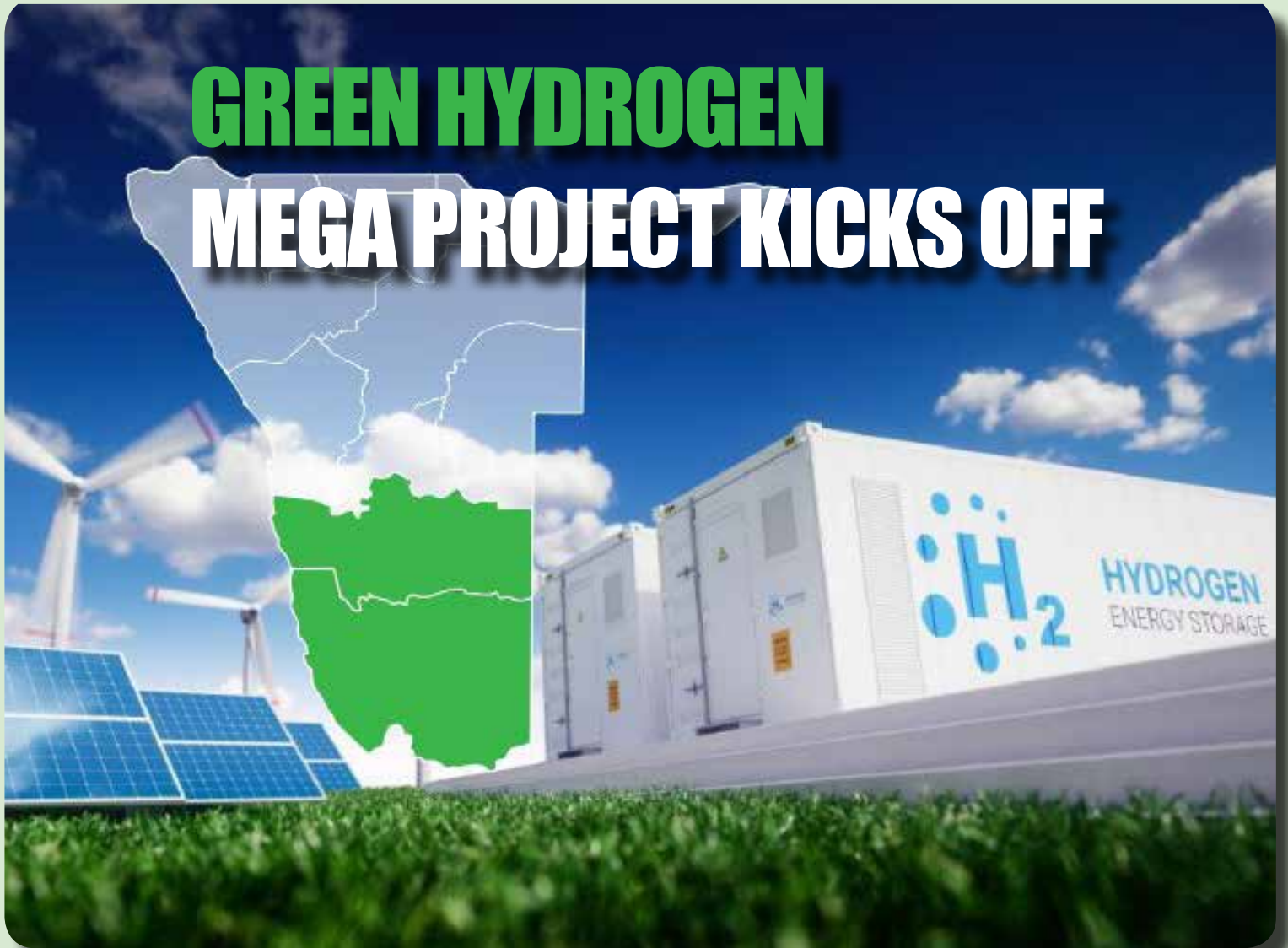


Etango

Namibia's Leading Renewable Energy Technologies
Magazine

NOVEMBER-DECEMBER 2021

GREEN HYDROGEN MEGA PROJECT KICKS OFF



European countries
scramble to partner Namibia



Green People's Energy to
electrify 15 rural schools



Reviewing latest trends in
the Electric Vehicle markets



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Green Hydrogen could transform economy

Noting efforts to speed up the low-carbon energy transition, we are happy to observe that Namibia's green hydrogen economy has moved from being a concept to reality.

The problems associated with fossil fuel and the world's growing dependency on it has necessitated the search for an alternative. Green hydrogen is seen as that perfect alternative.

In the past few months, Namibia has been busy aggressively promoting its green hydrogen potential to the world. This has culminated in the country entering into green hydrogen partnerships with a number of European countries, notably Germany, Belgium and the Netherlands. Neighbouring South Africa, which has its own green hydrogen ambitions, has indicated willingness to team up with Namibia on this gigantic game-changing project.

Namibia also recently appointed Hyphen Hydrogen Energy (Pty) Ltd, a project development company established with the objective of developing, constructing and operating green hydrogen production facilities

in the country to supply international and regional markets.

These are indeed bold steps earmarked to attract more than US\$12 billion in foreign direct investment, as part of the broader Southern Corridor Development Initiative (SCDI).

Green hydrogen can play a significant role, not only to address energy access and security, but also in terms of industrialising Namibia and the entire SADC region. It can be stored, it can function as a carrier, it can be used directly for heating and cooling, it can decarbonise production processes and will likely be made available at the same production cost as fossil or blue hydrogen within the next three years.

We commend the government for taking this bold move to venture into uncharted territory. We believe that the green hydrogen project, if executed according to plan, will enhance Namibia's energy security, decarbonise the country, assist neighbours to reduce their emissions, and help build a more resilient economy.

In this year-end edition of **Etango** we focus primary on the subject of green hydrogen. We zoom in on plans by NamPower to

increase local generation capacity through the development of wind farms and solar plants. We also review progress of the Green People's Energy project to electrify remote rural schools, and bring you an update on latest local and international developments in the Electric Vehicle market.

The **Etango** Team is also delighted to inform you that the development of a dedicated website for the magazine has started and should be completed by early 2022. Look out for your favourite magazine on www.etangonam.com

As the curtain comes down on an eventful 2021, the **Etango** Team would like to take this opportunity to thank all our readers and advertisers for appreciating the value of our publication and supporting us throughout the year. We would also like to wish you a Merry Christmas and prosperous 2022. Stay safe and see you soon.

Happy Reading!

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TAKING THE LEAD ... Namibia's Green Hydrogen economy is being unlocked as part of the broader Southern Corridor Development Initiative (SCDI), which is earmarked to attract more than US\$12 billion in foreign direct investment.

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PIONEER ... InnoSun's 5MW Ombepo wind farm, just outside Lüderitz, is currently the only grid-connected wind farm in Namibia

NamPower seeks developer for 40MW wind farm

Power utility NamPower has begun the search for a suitable developer for its 40MW wind plant in the south of the country.

The latest wind farm, estimated to cost in the region of N\$1, 2 billion, will be the second grid-connected wind plant in Namibia. Currently, InnoSun's 5MW Ombepo wind farm, just outside Lüderitz, is the only grid-connected wind farm in Namibia. The onshore wind plant, which features three giant turbines, started feeding power into the grid on 20 August, 2017.

For the 40MW plant, which will have between 10 and 16 turbines, NamPower is looking for a contractor for the engineering, procurement and construction. The utility will retain ownership and operation of the power plant.

The tender for the project closes on 20 January, 2022, with construction earmarked for the last quarter of 2022.

The site for the gigantic wind farm will be located some 35 km north-west of Rosh Pinah, in the //Karas region. The project forms part of a group of projects initiated by the utility in 2018. These include the 20MW Khan Solar PV IPP Project, the Omburu 20MW Solar PV, a 40MW Biomass Power Project and the 50MW Anixas II Project.

NamPower says in order to fulfil the country's developmental goals, sufficient supply of electricity is needed, as the country currently imports a significant share of its electricity needs from its SADC neighbours.

"NamPower crafted its new corporate strategy and business plan for the period 2019 to 2023. In line with the new strategic intent by the company, and the determination by the Ministry of Mines and Energy to develop generation projects with a total capacity of 220 MW," NamPower Managing Director Simson Haulofu said.

