

Etango

Namibia's Leading Renewable Energy Technologies
Magazine

November-December 2018

Inside

- Are electric vehicles the solution for Namibia?
- Pioneering energy storage at Chobe Water Villas
- DBN says solar energy critical for industrialisation
- Finnish Wärtsilä keen on Energy Solutions for Nam
- NaDEET earns UN award for Sustainability Education



SACREEE inaugurated

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Another eventful year for Renewables sector

As we wind down the year 2018, we look back with pride at the significant strides that Namibia and SADC have taken in growing the Renewable Energy sector.

At regional level, we celebrate the official inauguration of the Namibia-based SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) on 24 October. SACREEE, if well supported by all the SADC Member States, can without a doubt play a key role in unlocking the huge potential of renewable energy in southern Africa.

The establishment of SACREEE comes at an opportune time in the region where there are diminishing electricity generation capacities. The over-reliance on fossil fuels has been the status quo for many of the regional countries and while the region's population is growing at a fast rate, fossil fuels cannot be sustainable as they are not renewable, hence the need for SADC to up the game in promoting renewable energy solutions.

Access to clean and modern energy services are key for Namibia and the entire SADC's development. For the region to advance economically there is need for sustainable energy that will take us to the future and also to conserve the resources we have.

On the local front, Namibia has continued to add new solar plants to the grid while more stand-alone solar facilities have been set up. SunEQ's five megawatt solar photovoltaic plant at Otjiwarongo is the latest to be inaugurated and will supply energy to the Ohorongo Cement manufacturing plant.

B2Gold's Otjikoto mine, O&L Leisure and Bidvest Namibia are among the companies that added renewable energy solutions to meet their daily energy needs.

Mitigating our collective environmental impact and looking to more sustainable sources of power to ensure sufficient capacity and security of supply for the country is a national imperative, and we must be resolute in exploring viable alternative sources of electricity generation, Mines and Energy Minister Tom Alweendo reiterated.

Namibia also successfully finalised both the National Energy Policy and the Renewable Energy Policy to clearly signal the government's commitment to a sustainable energised future for its people.

The energy generation future remains bright for Namibia and the SADC region. As the curtain comes down on an eventful 2018, the *Etango* team would like to take this opportunity to thank all our readers and those who have made it possible for us to continue producing this publication and supporting us throughout the year. We would also like to wish you a Merry Christmas and prosperous 2019.

Enjoy reading this last edition for 2018!

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Reg. No. 2007/3268

VAT No. 4530957015

Publisher

Globe Communications Namibia cc

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Distribution

Globe Communications Namibia

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Cover picture:

OFFICIALLY LAUNCHED: Mines and Energy Minister Tom Alweendo inaugurated the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) in Windhoek on 24 October, 2018. The Minister said SACREEE will help unlock the potential of SADC's huge and underutilised renewable energy resources by providing business focused guidance on the regional market opportunities. **See stories inside**

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By Helvi Ileka

The Namibia Energy Institute (NEI), at the Namibia University of Science and Technology (NUST), continues to play a key role in the promotion of renewable energy, energy efficiency, rural electrification and climate change mitigation and adaptation efforts.

One of the key highlights of NEI activities was the launch of the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE), in which the institute played a key role as a member of the Organising Committee.

SACREEE was inaugurated on 24 October 2018 in Windhoek. The launch was attended by several high-level delegates including Ministers and Deputy Ministers responsible for energy in Botswana, Mauritius, Namibia, South Africa and Zimbabwe, the SADC Secretariat, the Austrian Development Agency (ADA), United Nations Industrial Development Organisation (UNIDO) and the Swedish International Development Cooperation Agency (Sida).

NEI has been nominated by the Ministry of Mines and Energy to be the National Focal Institution that will implement SACREEE programmes in Namibia.

A series of workshops and events preceded the official launch, which took place between 22 and 24 October, preceded the launch event. A public dialogue forum on youth and innovation was held on 23 October.

The NEI participated in an exhibition held to coincide with the launch of SACREEE and demonstrated the use of renewable energy and energy efficient technologies through the Solar Water Heater trailer and the energy trailer. The participation in the exhibition showcased NUST's initiatives towards the promotion of renewable energy and energy efficient technologies, such as water heating for domestic and industry purposes, solar home systems and a solar taxi.

Dr. Martin Ledolter, the Managing Director of the Austria Development Agency (ADA), which finances the successful Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN) project in Namibia, was among the high-level level delegates that attended the launch of SACREEE.

NEI accompanied Dr Ledolter on a site tour to some of the beneficiaries of the SOLTRAIN project in Windhoek.

SOLTRAIN Project update

The Centre for Renewable Energy and Energy Efficiency (CREEE) at NEI, installed Solar Water Heaters and PV Water Heaters at some houses constructed by the National Housing Enterprise

Namibia Energy Institute



SACREEE was inaugurated in Windhoek on 24 October 2018, at an event attended by several high-level delegates including Ministers and Deputy Ministers responsible for energy in Botswana, Mauritius, Namibia, South Africa and Zimbabwe, the SADC Secretariat, the Austrian Development Agency (ADA), United Nations Industrial Development Organisation (UNIDO) and the Swedish International Development Cooperation Agency (Sida)



Dr. Martin Ledolter, the Managing Director of the Austria Development Agency (ADA), which finances the successful SOLTRAIN project in Namibia, visiting the first collector manufactured in Namibia by participants of the Train the Trainer courses carried out under SOLTRAIN

(NHE) in Otjomuise suburb, for research purposes.

The aim of the project is to carry out a techno-economic analysis comparative study between the two technologies (SWH and PV WH). Senior Shimhanda, an intern at the Institute and a final year Master of Environmental Engineering student at NUST, with specialisation in Renewable Energy, is spearheading the comparison analysis as part of his thesis. Data is being collected at the systems.

SOLTRAIN, together with the Ministry of Mines and Energy, will also be financing the refurbishment of the Solar Water Heater System at the Katutura Hospital Maternity and Tuberculosis Wards. NEI and AEE INTEC are now compiling terms of reference

takes lead in RE campaign



Ms. Helvi Ileka, Centre Head for CREEE, demonstrating the lighting of incandescent and LED bulbs at the solar demonstration trailer during the training of 40 SMES on the uptake of solar energy technologies and business related concepts

to request for quotations from companies who have attended the various SOLTRAIN training programmes.

