

Etango

Namibia's Leading Renewable Energy Technologies
Magazine

MAY-JUNE 2021

DRONES & SOLAR BRINGING MEDICAL SERVICES CLOSER



Namibia, Botswana Mega Solar project gets thumbs up



TeraSun unveils N\$1billion, 81MW Arandis solar project



Customers to pump N\$500m into NamPower energy plants



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New game-changers in medical services

The Covid-19 pandemic has underscored the importance of the need to deliver critical life-saving medical services and supplies to citizens in all corners of the country much faster and reliably.

In these pandemic times we live in, the speedy delivery of cold-chain and non-cold-chain medical commodities, patient testing samples, testing kits, medical supplies, vaccines and other medicines to and from various remote medical locations, has become a matter of life or death.

Thus, we commend the step that the Namibia Institute of Pathology (NIP) has taken to team up with the John Hopkins University and the United Nations Children's Emergency Fund (UNICEF) to use unmanned drones and solar power to bring medical services closer to remote communities in Namibia. This pilot project is indeed a step in the right direction as far as enhancing coverage of medical services and could save hundreds, if not thousands of lives.

Namibia is indeed a vast country. A large number of citizens reside in remote areas which do not have good access roads and have no access to electricity. Providing the required

medical services to these communities is often a challenge and in times when such medical service is needed urgently, it calls for new ways of thinking and of doing things.

The initiative by NIP to tap into the mobile technology and enlist the use of unmanned medical drones, combined with the readily available solar energy, will go a long way in unlocking medical services to under-served communities in Namibia.

The experience from fellow African countries, namely Rwanda, Madagascar, Malawi and Senegal where bi-directional drones have been used to strengthen healthcare provision shows that this is indeed the way to go to expedite service delivery and respond to disasters, especially in remote areas on the continent. The Covid-19 pandemic has also accelerated the growing demand for drones worldwide.

Namibia is endowed with a good solar resource which is being tapped to provide basic electrification of medical facilities in remote areas of the country. Solar energy is also vital for charging drone batteries thereby ensuring a smooth service.

A study commissioned by UNICEF found

that the use of integrated drones in the health supply chain in two hard-to-reach districts in Malawi increased equity and access for patients, responsiveness to urgent needs and potential use in emergencies and catastrophes. As fast and efficient alternatives to using road transportation to cross unreliable terrain, drones can get to remote places in Namibia in minutes and with minimal risk of contamination.

Drones have proven their versatility during the Covid-19 pandemic because on top of delivering medical supplies to remote areas timely, the technology is also being used to disinfect cities in the Philippines, India, Ghana, Nigeria, and to enforce lockdown rules in Sierra Leone, Rwanda, Tunisia, among others.

Read about Namibia's plan to roll out this technology, as well as other latest developments in the country and SADC region's renewable energy sector in this edition of Etango.

Happy Reading!
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Cover picture:

DRONES & SOLAR FOR HEALTH: The Namibia Institute of Pathology (NIP), has teamed up with the John Hopkins University and the United Nations Children's Emergency Fund (UNICEF) to pioneer a pilot project that uses drones and solar power to bring medical services closer to remote communities in the country.

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Namibia is looking to use drones and solar power to bring medical services closer to remote communities in the country

Drones, solar power to bring medical services closer to the people

Namibia has joined hands with the John Hopkins University Medical Drones and the United Nations Children's Emergency Fund (UNICEF) to use drones and solar power to bring medical services closer to remote communities in the country.

The Namibia Institute of Pathology (NIP), which is spearheading the initiative, said the project aims to use drones for the delivery of cold-chain and non-cold-chain medical commodities, patient testing samples, testing kits including Covid-19 testing kits, medical supplies, vaccines and other medicines to and from five local health clinics in the northeast Zambezi region.

All the five clinics earmarked for the pilot project, Schuckmansburg, Impalila Island, Kanono, Imbalasinte and Itomba,

have access to a steady power supply from solar panels which are not powerful enough to run deep freezers but can be used to charge electronics such as drone batteries.

NIP plans to roll out the project to more remote clinics in the country.

"The service which will be tested for a period of four months is envisaged to remove obstacles such as annual floods that make roads inaccessible for periods of up to six months. Floods in the Zambezi region often cut communities off from access to vital health and laboratory diagnostic services," NIP said.

The drones that will be used in the trial run will have a capacity to carry a minimum net weight of 1.5 kilograms for a distance of at least 70 kilometers without landing, recharging or refueling. The central hub which is in Katima

Mulilo will be used as a landing, maintenance and recharging center for the drones.

The service provider will be required to have a Namibian partner which will be responsible for service provision. The service provider will be required to run sustained drone delivery operations that will deliver efficient, quality, and timely technical services for the proof of concept period of four months.

Of all the specimens collected from the five clinics, more than 90% are tested at the Katima Mulilo Laboratory and have an average turnaround time of three to four weeks.

Most of that time is spent in sample transport. More than 20% of samples are rejected because of spoilage during transit and the drones will eliminate most of the transport challenges.



MEGA SOLAR - US Ambassador to Namibia Lisa Johnson joined Minister of Mines and Energy Tomas Alweendo to commemorate Namibia's signing

US-backed Namibia, Botswana Mega Solar project gets thumbs up

The governments of Namibia and Botswana, together with the United States of America, have signed a memorandum of intent to develop solar parks that will generate between 3 000 and 5 000 megawatts of energy.

The Mega Solar project, widely dismissed by critics as a pipedream, seems to be inching closer to reality. In Namibia US Ambassador Lisa Johnson joined Minister of Mines and Energy Tom Alweendo to commemorate the country's signing.

Mega Solar is a partnership between the governments of Namibia and Botswana, and

others, which is expected to generate up to five gigawatts of solar power and to avoid an estimated 6.5 million tons of CO₂ annually – the equivalent of taking almost 1.5 million cars off the road. It is part of USAID's Power Africa Initiative, which is committed to assisting the southern Africa region transform from reliance on fossil fuels to clean energy, enabling a path to decarbonisation.

The United States administration of President Joe Biden and vice president Kamala Harris gave the project the nod at the Leaders' Summit on Climate held on April 22 and 23. The summit brought together 40

world leaders in a virtual Leaders' Summit on Climate to rally the world in tackling the climate crisis

"I am very excited that Namibia, Botswana, the United States, the World Bank, the International Finance Corporation, and the African Development Bank have taken important steps forward together on the Mega Solar Project," US Ambassador to Namibia Lisa Johnson said, adding that the project will directly advance a goal set forth in President Hage Geingob's Harambee Prosperity Plan II for Namibia by achieving a secure and cost-effective energy supply.

The International Bank for Reconstruction and Development

(IBRD) is also part of the mega project.

“When fully realized, Mega Solar could be one of the largest solar parks in the world, generating up to 5 gigawatts of energy.

This could transform Namibia and Botswana into two of the globe’s most significant producers of solar power, enough to begin exporting renewable energy to the southern Africa region,” Ambassador Johnson added.

Mega Solar’s initial goal is to provide additional power from solar photovoltaic and concentrated solar thermal technologies to meet local demand, an ultimate benefit of the collaborative efforts of the Mega Solar partners in strengthening the institutional and technical capacity as well as legal and regulatory frameworks of the focal countries.

Mark Carrato, USAID’s Coordinator of Power Africa, said: “Simply put, this milestone agreement, with Botswana and Namibia demonstrating unprecedented leadership and collaboration, moves Mega Solar from the concept phase to the action phase. Unlocked by this partnership is the extraordinary development potential for life and globe changing clean energy, emanating from southern Africa on a pioneering scale of massive productive use.”

The Power Africa Initiative – established by the 2013 Electrify Africa Act – is making a difference across sub-Saharan Africa by improving lives, supporting economic growth, and combating climate change through improved access to clean, reliable, and affordable electricity.

Since 2013, Power Africa has



I am very excited that Namibia, Botswana, the United States, the World Bank, the International Finance Corporation, and the African Development Bank have taken important steps forward together on the Mega Solar Project”

leveraged the combined expertise of the private sector and 12 US government agencies to bring 12,000 MW – representing a US\$22 billion investment – to financial close. Already, Power Africa has connected more than 20.8 million homes and businesses to on- and off-grid solutions, bringing first time electricity to 98 million people across sub-Saharan Africa.

