WattsOn

Newsletter of NamPower - Leading Energy Company in Namibia

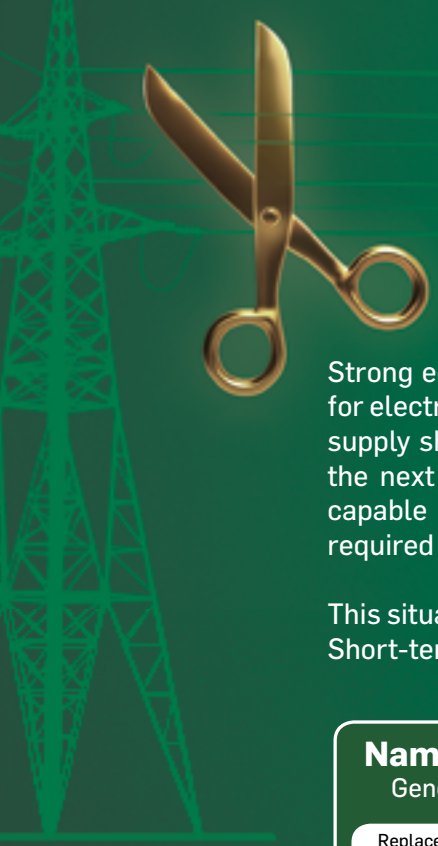
1st Edition 2014

IN THIS ISSUE

Enquiries, email: MarketingCorpComm@nampower.com.na
Production: NamPower Corporate Communication Section
NamPower, PO Box 2864 Windhoek

NamPower

Powering the Nation and beyond



THE POWER OF KNOWING

OUR SHORT-TERM CRITICAL SUPPLY INITIATIVES

Strong economic growth and development in our country has resulted in an increased demand for electricity. Due to the increased demand for electricity locally, and the trend of regional power supply shortages, it is anticipated that Namibia will experience severe supply shortages during the next 5 years, until the commissioning of a base-load power station by 2018/9 (a station capable of operating 24 hours a day and which only shuts down when routine maintenance is required or due to unforeseen circumstances).

This situation has prompted NamPower to implement various solutions, as listed below, under its Short-term Critical Supply Project to address the shortage of electricity.

NamPower
Generation

- Replace runners on Unit 1,2,3 – Ruacana Hydro Power Station
- Refurbish Van Eck Thermal Power Station
- Install Emergency Diesel Generators (Under consideration)

Consumers
DSM

- Energy Savings Initiatives
- ToU Tariffs
- One-million LED (1mLED) Campaign
- Twenty-thousand Solar Water Heater (20kSWH) Campaign
- Virtual Power Station (VPS) Campaign
- Demand Reduction (DR) Campaign

IPP
Renewable Energy

- PPAs with Wind Projects
- PPAs with Solar Projects

SAPP
Imports

- Extend current import PPAs
- Negotiate new import PPAs
- Negotiate import PPAs with regional IPPs

ABBREVIATIONS

- **SAPP** – Southern Africa Power Pool
- **IPP** – Independent Power Producer
- **DSM** – Demand Side Management
- **PPA** – Power Purchase Agreement
- **ToU** – Time of Use

NamPower
Powering the Nation and beyond

Balancing Demand and Supply of Energy

With the drive for Namibia to become an industrialised country by the year 2030, NamPower as the national power utility has a major role to play, that of ensuring reliable and sufficient energy supply at all times. This is no easy task considering the challenges facing the local electricity supply industry which includes:

- Over-reliance on imports, averaging 60 percent per annum
- Seasonality of Ruacana Power Station
- The unavailability of Van Eck Power Station due to ongoing rehabilitation works
- Vulnerability of the current demand/supply balance within the SAPP region
- Expiry of current Power Purchase Agreements with neighbouring power utilities

However, despite these challenges NamPower has put in place various short, medium and long term projects to ensure security of supply. The Managing Director of NamPower remains confident that:

"Despite all these and many other challenges we want to reassure our stakeholders that we shall continue to work day and night to ensure that we continue to deliver on our national mandate of powering the nation and beyond at all times."

In terms of demand, a new hourly System Maximum Demand record of 553.555 MW was registered in June this year compared to 485.000 MW in June last year, which clearly shows that the demand for energy in Namibia continues to grow steadily.