Thirteen SWH systems with a tank size of 300 litres and a collector area of 3.64 m², co-financed 50% of total cost by the SOLTRAIN Project, were installed at the Windhoek Vocational Training Centre. Three more SWHs with tank size of 300L and a collector area of 4 m² were installed at Namib Guest House in Swakopmund. Another 14 SWHs with total collector area of 31.62 were approved for co-financing of 50% by the SOLTRAIN Project to be installed at Susanne Grau Old Age Home in Windhoek.

One SWH, which was approved for co-financing of 35% by SOLTRAIN, will be installed by Solsquare at Hotel Pension A La Mer in Swakopmund. This will consist of 33.46 m² collector area.

Design rigs at the Energy Efficient Building

NEI financed the construction of three research houses (design rigs) that were constructed and insulated, using different locally available materials. One rig was constructed and insulated with agricultural waste made of rice hulls, maize husks, millet hulls and cow dung. The second rig was insulated with marble dust and the third rig was constructed with cement without insulation.

The concept will provide recommendation on local available insulation materials that can help in constructing energy efficient buildings such as the Energy Efficient Building of Namibia (EEBN). A data logger was installed to record the temperature and humidity for every 15 minutes to compare with the data collected for the EEBN.

The project is being carried out by a PHD student in the Civil Engineering Mr Leonard Onjefu for his research topic "Comprehensive Study of the Impact of Using Agricultural Residues for Enhancing Building Energy Performance in Namibia".

Electrification of Public Institutions

The Ministry of Mines and Energy is electrifying four schools

in Otjozondjupa Region. Aasvoelnes Primary School (PS), Nhoma PS, Grashoek PS and Kanovlei PS are being electrified through containerized solar systems supplied by Central Technical Supplies (CTS).

NEI is offering technical support to MME and visited the sites on 13 August and on 26 October to track the progress. The final commissioning date of the projects is planned for early December 2018.

In addition, two schools have been electrified in Ohangwena (Ondjabayonghalu and Omauni Combined School) with 3kW PV systems and Lithium ion batteries. The two schools were electrified through a collaboration with the Promoting Renewable Energy in Namibia (PREN) project and funded by the Hanns-Seidel Foundation.

About 40 SMEs were trained on the uptake of solar energy technologies and business related concepts. The training was conducted by NEI, the Centre for Entrepreneurial Development and the Solar Revolving Fund, at MME.

Climate Change Mitigation in Namibia

NEI, together with Namibia Red Cross Society (NRCS), the faculties of Natural and Applied Sciences and Engineering, an exchange student from NUST and a Master of Environmental Management student from the University of Free State in South Africa, undertook a field trip to Zambezi, Kavango East and Kavango west regions to test the first four demo wood efficient stoves that were constructed in the four communities of Lichaba, Mpacha (Zambezi) and Sharukwe, Mayana (Kavango).

A report was submitted to NRCS with recommendations on the improvements to be made in the construction of the wood efficient stoves that would follow.

Another field trip took place from 26 - 28 September 2018, where a new demo stove incorporating improvements was constructed. The efficiency of the new demo was tested in October 2018.

Namibia Energy Statistics Committee

NEI is a member of the Namibia Energy Statistics Committee nominated by MME to compile the energy balance of the country. Other members of the committee are Namibia Statistics Agency, NamPower, MME and ECB.

The CREEE has started with the collection of renewable energy data on SWHs, grid and off-grid solar photovoltaic, including solar water pumps. The Centre for Electricity Supply (CES), at NEI, collected data on electricity and biomass.



John Titus, Chairperson of the SACREEE Steering Committee

SACREEE programmes, projects hinge on partner collaboration

Despite the challenges related to the legal instruments necessary for the establishment of the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE), the Secretariat, though very thin on the ground, has leveraged on its anchor technical assistance and funding from the United Nations Industrial Development Organisation (UNIDO) and the Austrian Development Agency (ADA), to formulate a number of programmes and projects.

These programmes and

projects are implemented in collaboration with other partners, including the International Renewable Energy Agency (IRENA), the European Union (EU), Swedish International Cooperation and Development Agency (Sida) and the National Renewable Energy Agency (NREL).

“More projects are in the pipeline with other partners. We will be launching our two flagship publications; the SADC Renewable Energy and Energy Efficiency Status Report and the SADC Industrial Energy

Efficiency Programme in the coming weeks,” Chairperson of the SACREEE Steering Committee, John Titus, revealed during the official launch of SACREEE in Windhoek on 24 October.

“The programmes and projects that SACREEE is working on are not generated just from the blue but are guided by approved regional strategic documents such as the SADC Regional Infrastructure Development Master Plan (RIDMP), the SADC Industrialisation Strategy

and Roadmap (2015-2063), the SADC Renewable Energy and Energy Efficiency Strategic Action as well as SACREEE Project Document,” Titus said.

Extensive consultations on the feasibility of a centre to promote renewable energy and energy efficiency began in earnest in 2012 culminating with the decision by the SADC Ministers responsible for Energy in 2015 to establish SACREEE as a subsidiary organisation of SADC.

This decision was endorsed by the 35th SADC Council of Ministers Meeting. SACREEE was given a mandate to contribute to increased access to modern energy services, and improved energy security across the SADC Region through the promotion of market based adoption of renewable energy and energy efficient technologies and energy services in SADC Member States.

“The establishment SACREEE could have been very difficult, if not impossible, were it not for the generous technical support of the UNIDO and financial assistance of ADA. We also appreciate and thank the Government of Namibia, who as host of SACREEE, have gone beyond their pledged commitment by ensuring a smooth Preparatory Phase and First Operational Phase of the Centre,” added Titus.

SACREEE is also working with sister Centre in East Africa, EACREEE, on the Energy Efficient



More projects are in the pipeline with other partners. We will be launching our two flagship publications; the SADC Renewable Energy and Energy Efficiency Status Report and the SADC Industrial Energy Efficiency Programme in the coming weeks

Lighting and Appliances project.

SACREEE is a member of the Global Network of Sustainable Energy Centre’s (GN-SEC) coordinated by UNIDO. The network, which is comprised of eight such centres around the world, is supported by the Austrian Development Cooperation (ADC), the Spanish Agency for International Cooperation (AECID), European Union (EU), the Global Environment Facility (GEF) and other partners.

“SACREEE is not oblivious to the challenges faced by the region; therefore addressing these challenges requires a strategic approach. The Centre

has embarked on developing its Business Plan for 2019 to 2023. The sustainable energy field is not static hence; the Business Plan will no doubt be flexible and very dynamic to the dictates of the environment.