"The 40 MW Rosh Pinah Wind Project will contribute towards achieving the national energy policy target of 80% by 2023, the renewable energy policy target of 70% by 2030, and will assist in the overall reduction in the cost of energy to the customer," said Haulofu.

Environment Minister Pohamba Shifeta said his ministry had allocated land within the fragile Tsau//Khaeb (Sperrgebiet) National Park where the generation of wind and solar energy can be conducted, in line with the country's submission to the United Nations on climate change.

"We have more sources of wind energy, especially close to the ocean and offshore. It is within our programme to have more wind power generated, with a combination of solar. It can supply power to the country for up to 70% by 2030. We can achieve that goal. It is also a cheaper source of energy to generate," Minister Shifeta said.

Namibia pushes **Green Hydrogen** agenda at COP26

...Project could attract US\$12 billion investment

Namibia plans to add 2 000 MW (2 gigawatts) of renewable electricity generation capacity to produce green hydrogen for conversion into green ammonia, at an estimated capital cost of US\$4.4 billion (approximately N\$66 billion) by 2026.

This ambitious target was revealed during the just-ended 26th UN Climate Change Conference of the Parties (COP26) held in Glasgow, Scotland, when Namibia announced that it had appointed a consortium called HYPHEN as preferred bidder to implement the country's gigantic green hydrogen project.

The green hydrogen economy is being unlocked as part of the broader Southern Corridor Development Initiative (SCDI), which is earmarked to attract more than US\$12 billion in foreign direct investment.

During the COP26, the Namibian delegation led by President Hage Geingob unpacked how the country intends to form strategic partnerships with other governments and the private sector to develop the green hydrogen economy and the impact this will have on the creation of opportunities for youth as Namibia and the region recovers from the devastating effects of drought and the Covid-19 pandemic.

Namibia is availing over 5 700 square kilometers in the //Kharas region for the development of green hydrogen and ammonia asset projects. The initiative is expected to triple the country's installed renewable energy generation capacity.

"We are taking these bold steps to enhance our energy security, decarbonise our country, assist our regional and global peers to reduce their emissions, and build a more resilient economy," President Geingob said.

HYPHEN Hydrogen Energy will develop



BOLD STEPS ... President Hage Geingob addressing COP26 in Glasgow, Scotland

the country's first large-scale vertically integrated green hydrogen project in the Tsau //Khaeb national park (formerly Sperrgebiet). The project is earmarked to ultimately produce 300,000 tons of green hydrogen per year for regional and global markets, either as pure green hydrogen or in derivative form (green ammonia).

The Tsau //Khaeb national park is among the top five locations in the world for low-cost hydrogen production, benefiting from a combination of co-located onshore wind and solar resources near the sea and land export routes to market.

Namibia Green Hydrogen Commissioner and Economic Advisor to President Geingob, James Mnyupe, said with the



MEGA PROJECT ... The Southern Corridor Development Initiative (SCDI) is earmarked to attract over US\$12 billion in foreign direct investment

green hydrogen project Namibia was unlocking one of the most significant socioeconomic projects for the country.

Namibia launched a worldwide Request for Proposals (RFP) for the development of the green hydrogen industry on 3 August, 2021. Mnyupe said the country received nine world class commercial proposals from six developers, including HYPHEN.

He said the evaluation process was transparent and thorough and the bid evaluation team was 100% Namibian.

“We asked them (bidders) about their work in relation to their conservation of the sensitive Sperrgebiet (Tsau //Khaeb) area and their social impact ambitions, what taxes they would pay to the state, their contribution to the soon to be launched Namibia Sovereign Wealth Fund. We also challenged them to indicate how much they would be willing to pay in concession fees for occupying the 5700km square national park,” Mnyupe said.

Final recommendations were forwarded to the Green Hydrogen Council chaired by National Planning Commission Director General Obeth Kandjoze for a final decision.

Namibia’s green hydrogen project is steeped in the ambition to decarbonize the country, its neighbours and beyond.

“The renewable energy plants will store excess energy in the form of hydrogen which will then be deployed at night stabilising the grid and eliminating intermittency. We will capture the energy generated by renewable energy plants and pump it into a machine called the electrolyser. The electrolyser puts the electricity into a water solution and separates the green hydrogen from the oxygen,” Mnyupe explained.

Since the generation of green hydrogen will need large

quantities of water, Mnyupe said the project will see the establishment of desalination plants in the south of the country to provide the needed resource.

He said the oxygen that will be left after the separation of the green hydrogen will be deployed in industrial manufacturing processes and in hospitals. The green hydrogen will be combined with nitrogen to make ammonia which will be used in the manufacture of products such as green fertiliser to be used in the green schemes earmarked for the southern regions.

Excess green hydrogen will be exported to neighbouring countries like Angola which uses hydrogen in synthetic fuel purification and South Africa (Sasol) for its fuel making processes. Pipelines will be built to export the green hydrogen while far away markets, like Europe, will be served by vessels.

HYPHEN will conduct a feasibility study in the next 12-18 months at a cost of N\$250 million.

“The first phase, which is expected to enter production in 2026, will see the creation of 2 gigawatts of renewable electricity generation capacity to produce green hydrogen for conversion into green ammonia, at an estimated capital cost of US\$4.4 billion. Further expansion phases in the late 2020s will expand combined renewable generation capacity to 5 gigawatts and 3 gigawatts of electrolyser capacity, increasing the combined total investment to US\$9.4 billion”, said HYPHEN CEO Marco Raffinetti.

Once fully developed, the project will provide a major boost to Namibia in terms of foreign direct investment and job creation. The project will see nearly 15,000 direct jobs created during the four-year construction of both phases, with a further 3,000 jobs created permanently during the operational phase. More than 90% of all these jobs created are expected to be filled by Namibians.



NEW FRONTIERS ... Port of Rotterdam Director, René van der Plas (seated left), and Namport CEO Andrew Kanime signing the MoU which will see the two ports cooperating in the handling of green hydrogen from Namibia.

Namport gears to become Green Hydrogen export hub

The Namibia Ports Authority (Namport) has moved to strategically position itself as a major player in the export of green hydrogen to European markets.

Namport and the Port of Rotterdam, in the Netherlands, recently entered into an agreement to collaborate on various areas, including facilitating the forecasted growth and flow of the green hydrogen supply chain from Namibia to Europe.

Namport Chief Executive Officer, Andrew Kanime, commended government's rapid movement towards making the green hydrogen economy a reality and emphasised the port authority's need to "strike while the iron is hot and promptly position Namibia as a global player in this developing multimillion-dollar industry."

As part of its positioning and readiness for the emerging industry, Namport has set aside 350 hectares of land at the Walvis Bay North Port for allocation to green hydrogen-related industries.

Namport says while the solar and wind farms will

be stationed inland or offshore, the electrolyser which produces the green hydrogen, as well as the factory that converts the hydrogen into ammonia, would need to be located inside a port close to a berth from where the ammonia or the liquid organic hydrogen carriers (LOHC) will be exported in order to ensure cost-effectiveness and competitive pricing.

Additionally, the planned new deep-water port of Lüderitz at Angra Point would complement the North Port in cementing the country's drive to become a hub for the production and export of green hydrogen to Europe.

The agreement with the Port of Rotterdam gives the Namibian hydrogen initiative a great opportunity to form part of the energy supply mix to serve North-western Europe.

The Netherlands is at an advanced stage of planning for the deployment of green hydrogen energy and the Port of Rotterdam anticipates a demand of 20 million tonnes of hydrogen per annum to pass through its port's industrial complex by the year 2050.



WIN-WIN ... Mines and Energy Minister Tom Alweendo with his Belgian counterpart Tinne Van der Straeten after signing the MoU set to assist both countries meet their climate goals.

Countries scramble to partner Namibia on Green Hydrogen

Following a recent partnership agreement with Germany, which will see the European economic giant pump in 40 million euros (nearly N\$700 million) into Namibia's efforts to develop green hydrogen, more countries have come on board seeking to be part of the country's move to develop the energy carrier of the future.

Belgium and France are the latest European countries seeking to partner Namibia on green hydrogen.

During the recently-held COP26 in Glasgow, Scotland, Mines and Energy Minister Tom Alweendo signed a Memorandum of Understanding (MoU) with his Belgian counterpart Tinne Van der Straeten, for cooperation in green hydrogen.