Many towns throughout Namibia have reached their installed transformer capacities with many more showing indications that they will reach their capacities soon as well. Thus, in support of socio-economic development, it is essential that NamPower meets the need for additional energy. The highest growth is experienced in the Northern areas (5-6%) compared to the rest of the country which shows an annual average growth of 3 – 4 percent.

To meet the increasing demand for power, NamPower will spend millions of dollars annually to upgrade its transmission network as well as upgrade the transformers at various towns. The cost will run into N$1 billion per annum over the next 4 -5 years.

Demand for energy is a positive indication of improving living standards, industrialization, light industrial, commercial and residential developments as well as rural electrification of areas previously not supplied.

Van Eck Rehabilitation in progress

The Van Eck Power Station has been out of service since 2012 for rehabilitation to extend its life span by 10 years. This will result in a much more reliable power station, meeting its original design output of 120MW and a guaranteed base-load output of at least 90MW. The project will cost approximately N$330 million.

The NamPower staff working at Van Eck

Replacement of Turbine Runners at Ruacana Hydro Power Station commences

The installation of the first Turbine runner at Ruacana Hydro Power Station commenced mid June.

The runner upgrade project is part of NamPower's Short-term Critical Supply (STCS) project, which includes various initiatives to address the critical shortage of power in the short term.

Local generation capacity will increase by maximising available capacity through upgrade and rehabilitation of existing generating stations.

Unit1 generator with rotor removed.

NamPower is replacing the Turbine runners' Penstock Inlet Valve (PIV) Hydraulic Oil Unit and other major parts of the generation units as well as refurbishing turbine components on Unit 1, 2 &3 at a cost of N$ 95 million.

The Turbine runner replacement is being carried out by NamPower staff under supervision by an Andritz Hydro installation engineer to ensure the quality of work. The new runners will have low vibrations, improved efficiency and will increase the maximum output by 5 MW for each unit. This and other upgrades will see the power station generation output increase from the current 332 MW to 347 MW. The improved efficiency will especially have a significant impact during the dry season as the units will be able to maximise power generation from the reduced river flow.

It is envisaged that the upgrade of the first two runners will be completed during the course of 2014 with each unit taking approximately 3 months. The last unit will be completed during the 2015 dry season to allow the power station to generate at full output during rainy season.

NamPower imports approximately 200 MW to satisfy system demand with Ruacana PS operating at full capacity of 332 MW.

One of the new Turbine Runners to be installed at Ruacana Hydro Power Station.

Usib 26 kWp Concentrator Photovoltaic Demonstration Plant Inaugurated

The Usib (26 kWp) Concentrator Photovoltaic Plant.

The Usib concentrator photovoltaic (CPV) demonstration plant, located near Rehoboth, 80 km south of Windhoek, was officially inaugurated on 9 June.The 26 kWp CPV plant, which consists of 2 CPV systems, resulted from a cooperative agreement between the French company Soitec, one of the world's leading manufacturers of CPV modules, and NamPower. The plant generates solar electricity which powers the Usib Primary School and hostel as well as a water pump which irrigates a community garden.

Under the terms of the cooperative agreement, NamPower identified the site for the plant and liaised with the relevant stakeholders for its use. Soitec then constructed the plant and currently operates it. The plant will be transferred to NamPower for operation and maintenance from July 2015.

In the keynote address of the Minister of Mines and Energy, Isak Katali read on his behalf by the Director of Energy, Selma-Penna Utonih at the inauguration, the minister noted that the project is a concrete example of "renewable energy in practice".

"It is clear through projects such as this that plenty of opportunities exist for small-scale renewable energy projects. Namibia has a huge potential of renewable energy resources, with a direct solar radiation of about 3000kWh/square meters per annum in some areas of Namibia being one of the best in the world, and thus offering opportunities for households not connected to the national electricity grid."

He further stated that the Government was committed to "supporting renewable energy technologies to complement conventional energy sources. Independent Power Producers (IPP) in solar, wind and biomass are thus strongly encouraged to invest in renewable energy projects such as this one."