“Obviously, the Business Plan will need to develop best means and ways to address the blight of low access to clean and affordable energy, the issue of low participation of women in the energy sectors, information and knowledge management and contribution to SADC’s development agenda. We therefore request you to contribute by way of ideas to our Business Plan,” Titus further explained.

During the launch of SACREEE Minister of Mines and Energy, Tom Alweendo, emphasised that the aspect of sustainability was not sufficiently considered when planning for the future.

“The establishment of SACREEE came at an opportune time in the region where there are diminishing electricity generation capacities. There are several reasons for the persistent energy crises though sometimes there is surplus in other member states.

SADC’s renewable energy resources are huge and underutilised. I believe therefore that the establishment of SACREEE will unlock this potential by providing business focussed guidance on the regional market opportunities and risks,” Alweendo said.

IRENA engages SACREEE on two initiatives

The International Renewable Energy Agency (IRENA) has engaged with the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) as a key partner in the implementation of two regional initiatives, Gurbuz Gonul, IRENA's Acting-Director for Country Support and Partnerships has said.

Gonul noted that both these initiatives will be facilitated by IRENA and will include the Africa Clean Energy Corridor and the SADC Renewable Energy Entrepreneurship Support Facility.

The Africa Clean Energy Corridor aims to promote the development of cost-effective renewable power options and cross-border trade of renewable power across the countries of Southern Africa and Eastern Africa Power Pools.

"The Corridor initiative has a strong capacity development subset, which touches up various areas including resource assessment, national and regional planning, policy and regulatory frameworks and project development and finance. Over the last two days, we have had consultative discussions with the ministries, utilities, regulators from the region, together with the regional organizations and development partners, to take stock of the progress so far made and have an exchange on the next phase of implementation of the Corridor," Gonul explained.

On the other hand, the SADC Renewable Energy Entrepreneurship Support Facility recognises the paramount role of small and medium-sized enterprises in the economy and envisions to equip entrepreneurs from the region with the adequate technical and commercial skillset so that they can better manage their business, prepare bankable project proposals



Within a broader framework of our regional and country level engagement in Africa and elsewhere, we believe in establishing strong, effective and result oriented partnerships with regional bodies and set-ups

and access to finance more easily to be able to scale up their business.

"Within a broader framework of our regional and country level engagement in Africa and elsewhere, we believe in establishing strong, effective and result oriented partnerships with regional bodies and set-ups.

"Obviously, the regional centres for renewable energy and energy efficiency are the key anchors for the fulfilment of our mandate in supporting governments to create conducive environments for renewable energy investments; to provide them with practical tools, analysis and advice in strengthening enabling policy, regulatory, technical and financial frameworks, and to facilitate sharing knowledge and best practices in providing clean, sustainable and affordable energy solutions to the world's growing population," Gonul further explained.

Through examples of solid collaboration with regional centres such as the ones in West Africa ECREEE and Middle East - North Africa REGREEE, IRENA endeavours to align its work with the regional objectives to achieve higher impact, which is the ultimate objective.

In the case of Southern Africa, the Renewable Energy and Energy Efficiency Strategy and Action



Gurbuz Gonul, IRENA's Acting-Director for Country Support and Partnerships

Plan, adopted in 2016, outlines a number of areas where IRENA and SACREEE could mutually leverage on their partnership and make meaningful impacts on the ground such as the strengthening of Regional and National Institutions, the creation of National Frameworks for renewable energy, regulation and capacity development.

“With its mandate to promote widespread adoption and deployment of renewable energy technologies in a sustainable manner across the globe, Africa has been central to IRENA's work as our engagement with the continent dates back to very early days of the Agency's establishment,” Gonul reiterated.

In essence, the first ministerial meeting organized by IRENA was the Africa Ministerial held in 2011, which provided a solid framework of cooperation between the region and the Agency.

Within that, Southern Africa's relationship with IRENA is also amplified by the fact that

some of the flagship initiatives were first piloted in Southern Africa. The Renewable Readiness Assessment that constitutes the backbone of IRENA's country level engagement was first implemented in Mozambique, along with Senegal. The concept of Africa Clean Energy Corridor regional programme was developed and applied in the context of Southern Africa and Eastern Africa Power Pool countries.

“The launch of SACREEE is not an end in itself. It should become a catalyst of concrete actions for a sustained development of the appropriate enabling frameworks that will eventually lead to an increased deployment of renewable energy and energy efficiency solutions throughout the region. I am confident that it will also help open new areas of cooperation in the energy sector between SADC region and development partners, including IRENA, and I hope that the resources that will ensure the good functioning of the centre will be mobilised and allocated with these goals in mind,” extended Gonul.



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Photo By Ranveig Eckhoff



The recently-inaugurated 5 megawatt Sun EQ solar facility at Otavi which was financed by DBN

DBN says solar energy a critical requirement for industrialisation

Privately owned solar generation is a significant force for the future of Namibian enterprises, Development Bank of Namibia (DBN) Head of Marketing and Corporate Communication, Jerome Mutumba, says.

Mutumba believes that solar photovoltaic (PV) plants can lend impetus to Namibia's drive towards industrialisation.

Namibia imports most of its electricity, up to 60%, from neighbouring countries and this limits the confidence of investors in the security of supply. Mutumba cites a report by Musa Carter carried by The Economist newspaper, which states that a group of unidentified investors decided against establishing manufacturing facilities in Namibia due to concerns over electricity.

Imports place Namibia at a disadvantage, as the country is dependent on pricing offered by exporters of power, mainly South Africa's Eskom. Costs are subsequently passed on to users of electricity. In the case of enterprises, this drives up the cost of productivity. At the same time, if elements of exporters' generation capacity fail, Namibia may become subject to load-shedding.

The DBN senior manager says although Namibia has various national development programmes and policies that give impetus to the country's aspirations, if the critical issue of supply to power industrial processes is not guaranteed, or is priced too high, economic development will remain slow.

The differences in tariffs across the southern African regions make countries which offer lower electricity costs and greater local generation capacity far more attractive to industrialists. If Namibia is to compete, a model has to be provided which is cost efficient for industrialists and gives

them security of supply.

The DBN has been backing a model in which enterprises can own their own distribution capacity in the form of renewables, particularly solar. For instance, DBN financed the Sun EQ solar power facility which provides electricity to Ohorongo Cement plant. The 5 megawatt Sun EQ facility, which was established by a consortium of private companies, secures the supply of electricity under an offtake agreement with Ohorongo, and also gives both entities the ability to agree on rates that make Ohorongo sustainable.