This followed Cabinet's full approval of the MoU between the two countries on cooperation in the field of green energy.

The MoU was designed as a win-win for both countries as Namibia needs technological know-how to develop green hydrogen, while Belgium needs large amounts of the resource for clean industry.

Also during COP26, President Hage Geingob engaged French investors who have interests in

Namibia's green hydrogen development agenda. The French National Task Force on Green Hydrogen is interested in collaborating with Namibia, while private investors from that country want to explore ways of laying their hands on the cake of the future.

Belgian companies want to work with Namibian companies to develop a hydrogen filling station, industrial hydrogen applications and a medium-sized solar power plant, which will produce 1 million tons of green hydrogen annually by 2026. Half of that hydrogen production is intended for export to Belgium.

Alweendo said Namibia sees "green hydrogen as a unique opportunity to harness our natural resources to make the necessary foreign direct investment and create new sustainable engines of economic growth for current and future generations".

Belgian energy minister Van der Straeten said: "Importing green hydrogen is the cheapest way for our country and necessary for the energy switch to 100% renewable energy and climate neutrality by 2050. It can be made where there is a lot of wind or sun, such as in Namibia. It is a more democratic fuel because it is less dependent on countries that are geopolitically sensitive".

South Africa moots Green Hydrogen partnership with Namibia

South Africa and Namibia could see collaboration in the development of green hydrogen as the two nations start putting together infrastructure to facilitate projects around the energy carrier of the future.

SA President Cyril Ramaphosa said his country was ready to be a major exporter of green hydrogen and has described the special economic zone (SEZ) proposed for development at Boegoebaai, in the Northern Cape, as a major step towards realising the country's potential to be a global leader in green hydrogen and derivative products, such as power fuels.

Ramaphosa said green energy had the potential to drive industrialisation and establish a whole new industrial reality. He singled out South Africa's potential to use its relatively low-cost renewable electricity to produce green hydrogen and derivatives, which are seen as increasingly critical to decarbonising so-called hard-to-abate sectors and products, such as marine and long-distance land transportation fuels, steel, chemicals, fertilisers and sustainable aviation fuels.

Green hydrogen is produced by using renewable electricity to split water into hydrogen and oxygen, using an electrolyser.

"We stand ready to be a major exporter in this market, to use hydrogen to rapidly decarbonise our existing industries, and attract industrial investment from across the globe seeking to meet new standards of green power in the production process," the Ramaphosa said.

This pointed to a future where tens of gigawatts of renewable energy feed electrolyzers at



massive scale to produce hydrogen, as well as the power fuels of the future.

The Boegoebaai SEZ will host such mass-scale production, but will also source green hydrogen volumes from emerging players such as Mahlako, which is setting up the Prieska Power Reserve, and projects like it across the Northern Cape solar belt.

Ramaphosa noted that neighbouring Namibia was developing its own green hydrogen hub on the other side of the border to Boegoebaai, saying that the project could "bring the two countries together".

It was wonderful when I sat down with President Hage Geingob and we started talking about this type of project and how this project, in Boegoebaai, is going to bring the two countries together – to get both countries to approach this type of project on a joint basis, so that we work together all developing a project that is going to have enormous industrial benefits for both South Africa and Namibia," said Ramaphosa.

Namibia's hydrogen-focused Southern Corridor Development Initiative is ahead of the one proposed for Boegoebaai, having already



INDUSTRY BOOST ... South Africa wants to collaborate with Namibia in developing the Green Hydrogen

selected a preferred bidder, Hyphen, to lead the green hydrogen project.

The Boegoebaai proposal received a boost ahead of Ramaphosa's address with energy and chemicals group Sasol announcing that it had signed an agreement with the Northern Cape Development Agency to lead the feasibility study to explore the potential of the site as an export hub for green hydrogen and ammonia.

The study is expected to take 24 months, with the outcomes to determine the next step of development.

Sasol stressed that it was pursuing a number of green hydrogen, ammonia and power-to-X opportunities as part of its new strategy, through which it aims to play a leading role in South Africa's nascent green hydrogen economy.

Ramaphosa also made reference to the Hydrogen Valley project, being spearheaded by Anglo American Platinum,

Bambili Energy and Engie Energy Services.

The proposed hydrogen valley will start near Mokopane, in Limpopo, where platinum group metals are mined, extend through the industrial and commercial corridor to Johannesburg and end in Durban.

A feasibility study report has identified nine hydrogen-related projects across the mobility, industrial and construction sectors that could be used as a springboard for the establishment of a South African hydrogen valley.

Ramaphosa said the priority being given by South Africa to green energy and green hydrogen was enabling the country to move "ahead of the curve" and become more proactive in tackling threats and opportunities posed by climate change.

"The world landscape has changed – if you don't embrace green energy and if you don't respond to the climate change process that's under way in the world, you are left behind. And, through this a new world is opening to all of us," Ramaphosa said.



FIELD WORK ...The Assessment Team with officials from the Oshikoto Regional Council and teachers at Oomanya Combined School.

Green People's Energy shortlists 20 rural schools for solar electrification

THE Green People's Energy for Africa (GPE) initiative is a German government-funded initiative aiming to enable, expand, and secure sustainable energy supply in rural Africa. The project has activities in nine African countries. In Namibia, the GPE project cooperates with the Ministry of Mines and Energy (MME) and the Ministry of Education, Arts and Culture (MEAC) to electrify rural schools with solar PV energy systems.

According to national statistics, 82% of schools in Namibia have access to electricity services. The 18% of schools without electricity are predominantly located in hard-to-reach, rural communities in northern Namibia. These remote schools are unlikely to be connected in the medium term by the electrification efforts through grid extension led by MME and implemented by NamPower and the regional electricity distributors (REDs). In such locations, decentralised solar PV systems are the preferred option. They are cheaper and quicker to install and can create local jobs in the engineering, installation, and maintenance sector.

One of the aims of the GPE team and its partner ministries (MME and MEAC) is to electrify 15 schools with solar PV systems. For this reason, the GPE project team has conducted assessments at 20 rural schools in six regions, which have been shortlisted for electrification. The selection criterion included, among others, the distance of the school from the national electricity grid, the number of learners, whether the school is located in an area

inhabited by marginalised communities, and the grades at the school. Larger schools were prioritised because a single PV installation can achieve a higher impact. Higher grades, for which the use of computers and digital literacy skills becomes increasingly important, were prioritised as such skills are impossible to teach without access to electricity.

The schools assessed are in the Kunene, Omusati, Oshikoto, Ohangwena, Kavango West and Zambezi regions, all situated in northern Namibia. The assessment started at Werda Primary School on the edge of the Etosha Nation Park, in the Kunene Region, and ended at Masambo Primary School in the Bwabwata National Park, in the Zambezi Region.

For its assessment, the GPE team built upon the experiences of a previous project by the Hanns Seidel Foundation (HSF). HSF implemented a pilot school electrification project called the Promoting Renewable Energies in Namibia (PREN) Project. Through the PREN Project, six schools were electrified. Lessons learned from the PREN Project include that the "one size fits all" approach is ineffective and that energy-efficient lights should accompany solar system installations. Furthermore, lithium-ion battery storage has been found to be the best storage solution for remote rural schools as they are maintenance-free. From the PREN Project intervention, it was observed that the different stakeholders should collaborate to address the challenges faced by rural schools to enhance their teaching and learning experience.

The technical assessment looked at the school infrastructure, electrical installations, the school's current energy requirements, and other key factors. The socio-economic survey aimed to understand the people at and around the school, the economic activities they are engaged in and how they can contribute to the long-term sustainability of the donated solar system. We found that parents support the schools in various ways according to their ability. Parents and community members in some regions actively contribute cash, other materials and in-kind to improve the teaching and learning experience at schools. Some parents have donated mini solar systems, while others have pulled resources together to build classrooms.

The assessment, which forms the basis against which the Social Infrastructure Component of the GPE Namibia Project will be implemented, provided an understanding of the shortlisted schools and the surrounding communities. The schools shortlisted for electrification were found to have varying needs. Hence, tailored solutions need to be designed to address their energy requirements. The most common electricity needs were identified to be for lights, computers, printers and copiers, telecommunications, as well as fridges and freezers to store food donated by the government's school feeding programs. Some schools also have hostel facilities that require electricity during the night, while other schools have a borehole and water pump.

