

Etango

Namibia's Leading Renewable Energy Technologies
Magazine

MAY-JUNE 2022



KATUTURA HOSPITAL SOLAR



**Minister Alweendo Urges
Africa to Tackle Energy Deficit**



**Anglo American Unveils World's
Largest Green Hydrogen Truck**



**Construction of 5,7MW Rosh
Pinah Solar Park Kicks Off**

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Green Hydrogen creates exciting opportunities

The potential that Green Hydrogen has towards speeding up Namibia's generation of sustainable energy cannot be over-emphasised. No wonder this fuel for the future is now the number one item on Namibia's investment promotion agenda.

Given its world class renewable energy potential in the form of abundant wind and solar resources, Namibia is in an optimal location to be a globally competitive producer of Green Hydrogen and its derivatives.

As Mines and Energy Minister Tom Alweendo said recently in Davos, Switzerland during Namibia's Green Hydrogen Event, "as the world economy works towards net-zero emissions by 2050, Namibia's vast natural renewable resources - in particular, its solar and wind capabilities - offer a unique opportunity for the country to generate sustainable energy, through the production of Green Hydrogen".

Though some schools of thought may say Namibia's Green Hydrogen push is a bit premature, we are particularly excited by the potential that this drive has on transforming Namibia from an importer to an exporter of energy within a short period of time.

Namibia's ability to produce hydrogen from renewables is without a doubt a fantastic opportunity. As electrolyser and renewable electricity generation costs continue to decline, cost parity with fossil fuel-based generation is a genuine prospect in the medium to long term in locations with the best renewable resources.

It is thus commendable that Namibia is one of the African countries that have taken the first steps to seize the opportunities hydrogen can offer, and government is actively promoting collaboration among private and other stakeholders to support the emerging renewable hydrogen sector.

Through the production of Green Hydrogen, an infinite renewable source of energy, Namibia will not only be able to boost energy generation from renewables making it self-sustainable, but will also be able to position itself to offer clean, affordable energy to the world economy.

As Minister Alweendo pointed out, this opportunity also opens up the viable possibility of a meaningful and crucial contribution to solving the global crisis that is Climate Change.

Namibia therefore needs to move fast in executing its Green Hydrogen agenda, like what Morocco is doing. While government can be

commended for creating key partnerships with some of the biggest hydrogen consumers in the world, we cannot afford to snooze on this golden opportunity.

We commend the efforts that are being made to create local skills needed to develop the fuel for the future. The government, in partnership with the German government, recently launched the Namibian Youth for Green Hydrogen (Y4GH) Scholarship Programme to create local skills for the anticipated jobs within the emerging Green Hydrogen economy.

Building local human resource capacity is one of the key priority areas we need to focus on if we are to make our Green Hydrogen dream a reality.

In this edition we continue to explore developments around Green Hydrogen and other exciting movements in the local RE industry, aimed at addressing Namibia's energy deficit. We also bring exciting stories on how two of Namibia's main hospitals have turned their solar water heating dream into reality.

Happy Reading!

Editor

globe@afol.com.na

www.etangonam.com

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Cover picture:

GAME CHANGER ... The Maternity Ward at Windhoek's Katutura State Hospital is now meeting all its hot water needs through solar following the installation of a state-of-the-art solar water heating system. The thermal system comprises of 120m² collector area, equivalent to 84kW of electrical power. Photo: Tabby Moyo



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Unit 9, Tal Terrace, Wecke Street, P.O. Box 99113, Windhoek, Namibia

Contact: +264 81 626 0010

Email: globe@afol.com.na

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Contributors

Publisher

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Editor

Tabby Moyo

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Tom Alweendo



Kornelia Shilunga

Alweendo Urges Africa to Tackle Energy Deficit

Africa must start to make radical but informed measures towards tackling the energy poverty that the continent is facing.

This was said by Mines and Energy Minister Tom Alweendo during the recently-held Namibia International Energy Conference (NIEC) in Windhoek.

"It is time that we become the main drivers of Africa's future. If we are going to make Africa's energy poverty history, we need to start reimagining ourselves. We need to start to think differently about our capability. We need to start to think hard as to what needs to be done to attract the necessary investment in the energy space," Alweendo said.

It is estimated that the continent needs an annual investment of US\$20 billion (about N\$300 billion) from now to 2030 in order to address the energy deficit.

"I believe it is not impossible, but we need to think and act anew," he told the conference.

“

The main issue here is infrastructure deficits, insufficient critical investment in the energy sector; and at times unhelping regulatory frameworks that do not encourage investment in the energy sector.

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"For us on the African continent, the issue is clear. We do not have access to energy and where we have it, it is not sufficient for our needs. We have an energy crisis that is spilling its havoc on economic, social and political issues. We therefore need to start asking ourselves some difficult but necessary questions on how best to navigate the rocky shores of reality and arrive safe on the other side. How do we navigate the geopolitics of energy? How do we go about navigating around the energy environmental issues?" the Minister asked.

Africa's energy gap is huge with over 600 million people lacking access to electricity.

"The main issue here is infrastructure deficits, insufficient critical investment in the energy sector; and times unhelping regulatory frameworks that do not encourage investment in the energy sector," Alweendo said.

Another item at the top of the agenda

regarding energy on the continent was that of renewable energy and energy transition. Significant developments have emerged on the continent within the renewable energy sector – be it solar, wind, hydro and green hydrogen.

"Here in Namibia, we have taken a conscious decision to make the country a global hub for green hydrogen. Our vast solar and wind resources provide us with a strong foundation for the development of a green hydrogen hub on the continent.

"We also see domestic renewable energy generation and green hydrogen production as key vectors of national decarbonisation. While doing so, we are also focused on regional partnerships that will help transform a potential surplus in solar and wind power into increased energy access in the region," Minister Alweendo said.

The Minister said although Namibia recently made two offshore oil discoveries which have increased the country's potential to become an oil producing nation, and at the same time raised questions about why the country was embracing both renewable energy and fossil fuels, the government would not renege on its commitment to the Paris Agreement.

The Paris Agreement is an international treaty on climate change, adopted in 2015. It covers climate change mitigation, adaptation, and finance. It aims to increase the ability of parties to adapt to climate change effects, and mobilise sufficient finance. Under the Agreement, each country must determine, plan, and regularly report on its contributions.

"Our position is that it does not make sense for us to suffocate ourselves by cutting off potential hydrocarbon

resources that could assist in solving our socio-economic problems. It is more sensible to take a pragmatic approach in the energy transition conversation. Our concerns are more with providing livelihoods and supplying basic necessities to the country's growing population," said Alweendo.

The Energy Minister dismissed Africa's carbon footprint as insignificant, noting that the continent was only responsible for 3% of the global carbon dioxide emissions.

"We suffer from energy poverty and this is despite the natural abundance of fossil fuels and renewable energy resources," he said.

Alweendo's deputy, Kornelia Shilunga, said now more than ever Africa must lend its voice to the growing discourse on the continent's participation in the energy industry's broader value chain and sustainability.

She said Namibia has truly and agreeably demonstrated its commitment to its energy future and is eager to capitalise on the potential opportunities.

"Our endeavour to win this battle is driven foremost by the fact that access to energy translates to a better quality of life, is a key to improved healthcare and unlocks more economic opportunities especially for the youth.

The lack of access to clean, cheaper and sustainable energy has had devastating results for Namibia, the rest of the sub-Saharan region, and has created constraints on people's social and economic progression. Namibia's energy remains insufficient," Shilunga said.

She said the energy challenges being faced by Namibia and Africa as a whole "must be understood to spur us into fast-tracking the migration towards cleaner sources of energy and making it available to the most remote areas".



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SUN POWER ... NEI Acting Head Helvi Ileka and NUST lecturer for Mining, Mechanical and Process Engineering Frans Hanghome in front of collectors of the 84kW solar water heating system installed at Katutura Hospital Maternity Ward.

Katutura State Hospital Maternity Ward Meets all its Hot Water Needs from Solar

The Maternity Ward at Windhoek's Katutura State Hospital is now meeting all its hot water needs through solar following the installation of a state-of-the-art solar water heating system by the Namibia University of Science and Technology (NUST), through the Namibia Energy Institute (NEI).