Mutumba says that a facility of this nature may be financed over a period of 10 or more years, out of an estimated lifespan of up to 30 years. Although the repayment is required for the period of 10 or more years, this can be recovered from sales of electricity during that period, subsequent to which the cost of generation falls substantially, and the gains can be used either for growth or in anticipation of future replacement.

The DBN believes that the Ohorongo model should be advanced to industrialists as a solution to Namibia's power deficit.

The vision of privately owned solar generation is not restricted to heavy industrial users. A significant number of commercial properties and private entities, including retail facilities, are increasing their use of solar power.

"Although this may seem unusual, this model can already be seen in shopping centres where electricity is supplied to a spread of tenants from solar installations on roofs. There is no reason why, given a bit of thought and ingenuity, it should not be applied to industrial parks office parks and housing developments," Mutumba says.

Namibia's Renewable Energy potential is underutilised, but this can change in 2019

By Paulus Mulunga

The last two years have seen positive strides in the uptake of Renewable Energy technologies in Namibia. On a macro scale, there has been a number of new solar PV plants coming online as the country tries to wean itself from overdependence on electricity imported from neighbors. We have also seen an increase in the rooftop installations as residents and businesses are becoming more aware of the benefits of having solar PV systems installed at their premises. Residents and business are becoming frustrated with spending huge amounts of their savings on the ever increasing electricity costs.

In 2017, 45% of Namibia's electricity was imported from Eskom, the South African utility company, with



Paulus Mulunga

only 36% generated locally. Eskom, recently signed R56 billion worth of renewable energy contracts with Independent Power Producers (IPPs). What this essentially means is that Namibia is partially financing the transformation in South Africa, owing to the fact that we import 60% of our power from our neighbours. In essence Namibians are paying for these investments through the yearly average of around N\$2 billion that we use for imported Power. NamPower and Eskom signed a firm five-year Power Purchase Agreement in March 2017 to be supplied with 200MW firm power

effective from 01 April 2017.

Finance Minister Calle Schlettwein recently commented that it was cheaper to buy power from South Africa thus buying was always seen as a good



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alternative. Funding was also not as readily available as it is now. However, that has all changed. The cost of the technology required for Renewable Energy plants, especially PV, has drastically reduced. There are a number of investors, both local and foreign that are willing to invest in Renewable Energy in Namibia.

Another issue raised was that using foreign funding is just another form of capital flight as money still leaves the country to the investors who finance the local power plants. However, good policies, such as enforcing local ownership in all local plants, will ensure that we are still able to take advantage of foreign funding which we need as there is not enough local capital to fund these types of projects, and safeguard locals benefit by being owners of these plants.

There is a lot of potential in the local energy. With the right interventions and government support, it can be one of the industries used to mitigate the high unemployment rate in the country, especially amongst the youth. I interact with a lot of brilliant young Namibian minds who have excellent solutions to our energy challenges and are eager for opportunities to solve our local problems.

These young minds believe that with the support of our neighbors, we can use Namibian expertise to solve not only Namibian challenges, but regional ones as well.

The government should push for local generation

and ensure that Power Purchase Agreements (PPAs) are signed with IPPs for local generation of energy in Namibia. It should be noted that the move towards renewable energy is a global trend which should not leave Namibia behind.

Our peak demand has been gradually increasing over the years and according to the 2017 NamPower Annual Report, Namibia's peak demand stands at just over 600MW. Compare this to the 200MW of Renewable Energy that we expect to come online, still leaves the country in a shortfall when we have resources that are enough to cater for our local needs and even export the excess power.

The solutions to Namibia's energy needs are here. There is a need for closer continuous engagement with all stakeholders and formulation of clear strategies on how we can create more Renewable Energy plants. Government obviously has a central role to play in ensuring that we have the right policies in place to address our energy needs.

To accelerate the development of power plants in Namibia requires our lawmakers to pass a law that stipulates that a certain percentage of the country's energy must be generated locally. This will result in more jobs being created locally and money (that is normally shipped over to our neighbours) is kept in circulation in Namibia, which translates to more taxes being paid over to our government.

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During 2018 more Namibian companies have joined the ever increasing portfolio of businesses investing in the purchase of a solar system from NEC. To name a few: Omaanda Lodge (36.45 kWp grid & 90 kWp Hybrid), The Wood Connection (118 kWp), Swavet (15.1 kWp), Zimmermann Garage (90 kWp), Fresh Produce Market in Prosperita (406 kWp) and Standard Bank Head office (151 kWp). NEC also completed the electrical scope of another Solar Park (the 6th for NEC), the 10 MVA Kokerboom Solar Plant near Keetmanshoop.

Beginning of August this year NEC installed another off-grid Solar System on a remote farm, where no Nampower was available. The owner opted for the new AxiStorage Lithium Ion batteries, which are maintenance free and offer a long term, highly efficient storage solution to any client. Three 10.5 kWh AxiStorage batteries have been installed, offering very high usable energy and high efficiency during deep DoD of up to 80% - and still providing up to 8 000 cycles.

The AxiStorage batteries have a much higher charge and discharge cycle and can be discharged down to 20%, compared to, for example, only 50% for Lead Carbon batteries. And will last up to 30 years (with a limited warranty of 10 years).

A lot of our clients combine the market leading Solahart geysers with highest Quality PV island / grid tied systems. These provide the client with a system with a design life of 25 to even 30 years. NEC's Axitec panels installed come with a worldwide market leading 15 year product warranty and a 25 year output guarantee of min 85%.

Going solar makes sense for every individual or business. It is not just the positive impact on our environment, but more importantly to a lot of clients, going solar is an economically viable choice as operating costs are reduced from day one after installation and as a result these savings can be re-invested into the business.

With solar Power on the roof, the cost of energy remain fixed and low while your profits grow. Even when national electricity tariffs increase!

Although the initial investment can be costly, the payback is around 3-4 years for our grid tied PV systems and Solar geysers.

Our Inverters have a 5 year full replacement warranty. The Solar PV panels have a 15 year factory warranty and a 25 year min 85% output Guarantee. Therefore the system components, being very high quality products, provide a significantly longer time of reliable solar energy, then the initial investment will take to pay itself back in savings.

It is a hard earned fact that very few companies in Namibia can match the long term service and installation history that NEC has in this industry in Namibia. NEC P&P strives to provide highest quality and efficient solutions to our clients with the best after sales service.





Wärtsilä is going all-in on storage and renewables

Finnish company Wärtsilä ready to build proposed 120MW Arandis Power plant

A top-level team from Finnish company Wärtsilä Energy Solutions was in Namibia recently as part of Minister of Economic Affairs of Finland, Mika Lintilä's high-powered business delegation. Lintilä headed a Finnish delegation seeking to promote exports and collaboration between Namibia and Finland.