At the event, José Bériot, Vice President of European and African Solar Projects Development with Soitec's Solar Energy Division, commented that: "Our CPV technology is perfectly suited for countries like Namibia, where there is a high direct normal irradiance. In such regions, our technology – which is already installed in more than 20 countries – achieves a module efficiency of 32 percent."

He added that "since the plant was connected to the grid in July 2013, it is producing an average of 136 kWh per day, reducing the amount of electricity consumed from the grid by the Usib Primary School and the community to merely 4.6 kWh per day. We are very proud of this project, as it perfectly illustrates how our CPV technology contributes to social and economic development in Africa, to which Soitec is strongly committed".

The Managing Director of NamPower, Paulinus Shilamba highlighted the fact that NamPower has done a lot in the past few years in terms of promoting the use of renewable energy sources. He noted that the company will continue to do so to make sure that the share of renewable energy resources in the Namibian energy mix is increased to optimal levels.

He referred to the Usib 26kW CPV Plant as "an ideal blueprint as it provides the necessary technological framework and conditions for the successful transfer and deployment of this specific renewable energy technology for on-grid power generation. It is also a good example of how the energy sector can make a meaningful contribution to socio-economic development in the country through the utilization of energy from the sun; a natural resource Namibia is blessed with in abundance".

Director of Energy in the Ministry of Mines and Energy, Selma-Penna Utonih.

Netmetering Connections explained

There has recently been much debate about "Netmetering" connections, including an initiative by the Electricity Control Board (ECB) to regulate such connections. Netmetering is defined as "owner produced excess energy, offset against imported energy from the grid".

NamPower eagerly awaits the rules to be issued by the ECB and for them to be seamless and equitable across Namibia. NamPower's view is towards uniformity in the industry.

As an interim measure, NamPower will allow customers to connect a Photovoltaic (Solar PV) roof-top system on a first-come, first-served basis until 15% of the Maximum Demand of the main feeder line serving a specific group of customers is reached. On the Customer side, the connected system must not be greater than 80% of their contracted breaker size. Primarily for the safety of our staff and network, NamPower customers must notify NamPower in writing of their intention to connect such a system so that NamPower can inspect the existing grid connection prior to the addition of the PV system. NamPower will then advise the customer in writing of the next steps to be followed including any costs involved and meter changes required.

Once effected, the ECB's Net-metering Policy will take precedence over these interim arrangements and customers will have to pay for any modifications required by the ECB.
Visit http://www.ecb.org.na/pdf/NET_METERING_Draft_RULES_V5.pdf for further information.

Please note that: "roof-top solar PV" systems will be allowed until the ECB has established and promulgated a net-metering policy for Namibia. NamPower will not compensate customers for any energy exported (fed-back) to the NamPower network at this stage.

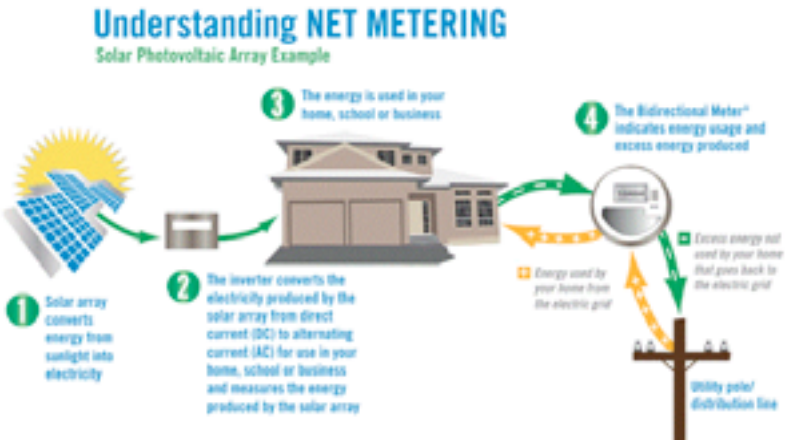


illustration by : http://certifiedsolar.net/solar-panels/

Extending Power to Rural Communities

NamPower has thus far spent over N$37million on rural electrification during the current financial year (2013 – 2014). Twelve regions, apart from Otjozondjupa and Erongo regions, have thus far benefited from the programme. This has significantly contributed to improving the livelihood of the rural communities that have benefited from the project.