NUST recently commissioned the thermal system comprising of 120m² collector area, equivalent to 84kW of electrical power. The project was implemented by NUST under the Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN) project on behalf of Ministry of Mines and Energy (MME). Half the funding (50%) was provided by SOLTRAIN, sponsored by Austrian Development Agency (ADA), while MME provided the other half.

The solar heating system was designed by NEI and AEE INTEC and installed by SEG Solar Energy (Pty) Ltd, from South Africa, and installation commenced on 25 April 2022. The project was commissioned on 16 May.

The NEI, which is the SOLTRAIN project implementing partner in Namibia, conducted a quality inspection on 17 May and was satisfied by the installation.

The brand new solar water heating system provides approximately 10 000 liters of hot water per day to the Maternity Ward, making sure that mothers have access to hot water during pregnancy, childbirth and the postpartum period.

The Katutura State Hospital had been battling to

operationalise the production of hot water from the initial solar water heating system which was installed in 2007.

The study conducted by NEI revealed a number of challenges which hindered the effectiveness of the system. These included limited technical expertise, mismatch in specifications of the system, weak technical supervision of work done, weak institutional arrangements, fragmented institutional roles in the operation and maintenance of the system, as well as lack of effective management, financial services accountability and clear roles in management.

To remedy this situation a concept note by NEI was submitted to the Ministry of Health and Social Services (MoHSS) by MME in 2018, for the refurbishment of the entire solar water heating system at hospital's Maternity and Tuberculosis Wards.

Out of the eight subsystems that make up the main solar water heating system at Katutura State Hospital, the Maternity Ward's system was selected as the first one to be refurbished, with the following sustainability plan:

- ✓ Engage and select a highly experienced private company, trained by the SOLTRAIN experts, with the necessary skills and expertise to redesign and re-install the system;
- ✓ Local companies and technicians to be included in the installation process in order for skills transfer to occur and to ensure future maintenance of the system by

local technicians;

- ✓ To at least have one demonstration system which is well designed, installed and working properly which can be monitored with already existing SOLTRAIN monitoring equipment;
- ✓ Develop a long term strategy to guide public institutions equipped with solar water heaters on maintenance of such systems;
- ✓ Involve the private sector in the operation and maintenance based on a cost-effectiveness basis;
- ✓ Demonstrate the benefits of solar water heating systems to stakeholders and facilitate technology deployment;
- ✓ To reduce the electricity bills for the hospital and achieve intended objectives of installing solar water heaters instead of using electricity for heating the water at the hospital;
- ✓ Increase the research outputs of students' projects in the involvement of data analysis at NEI and academic institutions (NUST and the University of Namibia);
- ✓ Build the technical capacity of inspectors in greenhouse gas emissions (GHG) data collection to inform the national inventory;
- ✓ Help SOLTRAIN to build capacity in the field of solar thermal technologies, and promote the use of solar thermal systems to ensure selection of quality products and workmanship in order to guarantee optimal performance during the lifetime of the systems;
- ✓ The hospital to benefit from the reduced maintenance of the long-term quality system, which could therefore save costs;
- ✓ Strengthen MME and MoHSS, as well the Ministry of

Works and Transport (MWT) in the provision of sustainable energy to the hospital and implementation of the Cabinet Directive of solar water heaters in a coherent manner.

During the installation of the new Maternity Ward solar water heating system two local companies participated in the exercise.

In addition a student each from the department of Mining, Mechanical and Process Engineering at NUST, NamVoc Vocational Training Centre and a Masters in Renewable Energy (UNAM) student were involved in the installation. Two NUST lecturers from the Mining, Mechanical and Process and Electrical and Computer Engineering departments also took part in the installation.

The participation of the local personnel in the installation was done to facilitate skill transfer for maintenance and monitoring and to ensure sustainable operation of the installed solar water heating system.

The Maternity Ward solar system will go a long way in helping Namibia achieve its national ambitions as stated in the various national policy documents, such as the revised National Determined Contribution (NDC) which aims to install 20, 000 solar water heaters by 2030, the Solar Thermal Roadmap which aims to install 0.5 m² collector inhabitant by 2030 and the promotion of sustainable renewable energy systems as stipulated in the National Renewable Energy Policy.



PROUD MOMENT ... Part of the team that installed the state-of-the-art solar thermal system at Katutura Hospital.



HOW IT WORKS ... Helvi Ileka explaining some of the modern components of the new system



GROUNDBREAKING ... Senior officials from Trevali, Emesco and Otesa attended the ground-breaking ceremony which signalled the beginning of construction of the Rosh Pinah Solar Park.

Construction of 5,7MW Rosh Pinah Solar Park Kicks Off

Construction work on the new 5, 7 megawatt Rosh Pinah Solar Park (RPSP), jointly owned by Otesa Energy Projects and Emesco Energy, has commenced.

The plant will supply up to 30% of the energy required by Trevali Mining Corporation's Rosh Pinah Zinc Mine and support the mine's efforts to reduce its carbon footprint.

The partnership between Trevali and Rosh Pinah Solar Park is one of the first bilateral power purchase agreements under the Namibian Modified Single Buyer Framework (MSB), allowing Independent Power Producers (IPPS) to directly sell electricity to transmission connected customers.

Trevali's Chief Operating Officer, Derek du Preez, hailed the positive contribution of the partnership between his company, Emesco, Otesa, NamPower and other stakeholders, and further stated that the Rosh Pinah mine, having been in existence for 50 years, is now focusing on its expansion and that the development of the solar PV plant is a step in the right direction for Trevali to meet its larger Environmental, Social and Governance objectives.

Otesa is the main contractor of the RPSP and has extensive experience in delivering Namibian infrastructure. Emesco and Otesa have previously worked together on two solar PV projects of similar size in Okatope, Namibia.

Pieter Rossouw, Director of RPSP said:



The partnership between Trevali and Rosh Pinah Solar Park is one of the first bilateral power purchase agreements under the Namibian Modified Single Buyer Framework (MSB), allowing Independent Power Producers (IPPS) to directly sell electricity to transmission connected customers.



"Emesco is proud to start construction on Rosh Pinah Solar Park. Reaching this important milestone in the project is the culmination of months of preparation and close co-operation between Trevali, RPSP and numerous stakeholders. We applaud Trevali for their commitment to reducing their environmental footprint and thank them for entrusting this initiative to Emesco."

The Development Bank of Namibia (DBN) recently signed an agreement to finance RPSP, which is expected to reduce the cost of energy to run the mine, diversify its sources of energy and improve its sustainability.

RPSP Director and Shareholder, Elmo Kaiyamo, said the facility will supply 30% of the Rosh Pinah mine's power requirements over the 15-year duration of the power purchase agreement (PPA). This will reduce the mine's emissions of greenhouse gases by 6% annually at a company level.

The Rosh Pinah Solar Park is the second renewable energy project to be financed using the DBN's Climate Adaptation Facility.

By financing renewable energy generated by IPPs, DBN aims to reduce cashflows out of the country, increase the amount of locally-generated electricity and reduce future costs associated with developing and maintaining cross-border transmission infrastructure, as well as enhancing security of supply.



TAKING THE LEAD ... Lady Pohamba Private Hospital in Windhoek has installed the largest pumped solar water heating system in Namibia to date.



INSPECTION ... Engineers from the SOLTRAIN project and NEI inspecting the Lady Pohamba Private Hospital installation.

Lady Pohamba Hospital Installs Namibia's Largest Pumped Solar Water Heating System with SOLTRAIN Co-Financing

Lady Pohamba Private Hospital, in Windhoek, recently commissioned 278, 2 m² of the total 358, 68 m² collector area of solar water heating to be installed at the private hospital.

The remaining 80.2 m² collector area will be commissioned by August 2022.

The private hospital, which pursues energy sustainability, will install in total 251.04 kW equivalent of electrical power and 39.8 m³ storage tanks, making it one of the largest pumped solar water heating system operational in Namibia to date. To supplement the electrical energy needs from the solar photovoltaic (PV) system already installed on the roof of the private hospital, Lady Pohamba has embarked on three solar water heating projects to supply its heat demand directly with solar thermal and heat pumps as backup.

The large-scale pumped solar water heating system in the country was recently installed at the North Block of the Lady Pohamba Private Hospital, consisting of 210 m² collectors area (147 kW equivalent of electrical power) and a hot water storage tank capacity of 15 m³ (15 000 litres). The system can supply the following divisions of the hospital with hot water on a daily basis without interruption:

- 20-bed paediatric ward
- 7-bed paediatric ICU
- 18-bed day ward
- 60-bed medical ward and,
- 10-bed step down/rehab ward.