The Namibia-Botswana Mega Solar project would be developed through a multi-phase procurement programme. The two neighbouring countries are seen as ideal for gigawatt-scale solar due to their high solar radiation, strong legal and regulatory environments, suitable

land availability and potential to host a low-cost, efficient electricity market to meet rising demand in the region.

Namibia has one of the best solar regimes in the world with an average high direct insolation of 2,200 kWh/m²/a and minimum cloud cover. The market for electricity produced by the mega-solar projects in Botswana and Namibia includes 12 other countries in the region that could be connected via new and/or upgraded transmission infrastructure.

The first phase of the project could see a 300-500 MW solar tender issued to meet domestic demand in the two countries. A second stage, planned to allocate 0.5-1 GW more solar, would be to generate power for export.

A third and final phase would see the contracting of 1-3 GW more generation capacity for electricity to be traded across Africa’s regional power pools.

Both countries are members of the Southern African Power Pool (SAPP) which, among other things, aims to increase the accessibility of electricity to rural communities, develop sustainable development priorities, and to co-ordinate the planning of electric power.

Only 5 percent of rural areas in southern Africa have access to electricity. Lack of electric power impedes their access to clean water, limits the availability of food, and constrains access to clean, sustainable sanitation.

The two countries want to reduce their dependence on power imports from South Africa, which is facing a power crisis due to the financial and operational troubles of state-owned utility Eskom.

Natura Energy unveils N\$1 billion, 81MW solar PV park for Arandis

Natura Energy has made headway in its bid to develop and implement a 81 megawatt (MW) TeraSun Energy Solar Photovoltaic Power Park at Arandis by signing a strategic agreement with London based blue-chip energy developer and investor, Globeleq Africa Limited.

Natura Energy and Globeleq will develop and co-own the N\$1 billion TeraSun Energy Solar PV Power Park. The Arandis plant will market and sell competitively priced electricity to large power users throughout Namibia, across the national transmission grid.

Globeleq is a global energy developer with over 1400MW of power generation plants in operation across 28 projects in sub-Saharan Africa. Over 300MW projects are currently being constructed under the company's umbrella, with a further 2,000MW in active development.

Fundamental to Globeleq's strategy is to play a transformational role on the continent by addressing Africa's need for large-scale and cost-effective power. This strategy is aligned to Natura Energy's vision to contribute to Namibia's energy independence and infrastructural development agenda.

Juwi Renewable Energies (South Africa), a leading solar power engineering and construction company originally established in Germany, has been selected as the preferred EPC contractor.



Natura Energy MD Ezio Vernetti



Natura Energy and Globeleq will develop and co-own the N\$1 billion TeraSun Energy Solar PV Power Park in the Erongo Region. The plant will market and sell competitively priced electricity to large power users throughout Namibia, across the national transmission grid.

Juwi, which has realised over 1,700 solar projects worldwide, is fully backed by major financial institutions in both South Africa and Europe, and is well placed to develop the Arandis power park.

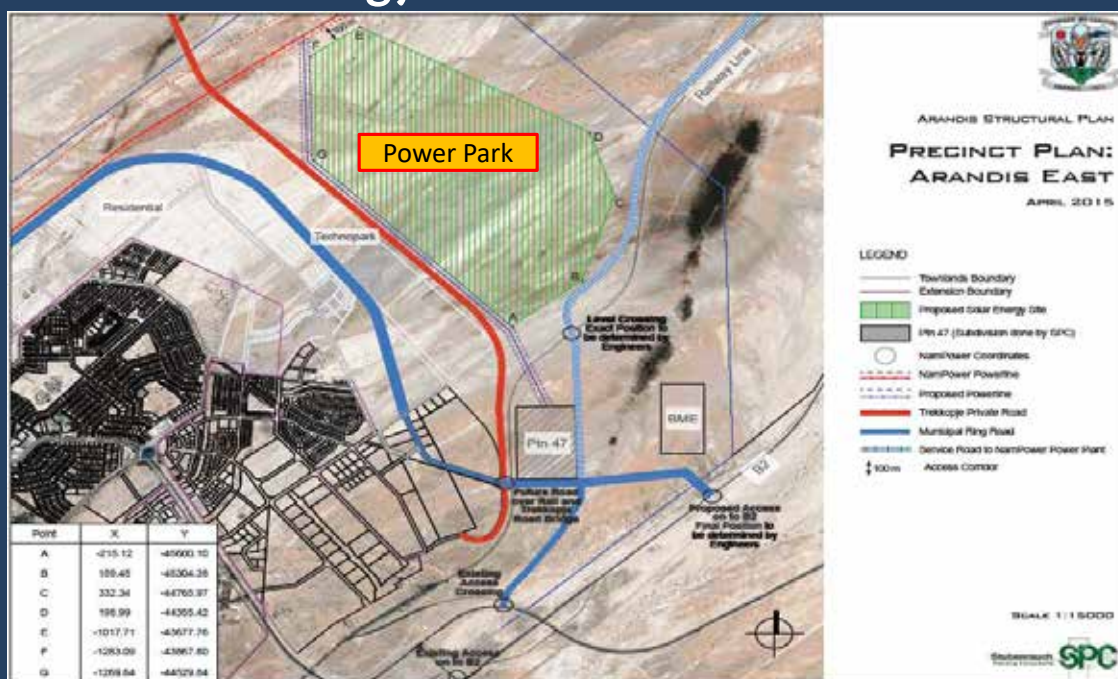
The TeraSun Energy Solar PV Power Park initiative is developed to operate within the new Modified Single Buyer (MSB) regulatory framework of the Electricity Control Board (ECB). This new regulation allows independent power producers (IPPs) to sell electricity to large power users locally and internationally across the NamPower transmission network.

In the MSB regulatory framework, market players are known as Contestable Customers and Eligible Sellers. Contestable Customers are all the Regional Electricity Distributors (REDs), the City of Windhoek and all NamPower customers that are connected to the transmission network. These Contestable Customers will be allowed to purchase electricity from IPPs such as TeraSun Energy via bilateral transactions for up to 30% of their annual energy purchases.

The motivation for this policy change in Namibia, is a drive for both electricity self-sufficiency and price competitiveness.

The TeraSun Energy solar power park, which will be the largest ever built in Namibia to date, will be situated in the town of Arandis, a location which enjoys amongst the best solar

The TeraSun Energy Power Park located in Arandis



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The site of the 81MW solar plant at Arandis

irradiations in the country and with a potential to generate over 227.700 megawatt-hours per annum; enough to power over 68.000 average Namibian homes for a whole year.

This completely private investment will be structured through multiple power purchase agreements with large power users for the supply of energy over durations up to 25 years, according to individual customer requirements.

To date, Natura Energy has been developing the TeraSun Energy project completely independently. The strategic agreement signed with Globeleq represents a major boost for the project with the assured injection of significant capital to assure

that all activities required to reach commencement of construction will be completed.

Current planning sets construction commencement date in the third quarter of 2022.

Speaking to Etango earlier, Ezio Vernetti, the Managing Director of Natura Energy highlighted that Namibia will benefit greatly from the initiative taken by the ECB and Government to restructure the electricity supply industry by adopting the MSB model policy.

"I believe that prices for electrical energy will be offered by the private sector at cost saving rates for large power users, municipalities and REDs (regional electricity distributors) alike. These saving benefits are also expected to reach not only households, but the economy at

large. After almost three years of unprecedented consecutive negative growth, the Namibian economy desperately needs both investment and cost-saving measures throughout all sector be it private or public," said Vernetti, adding that the TeraSun Energy Power Park project addresses both these goals in a positive and constructive manner.

Vernetti noted the firm carried out a very detailed and in-depth study of the Namibian power system which demonstrated that the country can become 100% self-sufficient and even export power within the next five years at a lower levelised cost of electricity. Such strategy would bring into the Namibian economy approximately N\$15 billion of investments.

Consumers to fund NamPower Renewables plants

NamPower customers will fund the utility's renewable energy plants to the tune of N\$500 million, the Electricity Control Board (ECB) has revealed.