It was observed that the maintenance of solar systems is a challenge. The team came across several non-functioning systems. The reasons for that were manifold ranging from insufficient funds to purchase spare parts to fires from faulty electrical installations to lack of capable technicians in proximity to the school.

Even though each school has its unique challenges, the team observed that apart from having no electricity, the visited schools had a plethora of equally pressing needs and challenges, such as shortage of classrooms, lack of potable water, shortage of teacher housing and lack of sanitation facilities. The team observed that the lack of electricity at schools, combined with poor access roads in remote areas, resulted in teachers having to travel long distances (at a cost) for simple services, such as making photocopies for the learners. Moreover, some schools are located in areas with poor mobile phone network coverage. This is a major impediment to e-learning implementation during the Covid-19 pandemic. In the Zambezi Region, annual flooding is the main challenge. When the rainy season starts in November, the water only subsides during July the following year, making it difficult to access the schools in the flood plain by road.

These multiple challenges faced by rural schools can be addressed if different stakeholders combine resources to ensure the attainment of the United



HUMBLE BEGININGS ... Mini-solar system donated by community members at Oomanya Combined School in Oshikoto Region.



HARSH CONDITIONS ... Two temporary classrooms constructed by community members to help address the shortage of classrooms at Omatope Primary School in Oshikoto Region.

Nations Sustainable Goal No 4, which aims to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” Furthermore, there is a need for stakeholders in rural school electrification to come together to find solutions on how best to maintain the solar systems installed at the schools.

Overall, the GPE team concluded that off-grid solar PV systems are integral on the road to 100% school electrification in Namibia. Especially in rural areas, solar electricity can immediately increase the security in schools and hostels at night, ensure access to information, and increase the quality of education by providing teachers with an option to create modern teaching materials on-site.

GPE will now select the 15 beneficiary schools based on the assessments in collaboration with key stakeholders. The school electrification will be split into two lots. Lot 1 will be electrified during the first half of 2022, while Lot 2 will be electrified in the second half. Different technology options will be explored during the implementation, such as containerised solar systems, the solar tree initiative, etc.

A review of latest trends in the Electric Vehicle market

Conrad Roedern

NAMIBIA currently has about 40 electric vehicles (EVs) in circulation, most of which are Nissan Leafs supplied by *EVs Namibia cc*.

My own *BMW i3 REX* has now close to 60 000 km on the clock and with the help of the range-extender (REX) I managed to do long trips to more remote places in Namibia, like my recent visit to the Outapi PV Plant in the north, just before the up-grade of the park commenced.

I still wonder why no company is selling one of their many popular plug-in hybrids in southern Africa, like the VW Golf GTE Mk8 plug-in hybrid vehicles. These would allow car owners to do shorter trips fully electric, while having no problems mastering the long distances using petrol.

After bringing two DC fast-charging stations to Namibia (which will be operational soon), *EVs Namibia cc* has written further history by giving a **second life** to EV battery cells from a Nissan Leaf which was imported with a weak traction battery. Fourteen cells in series perfectly match with any 48V DC/AC inverter-system.

The picture below shows the battery packs during installation at the premises of Karsten Denk, a member of *EVs Namibia cc*. However, the Namibian automotive sector is still silent about if and when their brands will start selling EVs in the country. My guess is that Volkswagen will first come to South Africa and then to Namibia with their popular models ID3 and ID4.

SOUTH AFRICA: South Africa has stepped up its charging infrastructure, allowing EV owners, for example, to drive without much charging delay from Johannesburg to Cape Town.

The “Jaguar Powerway” (in partnership with GridCars) was the result of a R30-million investment and has made a significant difference in bolstering new charging

infrastructure in major hubs and along major holiday routes across South Africa.

Furthermore, brands such as BMW and Nissan have also collaborated to increase access to public charging infrastructure across the country. Thus, SA is ready to accommodate the newest EV arrivals, like the *Jaguar I-Pace*, *Porsche Taycan*, *Mini Cooper SE* and the existing fleet of *Nissan Leafs* and *BMW i3s*.

Recently, BMW South Africa announced that orders can be placed for their brand new BMW iX3, coming with an 80 kWh battery with prices starting at R1.65 million. *Volvo’s XC40 Recharge* is now also ready for ordering, starting at R1.2 million.

EUROPE: Europe’s most interesting figure is that **10.3%** of all new passenger car registrations were pure electric BEV on a 12-month annualised basis. Some of this significant increase can be attributed to incentives on EV purchases.

Volkswagen is the company

with the strongest focus now on seriously electrifying their cars. They even invited Elon Musk of Tesla to address 200 VW group managers. Volkswagen Holding includes the AUDI, SEAT, SKODA and PORSCHE brands. About 18% of Porsche’s sales are now EVs, with the *TAYCAN* being a common sight on the Autobahn as well as at the 800V ultra-fast chargers.

AMERICA: There has been excitement about the news of new US bakkies which are hitting the market. *The 2022 Ford F-150 Lightning* pick-up truck will start as low as US\$40 000 (about N\$600 000) and reservation has started already. *RIVIAN with the R1T* double-cab bakkie follows hard on the heels of Ford. TESLA is still by far the US EV bestseller of sedans, but for their futuristic *CYBERTRUCK* pick-up the sale has been delayed into 2022.

CHINA: China has the widest spread of EVs and commercial vehicles. In the city of Shenzhen with 12 million people, public



Second-Life Leaf batteries



The BMW i3 REX electric vehicle after its trip from Windhoek to Outapi, in northern Namibia.

transport utilises more than 16 000 full-size EV-buses and 22 000 EV-taxis.

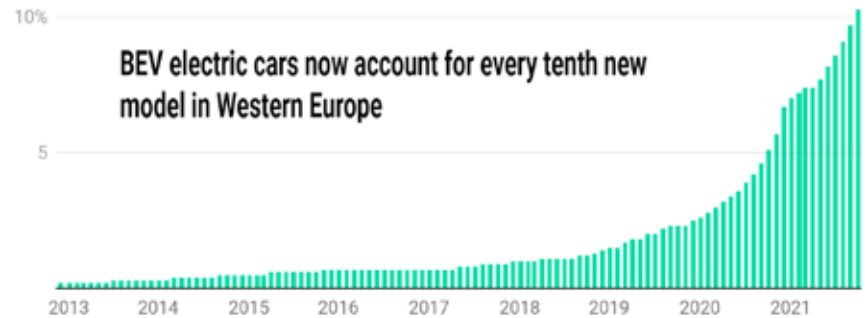
A bus typically has a 250 kWh battery, while about 1,800 chargers blanket the city. The cost of charging a bus is around US\$45 (about N\$675).

China, after supplying its home market, has now started exporting EVs. One of the first competitive arrivals in Europe is from **NIO**. **POLESTAR**, which is based in Sweden but belongs to **Geely Holding of China**, has been selling a Chinese-made battery-powered model in Europe and the United States since 2020. And many of the Teslas on European roads were imported from the company's factory in Shanghai.

CONCLUSION: The world is shifting more and more towards driving electric vehicles. In many

EVs now account for every tenth new model in Western Europe

12-month rolling annualised BEV share of the W-European new passenger car market Full-year 2012 - Oct 2021



Western Europe 18 Markets: EU Member States prior to the 2004 enlargement, plus EFTA markets Norway, Switzerland, Iceland, plus UK

Source: Schmidt Automotive Research • Created with Datawrapper

respects, we could benefit from approaching electric mobility more pro-actively by using our sun for fuelling our cars.

We cannot maintain a clean and green image if we allow others to venture into the backwardness of oily exploitation. In Europe the DIESELGATE scandal helped to more swiftly change to EVs. Pending damage to our pristine nature should be our wakeup call. The onus is on us to change.





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Why Green Hydrogen?

Tomas Persson

A major rollout of green hydrogen technologies could offset up to one third of global greenhouse gas emissions produced by fossil fuels and industry by 2050. Namibia has been identified as one of the best locations for green hydrogen production due to high solar radiation and very good wind conditions.

The problems associated with fossil fuel and the world's growing dependency on it has necessitated the search for an alternative. Among all, hydrogen seems to be a perfect alternative. It is seen as a potential energy carrier for the future. High specific enthalpy of combustion makes it a potential candidate as a fuel for transportation. The need to mitigate the effects of greenhouse gases can be fulfilled with water electrolysis hydrogen production using renewable energies such as wind, solar.