The 16 thermosiphon systems with a total collector area of 68.2 m² (47.7 kW equivalent of electrical power) and hot water storage tanks with capacity of 4.8 m³ (4 800 litres) were installed in February at the cardiac wing of the hospital to supply hot water to the following divisions:

- 11- bed ICU
- 33-bed cardiac/neuro ward
- 10-bed maternity ward extension, radiology and pathology.

To upgrade, the existing 20 m³ (20 000 litre) storage tank

system currently heated by electricity will now be heated by a solar collector area of 80.48 m² (56.34 kW equivalent of electrical power).

The hot water system will supply hot water to the following divisions in hospital:

- 15-bed of trauma unit
- 7 operating theatres
- 2 surgical wards (which include 41 beds)
- 7-bed isolation unit
- 10-bed multi-intensive care unit
- 11-bed cardiac vascular intensive care unit
- 34-bed medical ward
- 11-bed paediatric ward
- 10-bed neonatal intensive care unit and
- 12-bed maternity ward.

It will also provide hot water to supportive services, such as the hospital pharmacy, radiology and pathology departments.

The pumped solar water heating systems at Lady Pohamba were designed and installed by Solsquare Energy, one of the leading local solar companies. Part of the funding for the systems came from the Southern African Solar Thermal Training and Demonstration Systems (SOLTRAIN) project.

The quality inspection for the systems at the cardiac wing and north block was completed on 23 February and 1 April respectively by a team comprised of local SOLTRAIN project representatives from the Namibia Energy Institute (NEI) and Namibia University of Science and Technology. Solsquare will start work on the upgrading of the existing system in August 2022.

It is envisaged that the installation of these three systems at Lady Pohamba will encourage other hospitals in Namibia to take up solar thermal systems for heating and cooling, in order to become carbon neutral and take advantage of SOLTRAIN co-financing benefits.

Lady Pohamba Private Hospital is a modern hospital owned by Namibians. It is located in the Olympia suburb of Windhoek, a few metres away from Grove Mall, the largest shopping mall in the country.



A **Solar Home System** typically has the capacity to power lights and devices such as radios, TVs, fridges and cell phone chargers.



A **Business Solar System** typically has the capacity to power lights and devices for business use.



A **Photovoltaic Pumping System** produces energy for pumping water for livestock and domestic use.



A **Solar Water Heater** uses energy from the sun to heat water for domestic use.



FINANCIAL SOLUTIONS FOR RENEWABLE ENERGY TECHNOLOGIES



Ministry of Mines and Energy,
6 Aviation Road,
Private Bag 13297, Windhoek,



OGEMP SOLAR REVOLVING FUND

FACT SHEET FINANCIAL SOLUTIONS FOR RENEWABLE ENERGY TECHNOLOGIES

SRF Mandate

The Ministry of Mines and Energy (MME) is the sole administrator of the Solar Revolving Fund (SRF). The SRF is a credit facility established by MME to stimulate demand for the utilization of renewable energy technologies in off-grid areas, especially for communities living in rural areas, but also to urban clients. The SRF is the element of the Off-Grid Electrification Master Plan for Namibia (OGEMP) whose objective is to provide access to appropriate energy technologies to rural areas.

Registered Energy Service Providers

SRF has a pre-qualified list of registered Energy Service Providers approved by the National Technical Committee on Renewable Energy (NTCRE) at Namibia Energy Institute (NEI). The Energy Service Providers provide installation services to SRF clients by providing them with detailed quotations and eventually install their solar systems at a site of choice.

Who can apply for the SRF Loan?

- Applicant must be a Namibian Citizen, age 21-55 and pensioners up to the age of 75 years old.
- Any person with an active bank account into which his/her monthly or regular income is paid and with a clean credit record. Credit references will be verified with Trans Union®.
- The applicant must prove 2 years of un-interrupted employment term or be in business operation for 2 years

Loan Criteria

- Maximum loan amount: N\$60,000 for Solar Water Pump, N\$6,000 - N\$40,000 for Solar Home System, N\$95,000.00 for Business Solar Systems and N\$35,000 for Solar Water Heaters
- The loan interest rates are in a range of 0-5% charged over the loan period of 60 months.
- Loan amount must not exceed three (3) times the applicants' basic income.
- Deposit is payable in the range of 5% - 30% of quotation amount.
- Applicants over the age of 55 years, pensioners, farmers and businesses with proven regular income pays 30% deposit of total quotation amount.
- Upon approval of the loan application form, an administration fee of N\$350.00 (non-refundable) is payable together with the deposit.

Loan Application Process

How to obtain Application Form: Forms can be obtained from the Ministry of Mines and Energy, Energy Service Provider and at all Regional Offices, and can be downloaded from the MME website.

Submission of an Application Form: Applications can be submitted to MME by attaching the following documents:

- Recent certified copy of your ID (All)
- Latest stamped pay slip or proof of income (Individuals)
- 6 months bank statement (Individuals)
- Founding Statements (Business)
- 1 year bank statement (Business)
- Financial Statements (Business)
- A detailed quotation from accredited Energy Service Provider (All)
- Proof of land ownership (land certificate, title deed or lease agreement)

Loan Application Outcome: The application will be assessed, if successful, client will be notified in writing, telephonically or contacted via an Energy Service Provider to pay the required deposit and forward proof of payment to MME.

Purchase Order: Once the deposit is confirmed with the bank, SRF will issue a purchase order within 14 days to your Energy Service Provider to arrange for the system delivery and installation at the address indicated on the application form. The Purchase Order is valid for two months, thereafter it will be cancelled together with the application.

System Installation: The client should sign the installation report, to prove that they have received the system as per quotation and to signify that they are satisfied with the installation and the system is operational. Do not sign the installation report if your system is not installed or not working.

Systems Inspection: The Ministry will conduct an installation verification to ensure that your system was installed. This is a once off activity, and will be done within twelve months after installation.

Repayment: Once the loan is granted, the applicant will be responsible to honor the monthly installments until full payment of the loan. The loan can be repaid via debit order and payroll deduction.

Loan Defaulting: A 5% interest rate will be levied on any overdue amount in respect of any period (s). After five (5) years of repayment the remaining balance becomes due & payable immediately.

General Information

TAKE NOTE:

Arrears and/or defaults in installments for three consecutive months may result in legal proceedings and possible backlisting on Trans Union® (ITC).

Insurance: The Ministry of Mines and Energy provides insurance that covers only "Acts of God", such as lightning, flood or hail, wind as well as damages caused by wild animals. An excess fee of 15% of the claim value is payable by the borrower on any claim made out to the insurer. The insurance cover is valid for a period of the loan. Theft is not covered.

Failure to repay the loan will result in terminating insurance benefits from the Ministry.

Applicants can obtain claim forms from the Loan Officer and should be submitted within two (2) months after the damage. Client should provide a quotation and a statement made under oath from the nearest police station.

In case of death, the remaining balance of the loan is written off and the system becomes a property of the deceased's family, provided that a certified death certificate is submitted to the Ministry.

Cancellation Fee: Clients will be charged cancellation fee, 15% of total deposit received, upon cancellation of loan applications. The Ministry may cancel the application if the client fails to pay full deposit on time or delay installation of the solar system.

TAKE NOTE:

Failure to repay the loan will result in terminating insurance benefits from the Ministry

After Sales Services and Warranty: There is limited maintenance of solar systems once installed properly. However, after sales service and warranty will be provided by your Energy Service Provider. The Ministry will not be held liable for malfunctioning systems.

TAKE NOTE:

The Service Provider is required to provide to the client guarantee or warranty of the materials provided. The SRF does not give any guarantee or warranty to the borrower in relation to the solar system.

Green People's Energy Trains Solar Professionals on PV System Design, Installation and Maintenance

Green People's Energy (GPE) Namibia recently conducted a training session for solar professionals, covering aspects of solar photovoltaic (PV) system design, installation and maintenance.

GPE, a project of the German Cooperation and the Ministry of Mines and Energy, is driven by the idea of improving the livelihood of people in rural areas using the untapped solar energy at their disposal, by providing training to start-up entrepreneurs and existing SMEs. It aims at providing the necessary solar solutions at the rural community level to improve livelihoods.

