UAS:
a vision for smart energy

Interviewed – Tony Korsten
Written – Rob Thomas
Photographed – Tony Korsten

**GLA talks to Christo Myburgh,
CEO of Utility Administration Services**

Standing: Eugene du Buisson – director of technology.
Christo Myburgh CEO

Was there ever a time when phones were really dumb, before the invention of smart technology? Perhaps not. But perhaps the same could not be said for smart electricity meters. With municipalities facing high bills from utilities, a billing crisis in some of the biggest cities in the country, if there was ever a sector of industry that needed a smart meter it would be this one.

Enter UAS, a Johannesburg-based company with a vision to make local energy consumption the smartest on the planet. Christo Myburgh is the entrepreneurial man-with-a-plan who heads up the company, and is its energetic leader. The maxim of the company is to use technology to effect smart innovation, and all indications are that he has the systems to pull it off.

The man's clarity of purpose is impressive. He started UAS back in the 90s, but shelved the company in 2002. "I had a wife and two young kids," he says, "and I was working 7 days a week, 15 hours a day." As a trade-off that would allow him the time to enjoy his family, Christo did the sensible thing and got a stable corporate job, working for Broll between 2002 and 2004. But the die-hard spirit lives on in the hardiest of entrepreneurs, and in 2004 he resurrected the company.

It wasn't all plain sailing, and the last thirteen years have brought their fair share of challenges. But Christo and his team stand at the precipice of a new era, where smart technology is very much the call of the hour. So, entrepreneur plus innovation plus opportunity spells a chance to serve the world.

Christo delves into detail: "Our long-term vision is world-class smart metering technology for the commercial property sector (including retail, office, industrial and residential), and municipalities and utilities, locally and into Africa." So, this is about creating a fit between smart metering and utilities and grid management. So far there are about 60 million smart meters in use around the world.

"If we want to bring about a sustainable change in the utilities management sector, it means we need to add value for the utility and property owner. The property owner is squeezing fees – if we can reverse this by adding value, then we would do better in terms of utilities management. This includes grid visibility, unaccounted for energy management, and the optimising of revenue. We have progressed from remote metering to automated metering, and now we are starting to embrace smart metering, which has some major benefits. We have realised that it's also in the best interest of the landlord to look after tenants, and we can help with that. When we have intelligence, we can remotely switch on, switch off, do load controls, and so forth. We can help the commercial property sector manage gross cost of occupation of the tenant, because when they reduce their unaccounted for energies, they reduce their losses, meaning you no longer have to chase

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➢ The NES System is an award-winning smart grid infrastructure solution, based on Open Smart Grid Protocol (OSGP).

❖ NES' smart grid technology is used in nearly 40 million smart meters and other smart end devices around the world.

➢ NES offers industry leading security built into its three tier Patagonia Platform.

❖ The most reliable smart metering solution in the industry, delivering >99.8% daily availability of meter data.

➢ The NES System offers a unique power line technology that enables grid mapping, automatic topology management, and many more low voltage grid applications.

❖ NES has more than 100 existing smart metering / smart grid projects and pilots in more than 25 different countries.
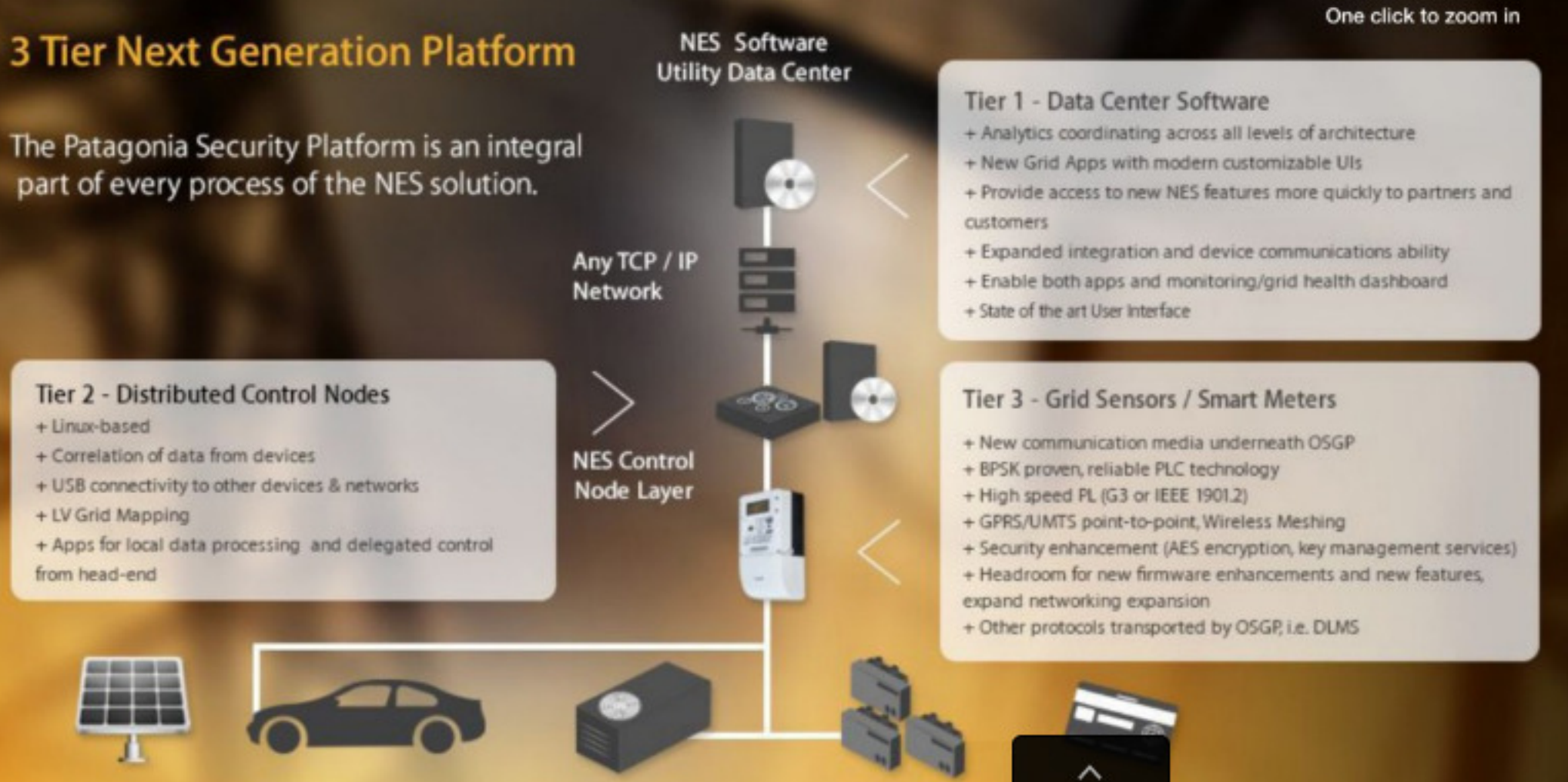
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revenue from the tenant in order to drive a return. Because you've now reduced your losses, sanity prevails. You can do tariff concessions to tenants, you can help them control their costs – you can make it attractive."