What is Green Hydrogen?

Green hydrogen is the term used for hydrogen produced through a process called electrolysis

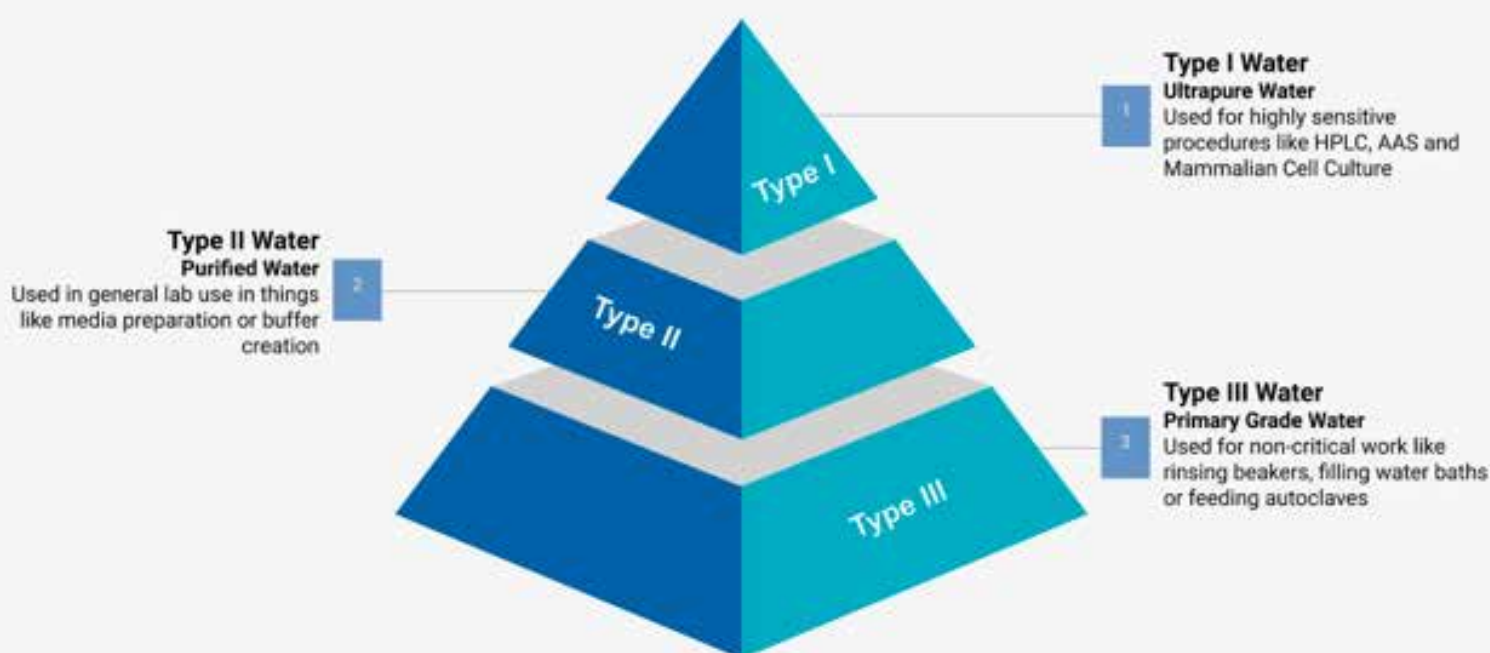
from 100 percent renewable sources, such as hydropower, solar PV and wind, which entail zero carbon emissions directly, and very few on a cradle to grave approach. It is important to note that green hydrogen production is very energy intensive. One implication of this is that the cost of renewable energy must be very low to ensure a competitive price for green hydrogen.

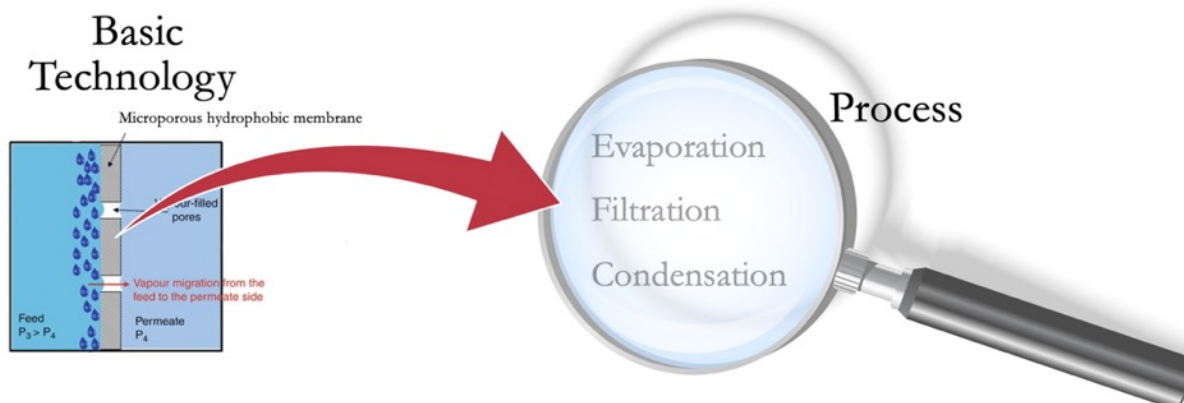
A second implication is that very large amounts of renewable energy capacity must be installed to drive the electrolysis.

How to Make Green Hydrogen

Green hydrogen is normally created from a process called electrolysis, in which electricity is channelled through a device called an electrolyser, which splits oxygen from hydrogen in water, creating pure oxygen and pure hydrogen with zero carbon emissions. In this process, approximately 50 kilowatt-hours of electricity and 9 litres of ultra clean water is required to produce 1 kilogram of hydrogen using an electrolyser of around 78 percent efficiency.

Water quality is important aspect of Proton Electrolysis Membrane (PEM) electrolyser. The





manufacturer defines minimum water resistivity to be $1\text{M}\Omega\text{-cm}$. High resistivity is associated with water purity. Contaminants such as electrolytes and ions found in water make it conducting for electricity. Removing these contaminants increases the resistivity of the water. To remove these contaminants and ions the water is filtered and then further treated by way of Reverse Osmosis and deionized (DI) using mixed bed resins and carbon filters. Often still additional steps. However, the purity of the water is seldom of the Type 1 quality a PEM electrolyser require not to damage the sensitive Platinum Group Metals – such as Iridium, Platinum and Ruthenium.

Each water type has its own level of purity. All types of water from Type 1 water (ultra-pure) to Type IV water (semi-pure) is defined by the American Society for Testing and Materials (ASTM) International standard to have certain characteristics of resistivity (measured in $\Omega\text{-cm}$) or conductivity (measured in $\mu\text{S/cm}$), which reveals inorganic impurities. Type 1 water is furthermore defined by its TOC (total organic compounds) purity, measured in parts per billion.

Ultrapure, Type 1, water is defined by the ASTM as having a resistivity of $>18\text{M}\Omega\text{-cm}$, a conductivity of $<0.056\text{ }\mu\text{S/cm}$ and $<50\text{ ppb}$ of Total Organic Carbons (TOC).

Reverse Osmosis (RO) vs Membrane Distillation (MD)

As described in the above, the mainstream water treatment for electrolysis is RO, and several other steps, which typically can only achieve Type 2 water.

Another issue with RO is water waste. From a pure, stoichiometric perspective, 1 kg of hydrogen requires 9 kg of water as input.

Due to inefficiencies in the RO process, taking into account the process of water demineralisation, with typical water consumption, the ratio can range between 18 kg and 24 kg of water per kilo of hydrogen.

RO takes out the contaminants mixed with water whilst MD takes out all the water leaving dry matter.

MD could be described as follows:

1. Evaporation with the help of using low-grade waste heat $50\text{-}90^\circ\text{C}$
2. Filtration, which only lets through H_2O molecules
3. Condensation using the incoming water in a heat exchanger.

In a country with very limited water resources you do not want to waste water. Say that you place the plant on the coast the major contaminant is salt. If you use RO you will typically return a brine which will increase the salinity depending on the currents in the area. Salinity of the water in the Arabian Gulf has doubled in the last 40 years.

In the MD case you will instead produce sea salt as a by-product.