The project further aims to provide rural enterprises with solar-based solutions, developing a valuable chain of installations, and assembly coupled with promotion, to enhance self-employment for potential entrepreneurs (start-ups and existing SMEs).

The distinctiveness of the proposed model is that it will focus on the youth playing a key role in the clean energy value chain.

Sixty solar professionals consisting of installers, engineers, renewable energy salespersons, sales consultants and electrical graduates from northern Namibia attended the training which took place at Monte Carlo Guest House and Eenhana Vocational Training Center over a five-day period, from the 9 to 13 May.

The aim of the training was to equip the participants with the relevant skills and knowledge and improving their competencies in PV design, installation, and maintenance, including solar water pumping and solar water heaters.

It was conducted as part of GPE's main focal areas of Training and Education, aimed at developing capacities in Renewable Energy. It was divided into two components - theoretical and practical training which was conducted by a group of 11 Technical and Vocational Education and Training (TVET) trainers from various VTCs around the country. They were mentored by two renewable energy experts, Dr Zivayi Chiguvare from the University of Namibia, and Mr Levy Nakatana from the National Youth Service. The training on solar water heaters was conducted by experts from Namibia Energy Institute (NEI), at the Namibia University of Science and Technology.

Furthermore, professionals were introduced to several RE topics such as the measurement of solar radiation; determination of best inclination angle for solar modules; battery testing; connection of solar modules in series and in parallel; connection and testing of an off-grid PV system; connection and testing of a PV water pumping system; maintenance of a PV water pumping system; solar thermal systems and solar thermal system maintenance.

Dr. Chiguvare said the training was planned as a refresher course for the professionals who have been active in the Namibian RE industry.

"The aim is to capacitate them to being able to carry out installations in a professional way," he said.

Titus Kandjengo, GPE Technical Advisor of Training and Education, said he was overwhelmed by the



SKILLS ENHANCEMENT ... The solar professionals going through theoretical and practical training covering aspects of solar photovoltaic (PV) system design, installation and maintenance.

turnout of the professionals for the training.

"We did not expect to have all 60 participants present. All our planning was for around 40-45 participants. This shows that there is a huge need for refresher training for professionals in the RE industry," he said.

Kandjengo further said GPE will explore whether to repeat such training and possibly move it to other regions as well.

The Eenhana VTC, which offers training in solar technologies, has been identified as one of the vocational centers where a "Center of Excellence" in solar photovoltaics can be established. The institution already offers solar equipment installation and maintenance courses.



Anna Hamukwaya

REIAoN appoints new Administrator

The Renewable Energy Industries Association of Namibia (REIAoN) recently appointed Anna Hamukwaya as its new part-time administrator.

Hamukwaya will attend to REIAoN matters every week day between 09h00 and 12h00.

Before joining REIAoN, Hamukwaya gained seven years of corporate experience working for member-based organisations such as Team Namibia and the Construction

Industries Federation.

Hamukwaya is experienced in the fields of Administration, Marketing, Project and Office Management, as well as Events Management. She holds a Bachelor's degree in Business Management from the Namibia University of Science & Technology (NUST).

"I am very excited about this opportunity and to be part of this energetic team. I cannot wait to learn more about the renewable energy industry in Namibia and watch its progress unfold," she told Etango.

REIAoN hosts safety training for Medium Voltage Switching

The Renewable Energy Industry Association of Namibia (REIAoN), recently organised a safety training course for local renewable energy technology installers.

The training, which was held in conjunction with the Technical Environment Training and Consulting Services cc (TETCS), an accredited technical trainer and assessor in Namibia, followed a recent fatality in the Erongo region during a solar system connection.

An employee of one of the leading renewable energy companies in the country died while connecting a NamPower-owned solar power plant to a substation near Omaruru in the

Erongo region.

The Medium Voltage Switching (MVS) training was open to all players in the Namibian renewable energy industry. However, REIAoN members attended the training at a discounted rate as one of the benefits of being a member of the association.

The training, which will be conducted in three phases, was facilitated by Stephen Muller of TETCS and took place in Windhoek from 25 to 29 April.

The certification the participants will receive upon completion of the training is NTA accredited.

For information on future trainings organised by REIAoN please contact info@reiaon.com.na



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DBN finance adds another 20MW to Namibia's renewable generation

The Development Bank of Namibia (DBN) has signed an agreement to provide N\$193 million to finance a new solar power generation plant, near the Khan substation in the Namib Desert. The plant will feed 20 megawatts into NamPower's Khan substation, from where it will be distributed to households and industrial consumers.

Anirep Aussenkjerr Solar One, a start-up company, was the recipient of a 25-year tender to produce power for NamPower. The company consists of two local partner companies, Anirep Solar and Aussenkjerr Energy Investments. Anirep is listed on the Namibian Stock Exchange.

The solar plant, 40 km from Usakos, will be developed by HopSol Africa, also a local company.

Emphasising the importance of solar power for Namibia, DBN Head of Marketing and Corporate Communication, Jerome Mutumba, pointed out that according to National Statistics Agency (NSA) figures for February 2022, local production of electricity stood at 65 362MWh but imports from the Southern Africa Power Pool (SAPP) stood at 255 286 MWh.

Mutumba said that these figures were a snapshot of the current need to substitute imports. He said that viewed over the short, medium and long-term local generation was highly variable due to the fact that Namibia's largest power generation facility, Ruacana Hydroelectric Power Station is dependent on fluctuating levels of the Kunene River.

He illustrated the impact



GOING GREEN ... Witnessing the signing of the DBN agreement to fund the Khan solar project are (from left) Metilde Nambahu, DBN Portfolio Manager responsible for the deal, Martin Inkumbi, DBN CEO, Iyaloo Nangolo, Managing Director, ANIREP and James Nyandoro, ANIREP Chief Financial Officer. Photo: DBN



DBN Head of Marketing and Corporate Communication, Jerome Mutumba, pointed out that according to National Statistics Agency (NSA) figures for February 2022, local production of electricity stood at 65 362MWh but imports from the Southern Africa Power Pool (SAPP) stood at 255 286 MWh.

of the levels of the Kunene River by saying that in July 2021, power production from Ruacana Hydroelectric Power Station fell by 87.5%.

Mutumba then said that this decline points not just to develop local power generation, but also to the need for stable sources of generation, such as solar.

Fluctuation in generation leads to fluctuations in costs which have an impact on Namibia's deficit as well as on the medium to long-term costs of industry as NamPower and regional distributors have to adjust their costs. By stabilising power generation, he said, Namibia can become a more attractive destination for investors seeking opportunities in Namibian

industrialisation.

Speaking about privately-owned solar generation facilities, Mutumba said that Independent Power Producers (IPPs) are an ideal means to promote economic inclusiveness. Currently, a small solar power plant can conceivably be financed over a period 10 years. With an offtake agreement of 20 to 25 years and a stable purchasing regime over an additional 10 to 15 years, this leaves an enterprise resource that can be maintained, expanded or diversified.

Mutumba concluded by saying that solar generation has benefits all round and urging all stakeholders to approach the DBN to examine business models and potential for future projects.



Bank Windhoek has Namibian Green financing

Bank Windhoek has established itself as a Namibian Green financing market leader. Can you give us a breakdown of some of the critical sustainability projects that the Bank has facilitated?

In its 32-year history, Namibia has established itself as a leader in environmental protection. It is the first country in Africa to incorporate environmental protection into its constitution. The Green niche segment in Namibia has been untapped for many years. As environmental disasters become evident, such as Namibia's 2018/2019 drought, combating climate change has become an important topic prioritised by most countries. This shift to reduce emissions, governments incentivising green assets, and the increased demand has made going green cheaper than a decade ago.

In this shift towards a sustainable economy, Bank Windhoek, a truly Namibian bank, saw an opportunity to make a difference and embark on a journey to provide access to finance in green and sustainability areas. In the last decade, Bank Windhoek has become one of the leading lenders to the Namibian Sustainable Energy market, with expertise and services designed for clients that range from individuals and small and medium-sized businesses to large corporations. The Bank is a pioneer in the Southern African region after becoming the first commercial Bank to issue and list a Green Bond and successfully issue a Sustainability Bond to raise alternative funding sources to finance green and sustainable projects within Namibian borders.

