public buildings.”



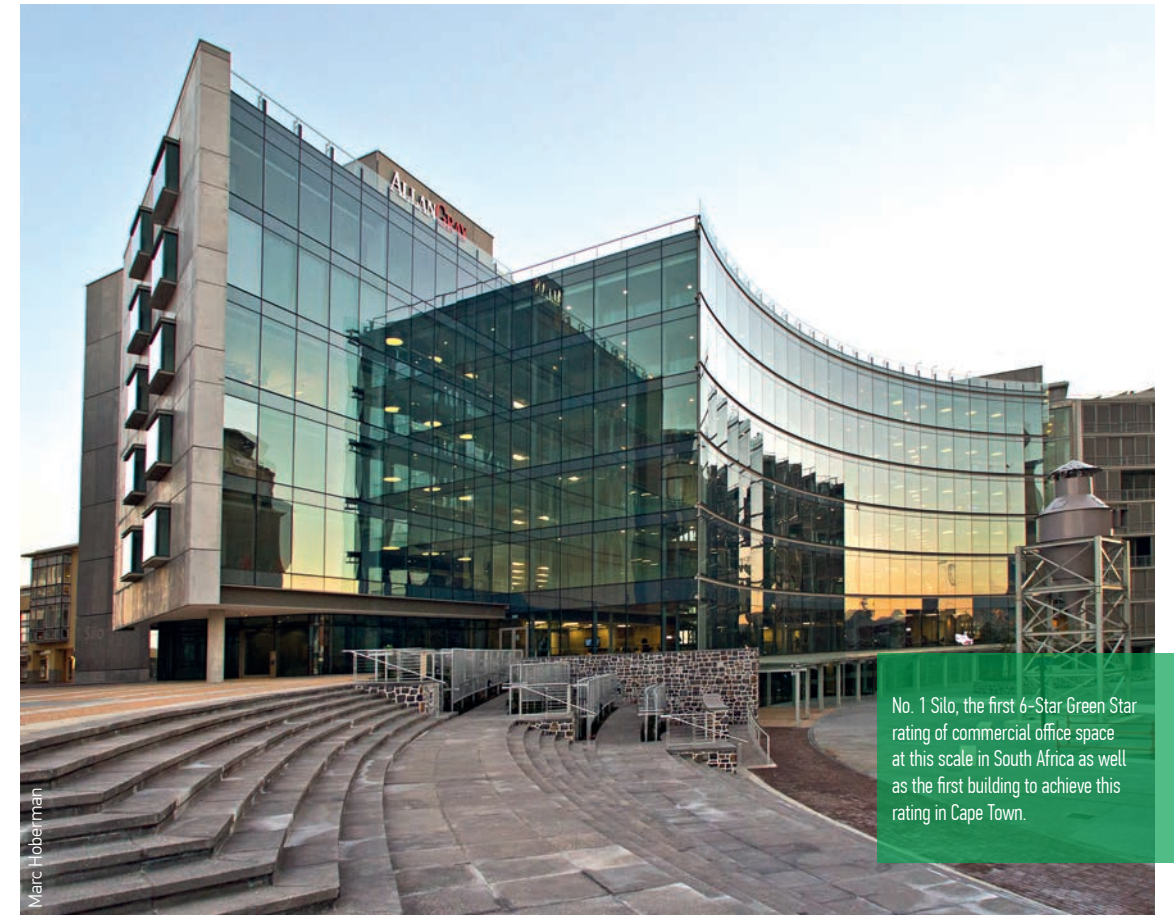
The Grain Silo forms the heart of the Silo District, and is world-famous for its bold re-imagining of this historical old Silo building into the Zeitz Museum of Contemporary Arts Africa (MOCAA) and the Silo Hotel.

Marc Hoberman

No. 5 Silo, a 6-Star Green Star-certified building, is home to PWC's new head office and Werksmans Attorneys.



Marc Hoberman



No. 1 Silo, the first 6-Star Green Star rating of commercial office space at this scale in South Africa as well as the first building to achieve this rating in Cape Town.

Marc Hoberman

But with more than 70% of South Africans expected to be living in cities by 2030, we need more than green buildings – we need sustainable precincts, sustainable cities and sustainable infrastructure.

As Pienaar says: “The trend internationally has been to expand the scope from a single-building focus to precincts and cities, and it is becoming clear that the precincts and cities that strive to create the most liveable places attract residents that are most sought after in the workforce.”

According to the New Climate Economy Report released last year, sustainable, connected, and resilient cities will be worth up to US\$17tn in economic savings by 2050. Pienaar adds that the benefits of green buildings extend significantly further than the individual property owner and a building’s occupants. “Research indicates that for every \$1 saved on energy, on average 77c is saved in health and climate benefits.”

The report also estimates that sustainable urban development is expected to account for between two-thirds and three-quarters of all infrastructure investment to 2030. Global climate finance – such as Growthpoint’s R1.1bn Green Bond – will provide an important source of this infrastructure funding, and cities that can demonstrate that they have “their own house in order” will be better placed to access such funds.

In the South African context, Cruickshanks says that encouraging steps are being taken in the right direction and that the urgent need for sustainable cities could be the stimulus that the construction sector

needs. South Africa subscribes to the global Sustainable Development Goals – one of which is to make cities more sustainable – and its National Development Plan 2030 has set a target of zero emission building standards by 2030, and for an economy-wide carbon price to be entrenched by the same year.

The business case for green precincts, such as the V&A Waterfront and Black River Office Park in Cape Town, and Oxford Parks in Johannesburg, are becoming more evident. “The V&A Waterfront is considered the greenest precinct in Africa with its 12 listed green buildings, including two 6-Star Green Star buildings, and we have found that the energy and water savings that are possible by taking a district-wide approach to green development are significant,” says Noble.

On a city level, Cruickshanks says that Johannesburg, Cape Town, Durban and Tshwane are four of the global cities participating in the C40 Building Programme, which aims for net zero carbon emissions from newly-built buildings by 2030. “These cities have committed to accelerating carbon neutrality and are rolling out aggressive targets and initiatives to achieve this, which should again encourage more building sector activity in each,” he says.

In the US, the green construction sector generated \$167.4bn in GDP, supported over 2.1m jobs and provided \$147.7bn in labour earnings between 2011 and 2014. South Africa has many unique challenges to overcome before we can achieve steady growth, but the green building sector may be a catalyst towards attaining that goal. +



GREEN BUILDING IN SOUTH AFRICA

Guide to Costs and Trends 2019 Edition

In the economic climate that South Africa, and indeed the rest of the world, finds itself in; the financial viability of commercial green building is starting to take prominence and is foremost on the minds of property developers wanting to go green.

The latest cost of green building study seeks to explore the issue and create a compelling business case for building green. The results of the thorough, peer-reviewed and validated research positively debunk the myth that green buildings are expensive to build.

The 2019 edition includes convincing results that shows a strong maturing of the green building industry. It additionally brings more focus by confirming previous outcomes and sharpening previous conclusions. The report looks at 146 Green Star-certified V1 and V1.1 new office buildings, with both design and as-built certifications taken into account, looking at two aspects of the cost of green – green design penetration and green cost premium. Here is a snapshot of some of the key findings:

GREEN DESIGN PENETRATION

Certification level - Green cost premium [%]	MIN	AVERAGE	MAX
TOTAL	15,4 %	42,4 %	83,0 %
2009/14	17,6 %	42,7 %	73,5 %
2015	17,6 %	38,8 %	71,4 %
2016	21,6 %	42,1 %	63,4 %
2017	39,2 %	40,8 %	43,8 %
2018	15,4 %	44,2 %	83,0 %

The report is published by the Cost of Green Building Study Committee, comprising selected members from GBCSA, the Association of South African Quantity Surveyors (ASAQS) and the University of Pretoria (UP). The first edition of this booklet was released in 2016.

- Results show a decrease in green design penetration of 42,4% when compared to the 2016 report at 42,7% but average green design penetration remained between 40-45%.

GREEN COST PREMIUM

Certification level - Green cost premium [%]	MIN	AVERAGE	MAX
TOTAL	1,1 %	3,9 %	14,2 %
2009/14	1,1 %	5,2 %	14,2 %
2015/18	1,1 %	3,5 %	12,0 %

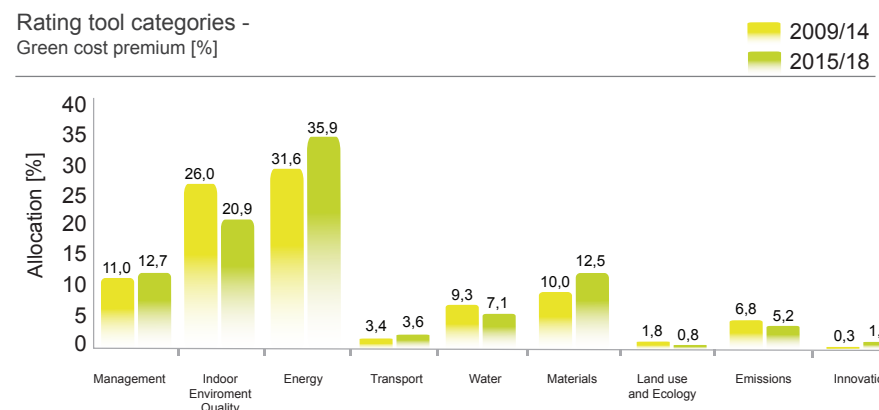
- Results show that the green cost premium has reduced from 5,2% (2016) to 3,9%, with the lowest cost premium reported at 1,1% and the highest at 14,4%. KwaZulu-Natal showed a significantly higher cost premium when compared to other locations (Gauteng & Western Cape).
- The report also shows that the private sector was able to achieve lower cost premiums when compared to public sector buildings.
- Larger projects managed to achieve Green Star certification for less cost when compared to smaller projects.

SINGLE CORPORATE OR MULTIPLE TENANTS?

Tenant mix - Green cost premium [%]	MIN	AVERAGE	MAX
TOTAL	1,1 %	3,9 %	14,2 %
SINGLE CORPORATE	1,8 %	4,9 %	14,2 %
MULTIPLE TENANTS	1,1 %	3,4 %	12,0 %

- Projects with a single corporate client will on average have a higher green cost premium compared to those with a tenant mix. The gap between the green cost premium of single tenanted buildings versus multiple tenant buildings did however narrow from 4,5% in the 2016 report to 0,2% for the 2015-2018 projects.

COSTS ACROSS CATEGORIES



- The allocation of the green cost premium to the nine categories of the Green Star Office V1 tool revealed that more than 57% of the total green cost premium was allocated to only two categories namely, Energy and Indoor Environment Quality.
- It is notable that the five categories comprising Energy, Indoor Environment Quality, Management, Materials and Water made up for more than 88% of the total green cost premium allocation.
- This, coupled with the MSCI green index (from 2018) that green buildings offer a better ROI, makes a good case for building green buildings. +



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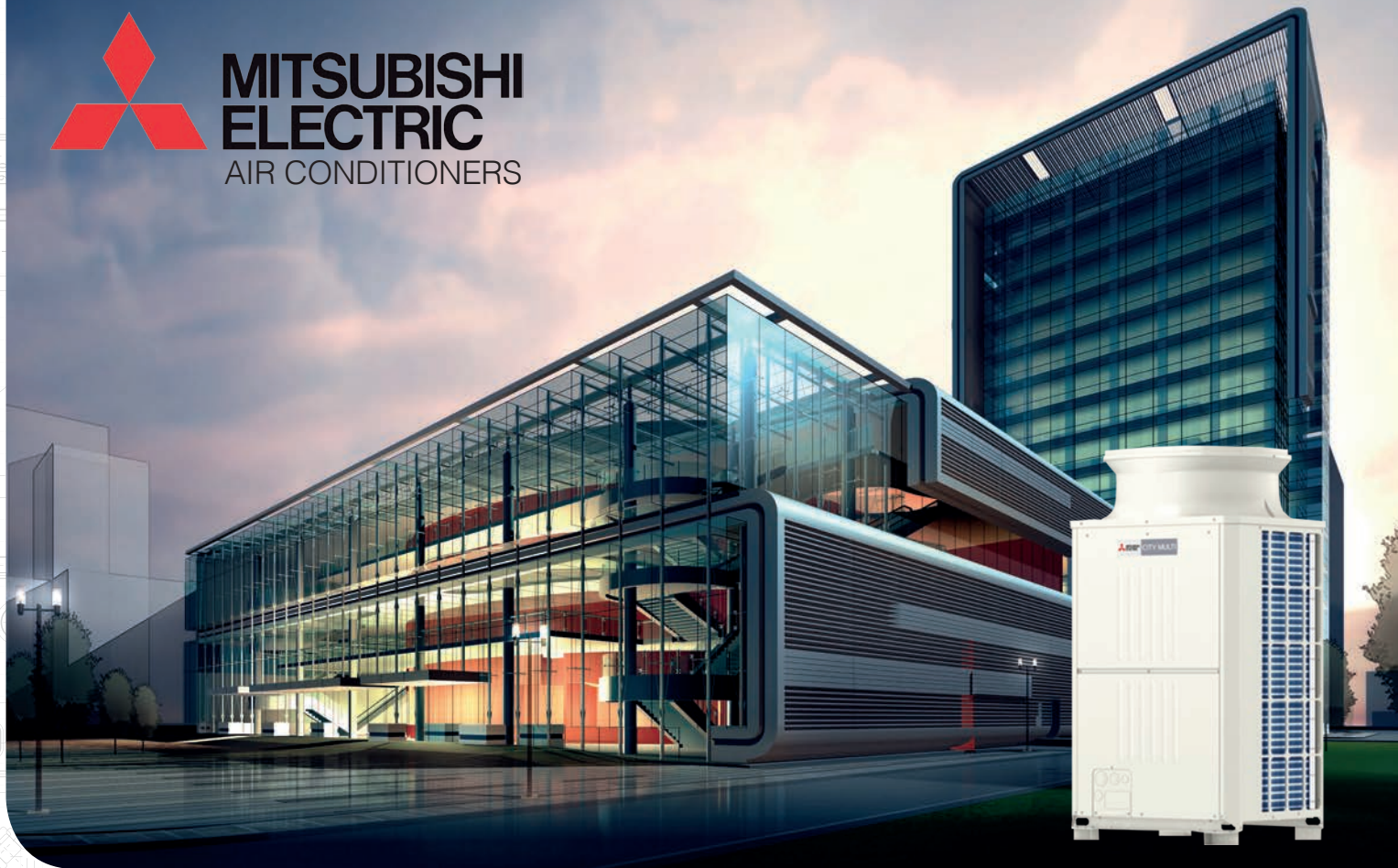
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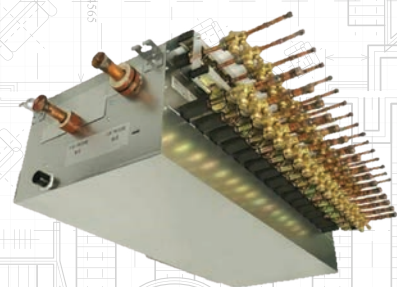
The power of small energy

Small-scale power generators, or microgrids, can contribute to the creation of a more resilient energy landscape.