ECB Chief Executive Officer Ms Foibe Namene said an amount of N\$342 million has been allocated to the 20MW solar PV plant currently under construction at Omburu, while N\$158 million will be used as part funding for the 50MW wind plant that NamPower plans to procure soon.

Ms Namene said the N\$500 million has been made available from the N\$576 million Long-run Marginal Cost Fund. The fund is intended to protect customers against unexpected tariff hikes to ensure manageable tariffs, especially in the event NamPower experiences unexpected cash-flow challenges.

"In accordance with the tariff methodology, NamPower will not be allowed return and depreciation on the assets created using the N\$500 million and this will result in a total net savings to the customer of approximately N\$1 billion over a period of 30 years, and making electricity affordable to end users," said Ms Namene.

NamPower plans to add 40 megawatts of solar power to the Namibia energy mix after the power utility recently signed engineering, procurement and construction (EPC) contracts for the construction of two 20MW solar photovoltaic (PV) power plants.

The Omburu plant, located adjacent to the NamPower transmission station some 12km from the town of Omaruru, is being constructed by the joint venture of Hopsol Africa and Tulive



ECB CEO Ms Foibe Namene



In accordance with the tariff methodology, NamPower will not be allowed return and depreciation on the assets created using the N\$500 million and this will result in a total net savings to the customer of approximately N\$1 billion over a period of 30 years, and making electricity affordable to end users.

Private Equity on behalf of NamPower, while the 20MW Khan Project is being developed by Independent Power Producer (IPP) Access Aussenkjer Solar One Namibia.

The two projects were initiated in 2018, when NamPower crafted its new Corporate Strategy and



The Omburu plant, located adjacent to the NamPower transmission station some 12km from the town of Omaruru, is being constructed by the joint venture of Hopsol Africa and Tulive Private Equity on behalf of NamPower

Business Plan for the period 2019-2023. In line with the new strategic intent and the determination by the Minister of Mines and Energy to develop generation projects with the total capacity of 220MW, the NamPower Board approved the implementation of six new generation projects under the strategic pillar of “Ensuring Security of Supply”.

NamPower will also construct a 50MW IPP Wind Project which was determined by the Mines and Energy Minister as one of the two projects to be developed as IPP projects where the utility would only procure the energy from the power producer.

The ECB said it was cognizant of the fact that the economy has been severely affected by the Covid-19 pandemic but is equally dependent on reliable and affordable electricity. As the regulator, the ECB has the responsibility to ensure a sustainable electricity industry at affordable tariffs.

As a result, after due consideration and in accordance with the tariff review process, the ECB resolved to increase the average electricity bulk tariff with 2.92% from the current approved tariff of N\$1.6500 per kilo watt-hour to N\$1.6982 per kilo watt-hour for the period 2021/2022. The approved increase, which takes effect on 1 July, 2021, follows a two-year period of no bulk tariff increases. The approved tariff is applicable to NamPower bulk customers (i.e. Regional Electricity Distributors (REDs), Local Authorities, Regional Councils and Mines).

NamPower had submitted a tariff application for an effective bulk tariff (inclusive of generation and transmission) increase of 5.8%, an increase from an average N\$1.6698 per kilowatt-hour to N\$1.7673 per kilowatt-hour for the financial period 2021/2022.

“In reviewing the tariff, the ECB considered several factors, including the impact of the tariffs

on the Electricity Supply Industry, consumers and the economy at large. In particular, the impact of the Covid-19 pandemic on several industries and the consumers as well as the current economic climate. As part of the tariff review process and considering Government directives on public gatherings on account of the Covid-19 pandemic, the ECB requested stakeholders to present their written views, facts, and evidence on the tariff application electronically via e-mail. Comments submitted by stakeholders were considered in the review process leading to the tariff approval,” said Ms Namene.

She added that the ECB was cognizant that the economy is still struggling and has not yet recovered. To mitigate the impact of the tariff increase on consumers and the economy for the period 2021/2022 an amount of N\$35 million will be used for variable operation cost of the thermal plants by NamPower from the Long-run Marginal Cost.

Bank Windhoek launches Namibia's first Sustainability Bond

- N\$227 million raised through private placement
- Renewable Energy projects to benefit

Bank Windhoek, one of the country's leading financial services provider for green and alternative financing solutions, has issued and listed the country's first Sustainability Bond. As with the Green Bond of 2019, the Sustainability Bond issued on 2 June is also a first for commercial financial services institutions in southern Africa.

Following the success of the bank's internationally recognised and award-winning Green Bond in 2019, Bank Windhoek obtained alternative sources of funding to the value of N\$227 million through the Sustainability Bond



The Covid-19 pandemic led to a steep increase in demand for innovative financial products like Green and Sustainable Bonds that facilitate and promote a shift to a more sustainable economy. In Namibia, we experience global warming, and the effects of climate change on our local environment and businesses are evident.

on a private placement basis.

Sustainability Bonds, commonly referred to as "use of proceeds bonds", are unique, fixed-income instruments and investment vehicles for commercial and institutional investors. The proceeds are exclusively applied to finance or re-finance a combination of both green and social projects, in part or in full, new or existing. The projects will be benchmarked and aligned with the four core components of the International Capital Market Association's (ICMA) Green Bond Principles (GBP), Social Bond Principles (SBP), and follows the ICMA Sustainability Bond Guidelines. The four components for compliance



NASDAQ welcomes Bank Windhoek to the club of sustainable bond financiers on New York's Time Square

include the use of proceeds, a process for project evaluation and selection, management of proceeds and impact reporting.

For investors, Sustainability Bonds provide an opportunity to support socially and environmentally responsible projects, along with the additional benefits associated with investing in an award-winning, highly regulated and “risk-free” instrument with a strong emphasis on transparency and impact disclosure.

Projects eligible for funding include those focussed on renewable energy, energy efficiency, green buildings, sustainable waste management and a focus on sustainable agriculture and tourism, and investments into quality, accessible and innovative healthcare and education facilities.

Bank Windhoek will evaluate social projects based on the primary objectives and the underlying impact of the project. The bank will report on the environmental and social effects of the projects financed in its annual Sustainable

Bond Impact Report.

“The Covid-19 pandemic led to a steep increase in demand for innovative financial products like Green and Sustainable Bonds that facilitate and promote a shift to a more sustainable economy. In Namibia, we experience global warming, and the effects of climate change on our local environment and businesses are evident. It is important to note that the proceeds of the Sustainable Bond will support a wide array of projects offering broad societal, economic and environmental benefits,” says Bank Windhoek Manager for Sustainable Investments and Deal Origination, Mr Ruan Bestbier.

Managing Director, Ms Baronice Hans, says: “Both the Green and Sustainability Bond issuances are milestones, not only for Bank Windhoek and Capricorn Group but Namibia as a nation. We unequivocally set the tone of our commitment to sustainable finance. We believe that the Green and Sustainability Bond issuances enable our clients’ sustainability

requirements. These Bonds enable them to create a complete value chain, from raising favourable funding to offering green loans with attractive and competitive terms to facilitating the transition to a low-carbon and client resilient future.”

“Sustainable bonds are a new addition to the cache of financial instruments. Along with established Green Bonds, Sustainability Bonds promote positive change in society and the environment and provide investors with a means of aligning their asset allocations with sustainability objectives in a meaningful way,” says the bank’s Chief Treasurer, Ms Claire Hobbs.

During 2020, sustainable debt issuances reached a record high of US\$415 billion globally, up 60% from the prior year. Green bonds still dominate the sustainable finance market. However, other products, such as Sustainability Bonds, are playing catch-up, with the market increasingly becoming diversified in the low-interest-rate environment to meet growing investor and client demand.



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Drive a Nissan Leaf – and leave the tailpipe behind

SOLTRAIN embarks on dissemination training for Thermosyphon Solar Water Heaters

In order to achieve the goals set out in the Namibian Solar Thermal Roadmap, it is essential to have enough skilled experts to be able to design, install and to maintain these solar thermal systems.