At the start of 2022, there was a strong optimism about the renewable energy sector within Namibia. We expected sustainable investments by businesses in renewable energy and wastewater treatment solutions to multiply over the next 12 months and beyond. However, the global coronavirus pandemic and economic shock placed 'green' investments at the bottom of many business and household agendas. This placement will disrupt the momentum gained over the past decade.

Namibia has a relatively hot and dry climate. It has an abundant sunlight resource of more than 300 days and up to 2,200 kilowatt-hours (kWh) per square meter recorded annually. This proves that the country is ideal for harnessing the sun's energy. Our

experience in the Sustainable Finance landscape, suggests that Namibia is still focused heavily on Renewable Energy, especially rooftop and commercial size Solar Photovoltaic (PV) systems; as such, we remain optimistic that we will continue to see more sustainable agriculture and socio-economic projects soon.

As Namibia prepares to develop the Green Hydrogen economy, where Renewables will play a crucial part, what role does Bank Windhoek play in this area?

The Green Hydrogen economy stands to revolutionise the energy sector globally and locally. It has tremendous economic impact throughout the value chain. The growing concern on climate and subsequent regulatory changes and increased pressure from investors on companies to adopt cleaner, greener technology will ensure that green hydrogen has a global market.

There are numerous spin-off commercial activities that will mushroom around green hydrogen production. In Namibia, we expect more solar and wind power projects to form part of the country's overall energy mix and green hydrogen production. We anticipate exciting developments in this sector in the future and the potential Public-Private Partnership projects announced during the World Economic Forum in Davos in May 2022.

In addition, Bank Windhoek is continuously researching developments in the renewable energy space and investigating how best to add value to the Namibian economy. For instance, Bank Windhoek is looking into the financial feasibility of technological developments in commercial battery storage solutions. Implementing diverse energy storage solutions, including long-duration batteries for utility-scale renewable integration, will ensure renewables such as solar and wind can supply the grid on a 24-hour basis. This type of technology is becoming more affordable and economically viable. As the effects of climate change continue to emerge as a business reality, and by financing bankable and sustainable projects, Bank Windhoek will assist in accelerating the local market's transition to lower-carbon energy and a resilient climate future.

What has been the uptake of special sustainability loans by Bank Windhoek's clients, and what does the Bank aim to achieve with this facility?

Although the cost of sustainable solutions has decreased significantly, there is still a relatively high upfront capital cost related to sustainable solutions such as water-saving technology or renewable energy generation like off-grid rooftop solar PV systems, which limits the local uptake by individuals and businesses. However, the ever-increasing electricity tariffs and water shortages have led to growth in the demand for affordable green financing solutions. This trend has led us to offer our clients a value-adding sustainable financing solution. Heeding favourable market sentiment regarding green financing, Bank Windhoek's Sustainability Loan Campaign provides a unique and first to market solution for our Capricorn Private Wealth, Selekt Platinum and Selekt Gold customer segments. Moreover, we aim to make favourable financing available to financially feasible projects. Each project is dealt with on a case-by-case basis. The final terms and conditions are based on the finance applicant's repayment-ability and the project's overall risk profile.

The Sustainability Loan offering encourages investments in energy efficiency, renewable energy, and sustainable agricultural projects



has established itself as a financing market leader.

to support individuals and businesses in operating more sustainably and reducing unnecessary overhead expenses. In addition, the attractive repayment terms also ensure that there are no extra expenses for the applicant. The loan repayments are aligned with the savings in operational costs from reduced electricity or water consumption.

The launch of this unique Sustainability Loan offering will allow the Bank to unequivocally set the tone of our commitment towards sustainable finance in the local market.

Which projects or areas can benefit from the Sustainability Loan facility, and is there a ceiling on the amount an entity or an individual can apply for?

Bank Windhoek is committed to ensuring that clients have sufficient access to funding that supports Namibia in its transition to an environmentally sustainable and low-carbon economy. Furthermore, the Bank Windhoek Sustainable Bond issuance and subsequent Sustainability loan offering aim to provide a unique and market-leading value proposition to anyone who wants to build a sustainable business and household. There are no limitations in terms of financing, and individuals or businesses can apply. The following broad categories of projects will qualify for financing from the proceeds raised with the issuance of the Bank Windhoek Sustainability Bond:

Eligible Categories:

- Renewable energy (i.e., Rooftop Solar PV Systems)
- Sustainable Agriculture related investments
- Wastewater Treatment equipment
- Any other project that has clear environmental and Socio-Economic benefits

To what extent has Bank Windhoek been involved in large scale renewable energy projects in Namibia?

Bank Windhoek was considered the leading partner of the Sustainable Use of Natural Resources and Energy Finance (SUNREF) programme initiated by Agence Française de Développement (AFD). The funding from SUNREF, coupled with the first Green Bond issuance, was utilised to successfully finance various commercial 5 MW Solar PV renewable energy and sustainable agricultural projects within Namibia.

The inaugural Green and Sustainability Bond issuance enabled Bank Windhoek to create a platform for clients to recognise and seize opportunities in greening the Namibian economy. Locally, solar and wind power are officially part of the country's energy mix, and exciting developments are expected in this sector for the remainder of 2022 and beyond. Considerably lower production

costs, growing concern around climate change, evolving global energy policies, and increased pressure from investors on companies to adopt environmental and social governance (ESG) policies and facilities like the Sustainable Bond issuance are pushing renewables into the mainstream.

Bank Windhoek is seen as the market leader in sustainable finance, with a proven track record of Renewable Energy portfolio of projects which consists of various residential to commercial-sized solar photovoltaic (PV) installations throughout Namibia. Additionally, the Sustainable Bond issuance and subsequent funding facility are only one of the Bank's responses to addressing the issue of climate change in Namibia. The Sustainable Bond funding facility was a milestone for Bank Windhoek and Capricorn Group, setting the tone locally and in the region, underpinning our commitment to sustainable finance and renewable energy growth in Namibia.

* More information on the Bank's Sustainability Bond is available on <https://www.bankwindhoek.com.na/Pages/SustainabilityBond.aspx>. Or customers can visit any nearest Bank Windhoek branch or send a detailed email to sustainabilityloan@bankwindhoek.com.na.



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Lights Systems Namibia offers practical training to Eenhana VTC and Young Africa trainees

Lights Systems Namibia (LSN) recently awarded industrial attachment opportunities to 17, Level 2 students from Eenhana Vocational Training Center and Young Africa Namibia who are required to complete a number of set hours working in their field of study in order to graduate.

LSN Ongwediva Branch Manager Philemon Nambuwa said the company understands the need for students to get practical on the job training to help develop their skills which will contribute significantly to their employability. The branch thus made an undertaking to provide the students with industrial training on some of the company's sites in the northern part of the country.

Nambuwa said the industrial attachment speaks to the needs and demands in the market because for too long students have been held back due to lack of practical learning or work integrated learning. During this period the students are placed in the field where they are

exposed to real-life work situations.

"There are multiple and complex causes behind youth unemployment. Amongst them is a lack of industrial attachment opportunities. By offering internship or industrial training, students can improve their employability. Industrial attachment also boosts the performance of the students in the academic studies.

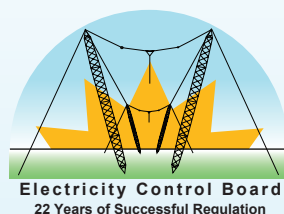
It cultivates their leadership ability to execute and perform a given task," said Nambuwa.

LSN believes that it's important for companies in the local renewable energy industry to partner up with training institutions by providing their students with on the job experience.

The company has an existing program to assist students from various institutions with industrial attachment and currently has an apprenticeship agreement with Namibia Training Authority (NTA) to attach students to the company.



SKILLS DEVELOPMENT ... Students from Eenhana Vocational Training Center and Young Africa Namibia who underwent industrial attachment at Lights Systems Namibia (LSN).



MEDIA STATEMENT

NAMPOWER BULK ELECTRICITY TARIFF APPROVAL FOR THE FINANCIAL PERIOD 2022/2023

1. TARIFF APPLICATION

In accordance with the existing legal provisions, NamPower submitted a tariff application for an effective bulk tariff (inclusive of generation and transmission) increase of 12.78%, which would have resulted in an increase from an average N\$1.6982 per kilowatt-hour (kWh) to N\$1.9153 per kilowatt-hour for the financial period 2022/2023.