WORDS Karen Eicker



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 Reusable energy at its best



The V&A Waterfront in Cape Town has invested heavily in rooftop solar installation across the precinct.

In a highly anticipated response to South Africa's energy crisis, former Energy Minister Jeff Radebe recently informed the National Energy Regulator of South Africa (NERSA) that it should begin licensing small-scale embedded generation (SSEG) projects with capacities of above 1MW. This move is expected to pave the way for up to 3500MW of SSEG capacity which, the South African Independent Power Producers Association (SAIPPA) estimates, has been constrained by regulatory resistance to date.

Dr Sam Duby, Africa director for TFE Energy and speaker at the 2019 African Utility Week and POWERGEN Africa event in Cape Town, observes that access to energy is a prerequisite to development and is enshrined in the United Nations Sustainable Development Goal 7. He says: "While the death throes of large, centralised utilities such as South Africa's Eskom continue to plague economic outlooks and general productivity, decentralised, digitally-enabled village-scale (usually renewable energy-based) power stations promise access to clean, affordable energy services that, in terms of quality and reliability, far exceed those available from the national grid."

These generation sources – minigrids or microgrids – have a global market potential of US \$400bn, and could offer efficient solutions to private businesses, educational institutions and communities who wish to reduce their dependence on the existing, centralised model of linear power delivery.

MICROGRIDS IN CONTEXT

Duby continues: "Because of woeful under-investment in infrastructure, corruption and lack of competition, a very rigid and fragile monopolised system has been created that is now disintegrating. In countries with much less rigid energy landscapes like Nigeria, Kenya,

Germany, and Australia, where diverse independent producers can feed energy into the national grid, energy networks can be much more resilient, more efficient, better for the consumer, and allow national energy providers to concentrate on maintaining distribution infrastructure rather than servicing the demand for new connections."

Justin Wimbush, founding director of Kambuku Consulting, agrees. "In South Africa, load shedding results in lost productivity are estimated at R2bn per day, according to analyst Chris Yelland. In addition, Eskom's price increases in the next year will be more than 9% above inflation. This massive increase is driving the incorporation of energy efficiency measures as initial mitigation measures; and embedded generation with energy storage as the next tier of mitigation."

A REGULATORY STRANGLEHOLD

Wimbush explains that, to date, projects of 1-10MW require a generation licence from NERSA and projects of greater than 10MW require a determination from the Minister of Energy in order to be granted a generation licence, whether the electricity generated is for own use or not, and whether these producers are connected to the national grid or not.

He says: "If the 1MW limit on the requirement to acquire generation licenses were to be lifted to 10MW, the likely growth in this industry and associated job creation created would be significant. Similarly, if the 10MW cap on projects requiring a ministerial determination were to be lifted to 50MW, the growth in the industry would be dramatic."

Duby advises that, in South Africa, the Electricity Regulation Act guarantees non-discriminating access to national transmitting networks. However, the reality is that only one organisation has ever been granted ▶▶



WORLD FIRST CASE STUDY

In October 2018, Siemens launched a one-of-a-kind, end-to-end Distributed Energy System (DES) at its headquarters in Midrand, Johannesburg. The system, which gives 40% reduction in energy usage from the national grid, is built around a 1MW PV-solar plant strategically positioned throughout the campus to take full advantage of the African sun; and is integrated using the SICAM 8000 MicroGrid Controller.

Sebastian Granow, head of Asset Management Africa for Siemens Real Estate, explains: “The drivers for the project were the need to keep the cost of our energy usage relatively stable; the need for a reliable energy supply, which is critical for our business; and a desire to demonstrate our technology to our customers. The decision is also in line with Siemens’ global goal to achieve carbon neutrality by 2030 through energy efficiency, decentralised energy systems, and the purchasing of clean electricity.”

The PV-solar plant, an EPC (engineering, procurement, construction) project from a third-party supplier, is divided between the campus carport (700kW) and building roof installation (300kW), and excess energy is stored in a 140 kWh Siestorage installation. The SICAM Controller allows for cost-optimised energy consumption, and monitors and stabilises the campus grid in case of an outage. The entire system is visualised via an IoT (Internet of Things) energy platform, Energy IP.

“This DES solution is a world first in the Siemens portfolio,” Granow adds. “The installation was a learning curve for everyone involved. The system was set up and commissioned by Siemens colleagues from Germany and Portugal, with South African engineers trained remotely and on site to provide local support. Shortly after completion, we had a

call from colleagues at Siemens Princeton asking about our experience – so the project has gone a long way to changing the narrative about where innovation happens.”

“The biggest challenge was integrating the different systems and getting them to speak to each other,” says Desmond Mabilo, electrical engineer at Siemens. “We needed to tie in our existing 20-year-old essential and non-essential networks with new technology and a renewable energy source, which was a complex undertaking.”

Granow says: “We have also taken the next step to connect the system with the Siemens Desigo CC Building Management System and Smart Metering network in the buildings via Energy IP, to further optimise energy consumption and building operation. The intention is to apply machine learning for an in-depth analysis of data, to look at optimising the system if weather patterns change, to do predictive maintenance and to plan for future energy demands. Learning through this process helps us to approach our customer implementations with better insights.”

Granow adds that, when an oversupply of power is produced, predominantly on weekends or between 11h00 and 13h00 weekdays, the system feeds back into the grid. “The energy landscape in South Africa is not yet geared for this kind of trading so the feed-in tariffs are not high enough (around R0,39/kWh). However, if microgrids became an integrated part of meeting energy demand, we could assist neighbouring residential developments when we don’t need power, for example on weekends. This would reduce the need for infrastructure and investment required from Eskom and the municipalities.”



a license to distribute and sell energy over the national networks. “I believe that, should control be relinquished over the way in which energy is generated, bought and sold, a more dynamic, competitive space will be created that is more responsive to the needs of consumers.

“Cleaner, more cost-effective localised energy projects would also create a grid-smoothing mechanism which makes infrastructure easier to maintain, improves the reliability of power supply as well as the ability to predict prices, and would help to bring the country in line with the rest of the world. South Africa’s distribution infrastructure is sophisticated enough, renewable technologies are becoming cheaper daily, and sufficient local technical skills are available. Being modular and very quick to implement, microgrids can also grow with demand which makes them less risky and more responsive to a dynamic market.”

Despite the existing restraints, many renewable energy project developers are already building projects to supply electricity to corporate clients who would like to see their electricity bills reduced and reliability of supply increased. For these corporate clients, electricity generation is not their core business and so more experienced suppliers are brought on board, resulting in a burgeoning C&I (corporate and industrial) energy supply sector.

MICROGRIDS EXPLAINED

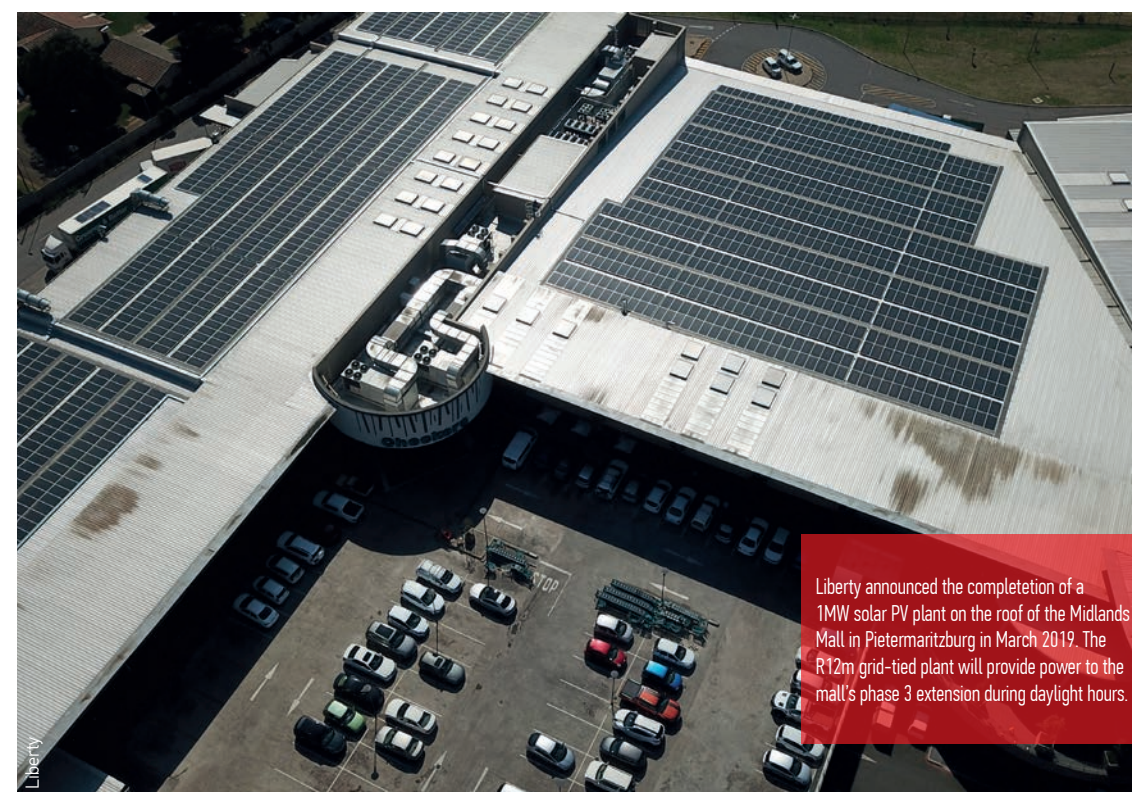
Wimbush explains that microgrids are low or medium voltage grids that are typically located close to the demand centre and are not geographically spread out. Microgrids usually consist of a generator, a control system which monitors the demand of the network and increases or decreases power generation as required, and some form of energy storage to help manage short duration load fluctuations or intermittencies in energy generation.

“Understanding the demand profile of a microgrid is essential in order to design so that the installation is cost effective and still provides the quality of supply desired. To do this, one considers the daily, weekly and seasonal demands of the individual consumers, which are then aggregated. This affects the size, cost and complexity of the system. It is not simply about totalling the maximum design loads of each consumer as this will result in a massively oversized system that is too expensive to be developed and would be unlikely to be able to operate efficiently due to the oversizing of the equipment.

“The baseload of a microgrid is the load that is steady throughout the day or for a large portion of the day. How large the baseload of the microgrid is will depend



Rather than having a few, large, ailing generation sources, we’re talking about a multiplicity of much smaller generation sources – a diversified mix of solar PV, wind power and hydro energy – that would bring resilience to the system and lower demands on grid infrastructure because power is being produced, generated and sold locally. *Sam Duby*



Liberty announced the completion of a 1MW solar PV plant on the roof of the Midlands Mall in Pietermaritzburg in March 2019. The R12m grid-tied plant will provide power to the mall’s phase 3 extension during daylight hours.



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Speat REIT installed a new 800kW solar plant at Sable Square in 2018, saving approximately 30% in municipal power.

on the usage patterns of the consumers but also on how many consumers are connected. Energy storage, such as from batteries or other technologies like compressed air or flywheels, can be used to fill in the gaps between demand peaks to increase the size of the baseload. The control system can be configured such that energy generated is only used to charge the batteries or other storage devices when it cannot be supplied directly to consumers. When the batteries are fully or partially charged, they can then be used to supplement the energy generation equipment. Depending on the level of reliability required, generator backup might be required. However, through balancing the loads of the microgrid and sizing the batteries and renewable energy generation sources adequately, it is possible to minimise the use of the generators.”

THE BUSINESS CASE

Apart from regulatory issues, the main challenge facing the microgrid sector is that of finance. But here too there have been major developments. Duby says: “If the market for the generation and selling of power was enabled, a huge amount of investment would flow into the space. An entire market would be created, as demonstrated in many other markets around the world.”

There is also a very valid argument for subsidising microgrid development. Dr Grové Steyn, who serves on

the Presidential Task Team at Eskom, partook in a panel discussion at African Utility Week and POWERGEN Africa in May 2019. He observed: “Eskom is now being bailed out by government almost on a monthly basis and even the R23bn allocated in the budget is not going to be enough to fill the gap and get the utility out of its debt trap.”

A recent report by TFE Energy entitled Subsidies for Rural Electrification: A Blessing or a Curse? stated: “Researchers estimate that the global fossil fuel industry is subsidised to a tune of US \$5.3tn (6.5% of global GDP) every year.” The report also cited Sam Slaughter, co-founder of Kenya-based PowerGen, who argues: “Without subsidies, the African rural consumer will be unique. They will bear the full cost of their power which has never happened on any other continent in the history of electrification.”

Given the above, together with the fact that the reticulation for microgrids is no more expensive (and often cheaper) than that of national grid infrastructure, the case for subsidised investment seems clear.

For grid-tied solutions, Wimbush observes that many utilities worldwide have been obliged to change their billing structures to incorporate a fixed price section that covers the minimum revenue they need to maintain distribution infrastructure. So alternative power operators are accommodated but, if people want the backup of the grid, there is an associated cost.

He adds: “If an operator wishes to export power to the grid under the current legislation, it needs a generation licence from NERSA. However, some municipalities such as the City of Cape Town will not require a generation licence if, over the course of a year, the power exported is less than the power imported. Cape Town, like Johannesburg, has also set a tariff and standing registration fee which makes exporting to the grid less viable for projects below a certain scale. If legislation changes in favour of exporting, then more people will find it viable. With many of Eskom’s power stations needing to be retired over the next decade, encouraging operators to export power will be far more cost effective than replacing them with new coal fired or possibly gas fired power stations.”



If the market for the generation and selling of power was enabled, a huge amount of investment would flow into the space. An entire market would be created, as demonstrated in many other markets around the world.