The Southern African Solar Thermal Training & Demonstration Initiative (SOLTRAIN) project, funded by the Austrian Development Agency (ADA) and OPEC Fund for International Development (OFID), has been training Namibians on various aspects of Solar Thermosiphon systems, Pumped Solar Water Heaters, Energy Auditing, Policy Workshops as well as Training of Trainers, to facilitate Namibia's switch from a fossil fuel-based energy supply to a sustainable energy supply system based on renewable energies, specifically thermal energy.

Mr Collin Hangula and Mr Homateni Nghihulifwa, past trainees of the SOLTRAIN workshops themselves, assisted by SOLTRAIN focal person for Namibia, Ms Helvi Ileka from the Namibia Energy Institute (NEI) at the Namibia University of Science and Technology (NUST), conducted two dissemination training workshops in May, which were targeted at local government officials, existing and prospective entrepreneurs.

A total of 25 participants attended the Windhoek dissemination workshop whose focus was on Solar Thermosyphon systems. An exam was administered on day 2 of the workshop and all participants who passed the exams will be able to attend



Windhoek trainees being taken through the solar demonstration trailer



Mr Homateni Nghihulifwa making a presentation during the Eenhana workshop



The SOLTRAIN project was designed to contribute towards the switch from a fossil fuel-based energy supply to a sustainable energy supply system based on renewable energies, specifically thermal energy from the sun.

the more advanced Solar Thermal training courses and also participate in the SOLTRAIN demonstration systems projects, where they can find suitable institutional clients for solar water heating systems who may qualify for a 50% co-financing opportunity from SOLTRAIN.

"The significance of these dissemination workshops is that they

provide a chance to increase the knowledge on solar thermal systems to private, housing developers who have not attended SOLTRAIN workshops before. They also provide a chance to those who attended training of trainers to share and practice what they have learned from experts with others in the region, thereby increasing the uptake of solar water heating countrywide,"



Eenhana workshop participants



Participants of the Windhoek SOLTRAIN workshop

said Ms Ileka.

The Eenhana workshop was oversubscribed, attracting over 50 participants, including government officials, housing developers, TVET trainers and students applied to attend the workshop. However, in order to adhere to COVID-19 safety protocols only 26 people were allowed to attend physically.

Besides the theoretical and practical training, the training also focused on quality control and examined the quality of imported products.

To date, over 250 Namibians have received training under the SOLTRAIN project which was started in Namibia, South Africa, Mozambique, Zimbabwe and Botswana in 2009. The SOLTRAIN project was designed to contribute towards the switch from a fossil fuel-based energy supply to

a sustainable energy supply system based on renewable energies, specifically thermal energy from the sun.

In Namibia, SOLTRAIN was designed to support MME in the implementation of the Cabinet Directive of 2006.

Hangula, who is an entrepreneur in the renewable energy industry and also currently completing a MSc degree in renewable energy at the University of Namibia, has been attending SOLTRAIN workshops and events since 2011. In 2020 he was also a recipient of a bursary from SOLTRAIN for which he wrote a report on the potential of Solar Thermal Technologies in the Namibia health sector.

Nghihulifwa lives in Eenhana and works at the Eenhana Vocational

Training Centre as a senior instructor in the Solar Equipment Installation & Maintenance program. He has also been a regular attendee of the SOLTRAIN Workshops, including those aimed at vocational college instructors.

There are a broad roll-out programs on small-scale solar water heating systems for the residential sector in Namibia. According to the Government of Namibia, 54 MW of electric power shall be compensated (replaced) by solar water heating systems mainly in the residential sector and in addition 100 000 existing electrical geysers shall be replaced. In order to contribute to these programs, training courses focusing on small-scale solar water heating systems are carried out in the framework of the SOLTRAIN program.

Solar pumping systems address

Solar water pumping systems are an ideal alternative to diesel generators for a number of reasons including low maintenance costs, environmentally friendly and have a longer life cycle.

These benefits were highlighted by Titus Koech, Technical Services Manager SSA at JinkoSolar, during an online discussion titled *“Solar-powered water solutions for sustainable agriculture in sub-Saharan Africa.”*

Koech further underlined that solar water pumping solutions not only provide water for irrigation systems but for domestic water supply as well as water for livestock, especially for most of the arid and semi-arid regions of sub-Saharan Africa.

Explaining the difference in the installations, he said the pumps can be deployed as either a standalone or hybrid system. However, each configuration will have its own advantages and also limitations, according to Koech.

“In the case of standalone, where PV is the only source of energy, this may result to low yield because pumping occurs only during the day. But for hybrid systems where there is more than one source of energy like PV plus electricity from the grid and diesel generator, the pump will operate for longer hours, even at night. It also comes with the advantages of higher OPEX and high initial costs. The choice of the configuration when it comes to liability depends on the requirements,” says Koech. To determine the suitable installation, Koech says JinkoSolar technicians would first conduct an assessment, what follows after the assessment is the sizing. “For the assessment,



Solar water pumping solutions provide water for irrigation systems, domestic water supply as well as for livestock

there are a number of factors that we look at like the water source, the water demand, solar resource, and solar radiation. We then use the assessment output to determine the sizing for the solar pumping solution and the PV array.

“What is also very important for solar pumping is the cost, not only the initial costs, but rather the lifecycle cost of the total project. While doing the cost analysis of the system, we also estimate, usually 20 plus years for the lifespan,” he says.

Factors that are considered include the CAPEX, the OPEX, the replacement costs and also the energy or fuel costs especially for hybrid systems.

Adding to the discussion, Asenath Kiprono, Global Water & Solar Specialist at Oxfam, shared high-level experiences, findings and lessons for solar application for water supply in the humanitarian sector.

“In 2017, it was approximated that about US\$1.4 million was used on diesel related expenditure in the humanitarian sector. Water supply remains the biggest consumer of energy in this context,” she noted.

In the humanitarian sector, energy is being used in four categories; heating, lighting, cooking and powering, including powering pumping systems for drinking water and agriculture. Solar is a sustainable solution that

dual water and energy challenge



addresses the energy challenge in the sector and specifically these four categories, says Kiprono.

She pointed out that one of the elements that makes solar very attractive is its cost-effective effectiveness over the long term. The capital costs of solar is higher than diesel, but over time due to the money saved by not buying diesel for the generator, the savings accrue very fast, with a system paying back within a very short time. The component with the highest lifespan is the solar panel and “even though we use 25 years to do the analysis, which is the expected lifetime of the solar panels, the cost benefit can be seen as early as 2-5 years. And so we don’t

have to wait 25 years to see the cost of benefits”.

Providing context when it comes to designing a solar water pumping solution that is tailored to the unique needs of a client. Simani Dube, the Technical Consultant at Samansco & Solarquest Group, said: “The first thing to do is to determine the kind of water source that you have; be it a dam, river, or a river that has been redirected for your system.

“The next thing after determining your water source is to size your hectareage. Even if you’re using your dam to irrigate your farmland, you have to make sure that the quantity of water is enough for the area chosen.”

The next aspect in the process is to determine the size of the pumping system advises Dube: “There are various pump suppliers worldwide that have a lot of water pumping solutions that range from purely DC pumps that will work with solar only to pumps that can function with both solar as well as an AC backup for those that would want to have overnight irrigation or an alternative to just pure solar on a day when they don’t have an adequate water supply.”

He noted that each pump has its own unique features and some brands have a wide range of solar water pumping solutions to fit the requirements of each client. – ESI



The adjacent Ejuva solar photovoltaic plants, each with a capacity of 5 MWp, are capable of feeding 25.8 GWh into NamPower's grid each year

Mergence acquires majority stake in Gobabis' Ejuva solar power plants

Mergence has become the majority shareholder in the two 10MW Ejuva solar plants outside Gobabis, following the acquisition of project developer CIGenCo's shares.

Mergence Unlisted Investment Managers Namibia, the subsidiary of South Africa based fund manager Mergence Investment Managers, now holds a 66% stake in the two 5MW adjacent solar plants. The fund previously held a 17% stake in the two Omaheke solar plants.

Mergence says it decided to increase its stake in Ejuva as part of the fund manager's broader strategy to position itself as a

regional and strategic energy company, focused on addressing Namibia's power shortages.

The Ejuva solar plants were built under the Feed-in Tariff Scheme (REFiT) initiated by the Namibian government to attract investment from independent power producers (IPPs).