2. TARIFF REVIEW PROCESS

Annual electricity tariff reviews are conducted to ensure that utilities charge appropriate tariffs to collect enough revenue to provide reliable and efficient services at affordable cost-effective rates.

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, were considered. The ECB is cognisant that prices of goods and services have been increasing, and this is negatively affecting consumers.

As part of the review process, the ECB consulted different stakeholders through a stakeholder meeting, at which NamPower presented its application to the stakeholders. The Stakeholders were requested to present their views, facts, and evidence on the tariff application. Submitted comments were considered in the decision making process leading to the tariff approval.

3. TARIFF REVIEW OUTCOME

After due consideration and in accordance with the tariff review process, the Electricity Control Board resolved to increase the average bulk tariff with 7.30% from the current approved tariff of N\$1.6982 per kilowatt-hour to N\$1.8222 per kilowatt-hour for the period 2022/2023.

The approved increase follows a tariff decrease in 2019/2020, no tariff increase for 2020/2021 and an increase of 2.29% in 2021/2022. The approved tariff is applicable to NamPower bulk customers (i.e. Regional Electricity Distributors (REDs), Local Authorities, Regional Councils and Mines).

As part of the discussions with the Minister of Mines and Energy, the Ministry availed N\$100 million through the National Energy Fund (NEF), to mitigate the impact of the increase on consumers. The allocated funds will be used for energy related variable costs of NamPower in consultation with the ECB.

The above-mentioned approved tariff will be applicable to NamPower bulk customers. The distribution utilities such as the Regional Electricity Distributors (REDs), Local Authorities and Regional Councils will individually apply to the ECB for a review of their distribution tariffs, which will be applicable to end consumers when approved.

The approved tariff adjustment is effective from 01 July 2022.

4. CUSTOMER FUNDED POWER PLANT

Over the years, the tariff included an amount for Long Run Marginal Cost (LRMC) purposes. The Long Run Marginal Cost is intended to ensure a smooth tariff path for the future, especially when NamPower is experiencing cash flow challenges due to expensive power supply options or building new power plants.

The Long Run Marginal Cost funds may be used to cushion customers from unexpected tariff hikes or in situations when the economy is depressed and/or to build new power plants that will ensure an affordable projected tariff path. For the past two years, a total amount of N\$85 million was availed to mitigate the impact of the tariff increase on consumers and the economy.

In 2020, an amount of N\$500 million was allocated from the Long Run Marginal Cost Fund to partially fund the construction of NamPower renewable energy plants. An amount of N\$342 million was allocated to the 20MW Solar PV plant at Omburu. The remaining amount of N\$158 million will be used for part funding of the 40MW NamPower owned Wind plant to be procured soon.

The ECB is pleased to inform the public that the construction of the NamPower Omburu solar PV plant is completed and the plant was commissioned end of March 2022. Since

the plant was customer funded, and only minimal operational costs are recoverable through the approved tariff, the NamPower Omburu Solar PV plant is currently the cheapest source of electricity in our energy mix, thus contributing to a reduction in the tariff increase.

In accordance with the tariff methodology, NamPower will not be allowed a return and depreciation on the assets created using the N\$500 million LRMC contribution, and this will result in a total net saving to the customers of approximately N\$1 billion over a period of 30 years and will assist in improving the affordability of electricity to end users.

Due to the current depressed economic situation, no provision was made for the recovery of the LRMC as part of the tariff for the 2022/2023 period. The ECB will in future consider reinstating the recovery of the LRMC.

5. CONCLUSION

The Electricity Control Board is cognisant of the fact that the economy is affected by impacts of the COVID-19 pandemic but is equally dependent on reliable and affordable electricity supply. It is the responsibility of the Regulator to ensure a sustainable electricity industry at affordable tariffs.

Future tariffs are expected to increase in line with inflation and to cater for new generation as per the National Integrated Resource Plan. However, we must realise that external factors such as the weather, foreign exchange fluctuations, and other unforeseen circumstances may affect the projected price path and must be taken into consideration when reviewing future tariff applications.


Rachel N. Boois
Acting Chief Executive Officer


ELECTRICITY
CONTROL BOARD
05 MAY 2022
P O Box 2923
WINDHOEK-NAMIBIA



SETTING THE TONE ... A Ministerial panel composed of Tom Alweendo, Gabriel Obiang Lima (Equatorial Guinea), Peter Chibwe Kapala (Zambia) and Omar Farouk Ebrahim (Secretary-General, APPO) set the tone for Africa's own investment in its energy mix transition.

Leveraging Africa's Energy Mix Calls for Enhanced Collaboration

The fourth edition of the Namibia International Energy Conference (NIEC) was held in Windhoek in April, under the theme, *"The energy mix: positioning for industrialisation, investment and growth"*.

The African market possesses huge potential for the world's energy market. Reaching these energy investments cannot be left to chance. The right policies need to be in place, countries have to have strong, functional systems and institutions in place to ensure resources flow towards investment, dynamic permitting systems, agile decision making and have clear and transparent criteria for investors.

Creating an attractive and mutually beneficial investment landscape does not only lie with the African countries seeking investment to be legislatively attractive and financially lucrative investment destinations.

Mines and Energy Minister Tom Alweendo said investors need to think about what they need to do to ensure that they establish real partnerships. This includes investors contemplating what they take out against what they leave behind and adhere to the country's environmental legislation to ensure the preservation of resources for future generations.

A ministerial panel facilitated by NJ Ayuk, Chairperson of the African Energy Chamber, and comprising ministers Alweendo, Gabriel Obiang Lima (Minister of Mines & Hydrocarbons, Equatorial Guinea), Peter Chibwe Kapala (Minister of Energy, Zambia) and Omar Farouk Ebrahim (Secretary-General, African Petroleum Producers Organisation), set the tone for Africa's own investment in its energy mix transition.

The panel agreed that no country can walk the journey

to energy independence alone. While investment may be required from external investors, Africa should take accountability for aspects of its own empowerment, beyond the external financial investments required.

Ibrahim proposed that intra-continental knowledge sharing become a key component of ensuring regional energy development. He also proposed the establishment of an African energy investment bank to finance efforts to realise energy potential in African countries.

A just energy transition was necessary for Africa's industrialisation and economic development to occur. There was overwhelming agreement that Africa must shape its own narrative and define for itself what a just energy transition must look like.

Being in a varying states of economic, industrial maturity and carbon footprint emission levels, the developed world "needs to decarbonise, and Africa needs to industrialise," said Ayuk.

The calls for Africa to exploit its existing resources to create and leverage an energy mix to transform its industrial and economic development comes at a time when there is a decline in investments in oil and gas in sub-Saharan Africa. According to global investment trends shared by Osam Iyahem of the Africa Finance Corporation, investment and finance institutions have increasingly reallocated financing previously directed to energy capital towards renewable energy, where investment in fossil fuels reached its lowest levels yet in over 10 years in 2020.

While capital is available, access to investment is also hamstrung by how countries navigate their regulatory environments, the feasibility and the preparation and bankability of projects. A good regulatory environment, where the needs of both the country and investors are met, where the state facilitates energy share; prompt exploration; addresses environmental concerns and local content through training and local employment as well as activity controls, can make the difference between profit and plunder.



WORLD LEADER ... The world's biggest green hydrogen powered truck unveiled by Anglo American Plc at a platinum mine in northeast South Africa.

Anglo American Unveils World's Largest Green Hydrogen Truck

Anglo American Plc has unveiled the world's biggest green hydrogen-powered truck at a platinum mine in northeast South Africa where it aims to replace a fleet of 40 diesel-fueled vehicles that each use about a million liters of the fossil fuel a year.

The 2 MW hydrogen-battery hybrid truck is designed to operate in everyday mining conditions.

The NuGen project at the Mogalakwena mine, owned by Anglo American subsidiary Anglo American Platinum Ltd., will use power from a 140 megawatt solar plant to supply hydrogen electrolyzers to split water and provide the trucks, which can carry up 315 tons of ore each, with hydrogen fuel. Engie SA has helped Anglo establish the system.

The project, expected to be fully implemented by 2026, is a first step in making eight of the company's mines carbon neutral by 2030, according to Julian Soles, head of Technology Development, Mining & Sustainability at Anglo American. The company, which mines metals around the world ranging from iron ore and platinum to copper, has set a target of getting all of its operations to that status by 2040.