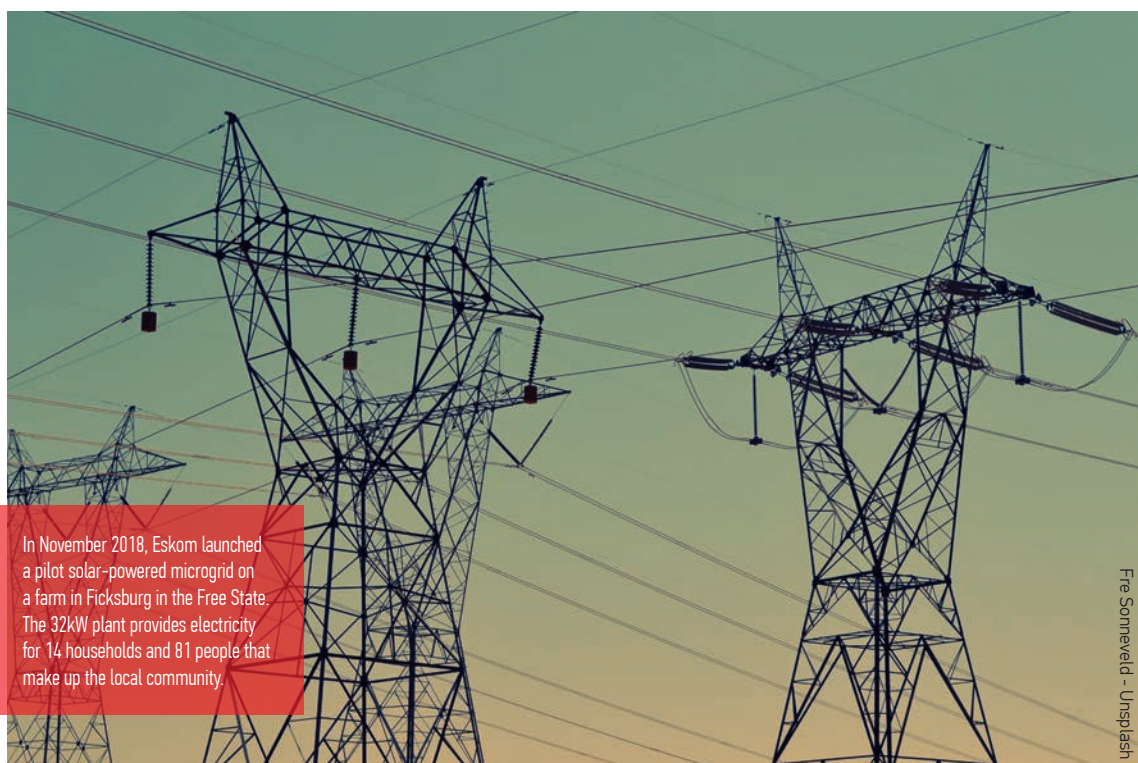
On the subject of billing customers, Wimbush says that new models are being explored. “Possibly the biggest issue for microgrid developers and operators is making sure that they get paid. In some instances, suppliers are building the electricity sales price into a lease agreement for the equipment, thus creating a service-based economy. And the advent of pay-as-you-go cell phone technology has allowed pre-paid solutions to be developed to resolve this matter, especially when considering potential consumers who do not have a credit rating.”

According to TFEs Kenya: The World’s Microgrid Lab report, smart meter pay-as-you-go technology has been the catalyst of Kenya’s energy access revolution. “Customers use mobile money platforms to incrementally pay for a solar system or to pre-pay for energy services (buying kWh) from a microgrid operator. The cashless payment system unlocks the possibility of running remotely located ‘energy vending machines’. This reduces transaction costs, lowering electricity costs for consumers and bringing down business expansion costs for the solution providers.”

Other financing solutions being explored globally include blockchain to track micro-investments in solar cells, peer-to-peer microgrid energy trading from rooftop PV installations, crowdfunding, and results-based financing with tradable tokens.

INNOVATION, SPECIALISATION AND STANDARDISATION

Improvements in the value chain are also rapidly improving the business case for microgrids. The falling cost of technology and equipment, together with standardisation of data reporting and specialisation in the sector are making it quicker and cheaper to develop microgrid sites, and easier to aggregate and scale



In November 2018, Eskom launched a pilot solar-powered microgrid on a farm in Ficksburg in the Free State. The 32kW plant provides electricity for 14 households and 81 people that make up the local community.

Fre Sonnenfeld - Unsplash



In South Africa, load shedding results in lost productivity are estimated at R2bn per day, according to analyst Chris Yelland. In addition, Eskom’s price increases in the next year will be more than 9% above inflation.

projects, thus reducing the risk of such projects and opening up the market for investment opportunities.

Duby explains that the standardisation of data analysis and sharing is good for industry at large, allowing data to be pooled as a resource and best practice business support to be offered to small local developers. “We are also seeing specialisation in the sector, from dedicated investment instruments to companies specialising in microgrid-specific technical hardware. Using data analytics and remote mapping with satellites, the best potential sites and customers can be identified. Using metering and control technologies, power consumption and payments are easily tracked, and tariffs can be adjusted in real-time to optimise the use of installed assets and increase operator revenues. Technology is therefore a critical enabler, bridging the informational, operational and psychological gap between the investor, the microgrid developer and the customer.”

With rising energy demand, rapid technological advances, the evolution of supporting finance models and a loosening of regulations, the energy sector in South Africa should be doing a lot more to develop microgrids as part of a diversified and more resilient energy landscape. +

soventix

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A RAND MADE OR A RAND SAVED – STAYS A RAND

With the ever-increasing cost of utility power, demand charge penalties, and the looming implementation of carbon tax, the investment in energy efficient systems has become a viable solution for both operational costs and environmental management. As such more and more private sector companies are deploying such newer technology driven systems to facilitate these savings and benefits.

Energy efficiency aligns with the aims of transitioning to a low carbon economy while the investment required to achieve this will indirectly help transform increase the business bottom line. Energy efficiency is always a good idea.



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Carbon Tax: Implications and benefits

The contentious South African Carbon Tax Bill was passed in parliament on 19 February 2019, following an almost decade-long consultation process. It was first put on the table in 2010 with the Carbon Tax Discussion Paper, which was followed by the 2013 Carbon Tax Policy Paper, the 2014 Carbon Offsets Paper and then, in 2015, the original 2015 Carbon Tax Bill. Comments were submitted by business, non-government organisations, civil society, labour, state-owned entities and government line departments; with opposition met, not surprisingly from those representing the heavy emitters.

WORDS Alan Cameron

The Carbon Tax Act states that any person – a partnership, trust, community, municipal entity, or public listed entity – who conducts an activity which results in the emission of greenhouse gases above the allowed threshold, will have to pay the initial phase carbon tax of R120 per tonne. In its current state, the tax provides for exemptions and rebates which might mean that emitters may end up paying only R6 to R36 per tonne emitted – criticised as being far too “watered down” to effect any change. The tax will increase at a rate of inflation +2% and is in addition to corporate tax. When the second phase kicks in, at the beginning of 2023, the plan is to push the rate up to R600 per tonne.

Greenhouse gas emissions are classed as either direct or indirect and organised into scopes. The Carbon Tax Bill, in its current form, only makes provision for Scope 1 emissions, which are directly emitted by entities, like installed capacity of diesel generators. Scope 2 emissions, such as purchased electricity, relate to the company's activities but are emitted from sources owned or controlled by a third party, and Scope 3 includes emissions that are neither owned nor controlled – such as waste disposal, leased assets and employee travel.

“The reality is that, due to its reliance on coal, South Africa ranks among the dirtiest energy producers in the world; we rank 16th on the global emission list and amongst the highest in the developing world. In order to honour our international commitments to The Paris Agreement on Climate Change (2015) as well as targets set by The National Development Plan, we need to address carbon neutrality from every angle,” says GBCSA CEO, Dorah Modise.

“The World Green Building Trends 2018 SmartMarket report states that the business benefits include an 8% operating cost savings in the first year, and an increased building asset value of 7%. With the building sector responsible for approximately a third of [global] greenhouse gas emissions, the carbon tax will serve to further level the playing field and strengthen the local business case for renewable options,” says Grahame Cruickshanks, GBCSA managing executive for Market Engagement.

“Whenever there are cost increases in the status quo, it makes the business cost for alternatives such as rooftop solar more viable,” agrees Kevin James of GCX.

Tshwane, Johannesburg, Cape Town and eThekweni are implementing policy processes now to ensure only zero-carbon buildings are built by 2050, according to the C40 Cities Climate Leadership Group and Sustainable Energy Africa (SEA). With plenty of sunshine and suitable wind conditions, it is little wonder that renewable energy alternatives are taking the domestic stage. Internationally, solar power has fallen in price by three-quarters since 2010, and wind turbine prices by half.

The tax's expected stimulus in the renewable energy sector will continue to help economic development not only in a wide spectrum of capital and operational investments, but in time through the provision of cheaper electricity, which will offset fiscal contractions as the economy inevitably transitions away from fossil fuels. +



The Carbon Tax Bill is an achievement for the green building sector, and every local sector working towards sustainability.

Dorah Modise, CEO of the GBCSA

The quest for Zero Waste

A decade ago the sustainability movement was considered alarmist, presumed to be led by tree huggers who favoured the environment over that of financial success. There were few contenders engaged with the strategic thinking of how to create circular systems that would reduce impacts; instead the “business as usual” model prevailed, entrenched in practices that relied on a linear framework of extraction, consumption and finally – waste.

WORDS Melissa Baird

Today every sector is being impacted by environmental, social and economic factors that were only being warned of then, but are now seen in evidence. The conception that waste has no inherent value and should only be sent to landfill, is beginning to change. And due to mounting restrictions on landfill space, energy restrictions and imminent carbon taxes, it is becoming more essential than ever, that waste be managed in a completely different way.

To that effect, waste-to-energy projects and technologies are emerging, zero waste-to-landfill initiatives, and a recycling surge is contributing to the reduced impact of the built environment. But it's not just the reduction targets driving the new methodology – business owners are seeing increased value in brand equity, achieving reductions in overheads and enabling micro enterprises to flourish.

We profile key projects that have truly stood out in their efforts to solve their waste problem and have turned it into an opportunity to build their brands, encourage their customers to support their new effort as well as those that support small businesses.

N1 CITY MALL
THE N1 CITY MALL IS HOME TO 140 STORES
AND RESTAURANTS

FOOD WASTE
ORGANIC WASTE SUCH AS FOOD SCRAPS,
ARE SEPARATED IN THE RESTAURANTS

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NOTHING GOES TO WASTE

Wild Coast Sun First GBCSA Net Zero Waste certification (pilot)

Among the factors driving the reduction of waste is that landfill space throughout South Africa is filling up. What remains of it comes at a high cost and this poses a future risk to high waste-generating sectors that have no waste management strategies in place. One such sector is the hospitality industry.

With these facts to hand, Sun International chose to embark on a zero waste-to-landfill journey at the Wild Coast Sun resort in the Eastern Cape. At the time however, no organisation in Africa had yet achieved this target. The complexity of zero waste-to-landfill posed significant challenges because of the complexity of Wild Coast Sun's business operations and that the majority of the waste generated by their customers, concessionaires and restaurants is post-consumer waste which means it is a mix of items and contaminated.

Sonja Stroud, the safety, health and environmental officer at Wild Coast Sun led the zero waste-to-landfill project and in December 2016, appointed Recycle 4 Africa as their waste management partners. The result is 100% of non-hazardous waste diverted from landfill. Current legislation mandates how the 3% hazardous waste left over can be disposed of, so this is restricted to landfill due to the healthcare risks.

In all great initiatives, partnerships play an important role. GCX is Sun International's sustainability partner. They specialise in zero waste-to-landfill, providing advice to all the Sun International units and conducting the certification processes. Jennifer van Niekerk of GCX explains: "The Wild Coast Sun's waste management strategy includes the composting of organic waste on site, recycling of recyclables by means of approved recyclers, donation and resale of reusable items and the manufacturing of bricks from non-valuable, non-recyclable waste." Brick manufacturing and recycling is conducted off site with the assistance of Recycle 4 Africa. They also work with Gayo Enterprises (an enterprise specifically created by Wild Coast Sun to aid in their waste management), who have been integral in achieving contaminant-free organic waste which is then composted. Large volumes of compost produced, stimulated the development of the hotel's vegetable gardens and the creation of a micro enterprise Vuka Uzenzele Trading.



Mountains of waste for recycling at the Wild Coast Sun.



Large volumes of compost produced, stimulated the development of the hotel's vegetable gardens and the creation of a micro enterprise Vuka Uzenzele Trading.

The GBCSA's Net Zero Waste certification requires consistent criteria to be implemented that included on-site waste recycling, regular waste stream audits and dynamic, operational management plans.

This success story is testimony to the possibility of net zero achievements even for large and complex organisations that manage many external factors in their waste management strategies.

WILD COAST SUN

GBCSA Net Zero Waste certification: January 2019

Location: Port Edward, Eastern Cape

Methods to divert waste from landfill:

- On-site composting of organic waste
- Recycling – working with approved recyclers
- Donation and resale of re-usable items
- Manufacturing of bricks from non-valuable, non-recyclable waste.



EXERCISING NET ZERO BEST PRACTICE

Virgin Active Constantia
GBCSA Net Zero Waste certification (pilot)

Hotels have complex waste issues for certain but so do health clubs, which is why Virgin Active has also made a commitment to reduce its waste footprint. Wesley Noble, head of changing business for good at Virgin Active, explains the kind of thinking that is now leading behaviour change across various business sectors: “Our planet is our natural capital. We believe that we have a responsibility to keep the environmental impact of our operations to an absolute minimum. That’s why we’ve committed to net zero environmental impact by 2030. We want to evolve into a restorative enterprise and this ambition includes net zero carbon, water and waste.”

With this inspiration, Virgin Active has committed to reducing the amount of waste sent to landfill from their operations, using recycled content in their products, and making it easy for their members to recycle (they can bring their recyclables to Virgin Active Constantia).

The recent GBCSA Net Zero Waste certification of their Constantia health club in Cape Town is just the beginning of the organisation’s net zero planning as they roll out their strategy across all their health clubs in South Africa.

The journey began in 2015 with an audit of their waste production at the Constantia club. An in-depth waste characterisation study revealed that 93% of the waste could be diverted from landfill and be either recycled or composted. Thus Virgin Active Constantia committed to divert 93% of their waste from landfill through vigorous waste reduction and recycling on site. The remaining 7% is offset through the Kariba REDD+ Project, a forest conservation project aimed at providing sustainable livelihood opportunities for poor communities in northern Zimbabwe, a region suffering from deforestation, poverty and drought.

This also led to the development of a vigorous Operational Waste Management Plan at Virgin Active Constantia that was in line with the National Operational Waste Management Plan. Waste is

ABOUT VIRGIN ACTIVE

Virgin Active, founded in 2001 by Sir Richard Branson, operates 143 clubs across southern Africa. Sustainability is a key driver of Branson’s various business ventures, including the B Team – a global group of leaders working together to accelerate Plan B that focuses on sustainability in business.
www.bteam.org



Julian Goldswain



We want to eliminate waste, not manage it. So, we introduced an End of Life Usage Policy. The policy requires that the end of every product’s life is considered upfront to ensure we are reducing unnecessary waste and eliminating problematic items that cannot be recycled or composted.

Wesley Noble

separated at source to ensure as much as possible is diverted from landfill. Ongoing waste-stream audits are also conducted to ensure there is achievement and improvement on the 93% diversion rates.

When an organisation makes bold moves to redefine its operational processes it is imperative that the staff are included in the thinking and the reasoning behind changes. To this effect there was a focus on educating the health club’s members, employees, tenant cafés and on-site contractors. Awareness campaigns about the Operational Waste Management Plan communicated the “how” and “why” of waste reduction and separation, and these have proved successful.

Sustainability consultant Andre Harms from Ecolution Consulting says: “Nature knows no waste, every product is reused, breaks down into the building blocks of something newly recycled or is reused in some form. While we’re far removed from that practice as a human species, it is inspiring to work with organisations like Virgin Active who let this thinking influence their operations in innovative ways.

“Minimising ‘waste’ through smart procurement, careful source separation and composting, reuse or recycling of the bulk of unused material goes a long way. This coupled with allowing member’s recycling into their stream and offsetting any imbalance through accredited carbon offsetting projects is what resulted in a Net Zero Waste certification.”