Rural areas that benefit from the project are those that have infrastructure such as police stations, schools and health services in place. Once these facilities are electrified, this service is then extended to businesses and homesteads within 500m radius from the transformer.

Community members have to however apply for connection with the distribution authority in their area. The rural electrification programme of NamPower is run inline with the Ministry of Mines and Energy's Rural Electricity Distribution Master Plan for Namibia which ultimately aims to provide sustainable energy for all.

For the financial year 2014/15 the ministry has increased the rural electrification budget from approximately N$45 million during the 2012/13 financial year to N$60 million. To date, approximately 30% of rural Namibia has access to electricity.

Media visits Ruacana Hydro Power Station

Journalists from different media houses at the top of the Headbay at Ruacana Hydro Power Station.

NamPower recently invited journalists from different media houses for a one-day trip to Ruacana Hydro Power Station. The purpose of the trip was to familiarise the media to NamPower's main source of electricity generation and to give them a better understanding of the operations of the power station. The trip was further aimed at strengthening NamPower's relationship with the media.

For many of the journalists, it was the first time to have had the opportunity of visiting the power station. The tour included a visit to the Angolan side of the power station's operations and the catchment dam, and a tour of the entire power station which includes the unit hall, control room and the generator hall.

From there the journalists climbed the 50-plus stairs to get to the top of the head bay, from where they could see the Ruacana falls as well as the transformer yard and transmission substation.

Unfortunately the media didn't get to see water cascading over the Ruacana falls at the time of their visit (in mid-May), as the Kunene river flow was too low: at 254 cubic liters per second and the flap gates were closed for water to be used by the power station. However about a month before the media visited the power station, all four turbines were generating power at full capacity (combined 332 MW) as the river flow was strong due to the late rains in the upper Kunene catchment area.As part of a project being undertaken to replace all the turbine runners at the power station at a cost of approximately N$55 million, the media was fortunate to see the first new runner on site that will be installed in one of the three turbines soon.

The newly designed runners will improve the current turbine efficiency levels from 81 to 94 percent and increase the maximum output with 15 MW from the current 322 MW to 347 MW. The Ruacana Hydro Power Station's operations has a direct impact on the average cost of energy supply to Namibia, and the more NamPower is able to generate from this plant the better for Namibia.

Ben Mingeli, Ruacana Hydro Power Station manager explains the operations of the power station to journalists.

Journalists posing in front of one of the new Turbine Runners.

NamPower supports "School Bag Project"

NamPower recently donated 100 school bags and water bottles to the Christina Swart-Opperman Aids Orphan Foundation Trust.

The donation valued at N$11 000,00 was in support of the AIDS Orphans Foundation Trust's "School Bag Project", an initiative started in 2013, aimed at providing orphans and vulnerable children from disadvantaged communities with a school bag that they would not otherwise have been able to afford.

The founder of the Christina Swart-Opperman Aids Orphan Foundation Trust expressed her deep appreciation to NamPower and all other business partners and individuals who committed their time and money to the "School Bag" Project.

The project directly benefited learners of Olof Palme Primary School in Greenwell Matongo in Katutura, who were all overjoyed at receiving the school bags and water bottles.

"The success of this project must be credited to our business partners and all the other helping hands whose tireless engagement made such progress possible," said Dr Christina Swart-Opperman the founder of the Trust.

NamPower is indeed proud to be part of this worthwhile initiative and will continue to support the education sector which is at the core of moulding our youth to become our future leaders. It is thus important that children from a young age receive all the help that they need, to sufficiently prepare them to face the future with confidence and pride.

THE POWER OF KNOWING

There is a thin line between what you use and what we are able to supply.

Energy saving tips

Air Conditioner:

- Clean and inspect your air conditioner filters regularly.
- Only cool or heat rooms that are occupied.

Geyser:

- A geyser accounts for up to 40% of your electricity bill.
- Ensure that the thermostat is set to no more than 55 Degrees Celsius.

Kettle:

- Only boil the amount of water that you need.
- Keep the kettle's element clean by boiling vinegar to remove lime scale build up.