The joint venture companies Ejuva One Solar Energy (Pty) and Ejuva Two Solar Energy (Pty) are also owned by Investec Bank, a commercial bank and subsidiary of the Anglo-South African international banking and wealth management group Investec. The two co-developers (Investec Bank and CIGenCo) have signed two 15-year guarantee agreements with the Multilateral Investment

Guarantee Agency (MIGA), a subsidiary of the World Bank Group.

The Ejuva solar photovoltaic plants, each with a capacity of 5 MWp, are capable of feeding 25.8 GWh into NamPower's grid each year. The Namibian state-owned company has a 25-year power purchase agreement (PPA) with the co-owners of the two plants.

Namibia's primary energy total consumption is still dominated by fossil fuels, especially petroleum and diesel which make up more than 60 percent of the country's total annual energy use, while more than 60 percent of the country's electricity is also imported from neighbouring countries.

Rosh Pinah solar plant to deliver 30% of mine's total power

Rosh Pinah mine will construct its own solar photovoltaic system that will meet up to 30% of the lead and zinc mine's total electricity needs for the next 15 years.

The mine's owner, Canada-based Trevali Mining Corporation, is committed to reducing the environmental impact of Rosh Pinah mine through the construction of a solar PV system that will be financed, built and operated by Emerging Markets Energy Services Company (Emesco). Emesco is a renewable energy provider based in Tshwane, South Africa.

Trevali Mining Corporation has entered into a 15-year Power Purchase Agreement (PPA) with Emesco. The PPA will supply 30% of the mine's power requirements at a fixed rate. It will reduce energy costs by 18% and cut the company's greenhouse gas (GHG) emissions by 6% during its

tenure.

Emesco is a full lifecycle energy services company operating in the renewable energy markets of southern Africa. It has implemented 32 MW of solar PV projects in the region. It will be responsible for the design, permitting, financing, and implementation of a solar energy system on a neighboring property at no cost to Trevali.

Emesco has built a 10 MWp solar power plant in Okatope, Namibia. The company has also installed a 2.2 MWp solar plant on the roof of Airport Junction, a shopping centre in Gaborone, Botswana.

"Our sustainability program commits to significant reductions in GHG emissions, and with the signing of this agreement with EMESCO we have taken a major step towards delivering on our commitment by securing renewable energy while also reducing our expected energy costs," said Ricus Grimbeek, President and

CEO, Trevali.

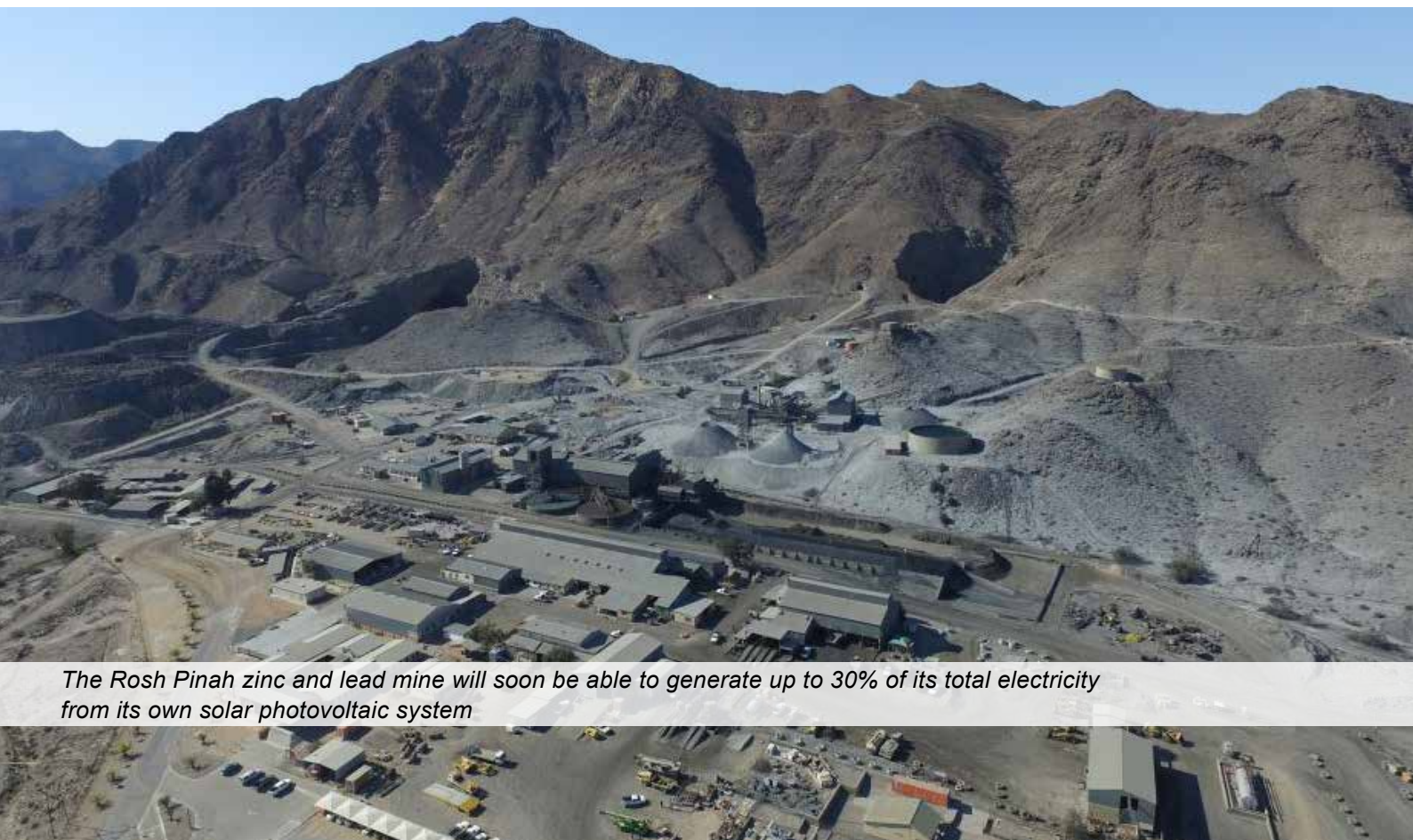
Both parties have, however, not provided further details, including the capacity of the Rosh Pinah solar PV plant.

"If Trevali makes a positive investment decision on the Rosh Pinah mine expansion project, Emesco will increase the delivery of electricity to Rosh Pinah to remain at 30% of the mine's annual energy consumption, as provided for under the amended single buyer framework in Namibia," the Canadian mining company says.

Trevali says the choice of a clean energy source is part of its overall policy to reduce its GHG emissions by 25% by 2025 from its 2018 baseline.

And the choice of Emesco to accompany it in its mission is not insignificant.

The renewable energy provider has a strong track record in solar power generation for industrial and commercial customers.



The Rosh Pinah zinc and lead mine will soon be able to generate up to 30% of its total electricity from its own solar photovoltaic system

Mediclinic signs 12-year solar power purchase agreement

The Mediclinic Group, which operates 54 private hospitals in Namibia and South Africa, is not wasting any time taking advantage of President Cyril Ramaphosa's decision to raise the limit on the self-generation of electricity from 1MW to 100MW.

The group has contracted Moshesh Partners, a black-owned alternative renewable energy asset manager, to install solar photovoltaic systems at its hospitals. It has signed a 12-year power purchase agreement with Moshesh (with the option to extend to 25 years), "ensuring that the hospitals have access to affordable and clean power over that time".

The solar PV systems will

generate electricity that is supplied directly to each hospital site, offering cost savings on power bills while relieving pressure on the constrained national grid. The solar facilities will be built by Aces Africa, which has already completed 153 similar projects in six countries.

Across the six hospitals targeted, the solar sites will have the capacity to generate about 4.1GWh/year, with the largest facilities being installed at Mediclinic Vergelegen and Mediclinic Durbanville. Mediclinic Windhoek already has 88 kWp power installed on its rooftop.

"Our investment in the project portfolio includes the full installation cost of the solar PV systems as well as maintaining them to ensure consistent,

excellent performance," said Daniel Palm, chief investment officer and co-founding member of Moshesh Partners, in a statement.