ORGANIC WASTE EQUALS VALUE

Waste Transformer at N1 City Mall

Waste-management innovations are flourishing countrywide. At N1 City Mall in Cape Town, the organic (food) waste generated by tenant’s businesses is being transformed on site into clean energy which contributes to the mall’s energy requirements.

The 3-in-1 technology is being trialled by Growthpoint Properties who have partnered with Dutch technology provider, The Waste Transformers. An on-site, anaerobic digester called a Waste Transformer installed at the mall, uses organic waste to produce green electricity, hot water and a high-grade natural fertiliser and compost.

This is an example of future-fitting business as Growthpoint Properties foresaw changes in regulations around waste in the Western Cape that would limit the removal of organic waste from operating buildings to landfill sites. Cape Town has announced that they want a 100% reduction of organic waste to landfills by the year 2027 and Growthpoint wants to reach that target by 2020.

“Organic waste in landfills produces methane gas which is worse for the environment than CO² emissions” says Gavin Jones, Growthpoint Properties’ regional retail asset manager for the Western Cape. It is also desirable to use organic fertiliser from nutrients in food waste, compared to bringing in expensive artificial fertilisers that deplete areas far afield.

The Waste Transformer functions like a digestive system. The containerised structure is made up of modular containers that take up as much space as a few parking bays on site at the mall. It can grow with the amount of organic waste available, currently between 600-3 600kg waste per day.

The organic waste is collected from the restaurants and supermarket operators and separated from any recyclable material at the source. The first stage of the process macerates the waste matter into a usable size and then a greywater mix is added from previous cycles. This mixture is then pumped into the Waste

THE WASTE TRANSFORMER

- Transforming 600kg of organic waste per day
- No transport of waste
- No extra CO²
- All on site
- Natural fertiliser
- Job creation
- Working towards zero waste-to-landfill

www.thewastetransformers.com

Transformer that operates in the same way a stomach does, breaking down the content to produce methane gas. The methane gas is turned into electricity for heating water or cooling fridges.

The methane gas is harvested, cleaned and housed in the gas tank of the Waste Transformer. This biogas is then used to run an electric generator (CHP) which is used to provide electricity and heat for the shopping centre. The hot water can be used in the mall and the waste area.

The final product of the biodigester is a natural liquid fertiliser and compost that is distributed for landscaping at all Growthpoint Properties in the area, as well as non-profit organisations, hospitals and the Parow Golf Course.

Organic waste in landfills produces methane gas which is worse for the environment than CO² emissions.

Gavin Jones



The capacity of this size Waste Transformer at N1 City mall is about 6kVA, which provides electricity to 11 row shops in the mall, and is generated by 600kg of organic waste per day. It is still a relatively small amount of power, but the system itself is a self-sustained modulated system that requires no external power source for it to function. Another benefit is the production of fertiliser, which is a sellable natural product that enables the development of a micro enterprise, is great for soil health, and it creates a huge reduction of diesel-polluting transportation of waste to landfill sites across the country.



GAME CHANGER

Current estimates show that 1 100bn tonnes of waste is produced in South Africa each year. Imagine if this waste could be used in its entirety – to make bricks that would be used to build infrastructure for the nation?

Don Thompson, CEO of The Center of Regenerative Design and Collaboration (CRDC), has invented a process that can turn any plastic waste into the very building blocks of sustainable development.

The products, EcoArena PRA (Pre-Conditioned Resin Aggregate) and Ecoblock, incorporate regenerated waste combined with a standard sand-cement mixture to produce a highly resistant, durable cement or cement block.

The product has been tested and applied by PEDREGAL in Costa Rica for the past two years with great success and CRDC is also collaborating with the international US chemicals giant, Dow, in the development of EcoArena in a bid to develop a lead initiative for the alliance to end plastic waste.

In South Africa, CRDC has partnered with a leading operations company that has extensive expertise and a long track record in on-site waste management, plastic recycling, waste-to-energy and implementation of zero waste-to-landfill solutions.



CRDC will be testing EcoArena PRA with two major concrete manufacturers in the Western Cape as well as a major South African cement producer.

This breakthrough in transforming plastic and using it in the same way as you would conventional aggregate is a game-changer. Not only can building be done with less impacts but it can help solve one of the biggest problems that has been created by the consumer culture, that of plastic contamination.

This solution illustrates the very essence of a circular economy – one in which the construction industry is helping the plastic industry solve a waste problem by turning it into a raw material that can be used in any construction on the planet. +

BENEFITS OF CRDC ECOARENA

- 10% increase in strength
- 8% to 16% decrease in weight
- Good thermal properties
- Same fire resistance as with standard concrete
- Lower dependency on other raw materials
- Reduce cement industries carbon footprint and carbon tax bill
- Reduces carbon footprints by eliminating plastic-to-landfill and plastic pollution (One tonne of mixed plastics going to landfill has an emissions factor of 21.3842kg CO²e)
- All types of plastic can be upcycled into EcoArena PRA – i.e. no costly separation required
- Waste plastic permanently eliminated from the environment



In South Africa, there is an established and sophisticated cement industry. Against this, we need to create jobs, we need to clean up the environment and there is an urgent need for housing. Our plan is to use the Costa Rican model to initially launch in the Western. *Don Thompson*

IsoBoard Thermal Insulation Retro-fit Solutions

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Short pieces of IsoBoard, up to 2400mm in length, are glued directly to the roof sheet, usually between purlins or rafters.



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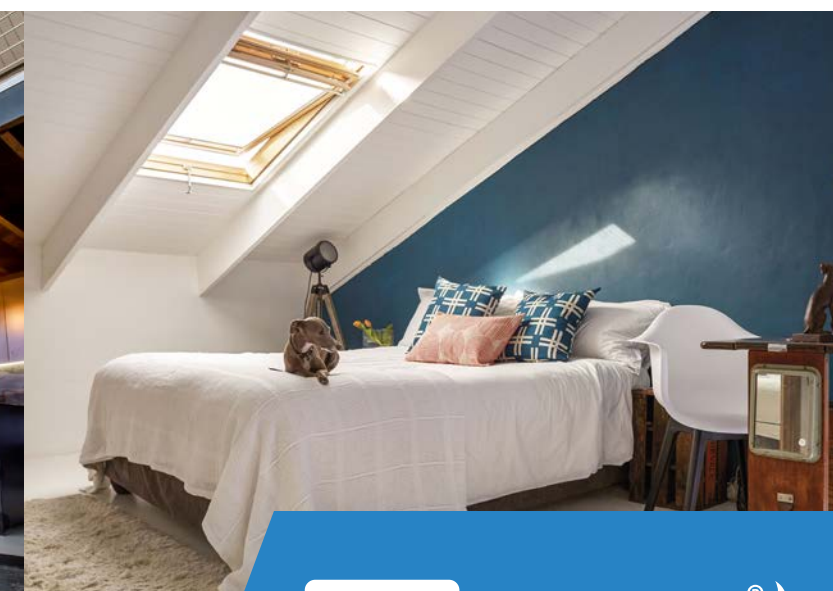
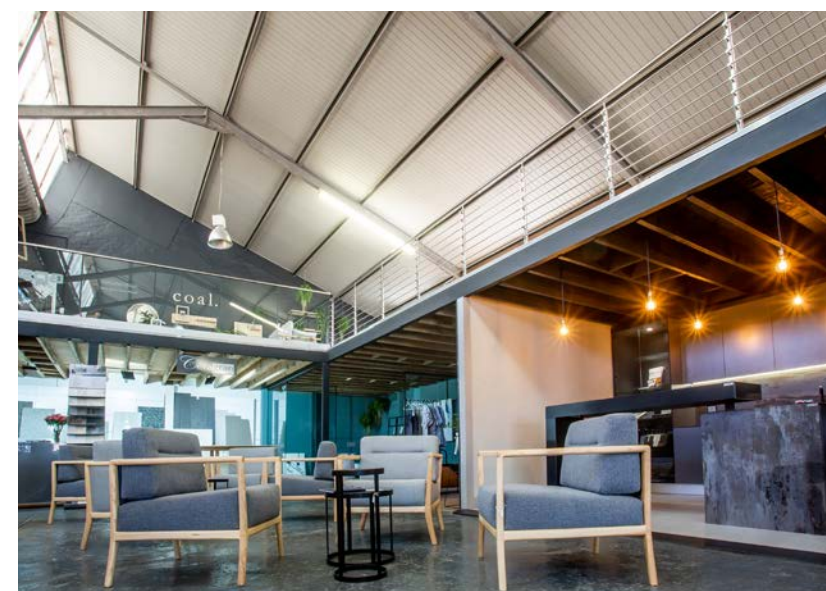
The boards are pushed firmly into the adhesive, interlocking with their tongue and groove edges.



SEE AND FEEL THE DIFFERENCE!



Trimmed pieces can be fixed along the edges as required.



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For Old Mutual, conducting business in a responsible and sustainable way goes beyond a PR or CSI strategy, and right back to the premise on which the organisation started 174 years ago: to respond to the pressures that customers and society face and to create a future for them, even at the most difficult times.

“So it starts there, at our purpose as an organisation. Taking care of the most vulnerable in our communities has always been a core principle of who we are,” explains Khanyi Chaba, Head of Responsible Business at Old Mutual. “We conduct business on a set of basic principles that enable us to respond in a positive manner to all those who are dependent on us – our customers, communities, employees, the environment and society. We are conscious that we have to be profitable, because this talks to being a responsible business – one that is ready and prepared for changing needs.”

Chaba says that Old Mutual's relevance is based on being nimble and agile enough to evolve according to societal pressures, and as such they have aligned themselves with the UN's sustainable development goals. They also have their feet very firmly planted on the African continent and have been intentional about investing in tangible solutions to contribute towards positive change; according to the nuanced challenges facing each country they're involved with. Overall, the organisation has invested more than R120 billion - R91.5 billion in paid claims and benefits, R1 billion in agriculture, R1.5 billion in education, R500 million in small businesses, R19.3 billion in affordable housing and R32.7 billion in renewable energy.



SUSTAINABLE INTERVENTION

“As a financial institution, the key thing that Old Mutual stands for is creating financial wellbeing. So we ensure that the way we invest is about business, but at the same time having a sustainable social impact. For example, renewable energy is one of the big sectors we're investing in, and we create opportunities for communities to own the programmes. This is happening with much success in the Eastern Cape; where the investment is going back into the community with positive effects. We ensure that wherever we create funds for affordable housing,

schools and transformational infrastructure, there are also opportunities to create awareness through our financial educational interventions. Our impact is also through the sheer number of people that we have touched through helping people to manage their finances, and create a sustainable future for themselves,” says Chaba.

“We quantify our success by how ready we are to help people; by providing a payment and treating all our customers fairly and equally. As one of the biggest payers we can be confident that we are fulfilling our purpose that goes right back to day one: being a friend when it's most needed. That, for us, is responsible business.” +

Star-quality treatment

Beyond hand sanitisers and aerated taps, what are South Africa's corporates doing to save water and relieve the municipal water grid?

WORDS Mary Anne Constable



No 2 Estuaries (currently being renamed from Old Mutual Wealth) achieved full marks in the water category when it achieved its Green Star rating in 2011. The basement water treatment system allows the building to be off the municipal water grid (when not undergoing maintenance). This set the building far ahead of its time.

Environmentalists, internationally, cite Cape Town's "worst drought in history" of 2017/2018 as an example of how regulators and communities can come together to meet challenges, and adapt to change when required. It's also been a huge wakeup call for commercial businesses. As they faced the prospect of the impending "Day Zero" (switching off the city's water grid) and the possibility that employees couldn't come to work if there was no water in the taps, they realised the real cost of NOT having water in their buildings. Not only did this realisation strengthen the business case for installing sustainable water solutions, but it also sparked ingenuity which has shown that, with a little extra thought, a lot can be done to increase water-efficiency, decrease wastage and find ways to treat and re-use wastewater. Not surprisingly, Cape Town has produced some of the first buildings to go off the municipal water grid since then.

LESSONS FROM THE ESTUARIES

No 2 Estuaries, situated on Oxbow Crescent in Century City, Cape Town, is one such example. The building achieved its 4-Star Green Star Office rating in 2011, gaining full marks in the water category. In 2017, it

made history as the first building in Africa to receive a Net Zero Water certification under the GBCSA's new pilot tool, for being off the municipal water grid. This was achieved with no additional retrofit to the building, explains Claire Holton from Terramanzi Group, green building consultants and Green Star accredited professionals on the job. "This is testament to the fact that the Estuaries building was ahead of its time, where our client chose to future-proof their development prior to knowledge of the looming Cape Town water crisis," she says.

At the time the building was owned by Asset Matrix and home to Old Mutual Wealth but is currently owned by Spear REIT who acquired the property in July 2018. Terramanzi were only appointed at a very late stage in the design process (when the roof trusses were going on). "This made it very difficult for us to align the Green Star requirements with the project's design process to ensure a seamless process to achieving a sustainable design," says Holton. "Subsequently, the project lost out on those Green Star credits considered 'low-hanging' fruits and had to take an all-or-nothing approach in targeting their Green Star rating. They chose to focus on optimising the building's natural ventilation, reducing their emissions and achieving full points in the water category by developing a building completely off-grid."



From a Green Star project perspective, this project has demonstrated that it is possible to achieve sustainable design improvements regardless of where a building project is at in its project programme.

Claire Holton

To achieve its exemplary water rating the building was first and foremost designed with efficiency in mind to include water-efficient fittings and fixtures, a water-efficient irrigation system and electronic meters that create awareness of usage. By monitoring and measuring water consumption, occupants are regularly informed, resulting in behavioural changes. Monitoring and measuring also assists with leak detection and water saving.

A Wastewater Treatment System (WWTS) installed in the building's basement purifies recycled wastewater (effluent) from the local municipality wastewater treatment plant at Potsdam near Century City. The wastewater is purified through a reverse osmosis filtration system which is supported by multiple stages of cartridge filters, and then circulated throughout the building for reuse. "The Estuaries building uses zero potable water from the municipal supply under normal design building demand. The only time the system reverts to using municipal supply is when the system is undergoing maintenance," Holton explains. The building's water consumption is approximately 5 000ℓ per day, which means that when the WWTS is fully functional, 5 000ℓ is saved from the municipal grid. The overall reduction in potable water consumption sits at approximately 88%.

Originally a biodigester system was installed to treat the black water but this was eventually removed as biodigesters require a large amount of biomass to sustain the fermentation process and the office facility simply didn't produce enough. The inefficient supply was being supplemented with cow manure, which created an extra expense and it was decided that the system would run more efficiently without the biodigesters.