- *Tomas Persson is a Swedish national residing in Pretoria, South Africa. He supplies Green Hydrogen/Ammonia developers with cost-saving technologies worldwide. This article was written exclusively for ETANGO.*

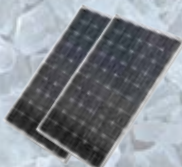
REFRIGERATION FOR ALL.



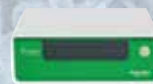
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Sun: Solar panel converts sunlight to electricity



Solar panel: Maximum Recommended Solar Panel Wattage 1000 Wp, 24V with OCV of 36V to 45V



SCHNEIDER HOMAYA, HYBRID INVERTER 1500 VA: Converts DC Solar Energy to AC



Solar Hybrid Freezer: Keeps food frozen for extended hours



DB BOX: Distributes AC power to appliances



Battery: Solar battery stores electricity safely

UNAM to set up Green Hydrogen Institute

With Namibia's green hydrogen economy fast gathering momentum, the University of Namibia (UNAM) has moved to establish the Namibia Green Hydrogen Research Institute (NGHRI).

The NGHRI will serve as a national research and capacity building hub and will conduct local research and development and provide innovative solutions. It will also help to up-skill and re-skill Namibians and develop local businesses across the value chain of green hydrogen.

Professor Anicia Peters, UNAM Pro-Vice-Chancellor for Research, Innovation and Development, said the institute will look at various aspects of green hydrogen, from desalination, wind and solar energy electrolysis, fuel cell technologies, community and societal impact, and emerging technologies. The UNAM centre will run some pilot projects on some of these aspects.

Currently the NGHRI has a total of 67 academic staff members working in 14 research project areas of green hydrogen and ammonia (GH&A). The University of Science and Technology (NUST) has also been formally invited to join the initiative.

UNAM has concluded a number of agreements with international universities, local and international private sector partners in the area of green hydrogen. During the just-ended COP26 summit, UNAM engaged the University of Edinburgh in Scotland on possible partnerships in the area of green hydrogen.

"Such strategic partnerships also include financing, equipment, training and expertise exchange, which includes serving as a member of the Council of Scientific and Industrial Research (CSIR), Energy Research and Development and Innovation Advisory panel in South Africa astute research and regulatory bodies," Peters explained.

The institute consists of six centers namely, the Centre for Clean Hydrogen Production, Hydrogen Storage, New Materials and Delivery, Hydrogen Fuel Cell Technology for Mobility Application, Hydrogen Capacity Building



Professor Anicia Peters

Competence and Standards, and Hydrogen Digital and Emerging Technologies.

The NGHRI will serve as a distributed science and technology park that will become a training centre for short skills training and new curricula, as well as a small-medium enterprise incubator for green hydrogen entrepreneurs.

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3

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Development Bank offers climate adaptation finance

The Development Bank of Namibia (DBN) has unveiled a facility to finance climate change adaptation, bolstering its long track record of finance for beneficial environmental and social initiatives.

DBN Chief Executive Officer Martin Inkumbi said the new facility provides an affordable and tailored financing solution for climate and environmentally friendly projects. The bank has previously financed low-carbon renewable energy generation, water reclamation for industrial use in Walvis Bay, water storage in Neckartal Dam and reclamation initiatives.

Inkumbi said that finance for climate adaptation is important, and there is a range of affordable financing instruments for such business projects.

DBN, he said, has already pioneered financing models for renewable energy, and is now setting its sights on, energy and water use efficiency as well as mitigating the effects of rising temperatures.

On water infrastructure, Inkumbi said that the DBN has been financed large scale water infrastructure such as Neckartal Dam and Aqua Utilities which semi-purifies water for industrial use at Walvis Bay. However, he said that in the face of prolonged droughts, there is an opportunity for enterprises to invest in water efficiency. Investing in technology and processes that are energy and water efficient reduces the amount of energy and water consumption per output for a business, which lowers production and or operational costs and improve profitability.

Although water efficiency will not alleviate drought, it can lead to improvements in enterprises bottom lines, in addition to preserving the environment.

Inkumbi urged enterprises to examine their energy and water usage and costs, and develop innovative methods to reduce their water usage and associated costs.

The DBN CEO added that the bank has experience in water reticulation for local authorities and PPPs but said there was still scope for further development in terms of water recycling, reclamation and storage in abattoirs.

Speaking about rising temperatures, Inkumbi noted that there is a twofold cost. The first cost is the cost of cooling facilities, and the second cost is the cost of mitigating health issues caused by rising heat. The cost of cooling facilities adds to the cost of an enterprise. It also places a burden on power generation. By constructing plants and facilities with heat dissipation in mind, these circumstances can be mitigated.



DBN CEO Martin Inkumbi

He extended the benefits of energy efficient housing developments, explaining that incorporating heat dissipation would reduce the cost of running a household as well as improve the health of its residents. This, he said would dovetail well with the DBN's finance for affordable housing projects.

Asked about how the facility would benefit enterprises and initiatives, Inkumbi said that there is an understandable reticence to finance projects with unfamiliar financing outcomes. This was the case when DBN pioneered finance for privately owned renewable energy. The bank however de-risks innovative projects with extensive due diligence on innovation and absorbs, manages and learns from its risks. In this way, the DBN hopes to pioneer finance for climate change adaptation that will make Namibia more sustainable.

Inkumbi called on engineers, architects, consultants and project managers to lean more towards energy and water efficient designs, and for businesses to approach the DBN for finance.

"Although you may have reservations about pitching new technologies and techniques, the DBN will give you consideration for finance if you can demonstrate their feasibility," he said.

Bank Windhoek facilitates investment in sustainability projects

In recent years, Bank Windhoek has established itself as a Namibian Green financing market leader. Pioneering initiatives have enabled the bank to gain insights to offer one-of-a-kind opportunities for clients and businesses to invest in sustainability projects.

The special Sustainability Loan offering aims to encourage Bank Windhoek clients to invest in sustainable solutions to support Namibia's transition towards a low-carbon and climate-resilient economy.

In addition to the environmental benefits, the attractive repayment terms of the offering will also ensure that there are no extra expenses for the applicant, and loan repayments are aligned as far as possible with the savings in operational expenses from reduced electricity or water consumption.

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Projects that can benefit from the Loan:

- Renewable energy (i.e., Rooftop Solar PV Systems)
- Sustainable Agriculture related investments
- Wastewater treatment equipment
- Sustainable tourism
- And any other project with clear environmental and/or socio-economic benefits

Sustainability loan features and benefits:

- No official deposit requirements
- Flexible terms up to 72 months
- Three-month payment holiday



- Loan value up to N\$500,000
- Interest rates will be determined on a case-by-case basis depending on the applicants' repayment ability and overall risk profile.
- In the case of Solar PV installations, these systems can be used as collateral under certain article finance conditions
- Green assets besides Solar PV systems will require collateral
- The loan can be made available partly on an unsecured basis to specific clients
- Standard credit criteria terms and conditions apply

The Sustainability Loan Offering will undoubtedly avail much needed financing opportunities to many Namibians wishing to make their own small contribution to the fight against climate change and other environmental concerns such as water scarcity.

As a commercial bank, Bank Windhoek prides itself in leading the change in directing financing of sustainability projects. Furthermore, the bank is responding to the international call for financial institutions to direct funds towards fighting climate change, and pave the way for sustainable economies.

NUST to set up Biomass Research Centre

The Namibia University of Science and Technology (NUST) will soon be home to an analytical service centre for the biomass industry.

Head of the Natural and Applied Sciences Department, in the Faculty of Health and Applied Sciences, Professor Habauka Kwaambwa, said the centre will support a wide range of industries and applications and help Namibia to become more independent in testing woody biomass samples in future.

Kwaambwa said there was need for such a facility as value addition of biomass required specific analyses to be carried out first.

"There are few analytical services available for the biomass industry within Namibia. The local industry relies on laboratories outside the country which is costly and time-consuming," he said.

A three-year initiative, called the Biomass Utilisation by Sustainable Harvest (BUSH) Project, a collaboration between the Namibian and German governments implemented by the Ministry of Agriculture, Water and Forestry (MAWF) and the German Society for International Cooperation (GIZ), was launched in 2018 and ended in August 2021.

The project focussed on technology development, applied research and capacity development in Bush Control and Biomass Utilisation through multi-disciplinary skills.