Wärtsilä was selected as Engineering, Procurement and Construction (EPC) contractor for the proposed 120 megawatt (MW) power generation plant by Arandis Power, following an international competitive tender. The Arandis Power Independent Power Producer (IPP) is a joint venture of Namibian and international companies, that have developed a unique proposal for the base load generation of electricity using heavy fuel oil (HFO) and solar PV energy.

Arandis Power is proposing the construction of a power plant with an output of 120MW using 7 massive 17MW Heavy Fuel Oil (HFO) engines

weighing over 350 tonnes each, manufactured by Wärtsilä.

Mark Zoeters, business development manager at Wärtsilä, told **Etango** that projects like the one proposed by Arandis Power enable Namibia to be energy self-sufficient, as well as establish a secure and stable electrification network which allows for sustainable economic growth of the country.

"With the sun belt running across the continent, Africa is optimally located to generate enormous amounts of solar and wind energy. In this context Namibia is the best placed country in Africa for the highest solar irradiation on the continent. Along with the constant increase in energy demand and falling technology prices, the renewables will become the new baseload in energy generation, permanently changing the power system," Zoeters said.

"Energy challenges in Namibia are related to adding domestic generating capacity in an economically viable and environmentally

sustainable way, increasing the share of renewables, such as wind and solar PV, in the power system, and increasing the country's energy self-sufficiency. With the huge potential of renewable energy in Africa and Namibia, the focus should be on finding the optimal mix of renewable energy sources such as wind and solar PV, energy storage and flexible generation capacity," he added.

Wärtsilä Energy Solutions is leading the transition towards a 100% renewable energy future. As an Energy Systems Integrator, the company designs and builds optimal power systems for future generations. Wärtsilä's offering includes ultra-flexible internal combustion engine-based power plants, hybridised solar power plants, and energy storage & integration solutions. Its solutions provide the needed flexibility to integrate renewables and secure power system reliability. The Finnish company has 68 GW of installed power plant capacity in several countries around the world.

Wärtsilä has a long tradition of working with African countries, having equipped and/or constructed over 600 plants with 7.2 GW of power in Africa.

Zoeters said in order to utilise Namibia's renewable energy potential, the energy generating mix should be optimised.

"Renewables are intermittent in nature, requiring the existing inflexible baseload capacity, like coal and nuclear, to be supported by modern flexible and reliable generation assets, like engines and energy storage. Flexible capacity is needed for grid stability and balance, peaking and load-following generation and back-up power for integrating wind and solar energy. Without fast-starting flexible capacity, renewables will cause instability to the grid and huge difficulties for grid operators," he said.

Wärtsilä's engine-based power plants and energy storage and integration solutions provide the needed operational flexibility to integrate renewables. They also provide capacity for grid stability, peaking and load-following generation, and back-up power for integrating wind and solar energy, securing power system reliability.

For Namibia to reduce her carbon footprint, the country needs to increase the share of renewables in the power system.

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Are electric motor vehicles a solution for Namibia?

Namibia has seen unprecedented increases in the prices of fuel over the past few months, with a litre of petrol now hovering around N\$15.

The increase in fuel price has put extra strain on motorists and also resulted in an upward spiral in prices of basic commodities.

Research Associate at the Economic Association of Namibia (EAN), Klaus Schade, says electric vehicles and vehicles running on hydrogen are on the rise globally. Some countries have already set deadlines for the phasing out of combustion engines by the year 2040.

“Namibia has the chance to be the first major mover on the African continent to support a major shift to e-vehicles including e-scooter, e-bikes etc. that are well suited for relatively short daily trips in urban areas.

“They can be re-charged during working hours, lunch breaks or at home during night. Namibia is endowed with renewable energy sources to recharge the batteries. Since the country is also endowed with lithium, it should be explored whether it is not viable to produce lithium-ion batteries that power e-vehicles,” says Schade.

The uptake of e-vehicles in Namibia has been very slow, mostly because car dealers are reluctant to take the plunge and the price of electricity in the country is relatively high.

Schade argues that the continuous subsidisation of fuel could delay necessary adjustments in transport behaviour. Government could therefore



Could electric vehicles offer relief to Namibians as fuel prices continue to rise?

consider using the National Energy Fund to fund investment necessary to support the shift to e-vehicles and or hydrogen, such as recharging stations at public places.

Furthermore, additional resources should be made available for research into more sustainable forms of transport and transport equipment, such as the e-taxi (solar-powered) prototype developed by the Namibia University of Science and Technology.

“Hence, rising fuel prices provide the opportunity to chart the way forward for an environmentally-friendly and sustainable transport sector. Not least, this will support Namibia’s efforts to achieve the Agenda 2030 – the Sustainable Development Goals, in particular SDG 13 that aims at combatting climate change,” Schade says.



The United Nations has also urged African governments to put policies and finances in place to start adopting electric vehicles to cut air pollution.

Benefits of e-vehicles

E-vehicles are cheaper to run. The electricity to charge an EV works out around a third as much per kilometre as buying petrol for the same vehicle.

They are also way cheaper to maintain compared to the conventional petrol/diesel car. An electric vehicle has a lot less moving parts and there is relatively little servicing and no expensive exhaust systems, starter motors, fuel injection systems, radiators and many other parts used by the conventional vehicles. Owner only needs to maintain the brakes, tyres and

suspension.

Batteries do wear out so replacement batteries will eventually be needed. Most car manufacturers warrant for e-vehicle batteries is for about 8 years.

By choosing to drive an e-vehicle, the motorist will be playing a huge part in reducing Namibia's carbon footprint as there are no harmful exhaust emissions.

Furthermore if one uses renewable energy (e.g. solar) to recharge your e-vehicle, one can reduce greenhouse gas emissions even further. You could recharge an e-vehicle from a solar PV system during the day instead of from the grid.

Recent findings have also shown that several e-vehicle features can improve safety. E-vehicles tend to have a lower centre of gravity that makes them less likely to roll over.



Chobe Water Villas staff pose next to the 150kWp solar photovoltaic plant erected to supply the luxurious resort in the Zambezi region with clean renewable energy

Namibia's largest energy storage system at Chobe Water Villas

A 150kWp photovoltaic plant to supply the luxurious Chobe Water Villas, in the Zambezi region, was recently completed by CRONIMET Mining Power Solutions. The plant, which has been in operation since August, works in combination with an efficient energy storage system with clean energy at a competitive price.