Light Bulbs:

- Replace conventional bulbs with Compact Flourescent Light (CFL) or
- Light-Emitting Diode (LED) light bulbs where possible. These light bulbs provide the same amount of light while using much less electricity and they last longer.
- Always switch off lights when leaving a room.

Stove:

- Never use the stove or hot plate as a heater.
- The size of the pot should match the size of the stove plate.
- Rather use a pressure cooker when preparing food that normally takes a long time to cook.

Let's work together and use electricity sparingly.

NamPower

Powering the Nation and beyond

For more information visit our website at www.nampower.com.na or call us at Tel: +264 61 205 4111

Sociable weaver and transmission lines

Looking at the Sociable Weaver, it is difficult to imagine how such a small and dainty bird can be the cause of power line outages in southern Africa. However, when studying the breeding and nestling behavior of the species, it becomes apparent how their behavior infact can and often does, cause power outages.

Photo: Thomas Schoch

The Sociable Weaver is a colonial breeding species that naturally builds communal nests on trees such as the camel thorn, shepherd's and quiver tree. Its nests can reach up to 1.5 meters high, 3.6 meters wide and 7.5 meters long, with up to 400 nest chambers per nest.

In particular, transmission lines, poles and pylons provide structural support and offer many other advantages over natural structures; they are more stable, more difficult for predators to reach and easier to access than the leaves and branches of trees.

This nestling behavior and the accumulation of excrement and/or nesting material, inevitably results in the short circuiting of transmission lines. This is understandably cause for concern, as any power outage compromises the stability of transmission lines and can lead to great economic loss and poor service delivery to industry, business and consumers in the country.

In Namibia, data in power distribution failure caused by birds nests dates back to 1983, although biography indicates that nesting on utility structures in the region has been an issue for more than 100 years.

Experience showed that nests have to be removed at least twice a week since the sociable weaver would reconstruct the nest back to its exact spot in less than 3 days.

In a study by Julia Amukwa in 2012 (University of Pretoria), some possible mitigation measures were identified to prevent the Social Weaver from making nests on power lines. These include:

- Using Dummy snakes as a deterrent, as no other enemy of the Sociable Weaver is found more influential in the bird's nesting behaviours than snakes.
- Providing artificial trees and fake poles/pylons as an alternative support structure. This may reduce nesting on electrical poles and pylons.
- Relocating of nests away from distribution wires where they may pose a threat to power distribution, to less sensitive parts of the poles/pylons.

- Anti-nesting devices such as the T-shaped, crossed and parallel designs on cat-head type pylons.

- Reflective features (or Laser beam technology) which includes any device with an intense sunlight reflective surface (a nuisance to the birds) that is small enough to be fitted on and/or around electrical structures as anti-perching devices. These can be made at home or from recycled materials and are probably the cheapest option. Good examples would be CDs, cans and aluminium foil.

Photo: Luderitz Photo diary

- Bird control chemicals such as 4-nitropyridine-N-oxide (Avitrol 100) or 4-aminopyridine (Avitrol 200), Methiocarb, Fenthion and Methyl anthranilate (MA). Although some of these chemicals were proved to be naturally occurring and/or non-toxic, all chemicals shall be used with caution.

- Other (least recommended) measures include: bird deterrent fog/haze devices; netting; sticky gums or jells; and ultrasonic devices