Bush encroachment is one of the key agricultural challenges in Namibia, and the initiative sought to find solutions to these national problems.

Funding was provided to NUST by the project to develop and test innovative, climate-friendly technologies for bush control, as well as to develop capacities for biomass utilisation in Namibia.



Professor Habauka Kwaambwa

The project further sought to contribute towards positioning Namibia as a research centre of excellence in biomass utilisation in order to support the development of the regional biomass-economy sector.

The BUSH Centre of Biomass Research and Development at NUST will be the first of its kind in Africa.

It is estimated that more than half of the country's prime rangelands is currently affected by the phenomenon. In figures, this affects 30 to 45 million hectares, which is more than 30% of Namibia's total land area. The most significant consequences of bush encroachment are reduced carrying capacity of affected rangeland, groundwater recharge and biodiversity loss.

"While bush encroachment constitutes an immense challenge for Namibia, it also opens significant commercial, as well as unprecedented socio-economic and ecological opportunities," said Professor Hannes van der Walt, Dean Faculty of Engineering.

"At NUST we are proud to be taking the lead in shaping these amazing new opportunities for Namibia."

The sub-project on 'Biochar Production, Processing and

Testing', led by Dr Ibo Zimmermann, Associate Professor in the Faculty of Natural Resources & Spatial Sciences, looked at how biochar can create income for farmers and entrepreneurs as well as benefits for crop and rangelands.

The project developed prototypes for stoves that heat water or allow cooking while producing biochar. Ultimately, this can make biochar production accessible to many Namibians. Biochar can also be instrumental in rangeland restoration and horticulture production: adding biochar to soils can create housing for beneficial microbes, return minerals and increase water holding capacity. However, the research showed that these benefits will only be realised in the long-term.

A 'Techno-Economic Assessment of Bio-Gasification Technologies' based on encroacher bush was conducted. This technology is highly relevant for electrification of off-grid communities and businesses such as hospitality operations. With gasification, Namibia can develop a powerful renewable energy source.

Environmental Commissioner in the Ministry of Environment, Forestry and Tourism, Timoteus Mufeti, said supporting science institutions is one of the keys to build a strong bush biomass sector

"As the bush biomass sector grows, we have to ensure that equally scientific research capacities are built that can support that growth. The NUST BUSH project showed that the development of innovative technology in the field of bush biomass utilisation can come from within Namibia for a wide range of value chains that can be taken up now by the private sector to make an economically feasible case," Mufeti said.



SUSTAINABLE UTILISATION ... *Harvesting encroacher bush*



MENACE OR RESOURCE? ... *Loading harvested encroacher bush onto a truck*



Germany pledges US\$116M for Africa renewable energy projects

Germany has pledged to contribute US \$116M to the African Development Bank's (AfDB) Sustainable Energy Fund for Africa (SEFA) to support private investments in renewable energy in Africa.

The funds will be injected into the Fund for Sustainable Energy in Africa (SEFA) which aims to unlock private sector investments that contribute to universal access to affordable, reliable, sustainable and modern energy services in Africa.

SEFA provides financing to renewable energy and energy efficiency providers. Recently, the fund participated in the mobilization of Africa Renewable Energy Fund II (AREF II). The fund, managed by Berkeley Energy, finances clean energy, including wind, solar, run-of-river hydro and storage projects in Africa.

Daniel Schroth, AfDB's acting director for renewable energy and energy efficiency said the German funding will support technical assistance and investments in power generation, transmission and distribution to increase the penetration of renewable energy in African grids.

"Germany's new contribution is a major boost to reach SEFA's capitalisation target of US\$500 million. It is also a recognition of SEFA's catalytic role in accelerating Africa's energy transition and supporting clean energy access solutions," said Schroth.

Berlin's funding is part of the G20 Compact for Africa

(CwA). The initiative launched under the German G20 presidency in 2017 aims to promote private investment in Africa, particularly in infrastructure. The CwA also aims to increase the attractiveness of private investment by substantially improving macroeconomic, trade and financial frameworks.

The CwA works in partnership with Benin, Burkina Faso, Ivory Coast, Egypt, Ethiopia, Ghana, Guinea, Morocco, Rwanda, Senegal, Togo and Tunisia.

South Africa gets R12.5 billion to dump coal

Meanwhile, Germany will contribute R12,5 billion towards helping South Africa phase out the use of coal.

The aim of the funding is to mobilise a total of R130 billion together with the World Bank and private investors to promote developing renewable energy sources in the country, said Maria Flachsbarth, Germany's parliamentary state secretary for development aid.

The money would also be used to expand and modernise electricity networks and help miners deal with the economic consequences of the phase-out there. President Cyril Ramaphosa said South Africa is committed to a move to green energy but will be heavily dependent on funding from other countries to achieve its goals.

"South Africa's ambitions cannot be achieved without the more developed economies meeting promises they have made to provide financial assistance to developing economies in their energy transition," he said.

Augustineum turns to solar for water heating

The iconic Augustineum Secondary School, located in Khomasdal, Windhoek, recently underwent refurbishment which saw the old electric boilers being replaced with solar water heaters.

Twenty eight (28) thermosiphon systems were installed to supply hot water to the school facilities.

The move by one of the country's oldest schools is a response to a Cabinet directive for public institutions to replace electric water heaters with solar water heating, an investment that will lessen the school's carbon footprint and save thousands of dollars in electricity costs.

Eight solar water heaters are providing hot water for 22 showers at the girls' hostel, while 16 solar water heaters are supplying up to 52 showers at the boys' hostel. Three solar water heaters supply hot water to the matrons' flats, while the one installed above the dining hall provides the much-needed hot water to the kitchen.

Each solar water heater has a collector area of 3.7 m² and a hot water storage capacity of 300 litres, resulting in a total collector area of 103.6 m² and a total hot water storage capacity of is 8 400 litres.

The solar systems were the first installation by the young entrepreneurs of Artiflex Engineering, who attended SOLTRAIN training and are exploring opportunities in the renewable energy market in the country.



GONE GREEN ...Some members of the implementation team, with the solar thermal systems in the background.

SOLTRAIN funds Postgraduate Students

Students from all SOLTRAIN partner countries (Namibia, Botswana, Lesotho, Mozambique, South Africa and Zimbabwe) are invited to apply for funding of up to 2 500 Euro (about N\$45 000) to support their research projects in solar thermal energy.

Postgraduate studies that deal with topics of solar thermal energy are eligible for funding. For Namibia, submissions in the documentation and analysis of mass housing programmes with mandatory installation of solar water heaters will be given priority.

To apply for financial support the following conditions must be met:

1. Must be a registered postgraduate student
2. Study area must be solar thermal energy
3. Must be a citizen of Botswana, Lesotho, Mozambique, Namibia, South Africa or Zimbabwe.

Applications close on 16 February 2022.

SA selects 1.6GW wind in latest renewables tender

South Africa has awarded preferred bidder status to 12 onshore wind farms with a combined capacity of just over 1.6GW in its latest renewable energy tender.

The Department of Mineral Resources and Energy also selected 13 solar PV projects, with a combined capacity of just under 1GW, in the fifth tender round of its renewable energy independent power producer procurement programme (REIPPPP).

Wind projects were selected with a weighted average bid price of R513.1/MWh (US\$33.43/MWh) – slightly higher than the R473.94/MWh weighted average for the wind and solar projects combined.

Irish developer Mainstream Renewable Power secured preferred bidder status for 824MW of wind and 450MW of solar projects in the tender.

In total, the 25 projects will represent more than R50 billion in investment and create nearly 14,000 jobs, according to the South African Wind Energy Association (SAWEA).

In 2019 South Africa announced plans to award contracts for 14.4GW of new wind power capacity due to be installed between 2022 and 2030 – more than any other energy source in this period.

A coal organisation's legal challenge had threatened projects successful in the country's fourth tender round, but South Africa's Supreme Court of Appeal ultimately rejected the case in March 2020, paving the way for developers to sign final contracts for their projects.

South African energy minister Gwede Mantashe said that he expects to open the country's sixth renewables tender in January 2022.

SAWEA chairperson Mercia Grimbeek said: "Consecutive bidding rounds will enable local manufacturing facilities to be re-established and the potential expansion of already operating manufacturers, which is crucial in creating long term sustainable jobs."