When it comes to driving the business case for installing water treatment technologies, Fabio Venturi, director of Terramanzi Group, says that modern off-grid facilities can achieve a considerable financial saving, however, the Estuaries' WWTS is now quite dated and therefore not as efficient as modern off-grid systems. "The water produced by the plant at the Estuaries is not cheaper than municipal water, largely because the inconsistent quality of the feed water requires extensive pre-filtration. Also, the maintenance costs for the plant are disproportionately high, given the relatively low volume of water production," says water services engineer, Noel de Villiers from Sutherland. Chief operating officer of Spear REIT, Cliff Toerien, highlights that there are however "tangible benefits from the reduction of the negative environmental footprint, something which Spear are keenly aware of and which we regularly aim to address". Thus despite not being an example of the most efficient and most economical system available, the building serves as a "proof of concept" that such things can be done, and the process has provided interesting and valuable learnings that will benefit others to come.

A GREEN RETROFIT FOR OLD MUTUAL

Old Mutual installed the largest privately-owned waste-to-potable-drinking-water filtration system at its office headquarters at Mutual Park in Pinelands, Cape Town in August 2018. The building is currently registered for the Net Zero Water certification and hopes to achieve it in November 2019, after the system has been operational for 12 months. Old Mutual is one of



Mutual Park hopes to achieve its Net Zero Water certification towards the end of 2019.

South Africa's biggest and oldest companies, owning and tenating many commercial buildings across the continent (in 13 countries). This project marked them as the first large corporation in the country to go off the water grid and set an example for other corporates to follow.

"The journey started well over ten years ago already, when we as a facilities management team challenged ourselves by questioning how we could add more value. This drove us to focus on efficiency and question everything we did, looking at opportunities to reduce our utility usage while increasing performance. We focused on energy first, then water and waste," says Khiyam Fredericks, Old Mutual's national technical

The business case for this project is performing very well, with a return on investment of about 3.5 years. This as a result of water savings.
Khiyam Fredericks

manager. Mutual Park gained a 5-Star Green Star Existing Building Performance rating in 2016, for the sustainable initiatives subsequently initiated. This was before the installation of a 1.25MWp solar PV system in 2016, and the water filtration system in 2018. The focus for 2019 is on waste management and improving the waste diversion rate to 70% by the end of the year.

The office campus is one of the largest in the country with approximately 9 000 people operating on it daily. On top of the wastewater filtration system, the building features water-efficient fixtures and fittings, water meters to monitor consumption and waste, a greywater irrigation system and waterwise plants throughout. The water filtration system supplies more than 85% of the water needed for the campus and has produced approximately 90 million litres of clean drinking water since inception, Fredericks explains.

The local municipality and the national Department of Water and Sanitation were involved from the beginning to provide guidance with regards to compliance. "Involvement from all stakeholders was critical," says Fredericks, in order to ensure the success of the project. This also included change management of the staff which involved implementing an extensive marketing and education campaign to keep people informed. So far, the results are only positive, marking this a milestone achievement for Old Mutual. +



MUTUAL PLACE ACHIEVES FULLS MARKS

Old Mutual's new corporate head office in Sandton, Gauteng, opened its doors in 2017. No 1 Mutual Place is the first of five buildings developed on the site over a single super basement, and consists of two wings, a lower six-storey banana-shaped wing, and an iconic 12-storey tower. The building achieved a 5-Star Green Star Office As-Built rating in March 2019, with full marks in the water category. Besides the obvious water-efficient devices to minimise consumption, and metering equipment, stormwater from the entire site is attenuated and a portion harvested in a centralised storm water facility. The rainwater is treated and reused in the building for toilet and urinal flushing, and for the building and precinct's irrigation requirements.

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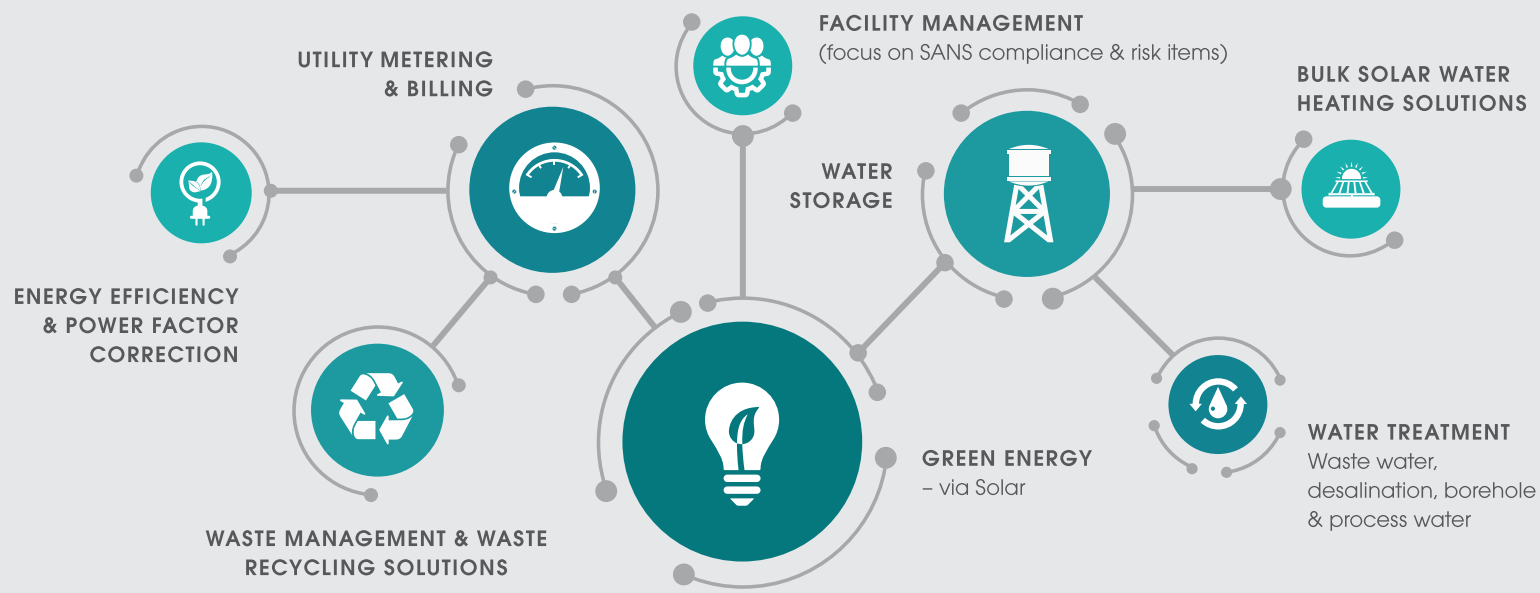
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Bringing the Outside In

Sustainability as a millennial design imperative



Kasha Ströh, interior designer at Tétris, is a Generation Y employee and can personally vouch for studies that report millennials are inspired by businesses with an ethical approach to society, which includes a strong social and environmental commitment. She gives her take on some of the sustainable trends currently inspiring interior design.

Sustainability as part of an effective workplace strategy means designing for people. The two go hand in hand. A sustainable work environment not only improves performance and productivity but perhaps, more importantly, breeds a healthy, happy culture. It's been proven that workers in green office environments typically experience less stress, have better health and work more efficiently. A Cone Communications Millennial CSR Study suggests as many as 91% of millennials would switch to a company or brand based on its commitment to social good and investment in things like sustainability.



A TWO-FOLD APPROACH

Sustainable design strategies are part of the initial build phase (with plans to reduce material waste and use responsible products) and are equally important when considering the long-term environmental impact of a building (installing energy efficient products and solutions).

The bottom line is that resources are running out. It's a situation that creates significant opportunities for innovative alternatives in the world of fit-out and design. Design has made it possible for us to create sustainable, healthy environments, and the only way we can achieve this is to focus on the way we live.



Biophilic office design involves including natural elements into the aesthetics of the workplace, such as this living green wall.

The new Discovery head office in Johannesburg, for example, puts this sentiment into practice. Resource-efficient and environmentally innovative, the 5-Star Green Star-rated building is centred around its occupants' health and wellbeing. The design focuses on fresh air, thermal comfort, daylight and a strong connection to the exterior. People have access to a fully-equipped gym, and there is a running track, yoga decks and multipurpose courts set in the indigenously landscaped rooftop space. It has as important a role to play in employee attraction and retention, as it does in driving sustainability.

THE SECOND NATURE TREND

The Discovery building, and many others like it, are highlighting nature-inspired solutions for a healthier workspace, a principle that has become "second nature" to designers and architects. Plants and biophilic design have grown beyond a fashionable nice-to-have to become embedded in design philosophy.

Natural lighting and ventilation are much-discussed aspects of biophilic office design, as is the inclusion of natural elements into the aesthetics of the workplace, from organic patterning to natural materials like stone or wood. The trend has taken an inspiring step further into the office design environment.

BRINGING THE OUTSIDE IN

Jamie Durie and Nadine Bush coined the term "transterior" in their celebrated book, *Living Design* which describes the "seamless transition between interior and exterior spaces to ensure a greater connection to nature". It is centred around people's relationship with plants and draws on the abundant benefits of incorporating all things natural – everything from flora and light to materials and layout – into an office fit-out.

The building integrated agriculture (BIA) concept is taking full advantage of this trend in the commercial office space and is being showcased in offices around



Rooftop garden spaces are trending in the corporate environment, as a place where employees can take a break in an outdoor setting.

Mary Anne Constable



Sustainability as part of an effective workplace strategy means designing for people.

the world. This innovative practice includes installing rooftop greenhouses and vertical gardens in corporate spaces, with sustainable and social benefits. An inspiring global example is Japanese recruitment firm Pasona's headquarters in Tokyo. The unique eco office building also operates as an urban farm to grow food for employees. All the produce is harvested, prepared and served on site, making it the largest farm-to-table office scheme in Japan.

In fact, rooftop garden spaces are becoming increasingly popular in our local office context, with urban corporates acknowledging their value as a place for employees to work or take a break in an outdoor setting.

Green office spaces are firmly on the millennial agenda, both for what they offer in terms of lifestyle and facilities, but equally for the impact they have on the planet.

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Retrofitting Regeneration



While demand for new green buildings continues to grow – to a large extent – these will not replace the importance of the existing building stock, particularly within our city centres and urban hubs.

WORDS Alison Groves,
Regional Director: WSP, Building Services, Africa



If we look at urban hubs that are economically key, like Sandton for example, commercial office space is sitting at vacancy rates in excess of 15.9%, much higher than the national average¹. This leads me to believe, that currently there is an excess of available office space and as a result, there likely won't be many new buildings being built in the short- to medium-term. In addition, new building projects only represent a very small portion of the entire built stock.

This presents an even greater opportunity to focus on urban regeneration – through refurbishing and retrofitting the existing building stock – keeping sustainability principles top of mind. There are two main change actors that continue to spur the urban regeneration movement.

#1: “BUILDING” FOR RESILIENCE

Resilience has become a bit of a buzzword when we refer to designing and building new, or retrofitting and refurbishing existing buildings. We can no longer afford to take a passive approach to adaptation and planning needed to mitigate the adverse effects of climate change.

The built environment accounts for 39% of global carbon emissions², and continues to rise around 1% each year³. Coupled with compounding pressure to address challenges around aging and inadequate network infrastructure and/or insufficient energy and water resources, as well as tightening building energy-efficiency standards – a clearer picture of the wealth of the urban regeneration opportunity begins to take form.

This regeneration, or urban renewal, can take place in different forms such as – but not limited to – corporates establishing campuses around their head offices, or

future proofing old buildings and city centres. The most important consideration for developers, and businesses who own and occupy their buildings, is to aspire to incorporate climate-responsive design into maintenance and refurbishments, being mindful of resource constraints and future weather assaults which may impact comfort and safety of old buildings.

#2: OPTIMISING BUILDING PERFORMANCE (AND COMMERCIAL VIABILITY)

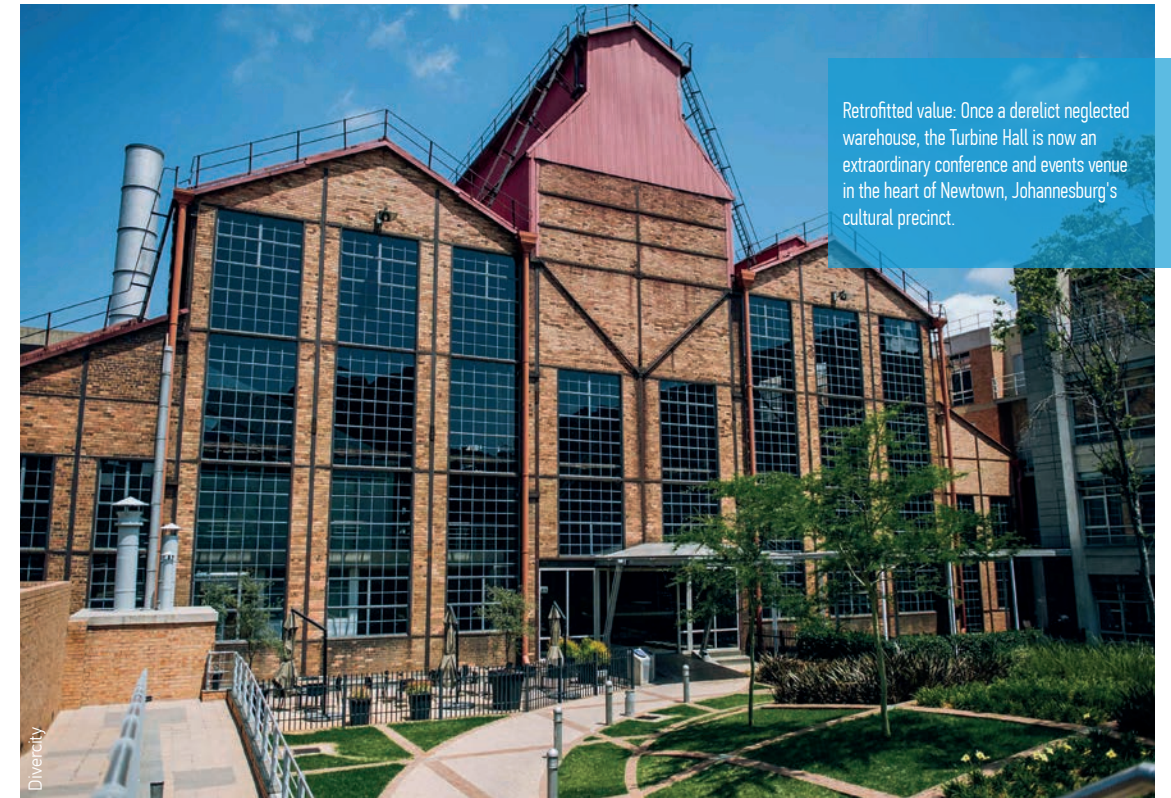
Some cynics might argue that refurbishments are difficult, and do not make economic sense for the effort required. However, there is in fact a strong business case for implementing “green building” interventions, aimed at ensuring that the building operates in an economically and socially sustainable manner, and improving the liveability of the space and thereby, the desirability for future tenants. For example, if specified and installed correctly, systems and structures can produce a sustainable return on investment (ROI) that may amount to between 20% - 70% of energy and gain revenue through this investment. Demonstrating these improvements would be a real incentive to attract tenants to older buildings in the more established part of the city.