Can the competition do this? Yes and no, suggests Christo. Certainly, they can do it with a collective skillset. "Smart technology can help with credit control, load management, reduced demand on energy, diffusing the cost of occupation. This is about bums on seats: new tenants for new spaces, because costs can be better predicted and controlled."

If there is to be a 50-year view, then the technology is necessary, he says, singling out NES (Network Energy Services) as a brand of meter that can get the job done effectively. It is the product that has the best security – it recently received an award in Europe – and the only one that can achieve a 99.7% visibility of the grid. It's already in use in Poland and widely deployed globally, and because they can see almost the entire 400Volt grid, they know what is being consumed, and the voltages, plus forward and reverse for photovoltaic. NES is starting to gain market share in SA in the commercial property space, with about 57,000 units deployed over the past five years through UAS and others.

What makes it so good? Explains Christo: "NES has a powerline communication chip and protocols that brings about an ability to effectively communicate along the power line. Others do it, but about 20 years ago the guys in Silicon Valley developed this chip with remarkable communication ability. There's an A band and a C band that are registered communications bands, that are unsurpassed. Lots of people have tried to copy it but it's still the best. Because the chip can communicate you can see the grid, and if you have visibility, you can see what your customer is consuming and you can interact with him. Over the C band you can start controlling appliances – washing machines, geysers, underfloor heating. In Europe they have an app for it, so you can switch off your geyser or your washing machine. The A band carries all your data usage – kiloWatt hours (kWh), active-reactive, forward-reverse, voltage-ampere,

One click to zoom in

3 Tier Next Generation Platform

NES Software
Utility Data Center

The Patagonia Security Platform is an integral part of every process of the NES solution.

Tier 1 - Data Center Software
+ Analytics coordinating across all levels of architecture
+ New Grid Apps with modern customizable UIs
+ Provide access to new NES features more quickly to partners and customers
+ Expanded integration and device communications ability
+ Enable both apps and monitoring/grid health dashboard
+ State of the art User Interface

Any TCP / IP
Network

Tier 2 - Distributed Control Nodes
+ Linux-based
+ Correlation of data from devices
+ USB connectivity to other devices & networks
+ LV Grid Mapping
+ Apps for local data processing and delegated control from head-end

NES Control
Node Layer

Tier 3 - Grid Sensors / Smart Meters
+ New communication media underneath OSGP
+ BPSK proven, reliable PLC technology
+ High speed PL (G3 or IEEE 1901.2)
+ GPRS/UMTS point-to-point, Wireless Meshing
+ Security enhancement (AES encryption, key management services)
+ Headroom for new firmware enhancements and new features, expand networking expansion
+ Other protocols transported by OSGP, i.e. DLMS

phases and so forth. This is smart automation. So let's see how this applies to you as the consumer. On average, 40 houses in Jo'burg are connected to a single transformer – like the ones you usually find on the pavement. Secondary to the transformer, you can have a data concentrator that all the smart meters speak to over the copper cable. We use a dedicated APN to communicate to the system software. If we say to the software, switch off a specific house, it can."