Renewable energy jobs hit 12 million globally

Renewable energy employment worldwide reached 12 million last year, up from 11.5 million in 2019, according to 'Renewable Energy and Jobs: Annual Review 2021'.

The report was released by the International Renewable Energy Agency (IRENA) in collaboration with the International Labour Organization (ILO) at a high-level opening of IRENA's Collaborative Framework on Just and Inclusive Transitions, co-facilitated by the United States and South Africa.

The report confirms that Covid-19 caused delays and supply chain disruptions, with impacts on jobs varying by country and end use, and among segments of the value chain. While solar and wind jobs continued leading global employment growth in the renewable energies sector, accounting for a total of four million and 1.25 million jobs respectively, liquid biofuels employment decreased as demand for transport fuels fell. Off-grid solar lighting sales suffered, but companies were able to limit job losses.

China commanded a 39 per cent share of renewable energy jobs worldwide in 2020, followed by Brazil, India, the United States, and members of the European Union. Many other countries are also creating jobs in renewables. Among them are Viet Nam and Malaysia, key solar PV exporters; Indonesia and Colombia, with large agricultural supply



GREEN JOBS ... The ILO says fulfilling the renewable energy jobs potential will depend on ambitious policies to drive the energy transition

chains for biofuels; and Mexico and the Russian Federation, where wind power is growing. In Sub-Saharan Africa, solar jobs are expanding in diverse countries like Nigeria, Togo, and South Africa.

"Renewable energy's ability to create jobs and meet climate goals is beyond doubt. With COP26 in front of us, governments must raise their ambition to reach net zero," says Francesco la Camera, IRENA Director-General. "The only path forward is to increase investments in a just and inclusive transition, reaping the full socioeconomic benefits along the way."

"The potential for renewable energies to generate decent work is a clear indication that we do not have to choose between environmental sustainability on the one hand, and employment creation on the other. The two can go hand-in-hand," said ILO Director-General, Guy Ryder.

Fulfilling the renewable energy jobs potential will depend on ambitious policies to drive the energy transition in coming

decades. In addition to deployment, enabling, and integrating policies for the sector itself, there is a need to overcome structural barriers in the wider economy and minimise potential misalignments between job losses and gains during the transition.

An ILO global sustainability scenario to 2030 estimates that the 24-25 million new jobs will far surpass losses of between six and seven million jobs. Some five million of the workers who lose their jobs will be able to find new jobs in the same occupation in another industry. IRENA's World Energy Transition Outlook forecasts that the renewable energy sector could employ 43 million by 2050.

The disruption to cross-border supplies caused by COVID-19 restrictions has highlighted the important role of domestic value chains. Strengthening them will facilitate local job creation and income generation, by leveraging existing and new economic activities.

SCHEDULE OF THE APPROVED ELECTRICITY TARIFFS FOR THE FINANCIAL YEAR 2021/2022



The Electricity Control Board (ECB) has recently approved NamPower's request for the NamPower Distribution Tariffs to increase with 1.9% for the financial year 2021/2022. The ECB Levy and NEF levy will remain at 2.12 cents per kWh and 1.6 cents per kWh, respectively. Kindly note that the Net Metering Avoided Cost has increased to N\$1.1200 per kWh.

In accordance with section 27, subsection (2) of the Electricity Act 4 of 2007, 'The Board may from time to time, upon application by a licensee, revise the schedule of approved tariffs of the licensee concerned and may require the licensee to submit such information as the Board may require for that purpose'.

SCHEDULE OF APPROVED DISTRIBUTION TARIFFS FOR THE FINANCIAL YEAR 2021/22 (N\$) Excluding VAT

SMALL POWER USERS	TARIFF 2020/21	TARIFF 2021/22	LARGE POWER USERS	TARIFF 2020/21	TARIFF 2021/22
NET METERING avoided cost - c/kWh	107.57	112.00	NET METERING avoided cost - c/kWh	107.57	112.00

PREPAID RATES

DOMESTIC			COMMERCIAL		
Charge per unit - c/kWh	221.00	229.00	Charge per unit - c/kWh	221.00	229.00
ECB Levy	2.120	2.120	ECB Levy	2.120	2.120
NEF Levy	1.600	1.600	NEF Levy	1.600	1.600

VILLAGE TARIFFS

DOMESTIC			BUSINESS		
Charge per unit - c/kWh	199.00	204.00	Charge per unit - c/kWh	199.00	204.00
Capacity Charge - N\$/Amp/month	5.60	5.60	Capacity Charge - N\$/Amp/month	5.60	5.60
ECB Levy	2.120	2.120	ECB Levy	2.120	2.120
NEF Levy	1.600	1.600	NEF Levy	1.600	1.600

POSTPAID - RE-DISTRIBUTORS, COMMERCIAL, WATER PUMPING, MINING, FARMERS, FARMS ADDITIONAL, AGRICULTURE, PLOTS & MISCELLANEOUS

SMALL POWER USERS			LARGE POWER USERS		
Charge per unit - c/kWh	219.00	219.00	Charge per unit - c/kWh	122.00	129.00
Service Charge - N\$/month	541.00	541.00	Maximum Demand - N\$/kW per month	267.00	267.00
Capacity Charge - N\$5.60/Amp/month			Maximum Demand - N\$/kVA per month	244.00	244.00
11.5 kVA - 1 x 50 Amps	280.00	280.00	Capacity Charge - N\$5.60/Amp/month	5.60	5.60
16 kVA - 1 x 70 Amps	392.00	392.00	Rental - N\$/month	Customer specific	Customer specific
23 kVA - 2 x 50 Amps	560.00	560.00	Tariff Rebate (N\$/kW or N\$/kVA)	2.00	2.00
32 kVA - 2 x 70 Amps	784.00	784.00	Service Charge - N\$/month	1351.00	1351.00
25 kVA - 3 x 40 Amps	672.00	672.00			
50 kVA - 3 x 80 Amps	1344.00	1344.00	ECB Levy - c/kWh	2.120	2.120
75 kVA - 3 x 120 Amps	2016.00	2016.00	NEF Levy - c/kWh	1.600	1.600
125 kVA - 1 x 541 Amps	3029.60	3029.60			
Rental - N\$/month	Customer specific	Customer specific			
ECB Levy - c/kWh	2.120	2.120			
NEF Levy - c/kWh	1.600	1.600			

POSTPAID - EXPORT

SMALL POWER USERS			LARGE POWER USERS		
Charge per unit - c/kWh	228.00	-	Charge per unit - c/kWh	128.00	134.00
Service Charge - N\$/month	541.00	-	Maximum Demand - N\$/kVA per month	248.00	248.00
Capacity Charge - N\$5.60/Amp/month			Capacity Charge - N\$5.60/Amp/month	5.60	5.60
11.5 kVA - 1 x 50 Amps	280.00	-	Rental - N\$/month	Customer specific	Customer specific
16 kVA - 1 x 70 Amps	392.00	-	Tariff Rebate (N\$/kW or N\$/kVA)	2.00	2.00
23 kVA - 2 x 50 Amps	560.00	-	Service Charge - N\$/month	1351.00	1351.00
32 kVA - 2 x 70 Amps	784.00	-			
25 kVA - 3 x 40 Amps	672.00	-	ECB Levy - c/kWh	2.120	2.120
50 kVA - 3 x 80 Amps	1344.00	-	NEF Levy - c/kWh	1.600	1.600
75 kVA - 3 x 120 Amps	2016.00	-			
Rental - N\$/month	Customer specific	-			
ECB Levy - c/kWh	2.120	-			
NEF Levy - c/kWh	1.600	-			

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NamPower



WE FINANCE THE OPPORTUNITIES OF CLIMATE ADAPTATION

The Development Bank of Namibia views climate change
as a pressing issue.

Although it poses challenges, it also offers opportunities
for adaptation initiatives and enterprise finance.

Among others, the Bank can provide finance for:

WATER

Groundwater and seawater purification
Water efficient industrial technology

RENEWABLE ENERGY

Solar and wind energy

ENERGY EFFICIENCY & HEAT DISSIPATION

Energy efficient infrastructure
Energy efficient enterprise technology
Heat dissipating commercial and residential projects

If you have a project or business plan that helps Namibia adapt to climate change,
we want to hear from you. Call us. 061 290 8000.



Expect more.

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