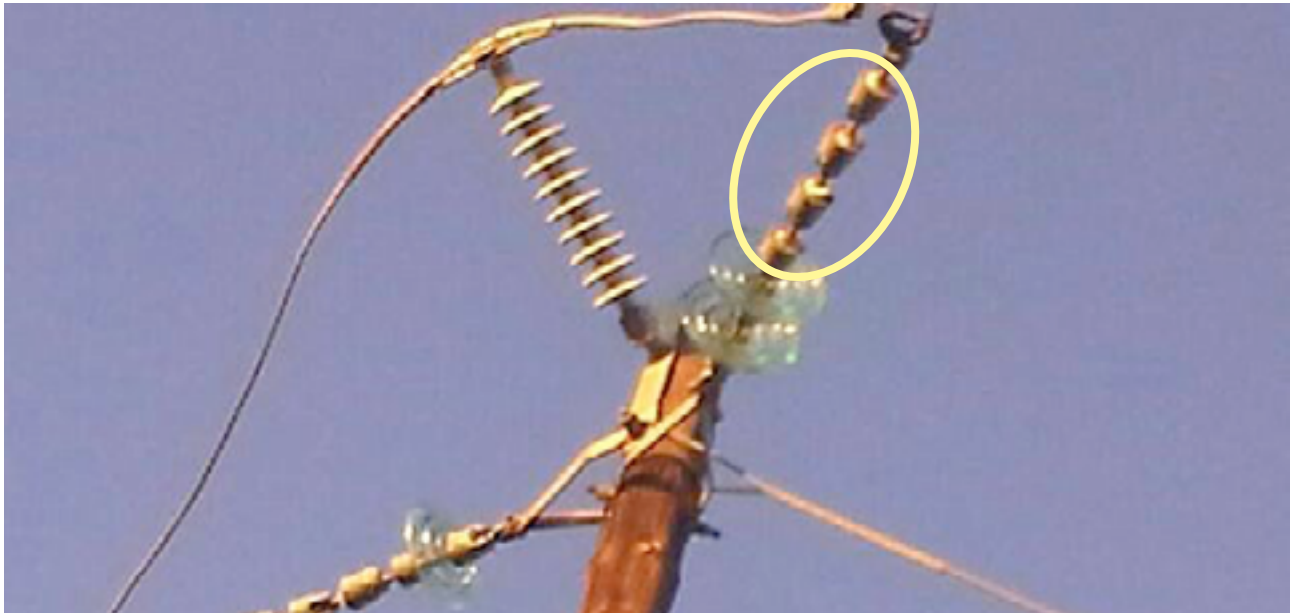
The study further concluded that the best way to prevent the Sociable Weaver and other birds from building nests on transmission lines, poles and pylons is through adopting a synergistic approach, using several methods collectively to achieve better success.

Currently, a project testing the effectiveness of some preventative measures, such as dummy poles and dummy trees is being tested in Namibia. The project was initiated by NamPower in partnership with the Namibia Nature Foundation (NNF), as a means of reducing power outages.

The results of a pilot study completed on nested power line poles earlier this year indicated high site fidelity of the species: colonies repeatedly rebuilt their nests on the same pole even after continuous removal of their nests twice a week for six weeks.

The entire study, which also includes cost estimates of mitigation methods, is expected to be completed by the end of the year in order to find the most efficient and cost effective solutions.

Vandalism a threat to power supply



Encircled: missing glass insulators.

Vandalism is a matter of extreme concern and while NamPower has attempted through various means to educate the population about protecting the national grid and the dangers of tampering with transmission lines, it appears that these efforts need to be reinforced.

The town of Opuwo and surrounding areas was left in the dark during the month May as a result of vandalism. The Opuwo 66kV line runs through very mountainous terrain which made finding the fault along the length of the line (110 km) extremely difficult, time consuming and very costly.

However, the NamPower maintenance team eventually discovered that the cause of the power interruption was due to the vandalism of 47 glass insulators, 30 of which were found to be damaged at Otjipahuriro and 17 at Omahukuzeva. After all the insulators were replaced, the line was energised.

“NamPower is seeking the support of all community leaders and educators to assist NamPower in preventing such occurrences from happening in the future,” says the Managing Director, Paulinus Shilamba.

The two parallel transmission lines between Arandis and Usakos explained

These 220kV parallel lines do not really connect the towns of Arandis and Usakos directly per se, but forms part of the West Coast strengthening project connecting Omburu substation, Khan Substation, Rossing substation, new Lithops substation, Walmund and Kuiseb with a parallel 220kV link in addition to the existing 220kV infrastructure. This is to cater for load growth in addition to the existing load at the West Coast and is mainly triggered by the Husab mining development and Walvis Bay supply upgrade to 80MVA.

THE POWER OF KNOWING

There is a thin line between what you use and what we are able to supply.

Use less electricity during peak times

6 - 9 AM

6 - 9 PM

Please avoid using washing machines, dishwashers, pool pumps, irons, air conditioners and all other appliances you do not need to use during these times.

Let's work together and use electricity sparingly.

Let's work together and use electricity sparingly.

NamPower