"People told us three years ago this is not going to happen, this is not a good idea. They are now beginning to take real notice," Soles said at a presentation in the South African city of Polokwane.

"The vision for us is to see this rolled out across our business and the mining industry. It's Anglo's choice whether to commercialize this."

The mining company, which dominated South Africa's

economy for eight decades before moving its headquarters to London in 1999, initially approached a number of equipment manufacturers with the idea of building a hydrogen-powered truck fleet. When it was turned down it took the decision to convert its diesel fleet to use the clean fuel itself.

About "80% of our diesel consumption at our large mines is through the use of large trucks," Soles said. "What we actually had to build was a full ecosystem. A solar photovoltaic site, an electrolyser and a refueling system to create a zero emission haulage system."

Anglo American's haul truck fleet currently generates 10% to 15% of its so-called Scope 1 emissions, those generated directly from its own activities, Duncan Wanblad, Anglo American's Chief Executive Officer said.

The use of hydrogen doesn't emit climate-warming gases while diesel does. And with water being split to create the fuel using energy from the sun, there are no carbon emissions from its manufacturing process either.

South Africa's Minister of Mineral Resources Gwede Mantashe said the country is endowed with the world's largest high-grade resources that play a critical role in the global hydrogen and battery storage sector. Therefore, support for the development of the local green hydrogen sector was important for the government.

"NuGen is a tangible demonstration of our FutureSmart Mining program changing the future of our industry, said Wanblad.

Namibia Moves to Build Green Hydrogen Skills Base

Namibia is stepping up its drive to make the country a Green Hydrogen hub by creating local skills needed to develop the fuel for the future.

The government, in partnership with the German government, recently launched the Namibian Youth for Green Hydrogen (Y4GH) Scholarship Programme to create local skills for the anticipated jobs within the emerging Green Hydrogen economy. The five-year scholarship is fully funded by the German Ministry of Education and Research (BMBF).

Given its world class renewable energy potential in the form of abundant wind and solar resources, Namibia is in an optimal location to be a globally competitive producer of Green Hydrogen and its derivatives. In the Harambee Prosperity Plan II, the government has articulated its plans to explore the feasibility of incubating a carbon neutral synthetic fuels industry to diversify and recover the country's economy. In order to ensure its competitive advantage, the government has established key partnerships globally, of which one such partnership is with the German government.

In term of the Communique of Intent signed by Namibia and Germany on 25 August 2021, in Berlin, Germany availed grant funding towards enabling a Green Hydrogen industry in Namibia.

One of the key priority areas of the agreement was capacity Building, where €5 million (about N\$85 million) was allocated towards scholarships for Namibian youth.

Currently, the number of annual graduates in Namibia is disproportionate to the available employment opportunities in the country. There are many local graduates, both post and

undergraduates, who are qualified but remain unemployed.

As an optimal location for the production of Green Hydrogen and its derivatives, it is vital that the government, taking a leadership role in building capacities for this new industry, ensures that people are trained and ready to contribute to the emerging Green Hydrogen economy workforce.

As a first move towards building a Green Hydrogen ready workforce, the scholarship has been designed to mainly target two groups.

The first group are unemployed Namibian graduates and the second are those interested in pursuing vocational education and Training in the field of Green Hydrogen.

The scholarship will cover full tuition, travel and accommodation, provided the chosen course is relevant to the field of the Green Hydrogen. A motivation from the applicant will be considered in determining the relevance of the field of study to the Green Hydrogen industry. The scholarship fund will provide a maximum of €25,000 (about N\$422 000) annually to each recipient, depending on the institution of choice.

Female and disadvantaged candidates are encouraged to apply for bursaries, especially in the Engineering study fields.

For further information, contact:

SASSCAL Regional Secretariat

28 Robert Mugabe Avenue

P.O. Box 87292 Windhoek

Tel: (+264) 61 223997

Email: JCol.Y4H2@sasscal.org

Germany supports development of Renewable Energy Infrastructure in Namibia

Namibia and Germany have signed two government agreements on financial cooperation and technical cooperation which will cover financing for eight new programmes in Namibia to the value of 40.5 million Euro (approximately N\$650 million).

Development areas to benefit from the German funding are;

- Green People's Energy project
- Technical and Vocational Education and Training
- Promotion of Small and Medium-Sized Enterprises
- Establishment of a Sustainable Financing Mechanism for Namibia's Protected Areas
- Establishment of an Urban Development Fund
- Sustainable Urban Mobility Windhoek, and
- Sustainable Use of Namibia's Minerals.

Namibian-German development cooperation is a central component of the relations between Namibia and Germany. Since Namibia's independence, Germany has supported the Namibian Government in its development efforts.



DEVELOPMENT COOPERATION ... National Planning Commission Director General Obeth Kandjoze and Germany Ambassador to Namibia Herbert Beck after signing the two government agreements on financial cooperation and technical cooperation.

To date, German development cooperation with Namibia (both governmental and non-governmental programmes) amounts to more than 1.2 billion Euros. In per-capita terms, Namibia is thus the largest recipient of German development cooperation in Africa.

At the last round of bilateral development negotiations,

To page 22

Germany supports development of Renewable Energy Infrastructure in Namibia

From page 21

Namibia and Germany agreed on new grants and loans in the amount of 242 million Euro (approximate N\$4 billion). The areas of cooperation consist of;

- Renewable Energy Infrastructure
- Private Sector and Financial System Development
- Vocational Education and Training
- Natural Resource Management
- Water Infrastructure and,
- Inclusive and Sustainable Urban Development

The 2030 Agenda for Sustainable Development, which has been domesticated in the national developmental frameworks such as NDP5 and the Harambee Prosperity Plan II, forms part of the backbone for structuring the Namibian-German development cooperation.

The priority areas are fully in line with contributing to the HPPII. The emphasis is on a quality-driven transformation process in order to achieve sustainable and inclusive development and to reach the common goal of overcoming poverty and inequality by supporting job creation, particularly targeting the youth.

Namibian-German development cooperation is based on agreements between the two countries, which are concluded during negotiations between the two governments every two years. In the scope of these negotiations, strategies for the future cooperation are developed together.

The next round of negotiations on development cooperation will be held in 2023. The Namibia - German cooperation has yielded positive results and has contributed to Namibia's quest of achieving its national aspirations such as employment creation and poverty reduction.

Some of the many ongoing programmes under the cooperation include the support to addressing the economic and social challenges Namibia is facing due to the Covid-19 pandemic, support to management of public enterprises, promotion of vocational education, support to transport sector, support packages for conservation, biodiversity and the tourism sector as well as the support programs for businesses, SMEs and informal settlements.



Green Energy Key

American undersecretary for economic growth, energy and the environment Jose W. Fernandez during the Investing in Africa Mining Indaba.

The United States government's initiatives to help address Africa's power and growth gaps are increasingly hinging on boosting the continent's ability to produce green energy and facilitate foreign investment, the recent Investing in Africa Mining Indaba conference in Cape Town heard.

The US undersecretary for economic growth, energy and the environment, Jose W. Fernandez, said any energy policy that warms our planet simply could not continue.

"We also know that moving to a clean energy transition will not happen overnight. In some cases where carbon-neutral options are unavailable, engagement on natural gas projects, abated to the fullest degree possible, may be necessary," he said.

The US has singled out a more efficient electricity supply as one of its top foreign policy priorities for Africa. This goes in parallel with the continent navigating a just and inclusive clean energy transition, leading to economic growth and prosperity; building robust, sustainable, and transparent supply chains for critical minerals in support of the clean energy transition; and improving the financial and regulatory environment in the sector and promoting transparent and accountable natural resource management.

For this reason, the Obama-administration-era Power Africa programme, administered by USAID, has supported the development of more than 5,700 megawatts of new generation capacity since 2013. According to USAID data, it's targeting adding more than 30,000 megawatts of output by 2030, sufficient to power 60 million homes and businesses.

Among the projects Fernandez highlighted is the Mega Solar initiative in Namibia and Botswana, which will facilitate the



MEGA SOLAR

to Bridging Africa Growth Gap

procurement of as many as 5,000 MW of renewable energy.

Southern Africa's most extensive solar power-generation programme will power millions of homes and generate thousands of jobs while preventing an estimated 3,5 million tonnes of greenhouse gas emissions annually. 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.

When fully realised, Mega Solar could be one of the largest solar parks in the world and 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.