Therefore, for a more objective and balanced view, it is important to evaluate the full life cycle costs of any intervention. This can be achieved by conducting a full audit of the performance of the building using one of the Green Star rating tools available in the market. For instance, one might use the Existing Building Performance tool to evaluate smaller retrofitting projects, establishing a benchmark of building



Regenerated neighbourhood: Arts on Main in the Johannesburg CBD is Maboneng Precinct's pioneering development and the heart of this lively neighbourhood, converted from historic warehouses and industrial buildings into artist studios, galleries and quirky shops.

Melinda Hardisty



Retrofitted value: Once a derelict neglected warehouse, the Turbine Hall is now an extraordinary conference and events venue in the heart of Newtown, Johannesburg's cultural precinct.



Delivering on successful regeneration projects requires a deep-seated understanding of the local context: including the built and natural environments; as well as before economic, political and social factors that can affect the outcome.

performance prior to investing in the refurbishment. The Green Star new build rating tool can be used to rate substantial redevelopment projects where plant and façade are overhauled. Doing so provides a solid metric to measure the success of the interventions and justify the capital investment.

Additionally, businesses and their people – as the primary targeted tenants or “users” of industrial and commercial spaces – continue to grow increasingly socially conscious of the effects of climate change and the need to safeguard and manage critical resources in a more sustainable fashion. These users also recognise the role green buildings can play in these aspirations. Green buildings therefore offer significant value-adds to savvy users; making these buildings more commercially viable and attractive, as what benefits the users also benefits the developer/owner.

The interventions may be vast, and vary between buildings, but will most certainly, at the very least, include things like:

- The materials, and specifically the recycled/reused contents of the materials, used in the refurbishment to reduce the embodied carbon of the development.

- Achieving improved energy efficiency, especially through the use of natural light balanced with efficient light fittings and smart switching.
- Improving water consumption with more efficient fittings.
- Optimising temperature and air-flow management, through considerations around the façade, placement of people in according with the façade and – depending on the scope of the refurbishment project – driving more efficiencies through upgrades to the mechanical plant (HVAC) system.
- On-site recycling access and waste-to-landfill considerations for the refurbishment and operational phases of the building.
- Operational measures to guide building managers and occupants to adopt more sustainable processes when it comes to managing the day-to-day operations.

Delivering on successful regeneration projects requires a deep-seated understanding of the local context; including the built and natural environments, economic, political and social factors that can affect the outcome. ►►

¹ SAPOA Office Vacancy Report, April 2018.

² The 2018 Global Status Report – Towards a Zero-Emission, Efficient and Resilient Buildings and Construction Sector.

³ UN Environment, Global Status Report, 2017 - Towards a Zero-Emission, Efficient and Resilient Buildings and Construction Sector.



STANDING TALL

Towers Main, Johannesburg

Over the last decade or so there have been a number of refurbishment projects within the Johannesburg CBD, collectively aimed at a complete regeneration of this important economic and urban node – and Towers Main is the newest project to these ranks.

Led by Divercity Urban Renewal Fund (partnership between Atterbury Property, iThemba Property and Talis Property Fund), and its cornerstone investors, RMH Property and Nedbank Property Partners, this project aims to completely redevelop the iconic 30-storey building formally known as the ABSA Towers to a mixed-use building. It is estimated that this redevelopment will be valued at over R400m once completed.

Work has already begun to revamp the future of this building. Replacing the existing façade (on commercial levels) for a new modern one with better glass specifications will not only visually completely transform the building from the outside, but also contribute to the passive design strategy to improve the mechanical plant (HVAC) system efficiency.

Changes inside the building however will be more dramatic. The floor plate will be extended in some locations, to bring a new different look and feel to the building. This undertaking will present some challenges during construction, not least of all heightened safety requirements when working at such heights to demolish the existing eyebrow while safely collecting debris and rubble from the demolition. Further to this, the new

eyebrow requires the steelwork to fit onto the existing structure, which was not necessarily built with the accuracy of today's tolerances. On-site dimensions will be required to make this work, ensuring that the new structure will be built correctly. Also, the design choice for the structure consisted of bondek slab with steel work, which allows for a lightweight structural solution to the new eyebrows, as the overall weight of the refurbishment has to fall within the initial structural design and allowances.

Additionally, the mechanical plant (HVAC) systems are being completely replaced, where services for the commercial and retail spaces will operate completely independently of each other – and the residential space will be naturally ventilated.

The project is expected to be completed and ready for occupancy by the first quarter of 2020, where the revamped Tower Main will consist of: residential (upper floors will be made up of 520 affordably priced residential rental apartments and recreation space), commercial (ABSA, as a key partner to the project, will lease back nine floors with 10 000m² of office space), and retail space (bottom two floors).

The vision behind the project redevelopment is to create a multifunctional, inclusive and diverse neighbourhood, which is also in keeping with the global new urbanism trend. This redevelopment will therefore extend the lifespan of this landmark building on the city skyline for many decades to come – by offering people adjacent space where they can live, work, play and thrive. +

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The Technology of Construction

Construction 4.0 is about the automation of processes and digitalisation in the construction sector. As technology advances in leaps and bounds, how can it push the sustainability agenda?

WORDS Femke van Zandvoort

Digital construction can take many forms: from simple tools that facilitate communication and reduce the need for travel, to 3D printing, cloud-based computing and software applications; or it could take more advanced forms, with the use of drones for site scanning, virtual reality and artificial intelligence.

Beyond the obvious commercial advantages, digitalisation is interesting from a sustainability point of view. Where traditional building management tools assisted facilities managers, learnings were usually not fed back to the design team. Digital technologies today have changed this by providing information and insight to engineers, architects, owners and facilities managers, as to how a building is performing during its entire lifecycle – giving them invaluable knowledge going forward. This deep learning has allowed buildings to become highly flexible and adaptable to their occupants' needs.

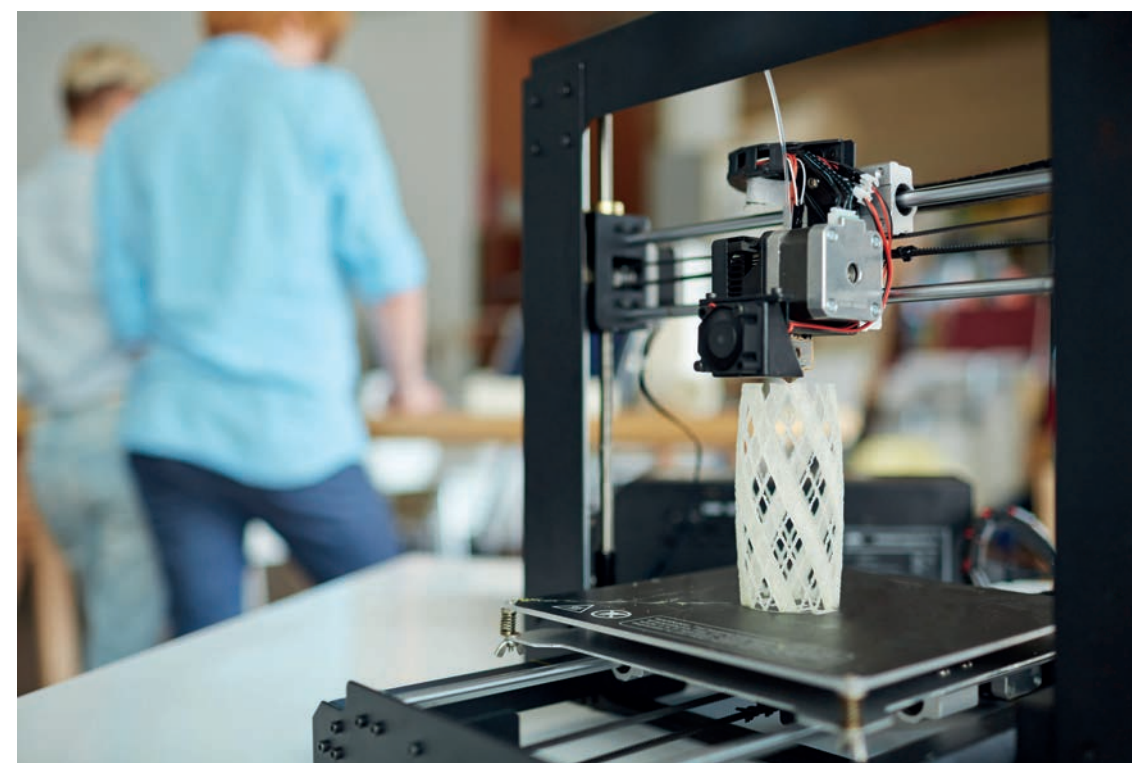
"The technologies coming out promise to give designers and engineers a true 'systems-level' perspective for the first time. This vastly richer level of insight means better, more sophisticated decision making for clients and a more efficient and sustainable use of the world's precious materials," explains Marcus Morrell, leader of the Arup Foresight team in the United Kingdom, India, Middle East and Africa. Changes to a design can have major implications to a construction project in terms of energy use, as well as waste and water reduction, for example. "Construction companies are also losing up to 30% of pre-tax profits in waste management and claim that there are no convenient mechanisms in place to change the business-as-usual approach of dumping at landfills. Technology could allow us to solve this problem in a way that is not only convenient but also sustainable and uplifting," says Carin de Beer, consultant at Arup and co-creator of DigiYard, a new digital waste management platform.

THE DIGITAL JOURNEY

"For the human brain it is sheer impossible to keep track of all the project parameters, but once captured as data, these parameters and how they are interlinked in a building design will be made clear in an instant," says Hermen Jan van Ree, global innovation leader at Royal HaskoningDHV. Van Ree explains how the company goes about a typical digital journey: "Together with the client, we would identify their needs and requirements and then use parametric models to build an optimised version, using data. You can optimise your design to its most cost-effective option, or use different criteria for optimisation, such as the most energy-efficient, least ecological impact, etc." Part of this journey could be more technology driven, using virtual reality (VR) or augmented reality (AR) to experience what the future is going to look like during operation. "In the initial stages we can also use software programs we developed inhouse, to identify where there is less traffic congestion (Flowtack), where the safest area is in terms of climate change and rising sea levels (BlueLabel), or how to be most energy-efficient (FastLane)," van Ree adds. With the data gathered, it can also turn out that the most cost-effective option is to rather refurbish an existing build.

The entire process can be turned around: instead of looking at how to add water- and energy-efficient features, the maximum water and energy levels you are prepared to reach when the building is operational could be entered, and a design modelled accordingly. This could well turn out to inspire an unconventional design the architect would not have otherwise considered.

So, let's assume the task at hand is to create a 6-Star Green Star building. What tools and processes are needed to achieve this?





BUILDING INFORMATION MODELLING

Building information modelling (BIM) is the process of capturing building-related data with virtual design tools. The UK is likely the most advanced on the use of BIM, where it is mandated by government. BIM can be described as a virtual prototype of an infrastructural project – be it a building or an entire city. This virtual 3D model provides a good understanding of what a design will look like. Depending on the data fed into it, which could range from material use to soil structure, to prevalent weather conditions to the type of light fittings used; the design's performance can be simulated in the operational stage before the building is built, thus providing the opportunity to tweak and improve the design accordingly.

The prototype is easily shared between stakeholders throughout the process and continues to evolve. Tied in with costs and data such as energy modelling, it instantly becomes clear what each adjustment does in terms of the feasibility of a project. The possibilities are endless, but it is important to feed the proper data into the system in order to make deliberate decisions. How to gather this data can vary: entering materials, dimensions, location, etc. is one side of the spectrum. There are many options available and the technology is always improving.

DATA ANALYSIS

Once the data has been gathered and captured into a BIM model, the next step is to analyse the data and use it to your advantage. With software programs such as Revit, Navisworks and BIM360; software company Autodesk, for instance, offers specific ways to analyse data and make visualisations before the build. Revit software enables you to produce complete building design models and documentation. All changes made to any of the parameters are automatically updated in the BIM model, as are 3D visualisations. This process, also known as parametric design, is an enormous advantage compared to older authoring software such as CAD, where considerably more time is involved to produce and adjust the model.

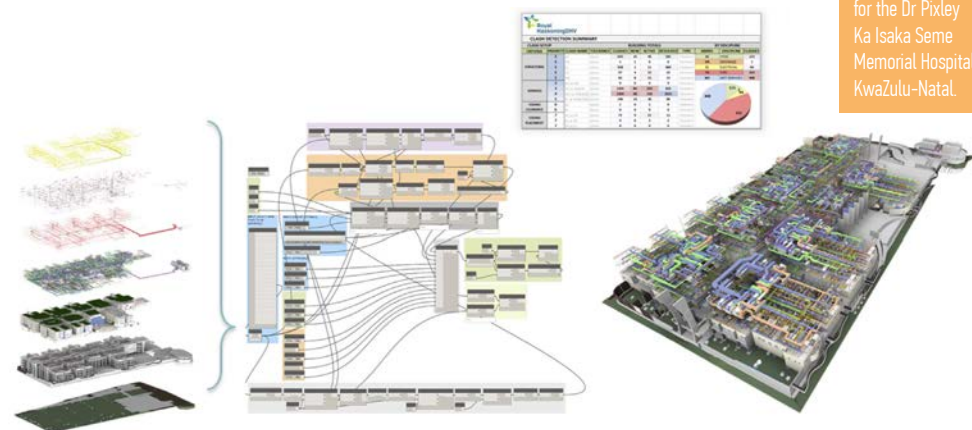


Carlos Muza - Unsplash

Navisworks software, according to Autodesk, lets architecture, engineering, and construction professionals holistically review integrated models and data with stakeholders during preconstruction to better control project outcomes. Interesting features here are clash detection and model coordination where the software can point out problems in the design (e.g. plumbing and cable routing clashes) in the design phase, minimising expensive rework and delays that relate to this.

BIM360 is a platform connecting project teams and data in real-time, during design and construction. It allows you to access building models in the cloud and then make adjustments on site, making sure everyone has the most recent and accurate information to work with, and again reducing the possibility of errors and delays. Similar apps integrated to the same BIM platform can be used by facilities managers in the operational stage. When discovering a broken fitting while doing the rounds for example, all that needs to be done is take a picture through the app and the correct lamp will have already been ordered for the exact location before the facilities manager is back in the office. Furthermore, if a ladder is needed to change the lamp, this will be indicated too.

BIM ENABLED IN DESIGN, BUILD AND MAINTENANCE

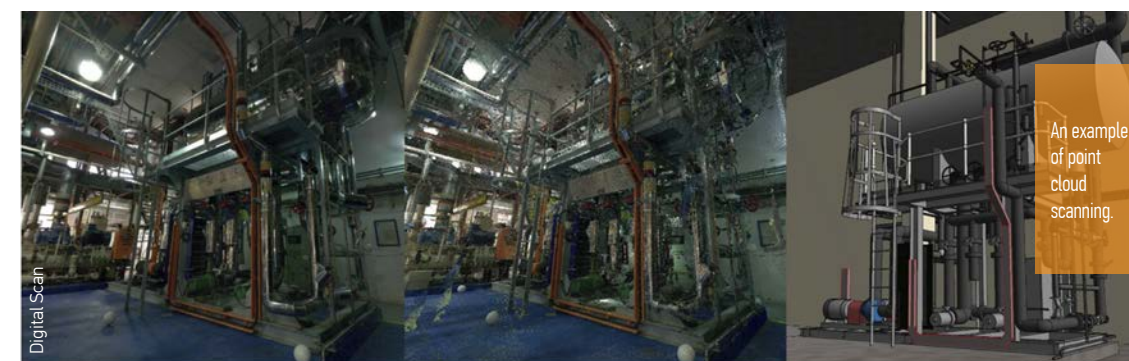


An example of a BIM model, with clash detection data, for the Dr Pixley Ka Isaka Seme Memorial Hospital, KwaZulu-Natal.