"Mediclinic will benefit from immediate and tangible savings, as well as consistent energy supply from a renewable energy source, without having to allocate capital expenditure. The power purchase agreement means that the hospital group will also be protected from excessive power price increases," Palm said.

Solsquare Energy planned and installed a PV roof system Windhoek Mediclinic with a total peak output of 88 kWp and covers the majority of the hospital's energy requirement. This enables Mediclinic to save around N\$140 000 each year.

The solar PV roof system installed at the Windhoek Mediclinic



Energy Partners is an innovative energy infrastructure company that builds, operates, and maintains solar and refrigeration assets in Namibia

Eos Capital invests in solar and refrigeration firm

Eos Capital, a Namibian private equity firm with N\$1 billion in assets under management, announced that it will acquire Utility Energy Partners' solar and refrigeration assets subject to approval by the Namibia Competition Commission.

Energy Partners is an innovative energy infrastructure company that builds, operates, and maintains solar and refrigeration assets in Namibia. Through their innovative business model, Energy Partners provides an energy solution to clients which reduces their grid energy consumption through its solar installations and optimisation of their freon/ammonia cooling systems combined with the use of world-leading monitoring technologies.

Energy Partners additionally reduces its clients' CAPEX burden by taking on all the construction costs and leasing the assets to their clients with long-term agreements.

Eos is making the acquisition of the Energy Partners business through its Namibia Infrastructure Development and Investment Fund (NIDIF), a N\$535 million infrastructure private equity fund. NIDIF invests into infrastructure projects in Namibia through equity funding with the aim of generating long-term, stable and

robust income yields, as well as capital growth, to its investors. The fund's main target sectors include Energy, Water, ICT, Transport and Logistics, Healthcare, Education.

Eos is also managing the N\$460 million Allegrow Fund, a general private equity fund, and is currently fundraising for the Euphrates Agri Fund.

Mr Henk van der Merwe, Energy Partners' Chief Executive Officer says: "We are excited to start our new journey in partnership with Eos Capital. Having a local, forward thinking shareholder with sufficient capital to grow this business will enable us to add more attractive Namibian assets to our portfolio, benefiting clients across the country."

Mr Frederico van Wyk, Eos Capital Senior Associate leading the transaction says the private equity firm invested into the business as it found that Energy Partners have stable, consistent cashflows, which speaks directly to Eos' mandate in NIDIF.

"The level of innovation Energy Partners has shown in the refrigeration industry is pioneering as they have optimised the use of cooling to be more energy efficient for Namibian businesses. We

further saw good growth potential in both the solar and refrigeration industries which was validated by management's existing project pipeline. Lastly, we are very excited to play our role in replacing high carbon grid energy with clean renewable energy through efficiently operating solar and refrigeration assets, respectively," says Mr van Wyk.

Energy Partners was founded as Bokstone Solar in 2014 with the sole purpose of building an asset portfolio consisting of rooftop solar PV installations. By 2017, it managed to grow a portfolio of roughly 1.3 MW in a market that was relatively unfamiliar to rooftop solar technology.

In 2018, Energy Partners South Africa expressed interest in the business and agreed to acquire a share in Bokstone and consolidate their assets into the newly founded EP Namibia. The transaction was completed in April 2020. They continued to expand the company's solar PV asset portfolio, while adding a refrigeration as a service as well. The business expanded its portfolio and currently has a presence in the south of Mariental, the coast and Namibia's north eastern corner of Katima Mulilo.

Mega boost for SA Independent Power Producers

The recent decision by South African President Cyril Ramaphosa to allow private investors and companies to generate and sell up to 100 MW in electricity without a licence, has been described as a game changer for independent power producers (IPPs) in that country.

The move is widely viewed as a major step towards unlocking the door to “a new era” for the battling South African energy sector and comes at a time when the country is battling ongoing load shedding as ageing Eskom power plants buckle under the pressure of increasing demand.

President Ramaphosa said there are companies willing to generate more energy, which motivated government to go beyond 50 MW. Some companies have proposed more than 50 MW, indicating they have the means to do so. Placing the threshold at 100 MW, means government gives capability to those who can get to that level. The current limit is 1 MW.

“We will be amending Schedule 2 of the Electricity Regulation Act to increase the National Energy Regulator of South Africa (NERSA) licensing threshold for embedded generation projects from 1 MW to 100 MW,” he said, following consultations with the public and technical work by the Department of Mineral Resources and Energy (DMRE).

Increasing embedded generation caps demonstrates the SA government’s commitment to engage closely with social partners and to take on board new ideas to address the longstanding power challenges.

President Ramaphosa said generators will also be allowed to wheel electricity through



President Cyril Ramaphosa

the transmission grid, subject to wheeling charges and connection agreements with Eskom and relevant municipalities. Generation projects will require a grid connection permit, in order to avoid destabilising the system.

Municipalities will be able to approve grid connections, based on their assessments of the impact on the grid. Projects will also require environmental impact assessments.

“This reform is expected to unlock significant investment in new generation capacity in the short and medium term, enabling companies to build their own generation facilities to supply their energy needs,” Mr Ramaphosa said, adding that government hopes that the new rules will cut the burden on Eskom.

Commentators have described the new move as a “game changer” which should prompt more businesses to invest in power plants to meet their electricity needs.

Johannesburg-based projects expert, Ms Emma

Dempster of Pinsent Masons, said the reform should unblock the delays we have seen in the development of larger scale embedded generation projects

“We have seen substantial growth in the commercial and industrial (C&I) solar market in South Africa for small scale generation facilities with a capacity of no more than 1MW given the current exemption under Schedule 2, and the increase in the capacity threshold for the exemption from 1MW to 100MW will encourage the same growth in the market for larger scale embedded generation projects,” she said.

It is perceived that IPPs will now have more confidence in investing in larger scale C&I projects as the

risk of not obtaining a generation licence following the investment of significant development upfront is largely removed.

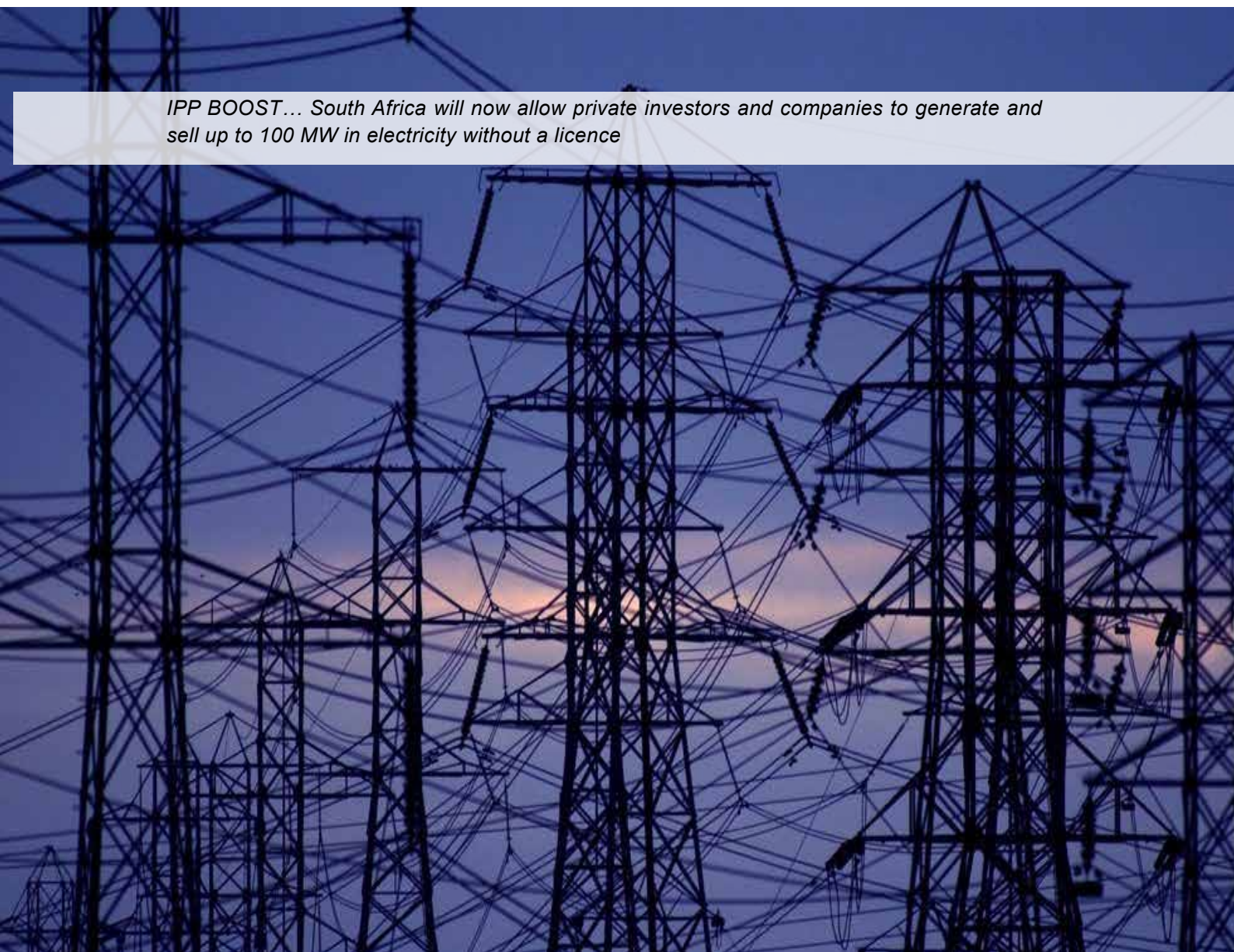
Obtaining a generation licence from NERSA has been seen as a barrier to the development of such projects and an obstacle to investment.