The Chobe Water Villas photovoltaic plant is combined with an efficient and fully automated energy storage system that is controlled by CRONIMET's technical department in Germany.

The new plant allows the lodge, which is owned and operated by O&L Leisure, a subsidiary of the Ohlthaver & List Group, which relied on gensets (a combination of diesel engine and electric generators) to meet the energy needs to cover its full daytime electricity demand and to further reduce the reliance on gensets at night.

After having realised plants at Mokuti Etosha Lodge and Midgard Country Estate, O&L Leisure developed another commercially feasible and environmentally friendly energy solution for a remote lodge.

OLC Solar Energy, a joint venture of O&L Energy and CRONIMET Mining Power Solutions GmbH, operates the plant as the Independent Power Producer.

Speaking at the inauguration of the solar-plus-battery storage system, O&L Energy CEO, and OLC Energy Director, Bernd Walbaum, said the plant will contribute significantly to downsizing operational cost of Chobe Water Villas, and ensure a reliable and sustainable energy supply for guests.

"With a capacity of 150 kWp solar photovoltaic system and a 332 kWh Lithium-Ion energy storage system, this plant is the largest of its kind in Namibia. This modern system is backed up by two 80 kVA

diesel generators. The entire plant is managed by an intelligent controlling system which co-ordinates all 3 energy supply sources automatically. OLC Energy is very proud to have developed and installed yet another renewable energy system for O&L Leisure, after the solar plants at Midgard Country Estate and Mokuti Lodge have started operation already beginning of 2018. With this energy plant we also put a new emphasis in the Namibian tourism industry," he said. Managing Director of CRONIMET and OLC Energy Director, Steffen Kammerer, added that the project was another milestone in the field of renewable energy in Namibia.

"Together with Qinous - an intelligent energy storage solutions provider that delivered the battery system for the project, we successfully implemented the hybrid system which is the biggest project of its kind in Namibia so far and another innovative step in the right direction for a sustainable and clean energy future for Namibia."

Chobe Water Villas is O&L Leisure's latest addition to its portfolio. The world-class, 16-room, 7-star establishment, inaugurated in October 2016 – is located at the eastern tip of the famous Caprivi Strip, in the Zambezi Region of Namibia.

The lodge is situated in the 150 km² Kasika Conservancy, in a secluded position directly on the banks of the Chobe River and near to the town of Kasane in Botswana. This location affords unobstructed views towards the world-renowned Chobe National Park and also overlooks Kasikili (Sedudu) Island, which boasts a phenomenal density of wildlife species, including elephant, lion, buffalo, hippo, crocodile, eight species of antelope and over 460 species of birds.

Bidvest Group embraces solar

The Bidvest Group in Namibia has joined the many big industry players that are turning to solar energy to reduce their electricity costs, as well as their carbon footprint.

Local company, SolarSaver, was recently contracted to install solar photovoltaic (PV) systems at a number of Bidvest Group companies throughout Namibia. This project includes fully-customised installations for Taeuber & Corssen, Manica and Cecil Nurse.

The systems are being installed in terms of a specially tailored solar financing arrangement. In short, the systems will be installed entirely at SolarSaver's cost and SolarSaver will be responsible for all ongoing maintenance and monitoring. That leaves Bidvest's capital free to grow its own business, while SolarSaver takes responsibility for ensuring the group benefits from cheaper, greener electricity into the future.

The first Bidvest installation was completed at Cecil Nurse in Windhoek and that system has already produced over 50 000 kWh's of green power. The SolarSaver team has proceeded to install a 500kWp system at Taeuber & Corssen's cold storage facility in Windhoek North. This system includes 1 523 solar modules producing 870 000 kWh's each year.

Further installations in Windhoek, Ongwediva and Walvis Bay are in the pipeline.

SolarSaver's unique solar rental offering allows businesses to 'go green' and cut their monthly electricity costs without the need for any upfront capital outlay. The rent-to-own contract

offers:

- Zero installation costs
- Immediate monthly savings
- Fully-inclusive maintenance, monitoring and insurance
- Flexible purchase rights

The business model focuses on clients with high grade properties of long term relevance and enables them to install a complete solar PV system without any capital outlay.

"These systems go a long way in fulfilling the demand for cost effective, renewable energy solutions. Our current clients range from retailers to fuel stations to hospitals, and many other businesses. Demand for our offering has been tremendous and our project pipeline should see us commission a further 60 PV systems this year," says Tim Frankish, one of the founding shareholders and a director of Solar Saver.

Numerous businesses throughout Namibia have taken advantage of this unique offering from SolarSaver and have installed solar PV systems on their roofs. These include: Lady Pohamba Private Hospital (400kWp currently under construction), Metro Cash & Carry stores, Oshana Build It, Oshakati Pharmacy, River Crossing Lodge, Puma Energy (Bach Street) and Engen Academia, to name a few. Metro Hyper in Kleine Kuppe, Windhoek, Metro Cash & Carry Namibia and the Windhoek Country Club Resort have also taken advantage of Solar Saver's concept and gone green.

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Electro Centre is Namibian Company dealing in General Electrical, Solar Energy Installation, Air-Conditioning Materials and Refrigeration services. The company supports various plants with a maintenance program in the fields of Mechanical and Construction. Servicing and Repairs of electrical appliances are part of the work scope.

Electro Centre was fully established in June 2009 and accredited in 2013 as an installer and Supplier of renewable energy products by the Ministry of Mines and Energy and the Namibia Energy Institute (NEI) under the Ministry of Mines and Energy (MME).

Capping solar energy generation misses the point

By Bram Buijs

Is Namibia, a country uniquely positioned to benefit from solar energy, really putting the brakes on solar system deployment when other countries are forging ahead?

If recent news is to be taken seriously, the answer is yes – progress towards a cleaner, more affordable supply of electricity in Namibia is indeed under threat.

The government recognises that Namibia is one of the best suited countries in the world for solar PV power generation and has a progressive national renewable energy policy. It has supported the establishment of fourteen 5 MW solar plants, spread across the country, under the very successful Renewable Energy Feed-In Tariff (Refit) programme.

It has also published national solar net-metering rules and celebrated projects such as the 37 MW Hardap Mariental PV plant and its first-ever solar-powered mine.

Continued growth in harnessing its amazing solar resource makes Namibia part of a global trend. Solar installations worldwide have been growing year-on-year with around 30% to 40% over the past decade, with 98 GW of solar capacity installed globally in 2017.