Is this not a major security threat? Do customers really want someone to be able to switch off their power supply, or even disable their appliances? "Ransomware and cybersecurity is definitely an issue," shares Christo. "The recent ransomware scare that came out of North Korea made everyone sit up and pay attention. There was another incident where hackers were able to gain access to a smart metering system in the Ukraine and they took two cities down impacting 225,000 customers in three different distribution level territories." Hillary Clinton and Donald Trump, it seems, are not the only ones being plagued by the Russian cybermafia. "When you switch to smart metering, your cyber security and data security is probably your number one consideration. The second consideration is your communication from the meter using a medium to a head-end system. When you plug billing and prepaid into that, and communicate back to the meter, you need to see your grid, otherwise you don't understand what your customer is consuming, what to bill or how the prepaid balances run. Multi-level security encryption on NES has in effect a firewall for every meter.

> **" The South African market space has a deemed market for about 12 million smart meter units. Whether it's Eskom, municipalities, or the property sector. "**

We have level 1 and level 2 encryption on the meter and the data concentrator. If somebody gets past that – and you have to be good to do that – the system is protected by intrusion detection and devise isolation. This is especially important for commercial properties, such as shopping centres, where the system is currently in operation. Of course, security has to be constantly updated, so new firmware and security software gets dispatched from the UAS office in Johannesburg and it gets disseminated across the entire grid. Our data is hosted in a Tier 4 data centre, so we can access the system and update right here from our own computers.

Some of the companies that have started employing this NES smart technology includes amongst others most of the listed property sector, while many of the shopping centres and office buildings in development are fitted with the NES technology. Christo shares the benefits for a centre. If an operations manager at a centre wants to receive an instantaneous reading for energy usage for a specific shop, then through the system that can be set up by UAS, they can get that reading simply by accessing the software interface through UAS on their personal laptop at centre management. If a shop is about to become vacant, then simply by sending a command from the laptop, the ops manager can turn off the

energy to a specific shop in order to keep those costs down. The same could be done for a commercial building (office) or even a residential one. This gives micro-grid visibility and control over the system – a whole unit can be turned off (a shop), or through relays, parts of the system can be turned off, such as just a specific aircon unit. Or in a load shedding situation, when the generator kicks in, then only those tenants who are making a contribution to the generator will continue to receive power. One of the other big benefits, shares Christo, is the ability to see where there are problems with voltage. Centres have opted for energy saving, but the way electricity works is that a decrease in loads does not always equate into a drop in voltage, so this can affect the lifespan of LED lighting and sensitive electronic equipment, for example, which can quickly blow if voltage levels are too high. By being able to see and monitor the micro-grid, it is possible to determine where the level is too high and go and readjust it so that there is no damage to sensitive equip-ment, which restores their lifespan. UAS carried out just such an action at a number of properties recently.

Christo shares some of the challenges that the business has had. In SA, there are multiple value-added resellers of the NES product, over and above UAS, each with their own business strategy. This has sometimes led to a bad experience between landlords and service providers, and the technology got a bad rep. "The technology is not at fault. It's the poor service," says Christo, for UAS utility

management is also to be blamed. In a way, it's understandable, but not excusable. He explains: "No one is using the full functionality of the smart meters. Everyone is so tied up with the utilities management that they are not pulling the full functionality out of the system. Companies are so busy squeezing their fees that they deliver an absolute below-standard service to the customer, which is the landlord. I believe utilities management needs a re-think. Landlords need to understand that by pushing the fees too low they are actually doing themselves a disservice."

"Our maxim is, always set out to do good, and allow time to pass. So we decided to take the lead, providing NES technology and solutions to the market, in an environment where you don't have to be the licence holder of the technology in order to enjoy its benefits."

UAS also brought their utilities management business down to below 1 million square metres, so as not to compete with others in the field, or even landlords who have taken their buildings back in-house. "As the UAS business," concludes Christo, "where we

traditionally used to do utilities management, we are now a NES smart meter technology provider to the entire 400Volt power grid."

NES footprint in SA is now growing by over 10,000 meters per annum, and soon there will be as many as 100,000 installed, covering all the big names – but currently it's still only being used as a meter reading device. "It's a big ship that turns slowly. You need training, and you need to make people more aware of what the tech can do. You can't work with the old technology."

By 2025 it is estimated that there will be 90 million smart meters in use around the world, and Christo believes there is plenty of room for growth in the SA property and municipal space. "Municipalities must be able to see the grid, control street lighting, manage their peaks, latch on to the system software and energy balance application, track unaccounted for energy on transformers in specific areas, and then dispatch the technical resources to go and find the theft, restore it, and reduce unaccounted for energy. This can ultimately be translated into lower tariffs for users who don't have to pay for theft, which will help stimulate economic growth and bring back manufacturing. It will also stimulate electrification, which empowers small businesses and empowers communities, reduces unemployment, strengthens the economy, and takes away security risks."

This is all part of a greater vision to serve SA. "I want to leave a legacy. Through electricity and smart metering, we can bring this vision to the fore. We love this country. We want to help make it work." Proudly SA all the way. |GLA