Ms Dempster said: “Given the electricity supply challenges faced by South Africa since 2008, there has been a growing demand for self-generation solutions, and commentators have called for the regulatory framework to be amended to make it easier for electricity generators to generate electricity for their own use. While the government took steps last year to remove the requirement that embedded generation

facilities used for self-generation with a capacity above 1MW must comply with South Africa’s national electricity plan, known as the integrated resource plan, IPP projects are still facing challenges in progressing the development of projects due to the time required to obtain a generation licence as a result of the other requirements that still need to be met in terms of the ERA.”

President Ramaphosa has acknowledged that the ability to bring new power sources on-line quickly is vital to South Africa’s economic recovery and growth. He said the final version of the amendment to Schedule 2 will be published by the Department of Mineral Resources and Energy within the next 60 days.

IPP BOOST... South Africa will now allow private investors and companies to generate and sell up to 100 MW in electricity without a licence



Mozambique starts construction on first solar energy storage IPP

Independent power producer (IPP) Globeleq and project partners, Source Energia and Electricidade de Moçambique (EDM), have celebrated the start of construction of a solar PV plant with energy storage in Cuamba, Mozambique.

The 19MWp solar PV plant and 2MW (7MWh) energy storage system will be located in the Teteane District of the city of Cuamba in the Niassa province, about 550kms west of the coastal town of Nacala. Electricity will be sold through a 25-year power purchase agreement with EDM.

The US\$32 million (about N\$448 million) project will contribute to the Mozambique government's 'Energy for All' strategy, aiming to have universal energy access by 2030.

The project is expected to receive US\$19m of debt funding from the Emerging Africa Infrastructure Fund, which is a member of the Private Infrastructure Development Group (PIDG). The project will also receive US\$7m in grant funding from the PIDG's Viability Gap Funding grant facility and US\$1m from CDC Plus to enable an affordable tariff and the energy storage system.

Nnenne Iwuji, British High Commissioner to Mozambique, commented: "The UK Government is actively partnering with Mozambique on the development of its renewable energy potential, through investments such as this, as well as through our BRILHO-Energy Africa programme which encourages private sector investment in off-grid energy solutions. The UK looks forward to continuing to work closely with Mozambique in the run-up to COP26 and beyond, to identify and support opportunities for sustainable, long-term green



Globeleq and project partners, Source Energia and Electricidade de Moçambique (EDM), have started constructing a solar PV plant with energy storage in Cuamba, Mozambique

growth, investment and jobs."

Jonathan Hoffman, Globeleq's chief development officer called the project a trailblazer for future utility-scale energy storage not only in Mozambique but the region. "Cuamba Solar, along with all our energy projects we are working on, cements our ongoing commitment to contribute to the long-term energy security and development of the country on a low carbon pathway."

Chris Chijiutomi, Head of Infrastructure Equity, CDC Group said: "We are delighted to be supporting Mozambique's demand for new renewable energy supply across the country; 7 in 10 people in Mozambique today do not have access to electricity and 53% of firms report electrical outages. Robust storage technologies are fundamental for the transition to clean energy."

Emilio Cattaneo, Head of PIDG TA, also commented: "Promoting

battery storage solutions alongside green, renewable electricity generation plants is of enormous importance to Africa's economic development and the world's efforts to manage climate change."

Globeleq and Source Energia are also collaborating on one of the country's first wind projects which will be located near the town of Namaacha, 40kms west of Maputo. Globeleq recently pre-qualified to compete for the 40MWp Dondo solar power project in Sofala Province and has been selected for two 15MWp solar projects in neighbouring country Eswatini.

Pedro Coutinho, Source Energia founding partners and managing director said they were excited to have worked on such a significant milestone in Mozambique and committed to developing projects which are in line with the country's energy goals for universal access led by EDM.



A rural micro-grid concept illustration

Could micro-grids be the solution to Africa's electrification challenges?

Tiaan Hendriks

Micro-grids as a self-sufficient energy system could potentially provide a solution to Africa's ongoing low electrification rates. These small and often isolated electrification solutions with the ability to easily harness renewable energy sources could pose the answer – or at least part thereof to the continents electrification problems.

It is well known and accepted that access to a reliable and uninterrupted power supply is critical to economic growth, development and sustainability, particularly in developing economies. Africa is no exception. However, the documented electrification rates show that whilst Africa's current population of more than 1.3 billion (2020), which is equivalent to 16.72% of the world population, the continent consumes a mere 4% of global electricity.

According to the Electricity Access in Sub-Saharan Africa report by AFD and the World Bank Group in 2019, the electrification rate in Africa is 43.5%. This is in sharp contrast to the figures in the 2018 World Bank World Development Indicators: Demographic and Health Surveys and Multiple Indicator Cluster Surveys for the Middle



East and North Africa (MENA) states that show a 98.7% electrification rate.

If the current low rate of electrification continues, the World Bank estimates that although by 2060 1,694.2 million people living in Africa will have access to electricity, a staggering 1,105.8 million will not. This is clearly not a sustainable future for a continent with enormous potential (and need) for economic growth.

Further to the World Bank's indications, of the staggering billion people across Africa that will not have access to electricity by 2060, 98% of them will be sitting in the Sub-Saharan region. What this essentially means is that in order to achieve 100% electrification, no fewer than 71,500 people will need to be provided with access to electricity every single day, for the next 40 years.

An almost impossible target to reach when taking the infrastructure gaps into consideration.

Micro-grids as an electrification solution offer a financial benefit over the costly transmission expansion required to electrify rural areas throughout Africa.

If the solution starts with existing micro-grids in communities, new systems could be developed in areas with no electricity whatsoever. As the systems gradually expand, the cost of connecting to other micro-grids as well as the greater interconnected transmission systems reduces significantly.

The impact of this could see a far greater reach into current 'no electrification zones', thereby helping to connect more citizens across the African continent.

A further advantage is that micro-grids allow for far easier inclusion of renewable energy options into their power generation due to their size and structure.

Africa is well placed for the diversification of energies with vast resources available to most countries across our continent.