Royal Haskoning DHV



POINT CLOUDS SCANNING



STATIC 360° PICTURE → CLOUD OF POINTS → PRODUCING A 3D MODEL

An example of point cloud scanning.

POINT CLOUDS FOR DIGITAL SCANNING AND PHOTOGRAMMETRY

Used in existing buildings, and even entire precincts, digital scans (such as offered by Leica Geosystems) can gather and process data at great speed. The digital scan – combined with or without High Dynamic Range (HDR) images – provides point clouds, or sets of data points in space, which measure a vast amount of points on the external surfaces of objects around them. In a similar fashion, although less accurate, a collection of pictures taken of an object from different angles can serve as input for a software program to create 3D output, called photogrammetry.

This data can then be fed into a BIM model. The data captured can range from the dimensions of a space, to the position of possible or exposed electrical wiring, plumbing and light fixtures; making it a convenient tool

for many stakeholders on site, in terms of producing 3D models as well as for during planning, coordination and later on in the operational stage of the building.

A DIFFERENT WAY OF WORKING

Digital means the industry must rethink its way of working. This also holds true for clients and other stakeholders. Having 3D models available is not only a great way for everyone involved to imagine a project, but scans and data capturing mean far less trips to site during the construction phase, thus saving time.

The digital way of working thus requires collaboration and a high level of maturity from client, professionals and contractors alike, as design elements need to be set in the early stages of a project and not added later, as this will drive up costs immensely. “As the bulk of

AN APP FOR CONSTRUCTION WASTE

The ability for digital technology to connect people and knowledge also makes it a powerful tool for solving social issues and strengthening community ties.

DigiYard, conceptualised for an internal Arup ideas competition, is a digital platform that looks to facilitate the flow of usable construction waste and surplus/used building material from construction sites to informal settlement upgrading projects. The platform aims to reduce construction waste in landfills while addressing the need for affordable, quality building materials in the informal housing sector.

DigiYard, created by Kausar Khan, Jaco Kemp and Carin de Beer of Arup, is currently in its pilot phase. The platform will eventually operate as a progressive web or mobile application. Among other features, it will be capable of using machine learning algorithms to enable the smart recognition of materials. This will allow quick measurements and descriptions of items to be uploaded to a cloud portal, providing convenience to suppliers. Mobile payments and a transport option to providing door-to-door delivery will also be explored in future to provide convenience for end-users.



ARUP



the work is completed during the initial stages of the project, most of the allocated time and budget will thus be spent there, which means that this time cannot be spent again at a later stage, while the client still expects the engineers to be on site later. This was common practice in the old setting”, says Hubert van Zandvoort, director Digital Engineering at Royal Haskoning DHV, South Africa. “This shows us that we need to work differently. I can see it going in the direction of building at value, instead of cost. For instance, you can design a building to be 100% efficient in energy, but due to the contractor’s quality of workmanship, this efficiency can drop to 75%. This contractor would only get paid according to the achieved percentage,” van Zandvoort adds.

Although it is too early to tell how the digitalisation will affect jobs, it is obvious that people will need to upskill as the industry will need less labourers and

more technical staff. Although this is unfortunate, the upside is that the digital aspect should be able to attract more young people and women to the industry.

BEING PART OF THE CHANGE

There are myriad types of software and technologies that fall under Construction 4.0 (far too many for one article) and these are all advancing at a rapid pace. The plethora of digital services and technologies on offer in the world today all have a role to play somewhere in the journey to create healthy, safe and sustainable buildings, cities and societies, believes van Ree. “If you want to become more responsive to the changes happening, you can be part of it. You can start small. If you are interested and want to push boundaries, then let’s co-create and build up a pilot in your office.” +

PRINTED STRUCTURE

3D printing products are built up layer by layer, offering freedom of form. This results in endless possibilities for mass customisation, weight reduction and product integration. Each product can look different, offering flexibility, without compromising on quality or safety. Arup designed a trio of large tensegrity structures for a shopping street in The Hague. Having integrated street lighting, they were called “urban chandeliers”.

Due to the irregular shape of the structures most of the 1 600 nodes, connecting the cables to the

struts, were different. This required “uniqueness” inspired Arup to learn more about additive manufacturing and the below image shows the first and second design iteration.

The three structural elements (nodes) shown are all designed to carry the same structural loads and forces. The difference is that the smaller item shown on the right is designed using the latest optimisation and design methods. As a result, construction costs could be decreased significantly, and architectural freedom could be increased.



Davidfotografie

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Landmarks to leave a legacy



Nweti is a wholly owned black infrastructure construction company founded in 2008, which prides itself on delivering exceptional service and project delivery to clients. Together with their patrons, the Nweti team contributes to fostering economic growth and sustaining development in the local communities in which they work, with the genuine desire to make a positive impact.

“Our biggest currency as a company and as a stakeholder is quality. It is through quality works that we continue to secure repeat business, harness and enhance our relationships with our partners, open up new horizons and build onto the next level,” says CEO Vusi Motha. He goes on to say that they are very clear that they want to be the best but not necessarily the biggest, and are therefore careful to recruit and associate with highly driven, ethical professionals that take pride in what they do and are fully accountable for their actions. “We acknowledge at the outset that we can never be too big to fail.”

Nweti’s core focus within the infrastructure and construction value chain is predominantly on civil engineering works covering:

- Roads and bulk earthworks
- Major stormwater management
- Water reservoirs, waste water treatment plants and heavy concrete works
- Bridges and other related structures.

With operations across Gauteng, North West, Western Cape and Free State, Nweti has an extensive client list and projects both completed and ongoing. Their work in Mamelodi (east of Tshwane), in expanding bridges and roads as part of the Bus Rapid Transport (BRT) system is a project that Motha says is part of their auto-biographical footprint, and one which they will always be proud of. “We were extremely excited and humbled to have been appointed for a project of such significance – it is literally a gateway to economic activity into and out of Mamelodi. The beauty of our industry is that we create landmarks that will be there for generations to see and benefit from.”

THE FUTURE WORKFORCE

In an effort to improve on the past imbalances; Nweti Construction is committed to educating, developing and training previously marginalised population groups. This is done by providing bursaries and in-service training to members of these groups. Through this programme they are also able to attract and retain competent and skilful employees. “This is of great importance to us; we inspire each other with significant work full of purpose, challenging development opportunities, and rewarding careers. We aspire to be the employer of choice in our industry,” says Motha.

Employees are brought into the ethos where high aspirations, responsible planning and the honouring of commitments is prioritised. Nweti builds a quality system based on mutual employee and client involvement; where distinct design stipulations from clients result in an elimination of rework and operational issues, which ultimately reduces operating costs. “Our team are required to have a clear understanding of quality expectations, and further to this we provide our employees with the training and support needed to deliver quality projects to clients.”

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Building with timber: Boons, bonds and the Carbon Tax Bill

A timber frame structure, whether a primary residence, a holiday home or an extension to an existing dwelling, is a substantial investment. Most people, barring a fortunate few, will need financial backing to realise their timber home dreams. How then does bonding a timber structure differ from other construction types and how will this be impacted by South Africa’s impending Carbon Tax Law?

RENEWABLE AND RELIABLE

Timber buildings bring tremendous returns to all players along the value chain, right from the grower through to the homeowner. Experts the world over cite competitive strength-to-weight ratios, design flexibility, quick construction time, longevity and superb insulating properties among the benefits of wood with environmental services as a significant attribute.

It also takes something special to match wood’s environmental credentials.

While carbon dioxide (CO₂) is one of the direct by-products of cement manufacturing, timber is a carbon storage machine. When a tree grows, it absorbs CO₂ from the atmosphere, releasing oxygen in return. The carbon remains locked up in the wood, whether it becomes a timber frame, flooring or furniture. Depending on the type of tree and growth conditions, one cubic metre of wood can store between 600kg and one tonne of CO₂.

Wood is the only truly renewable building material and if farmed in a sustainable and rotational manner, has endless potential to cater for the world’s wood, pulp and paper needs in a truly sustainable way.

As the benefits offered by timber become better known to both trade and public, there remain a few misconceptions that building with timber is far less accessible than it really is. Among these is the perceived notion that accessing finance for timber frame structures is difficult.

ACCESSING FINANCE

According to the Institute for Timber Construction South Africa (ITC-SA), major South African banks have the same approach to financing timber frame homes as they do brick-and-mortar structures; that the applicant qualify for a bond by meeting the basic credit requirements. The structure itself would have to meet all national building standards and regulations by a qualified timber frame builder.

Additional requirements include an ITC-SA membership certificate, denoting the builder’s competence in timber frame construction as well as a registered engineer’s certificate confirming that the structure has been built to standard.

While local authorities will approve and pass a timber frame home, structures must of course comply with the necessary regulations.



Timber buildings bring tremendous returns to all players along the value chain, right from the grower through to the homeowner, as well as the environment.

THE CARBON TAX BILL AND THE GREEN ECONOMY

In November 2018, Finance Minister Tito Mboweni introduced the Carbon Tax Bill to Parliament following eight years of extensive stakeholder consultation. The bill forms part of the country’s commitment to meeting the targets set by the Paris Agreement on climate change, one being to reduce greenhouse gas (GHG) emissions by up to 42% by 2025. The bill, which will come into effect from 1 June 2019, will play a role in achieving the objectives set out in the National Climate Change Response Policy of 2011 and contribute towards meeting the commitment to reduce GHG emissions.

This means that there is a financial incentive to find alternatives to carbon-intensive business practices.

The Paper Manufacturers Association of South Africa (PAMSA) and Forestry South Africa lobbied government to take into account the sequestration of carbon (S-factor in carbon tax formulae) by commercial plantations as well as the planting of new trees as a means to offset emissions.

Timber-built staff housing and public buildings are just two such examples of how business and government could offset their GHG emissions – and resultant carbon tax burdens – through essential infrastructure.

The misconceptions around the viability of financing timber construction will slowly but surely be eroded through education, awareness, and, most notably, through legislation, ensuring that greener construction methods are not only a viable prospect, but an essential aspect of sustainable business, government and lifestyle practices. +



Appropriate solutions for every lighting condition



Product Review: Junkers & Müllers Silkshade Blinds by Luminos

JM Silkshade is a range of fabrics that offers a choice of appropriate solutions for each specific lighting condition. Luminos Blinds uses these fabrics in various applications such as roller blinds and pleated blinds, using only the highest quality systems and components available to the industry. These products can also be motorised for convenience as well as energy savings.

The fabric, produced in Mönchengladbach, Germany, has four quality grades with a 5% openness coefficient. These come with or without an aluminium backing. JM Silkshade D with a 3% openness coefficient can be easily combined with the similar optics of the 5% article. The product range is complemented by a blackout product, which achieves one additional level of light screening. The high gloss character of the product makes JM Silkshade interesting, not only for the commercial sector, but also the home environment. The colour range extends from white to fashionable linen and stone colours to black. With a product width of up to 310 cm, these materials are also recommended for large window areas.

A FABRIC THAT OFFERS LONG-TERM SECURITY

The core component of JM Silkshade is Trevira CS, an inherently flame-retardant polyester with a strong environmental profile due to its permanently flame-retardant properties. Unlike fabrics that receive a surface treatment at a later stage, Trevira CS fabrics offer long-term security. The flame retardant Trevira fibre and yarn types ensure that Trevira CS furnishing materials satisfy all important international fire protection standards. Flame retardant Trevira fibres and filaments are, furthermore, certified to the Oeko-Tex 100 Standard.

Since 1972, the Oeko-Tex® Standard 100 has offered textile companies the opportunity to have their products' human ecological characteristics voluntarily tested and certified. Junkers & Müllers has had its entire sun shading, Mediatex and EventTex product ranges certified in accordance with the Oeko-Tex® Standard 100 IV, and can therefore guarantee that its fabrics do not contain any harmful substances.

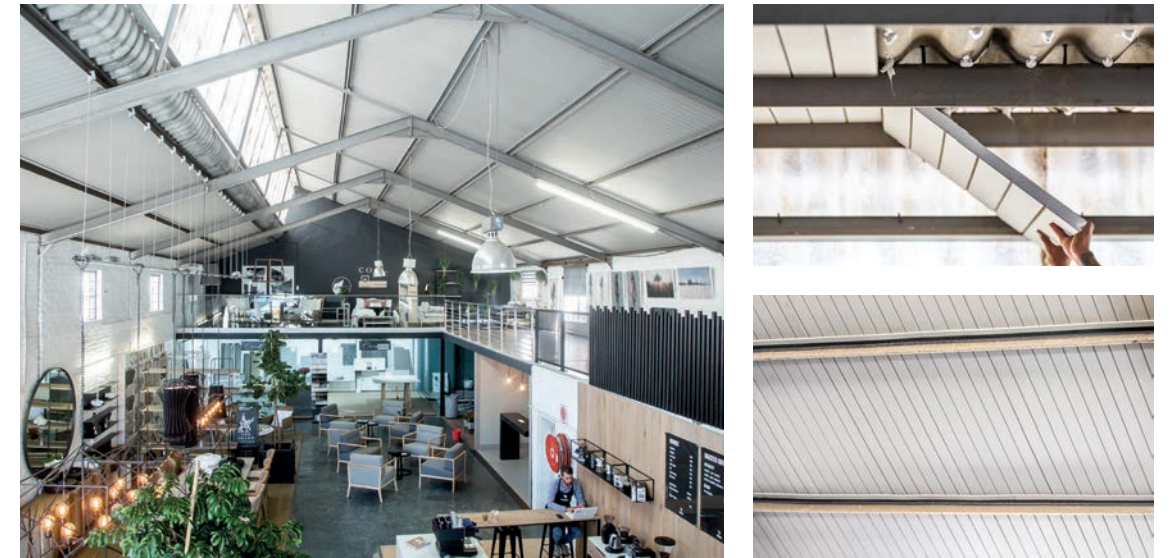
The Oeko-Tex® label "Textile Trust" is a global synonym for responsible textiles manufacture – from raw materials through to the finished fabric. For the consumers, this label represents an important decision guidance. They can rest assured that they are buying high quality products, which are harmless to their health.