The key reason for this growth is that solar PV has become the cheapest source of electricity. This presents a massive opportunity for Namibia especially: the country has some of the highest power tariffs in the SADC region, and electricity costs are a significant burden for local businesses and domestic end-users. To illustrate this point, tariffs in some cases exceed N\$2 per kWh as opposed to N\$0,40 in Zambia and N\$0,88 Botswana.

Allowing consumers to cover part of their energy consumption via solar PV systems,



Bram Buijs

Continued growth in harnessing its amazing solar resource makes Namibia part of a global trend. Solar installations worldwide have been growing year-on-year with around 30% to 40% over the past decade, with 98 GW of solar capacity installed globally in 2017.

and therefore alleviating high electricity costs, will benefit the whole economy and lead to job creation in the solar sector and beyond.

So, why have distributors stopped approving new solar systems?

Some distributors may point to Namibia's grid and stability of supply. Concern over the stability of Namibia's grid is valid since its population is sparse and its grid-lines widely dispersed. Studies have been conducted by the Electricity Control Board (ECB) and NamPower to map out how much solar uptake can be allowed while keeping the grid stable.

However, it is evident that Namibia is not close to any tipping point where stable grid supplies are threatened by additional installations of intermittent renewable power. Therefore, the much-cited issue of 'grid stability' cannot be considered a valid argument. In addition, the systems refused by the distributors include those for self-consumption only (no export), which have minimal impact on the grid.

At present, technical constraints are clearly not critical at all. The contribution of solar in Namibia's power mix is still only a few percentages at best. In some countries such as Italy, Greece and Germany, solar production already accounts for more than 7% of total electricity consumption and it is increasing every year. Solar is not just suitable for large economies with extensive grid infrastructure: even in a small country as Honduras, solar already contributes more than 10% to the power generation mix.

Instead, the caps on solar have commercial reasons. The distributors are becoming less profitable, as consumers are helping themselves with more affordable solar electricity at an increasing scale. This situation is not unique to Namibia – it is happening across the world.

The way forward is not to impose unjustified caps and, in this way, kill the burgeoning solar industry in Namibia. Wishing away solar PV as a low-cost source of electricity is just a way of hiding one's head in the sand.

It is important for the ECB to take a strong stance against these artificial caps and the matter of own-use and net-metering solar installations

throughout the country. Regulation should not be used to actively block more efficient or affordable power sources. Consumers should be allowed to install solar for own-use, just like they are allowed to install energy efficient LED lighting. The size and shape of a consumer's demand for electricity should be his or her own choice.

A more productive way forward would rather be to manage the transition towards the uptake of clean and decentralised electricity supply options, focusing on how battery storage can help firm up the variable (but cheap) supply of solar power, as well as making sure that distributors are fairly compensated for providing grid services to consumers.

Embedded generation, such as own-use solar systems, can make the grid and power supply more resilient and at the same time enhance access to affordable energy.

Seen from a wider perspective, Namibia stands to gain tremendously if it were to fully use its solar resource.

Namibia currently imports 57% of its power at high cost, yet it has the potential to become a regional net-exporter of electricity. In one future scenario, Namibia could link its solar output with the hydro resources in Zambia and Mozambique to provide power to the wider region.

In this way, national competitive advantages such as Namibia's world-class solar energy resources could be used to mutual benefit. Similarly, Denmark exports excess wind power to Norway where it is stored in hydro reservoirs but sent back the other way when the wind doesn't blow.

An affordable and clean energy supply in Namibia needs more solar – not less. We should not accept distributor caps that hold back the future and force consumers to accept high electricity charges.

**** Bram Buijs is the regional manager at Sola Future Energy. He holds two masters of science qualifications and has extensive experience with the development of utility-scale renewable energy projects. He previously worked at a global strategy consultancy firm.***



The UNESCO-Japan Prize on Education for Sustainable Development 2018 was awarded by UNESCO's Assistant Director-General for Education, Stefania Giannini, and the Ambassador and Permanent Delegate of Japan to UNESCO, H.E. Takio Yamada, in a ceremony at UNESCO Headquarters, Paris on 9 October. Viktoria Keding, Director of NaDEET (second from left) received the prize on behalf of her organisation.

NaDEET earns UN recognition for Sustainable Development Education

The Namib Desert Environmental Education Trust (NaDEET) was honoured as one of the three laureates for the 2018 UNESCO-Japan Prize on Education for Sustainable Development (ESD).

This was the fourth edition of the US\$50, 000 prize, funded by the government of Japan and created in 2014 to honour outstanding projects and programmes in the field of ESD. NaDEET was honoured together with the 'Let's Do It Foundation' from Estonia and the 'Kalabia Education Programme' from Indonesia.

Viktoria Keding, Director of NaDEET said: "This award brings global attention to the importance of quality education in reaching the SDGs. We are proud to be part of the growing movement to reach these goals."

NaDEET won the award for its "Centre on NamibRand" which provides hands-on environmental education for youth and community groups deep in the Namib Desert.

NaDEET was established as a Namibian trust in 2003. The NaDEET Centre is located 100 km south of Sesriem/Sossusvlei on the NamibRand Nature Reserve and the head office is located in the coastal town of Swakopmund. NaDEET believes environmental education must not only increase awareness and knowledge but also eco-friendly attitudes and skills in Namibia's youth and educators to promote participation.

NaDEET aims to provide environmental education for Namibians, regardless of income, by addressing relevant environmental issues through hands-on, experiential learning, supporting the Namibian

school curricula in a practical, learner-centred way and providing the opportunity of experiencing the county's namesake - the Namib Desert - first hand, thus creating a sense of respect and responsibility for their natural environment.

"Education for Sustainable Development (ESD) transforms individuals and societies and empowers them in the face of today's big global sustainability challenges, such as climate change, migration, inequalities," said UNESCO Assistant Director-General Stefania Giannini at the award ceremony. "This prize was established to reward and spread ESD action worldwide."

Ambassador Yamada, who presented the award, affirmed: "The adoption of the Sustainable Development Goals (SDGs) has made ESD even more important, not only as an integral part of the Goal on Education, but also as a key enabler for all the other SDGs." He said: "I sincerely hope that the exemplary activities of the three prize-winners will further contribute to the world-wide promotion of ESD, and will help realise a sustainable society on our planet."

Each laureate received a diploma, an award and a cheque of US\$50,000 (about N\$695 000). In addition to the award, the three winning organisations will be invited to become key partners of the Global Action Programme on ESD (GAP), driving the GAP implementation forward in close collaboration with UNESCO.

"The Prize is unique in its approach, as it provides thorough follow-up and long-term collaboration with every laureate way beyond the award ceremony," said Giannini.