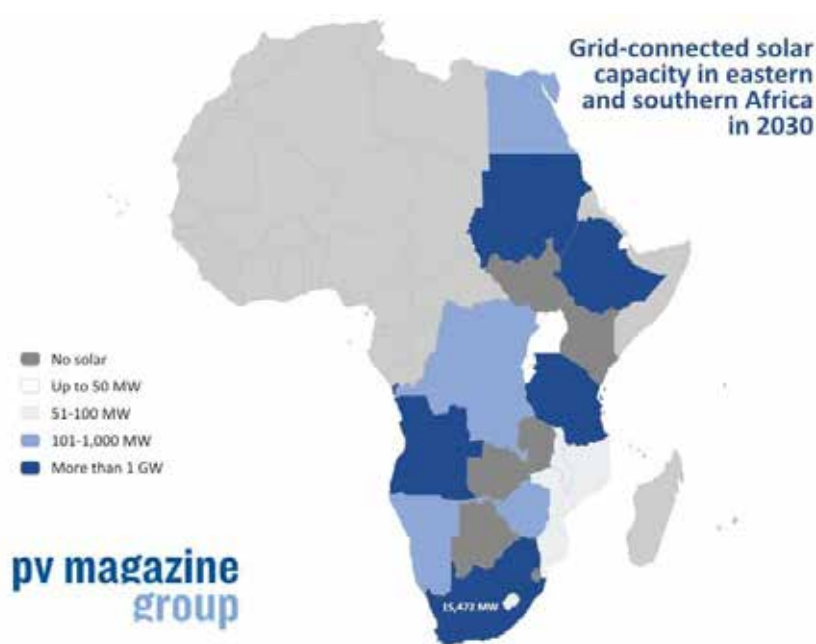
Further benefits of an expanding micro-grid network would be the increased ability to easily harvest renewable energy sources including solar, wind and biomass.

Solar, wind could provide half of 2040 power mix across 22 African nations

The International Renewable Energy Agency has combined energy infrastructure commitments across a huge swathe of the continent with hundreds of regional sites which offer rich solar and onshore wind potential, to determine what could be possible.

A study of the future power grids of 22 African nations, published by the International Renewable Energy Agency (IRENA) has laid bare the lack of ambition spelled out by national governments in their pledges to meet the Paris climate change agreement.

The international think-tank identified numerous promising, grid-connected solar and onshore wind development regions in the nations considered, based on anticipated levelised cost of energy and vicinity to transmission infrastructure. The potential of those sites was combined with existing power development commitments to model a base case for future energy mixes in the two power pools. IRENA then modeled five alternative future scenarios, based on restricting the penetration of variable renewable energy (VRE) sources solar and wind; unlimited renewables adoption; planning to compensate for drought to reduce hydropower production; delayed hydro project construction; and freeing up more trans-border



IRENA's estimate of solar generation capacity in the nations concerned at the end of the decade.

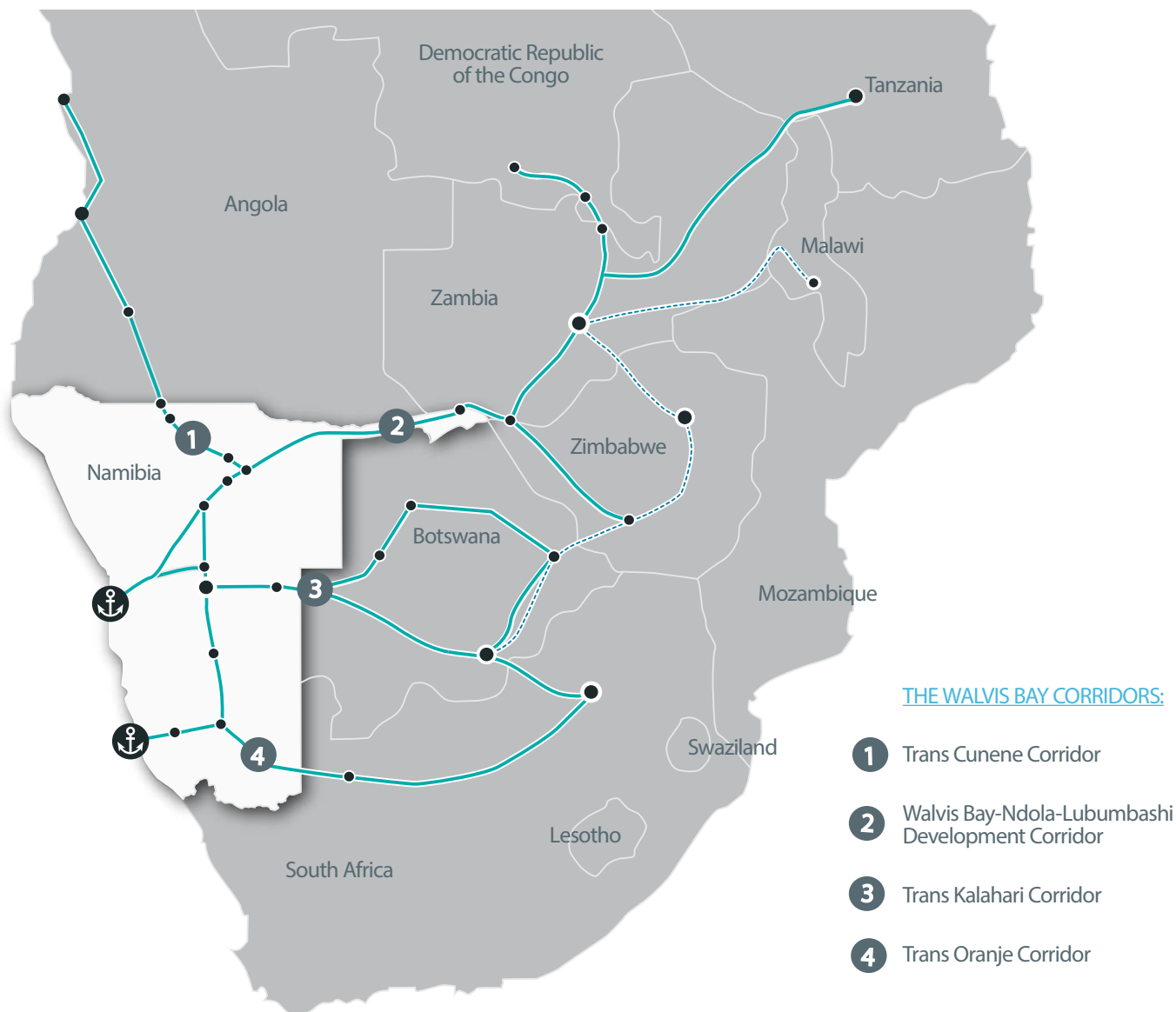
interconnector capacity.

In the high-VRE scenario, Zimbabwe could more than double the 1.51 GW of solar and wind capacity it has committed to installing this decade, to 3.4 GW; the 60 MW of facilities pledged in Zambia by 2030 could become 4.2 GW; and Ethiopia's commitment to plug in 6 GW of solar and wind this decade could be ramped up to 26 GW.

IRENA estimates its reference case scenario would require generation investment of US\$562 billion as part of a US\$2.03 trillion overall system cost. That generation investment figure rises to US\$642 billion in the high variable renewables model and could fall to US\$480 million if clean energy penetration was limited. In terms of overall system cost, the volume of renewables required to cover for drought-affected hydro power has the biggest cost, at US\$2.09 trillion, while providing more interconnector capacity would

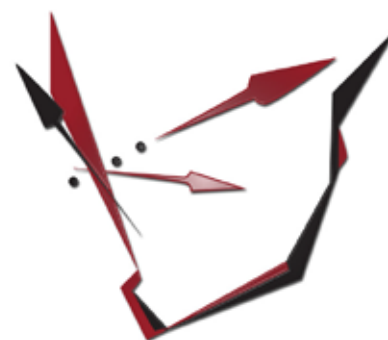
be most cost-effective, at US\$2.029 trillion.

Of the most promising 24 solar and wind development regions identified by IRENA in the nations studied, three of the top four, including the most promising site, are PV-friendly areas of South Africa. The top location could host 5.83 GW of solar from 2028, according to the study, and numbers three and four on the list could feature 3.2 GW and 2.83 GW this decade, with the latter able to grow to 3.95 GW by 2040. Both of those two options already feature solar farms. The next 15 variable renewables zones, like the second, are listed for wind power potential but there are further solar locations in South Africa (up to 1.28 GW in 2030, starting from 2027), Tanzania (1.2 GW in 2030, rising to 3.09 GW), Ethiopia (1.18 GW in 2030, from 2027), and Sudan (1.08 GW in 2030, rising to 2.16 GW, and starting from 2026).



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5 Public Infrastructure Finance	For renewable energy projects established by ministries and state-owned enterprises
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