LUMINOS BLINDS

Luminos is the key brand of The Blinds Syndicate, a world class manufacturer based in Durban, Kwa-Zulu Natal, which specialises in highly technical coverings for doors and windows. Our blinds are locally manufactured, handmade, and prized for their outstanding quality and workmanship, thus offering architects, interior consultants and Green Building professionals products which boast technical qualities to control light, heat, sound and hygiene. Luminos holds the sole distribution rights in the entire SADC region to the most highly specified technical textiles in the world. These textile companies include Junkers & Müllers Technical Textiles. +



Repurposing buildings: New life from solid stock



Some buildings have their lifetime's design calling: cathedrals: monuments, hospitals and palaces. Some are homes, renovated and refreshed from time to time. And others once had a particular purpose; long forgotten as the needs of the community changed.

As an example, in Somerset West we have what was once perhaps a light industrial workshop or warehouse, now reinvented as a chic interior design showroom – The Mood Collective. A large walled space with mezzanine, ideal for displays, with offices, and lovely natural light beaming through the high industrial windows. With a lot of love, effort, tears, and perhaps some money, the industrial building has been refreshed into a stunning showroom, where interior specialists showcase their wares to interior designers and homemakers.

ADDING PASSIVE COMFORT

Amongst the challenges to be overcome in preparing the building was adding passive comfort, to allow patrons to browse at their leisure. While the building has some aspects which contribute to occupant comfort, such as cross-flow ventilation and high thermal mass solid walls, it was built in an era when limited thought was given to the disposition of occupants, and the effect of discomfort on patronage and energy efficiency. The 300m² asbestos fibre roof was completely uninsulated, meaning high temperature loads in summer, and a cold interior in winter.

While one option would have been to remove and replace the roofing after installing thermal insulation, because there was opportunity to work from within the empty structure, the decision was made to solve from within. In addition, this saved replacing the roof sheets.

The solution chosen has been to add proven thermal insulation, in the form of 30mm thickness IsoBoard panels, directly adhered to the existing roof sheets. IsoBoard panels were factory painted per specification, glued to the asbestos sheeting between the existing purlins, and finished with a trim piece. This intervention has made a considerable difference to the interior comfort and the aesthetic appeal of the showroom, while preventing any shedding of asbestos fibres.

A NEAT, QUICK AND RELATIVELY AFFORDABLE SOLUTION

The installation team of four took a week to install the IsoBoard roof lining panels, working from scaffold platforms. The adhesive forms the permanent bond between the roof sheets and interlocking IsoBoard panels, making use of no mechanical fasteners at all. The key to this installation is having dust and oil-free surfaces on the sheeting and boards, allowing the water-based adhesive to bond. The recommended adhesive allows IsoBoard panels of up to 2400mm in length to adhere almost instantaneously, enabling the installation of the next and subsequent boards without dislodging the initial board. Pre-painting the boards saved time, mess and disruption on site.

Overall, this has been a neat, quick and relatively affordable solution, delivering a comfortable and appealing environment for occupants, without affecting the integrity of the roof system. +



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The Art of Architecture: The ConneXXion by AMA ARCHITECTS



“For AMA Architects, architecture of merit is the physical expression of the dreams and ambitions of our society. We design buildings to attract people to them – our cities must speak to us of community, technology, the hope of its people and its spaces in the African light. We attempt to build environments that will exert a kind of ‘magic’ that lives well beyond the functional experience and its obvious environment. Through this, we find meaning and memory in our architecture. Our architecture talks to a greater purpose - it provides an uplifting and human framework for our cities.” says Adrian Maserow.

“We design public spaces and private spaces, some with largesse and some that are intimate. But the ultimate responsibility of the architect is the Art of Architecture, which must function at an optimal level. The firm has excelled in the design and delivery of head office buildings, residential developments, extensive commercial refurbishments, office parks, specialised retail projects, motor showrooms, luxury homes, office relocations and distribution warehousing facilities. Clients include listed property groups, financial institutions, prominent private developers, parastatals and individual owners “notes Gerald Pereira

“AMA Architects is a dynamic South African Architectural firm practicing architecture from their head office in Sandton, South Africa and recognized as a leading Contemporary Design firm dedicated to its vision and passion for excellence in design. Environmentally Sustainable Design [ESD] forms a high priority of the group’s ethos, and AMA Architects seeks like-minded developers and professionals who are interested in promoting the long term view of well-considered building design and construction” adds Marco Fanucchi.

ABOUT THE BUILDING: UBUNTU

Encouraged by the philosophy of ‘UBUNTU: I AM BECAUSE WE ARE’, the African philosophy of inclusivity embraces true diversity as Exxaro transitions its community from old to new. A shared vision for this project’s design

envisioned a culturally rich and expressive building, as home to its diverse African workforce and its continental visitors alike.

This 18 500m² office building developed by Growthpoint Properties, The ConneXXion, is generous in its spatial poetic and the building’s urban scale; its curvaceous form, and a seam-less boundary experience with pedestrian links to the Gautrain Station and the Centurion Mall with neighbouring shops is the context.

In Africa we respond well to nature, its pristine light, lush plants, fresh air and to the natural textures of warm woods and soulful organic materials. Through generous fluid spaces, the presence of the Centurion sky forms abstract cloudlike-patterns reflected in the curves of the glazed ‘canvas’. The building’s layered, fluid and curvaceous spatial form flows uniquely in its poetic language as a physical vision of connected spaces with curvaceous volumes.

The Interior Architecture of the building is designed to reflect rich earth patterns and geological veins and fissures and grains, seeped in the stone and timber interior surfaces. Playful light patterns celebrate the loftiness of the highveld sky and shaped sound attenuation panels offer a profound visual contrast with the off-shutter concrete wing walls.

Indigenous buildings in Africa are soft, tactile, handmade and crafted through their roundedness and fluidity and this architecture reflects these qualities with its sweeping lines of visual connection and flowing organic pathways through the layered spaces to guide its users through a visceral experience. The ConneXXion has a 5-Star Green Star Rating and will achieve a first time Wellness rating in South Africa, as part of a social responsibility journey, and takes its place as an uplifting architectural experience with a unique emotional connection to its contemporary African Urbanity. +

AMA ARCHITECTS

d12 INTERIORS



Niklas Oriander (Co-founder) and Birger Lundgren (CEO/Founder)

Water-saving the Scandinavian way

Scandinavian Water Saving Products is a company specialising in extreme water-saving products. Founders Birger Lundgren, from Sweden, and Niklas Oriander (Finland), discuss their innovative approach to sustainable living in times of water scarcity. Both reside in Cape Town.

How did the company start?

The idea originated during the extreme drought in Cape Town. Living with Level 6B water restrictions was not much fun. I was tired of carrying buckets and wanted a water-efficient long-term solution that would give me back my lifestyle, without compromising on quality and design. And so I decided to import the Wostman EcoFlush Toilet that I use in Sweden, which became the start of Scandinavian Water Saving Products (Birger).

Does The EcoFlush look different compared to a standard toilet?

Yes, when you see it for the first time it is a little different, but after a day or two it feels normal. The toilet has been on the Swedish market for almost 30 years, so it is tested and proven. It looks and works like a normal toilet, but saves over 90% of water compared to standard toilets. With EcoFlush, there is no need to ‘yellow mellow’; no need to carry heavy buckets of water to flush, no need to place bottles in the cistern to control flow. You can use the toilet as usual with peace of mind that you’re saving water, doing your bit for the environment and maintaining your lifestyle (Niklas).

How much water can you save?

If you use the EcoFlush Toilet and flush every time you go to the toilet, you will use less than 6 000ℓ a year for a family of four, compared to the 13 000ℓ allowed during the 6B water restrictions. Before the restrictions, a family typically used 74 000ℓ per year; so it’s a massive saving. EcoFlush uses only 30ml for a “number 1” flush and 2.5ℓ for a “number 2” flush.

What is the shower you are showcasing?

The technology of the Nebia shower system took about five years to develop. In the US they market it as a luxury spa shower that saves water, but, actually, it’s the tiny amount of water you use that makes it so impressive. It really does feel like standing in the rain and it uses only 2.7ℓ of water/minute.

A normal shower uses about 10ℓ per minute and, according to the City of Cape Town, you can shower using 15ℓ in 1 ½ minutes during the 6B restrictions. But in the Nebia you can shower for almost six minutes with the same amount of water. +



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Pushing the boundaries

Situated in North Riding, one of Johannesburg's most desirable industrial and business nodes, Boundary Park, strategically placed on Malibongwe Drive, is pushing the boundaries of how business parks are designed and built, both from an architectural and an environmental standpoint.

Boundary Park allows complete flexibility with a combination of warehouse and A-Grade office space with 58 000m² under roof built to date and a further 132 000m² to be built. Current and future tenants include Tiletoria, Storage King, Cube Route and Ascendis Medical.

A SHARED VISION

The developer, Orpen Group, and the architects, Architects of Justice (AOJ) share the same sustainable vision and have implemented a number of features into the project to ensure its green credentials. "Due to the location on a main arterial, we have designed striking buildings which are outward looking, as opposed to the architecture prevalent in the area which is very much internalised and doesn't talk to the public realm," notes AOJ's Alessio Lacovig. They have specified low maintenance materials with a low carbon footprint in terms of construction and lifecycle costing, and included elements to futureproof the buildings, for example by adding high volumes in the warehouses - 14.5 metres clearance instead of the conventional 10 metres - which makes them more versatile in terms of leasing.

Orpen Group have been mindful of the carbon footprint of the project since the start, and as such have ensured that materials are sourced from tenants in the area as well as using and upskilling local labour. The business park was designed to have almost zero spoil of material and no material on site was taken away to other dumpsites. "We designed the cut and fill ratio of the terraces with all the material we had on site," says Fabiano Cellini, Orpen Group director. "We recycled

all the material which was originally illegally tipped; cleaned it, screened it, and reused it. All the soil needed for layer works, platforms and roads was sourced on site from either blasting or excavation activities, blended with material and reused." As the project is driven by one developer, one set of fire tanks was designed for the whole development, and a large attenuation pond works to best manage the park's stormwater, improving the efficiency of individual sites and, as a permanent pond, will help to promote biodiversity. Furthermore, Orpen Group's upgrade of the Malibongwe Drive and Epsom Road intersection will bring a taxi and bus stop near to the park's entrance, while large pedestrian walkways to and within the park aid in supporting Non-Motorised Transport (NMT) modes.

GREEN AT THE CORE

A key feature of the design of all the buildings stems from an understanding of what green building should be, aligned with passive design principles. "Whether it's an efficient envelope design to reduce energy usage and energy loss, installing energy efficient air conditioning and LED light fittings or over-engineering all roofscapes to accommodate solar, it is all about reducing the resource requirement, whether it's electricity or water, to make the buildings better for the users, and ultimately the landlord," explains Lacovig.

The aligned core principles of energy efficiency from Orpen and AOJ are delivering an industrial park which is a break from the norm. "The buildings will perform as Green Star Rated buildings, and we are keen to have them rated in the future," concludes Cellini. +

A O J ARCHITECTURE
+ INTERIOR DESIGN

World-Class Student Accommodation in Africa

Nkosi Johnson House, one of STAG African's flagship developments, is the latest of three new student residences at Stellenbosch University's Medical and Health Sciences campus in Tygerberg. Extensive research went into every aspect of the design of this "greenest residence in Africa", in order to promote close-knit, well-functioning student communities, which is at the heart of student success. STAG African designed, developed and built Nkosi Johnson House in line with these eight principles:

1) COMMUNITY

The community in which a student resides is the hidden context of learning and so Nkosi Johnson House is designed to recreate the sense of a village. The first step is the "home" which consists of accommodation for eight students who together share a kitchen and common space. Next there's "the street where you live", translated into the passage connecting the apartments. The third element is "the neighbourhood" – the whole 250-bed residence (beyond this number the sense of community is lost), falling within the wider context of the campus "village". The residence is designed with open corridors around a green quad, so there is optimal visibility for students as they come and go in the context of their shared life.

2) SUSTAINABILITY

The residence is sustainable in every sense of the word; from the low embodied energy of the materials used in construction, through to the solar panels used for lighting and heating the building and the extensive greywater system which captures water from showers, treats it and uses it for toilet flushing and irrigation. The construction required 45% less building materials and much less water than conventional methods, and produced only 0.25% waste, compared to 25% waste generated by standard construction.

3) INNOVATION

"The entire concept and the whole building is innovative," Schooling explains. "It is about living the green agenda and applying the principles to a real-life situation. Many admirable green buildings are built by corporates, but they have achieved their result with extravagant budgets. Nkosi Johnson was built within stringent cost and time constraints."

4) FLEXIBILITY

The lightweight steel structure and Versapanel cladding material inputs allow for the space to altered, as residence's needs change. At the end of its lifespan, the materials can be re-used – this means a 40% saving of the total construction cost. Bricks and mortar offer very little flexibility and are reduced to dust when deconstructed.

5) TECHNOLOGY

Nkosi Johnson offers WiFi and technology solutions for its digital native residents. The design and construction process also made use of Innovative Building Technology (IBT) to achieve its cutting-edge results.

6) TRANSFORMATION

Transformation is a core principle that STAG African upholds, both within its own management structure and labour teams. The residence is built with transformation as a guiding goal.

7) AFFORDABILITY

Nkosi Johnson has been built according to Optimal Architectural Design, with every element considered within this framework. The result is a decreased overall cost, which is innovative in this field - a green premium is the norm. Access to humanitarian grant funding meant that STAG African could offer the residence to the university at no cost bar the ongoing operational expenses.

8) JOB CREATION

The nature of the materials used in construction meant that STAG African could employ young individuals that did not necessarily have extensive building skills. They could in turn gain useful experience ultimately boosting employment among the country's youth. +



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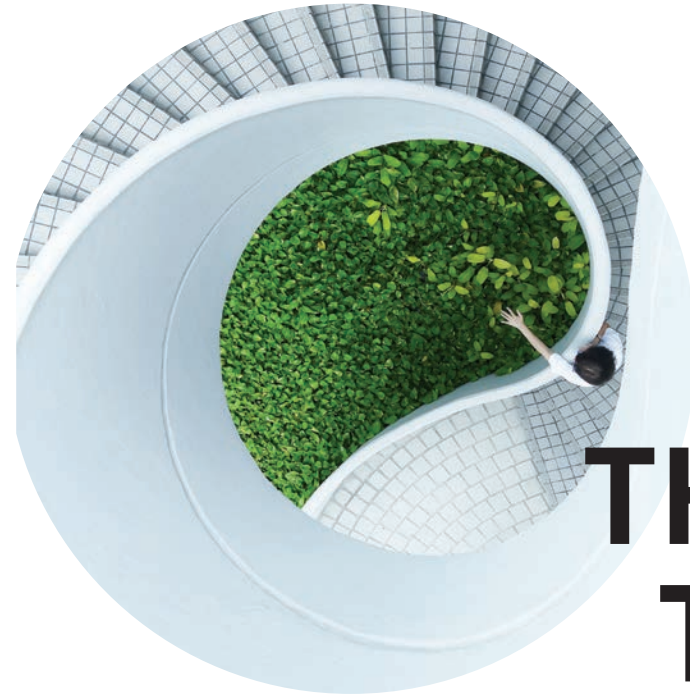


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