LIST OF APPROVED & REGISTERED INSTALLERS AND SUPPLIERS WITH NTCRE / TC1

AS OF NOVEMBER 2018

Category: PV INSTALLERS		
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4	Kuutondokwa Vitalis	Cell no: 0812399622, Email: vitaliskuutondokwa@yahoo.com; Ongwediva, Onawa, Oshakati, Oshana Region
5	Lubinda Josty	Cell no: 0812061280 or 0855575185, Email: ljostylubinda@yahoo.com OR katimasolar@yahoo.com; Erf No: 156 Choto Compound, Katima Mulilo, Caprivi Region
6	Namadhila Sackarias Nangolo	Cell no: 0812565008, Office: 061 225648 / 2087652; 74 Columbia Street D/Park, Windhoek; Khomas Region
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9	Nguuo Jackson	Cell no: 0811296337, office: 061 0608038736;75 Black Rock Street, Rocky Crest, Windhoek, Khomas Region
10	Nyambali Mathew Ukongo	Cell no: 0812432192, Office: 065 245882, Onamulunga, Oniipa, Ondangwa Oshikoto Region
11	Sakaria Leonard	Cell no: 0812809497, Email: lonnysacku@yahoo.com; Ohangwena, Onekwaya-East, Main Road, Ohangwena Region
12	Shikokola Letisia	Cell no: 0812893208, Office: 065 220689 / 220688 Email: shikolola@yahoo.com; Mwatale E Street, House No: 8219, Oshakati, Oshana Region
13	Siyemo Blasius Hamutenya	Cell no: 0813170920, fax: 066-255685, House No: 131/1178, Tutungeni, Rundu, Kavango Region
14	Tjamburo Prescott	Cell no: 0811287168, office: 061 222649, Email: futuresolar@iway.na; Osler Street 17, Windhoek West, Windhoek, Khomas Region
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Category: SOLAR THERMAL INSTALLERS

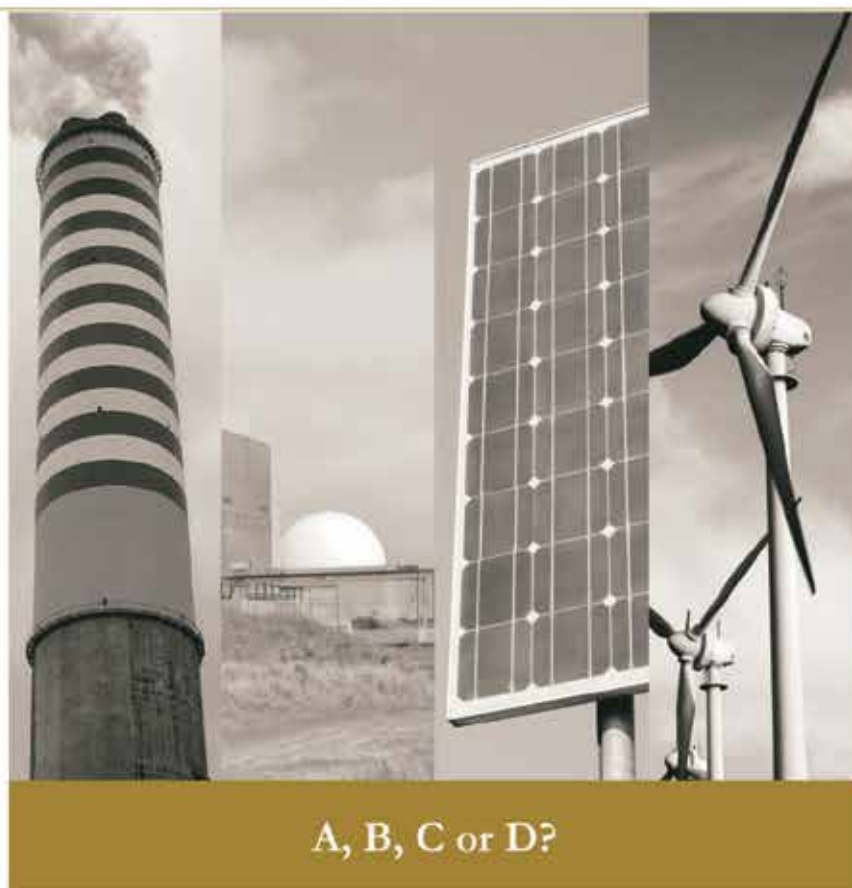
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Category: RENEWABLE ENERGY TECHNOLOGIES SUPPLIERS

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2	Namibian Engineering Corporation (NEC)	SWH, Photovoltaic, SHS, PVP,	Niko Brueckner	Telephone no: 061 236720, Fax no: 061 232673, 21 Joule Street Southern Industrial, Windhoek
3	Trinity Business Solutions (TBS)	SWH, Photovoltaic, SHS, Solar cookers/box, streetlights	Bernadette Simana	Telephone no: 061 258112, Fax no: 061 225667, Jacona Street, Hochland Park Erf. 1600B, Windhoek
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5	Solar Age cc	SWH, Photovoltaic, SHS	Rehab Kaavela	Tel: 065 240849, Cell: 081 3997154, P O Box 2873, Ondangwa, Olunkono Industrial Area (behind M & Z Motors), Email: solarage@iway.na
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8	Engineering Centre cc	Photovoltaic	Greiter Joern	Telephone no: 061 220696/221069, Fax no: 061 220703, 21 Schafer Street, Windhoek
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14	SolTec	SWH, Photovoltaic, SHS, Energy Efficient appliance	Heinrich steuber	Telephone no: 061 235646, Fax no: 061 250460, 51 Marconi Str, South Industrial, Windhoek
15	Solar Plus Renewable. E	SWH, Photovoltaic, SHS, Energy Efficient Appliances, gas stoves, solar freezer	Leonard S. Sakaria	Cell: 0812809497, Fax: 065-260038, Onekwaya East, Ohangwena- Main Road, P. O. Box 449, Ohangwena.
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19	FLA Trading cc	Photovoltaics, SHS, EE appliances	Lucky Namupolo	Tel: 061 222092 Cell: 0811290045 or 0811240882; P.O. Box 11554 Windhoek
20	SkyPower Namibia cc	All listed products, plus fridges and wind except stoves.	Chris King	Tel: 064-209952, cell: 0812720508, Fax: 064-209952, P.O.Box 1861 Walvis Bay.
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KEY
 SWH Solar Water Heaters
 SHS Solar Home Systems
 PVP Photovoltaic Water pumping



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