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.

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.

Power Africa has been ramping up activity. In April, it launched a new public and private partnership seeking to electrify an additional 10,000 health care facilities in sub-Saharan Africa within the next decade.

Fernandez also highlighted an initiative called Prosper Africa, which was announced by the Trump administration seeking to connect American and African businesses. The US government uses this initiative to push Africa toward cleaner energy.

He, however, cautioned that government initiatives would probably be insufficient to address Africa's energy needs, and that the private sector would have to lead the push for progress going forward.

OPINION

Renewables Intermittency Not a Showstopper



Mark Z. Jacobson

Mark Z. Jacobson

The intermittency of renewable energy has raised concerns over potential supply shortages, but technological solutions exist to keep the electricity grid stable.

Despite worries about blackouts, research suggests that an energy grid relying on wind and solar technologies can remain stable.

The greatest question facing the world as we transition away from traditional fuels to 100% clean, renewable energy is whether we can keep the electricity grid stable every minute of every day given the variability of wind and sunlight. My answer is yes! We can avoid blackouts by taking advantage of multiple tools that are already available.

Clean, renewable energy is energy that is naturally replenishable, results in no emissions of health- or climate-affecting air pollutants, and does not pose other major environmental threats. The main clean, renewable electricity-generating technologies are onshore and offshore wind turbines, solar photovoltaics, concentrated solar power plants, geothermal plants, and hydropower plants. Collectively, these are called wind-water-solar (WWS) technologies. Electricity-generating technologies that aren't clean and renewable involve fossil fuels, biomass, and nuclear energy. Fossil fuel and biomass power plants produce air pollution - a problem not solved by adding carbon capture technology to these plants. The main concerns with nuclear power are radioactive waste, the pollution from mining and refining uranium, the meltdown risk of reactors (1.5% of all energy-supplying reactors ever built have experienced some level of accidental core melting), and the possibility of nuclear weapons proliferation.

But these polluting energies are often deemed necessary for maintaining reliable power production. And yet, the ability to avoid blackouts with 100% WWS is already a reality in several countries.

In 2021, 10 countries – Namibia, Iceland, Norway, Costa Rica, Albania, Paraguay, Bhutan, Nepal, Ethiopia and the Democratic Republic of the Congo - produced 97.5 to 100% of all their electricity from WWS resources. Some of these countries even produced excess electricity that they could sell to their neighbors: Paraguay exported electricity to Argentina and Brazil, and both Bhutan and Nepal exported energy to India.

In all the 100% WWS countries listed above, the dominant renewable is hydropower. Of course, not all countries have a large hydropower capacity, so reaching 100% WWS electricity for many countries will require 90% or more of electricity generation from wind and solar. A common worry is that consumers will face blackouts when the wind doesn't blow, or the Sun doesn't shine.

However, we can make a WWS-supplied grid stable by combining a number of methods. First, wind and solar energies are complementary in that the Sun often shines when the wind isn't blowing, and vice versa.

Thus, combining wind and solar smooths the power supply compared with using wind or solar alone. Similarly, combining wind or solar energy from distant facilities can average over productivity lulls in particular locations.

The location of wind farms can also have an influence on grid stability. Building wind turbines in coastal waters helps in meeting spikes in electricity demand because offshore wind is usually less variable than onshore wind and often peaks when electricity demand peaks. Building more wind turbines in cold climates also increases reliability because, on average, when temperatures drop and heating demand goes up, winds become stronger.



As renewable energy sources continue to increase globally, they have brought with them a new set of challenges for the energy industry. The most common concern associated with the increase in renewable energy technologies for energy production is intermittent availability.

Another grid-stabilising strategy is electricity storage, which can often fill gaps in wind and solar supply. Existing electricity storage technologies include batteries, pumped hydropower storage, flywheels, compressed air storage, and so-called gravity storage. In many places, solar plus batteries is already cheaper than coal or nuclear and is replacing both. In fact, battery costs have declined 97% since 1991. The more storage costs decline, the more storage will be coupled with WWS generation to keep the grid stable. Other ways to avoid blackouts focus on demand. Efficiency improvements - such as switching to LEDs and insulating buildings - can reduce electricity consumption. Utilities can also give financial incentives to encourage consumers to shift the time of their energy use to periods when sunlight or wind is available.

I've studied the use of these techniques in 143 countries and found that the grid can stay stable everywhere in the world with 100% WWS. There are many incentives to make the transition. For one, a fully WWS-based energy supply would reduce energy needs,

primarily because it would imply a transition from gas-fueled vehicles to more efficient electric vehicles. Other motivations include less pollution-related diseases and reduced environmental impacts.

In summary, there are many tools available to keep the grid stable with 100% WWS.

Doing so will reduce costs, increase employment, reduce pollution-related deaths, mitigate climate damage, and provide energy security. In order to avoid the worst climate damage, we need to stop emissions immediately, but - barring that - we need at least an 80% transition by 2030 and a 100% transition, ideally, by 2035–2040 but no later than by 2050. We have at least 95% of the technologies we need for a transition today. As such, we have no excuse not to proceed as rapidly as possible.

Mark Z. Jacobson is a professor of civil and environmental engineering at Stanford University. His work forms the scientific basis of the Green New Deal and worldwide laws to go to 100% clean, renewable energy.

Green Hydrogen Provides Boost For Africa's Mining Sector

Mark Venables

Currently, global production of low-carbon hydrogen is minimal, its cost is not yet competitive, and its use in promising sectors such as industry and transport remain limited, but there are encouraging signs that it is on the cusp of significant cost declines and widespread global growth, according to the IEA's Global Hydrogen Review 2021.

Hydrogen is light, storable, and energy-dense, and its use as a fuel produces no direct emissions of pollutants or greenhouse gases. The main obstacle to the extensive use of low-carbon hydrogen is the cost of producing it. This requires either substantial amounts of electricity to produce it from water, or the use of carbon capture technologies if the hydrogen is produced from fossil fuels. Almost all hydrogen produced today comes from fossil fuels without carbon capture, resulting in close to 900 million tonnes of CO₂ emissions, equivalent to the combined CO₂ emissions of the United Kingdom and Indonesia.

Challenges for green hydrogen

However, green hydrogen, produced from renewable energy through electrolysis is seen as the most effective way to combat climate change. However, there are several challenges that need to be overcome for this technology to grow at the rate required. Access to low-cost and abundant renewable energy is one of the prime requisites, and in that scenario, Africa has a leading advantage.

According to the 'Scaling up Renewable Energy Deployment in Africa' report from the International Renewable Energy Agency (IRENA), Africa could meet nearly a quarter of its energy needs from Indigenous and clean renewable energy by 2030. Modern renewables amounting to 310 GW could provide half the continent's total electricity generation capacity. This corresponds to a sevenfold increase from the capacity currently available, which amounted to 42 GW. A transformation of this scale in Africa's energy sector would require average annual investment of US\$70 billion to 2030, resulting in CO₂ emissions reductions of up to 310 megatons per annum.



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Low electricity cost is not enough by itself for competitive green hydrogen production, however, reductions in the cost of electrolysis facilities are also needed. This is the second largest cost component of green hydrogen production. According to IRENA's 'Green Hydrogen Cost Reduction' report, strategies to reduce investment costs for electrolysis plants from 40 per cent in the short term to 80 per cent in the long term are feasible. These strategies range from the fundamental design of the electrolyser stack to broader system-wide elements.

Mining's role

According to the IEA, increased electrolyser production will affect demand for minerals, particularly nickel and platinum group metals (depending on the technology type). The catalysts in polymer electrolyte membrane (PEM) electrolysers require 300 kg of platinum and 700 kg of iridium per GW. Therefore, if PEMs supplied all electrolyser production in 2030, demand for iridium would skyrocket to 63 kt, nine times current global production.

Experts believe, however, that demand for both iridium and platinum can be reduced by a factor of ten in the coming decade. Recycling PEM electrolyser cells can further reduce primary demand for these metals and should be a core element of cell design.



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 - wind
- Energy efficiency
 - distribution technology
 - energy efficient enterprise
- Buildings
 - heat dissipating buildings & housing projects
 - energy efficient buildings & housing projects
- Transport & logistics
 - fuel efficiency
 - freight consolidation
 - mass public transportation
- Agriculture
 - agri-enterprise water distribution
 - agri-enterprise water efficiency
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