

ROUTE EVALUATION AND ENVIRONMENTAL IMPACT ASSESSMENT
PROPOSED 132kV POWER TRANSMISSION LINE
FROM KEETMANSHOOP TO LÜDERITZ
BACKGROUND INFORMATION

This document:

- Provides a brief background and rationale of the proposed Keetmanshoop to Lüderitz power line
- Lists the objectives of and approach to this study
- Invites stakeholders and interested and affected parties to provide input.

Why does NamPower need to build a new power line?

At present, Lüderitz and Elizabeth Bay presently have a combined electricity demand of 13 MVA. Namdeb has expanded its mining activities and processes at Elizabeth Bay, requiring a significant increase in electricity demand. Taking into account the growth in demand at Lüderitz (4% per annum) and Elizabeth Bay, the demand forecast for the next 10 years is for the Lüderitz area is 24 MVA.

The current supply to the Lüderitz and Elizabeth Bay area is through a 132kV wood pole transmission line running from the Kokerboom Transmission station close to Keetmanshoop to the Namib Transmission station close to Lüderitz. The maximum capacity of this existing line is 20MVA. The line has been designed and built optimally, thereby eliminating any possibility of upgrading the line.

Due to the radial nature of the Namibian transmission network, the existing supply to Lüderitz is extremely vulnerable and prone to outages. Further, the arid conditions of the area where the line is located, lightning severely effects the area around it with resultant power failures and outages to all the towns west of Keetmanshoop. This has some serious consequences for all the “round-the-clock” industries, especially in Lüderitz and Elizabeth Bay.

Therefore, due to expected growth in electricity demand in Lüderitz and Elizabeth Bay and the power failure and outages along the existing 132

kV line, NamPower has to add an additional 132 kV line between Lüderitz and Keetmanshoop.

What type of structures will be used?

The photo below shows an example of the proposed structures.

The power line will carry cables (conductors) on 23m high steel monopole structures. These structures can be erected fast and with ease, thereby limiting the impact on the environment during the construction phase.

The line will further have the following characteristics:

- Twin Waxwing conductor
- Silicon post insulators
- Optical fibre shielding wire (OPGW)
- Corrosion protection measures for the last 47km will include twin copper conductor, painted steel poles, and pasted and taped conductor clamps.



Why NamPower prefers this new line over other options

The table overleaf provides a summary of the advantages and disadvantages of some alternatives NamPower considered to supply

the increased power demand to Lüderitz, and the rationale for the preferred option.

Alternatives Considered	Advantages/Drawbacks
<i>Alternative energy</i>	
<i>Wind Park at Lüderitz</i>	<ul style="list-style-type: none"> • Subject to seasonal and daily fluctuations • Need sufficient stand-by supply for no-wind conditions • Wind energy only good for top-up applications, not suitable for dependent base-load application • Very high capital cost, electricity unit price will be too high if the project is not sponsored • Technology does not exist to store AC power on large scale • Not considered to be a viable alternative
<i>Solar energy</i>	<ul style="list-style-type: none"> • Technology does not exist for feasible large scale power generation
<i>Diesel generators</i>	<ul style="list-style-type: none"> • Diesel power costs 5 times more than conventional electricity
<i>Additional lines</i>	
<i>132kV from Obib to Lüderitz</i>	<ul style="list-style-type: none"> • Requires expensive 132kV extensions at Obib Transmission station (located close to Rosh Pinah) • New line will run mostly in Sperrgebiet • Technically not possible to run 2 x 132kV lines in parallel due to 400kV link between Kokerboom and Obib
<i>220kV from Kokerboom to Lüderitz</i>	<ul style="list-style-type: none"> • Will have 2.8 times the capacity of 132kV line, but also at ±3 times the cost of a 132kV line, not economically feasible • Requires expensive extensions to the Namib Transmission station • More environmental impact than 132kV line • Not considered to be an optimum solution
<i>132kV from Kokerboom to Lüderitz</i>	<ul style="list-style-type: none"> • Economically the most feasible option • Slim tower with low visual and least environmental impact • Existing 132kV capacity at Kokerboom and

<i>Lüderitz</i>	<p>Namib requires minimum modification</p> <ul style="list-style-type: none"> • The additional line will improve reliability of supply in the area • Additional line will compliment the technical feasibility of the wind park at Lüderitz
-----------------	---

Can the line go underground?

The option of supplying the electricity with underground cable is not feasible due to extremely high costs of HV cables on 132kV as well as the very high level of electrical compensation required with cables over this distance.

Will power supply from the line be possible?

The option of tapping power from the existing and new 132 kV lines are extremely expensive and not feasible. Several areas between Keetmanshoop and Lüderitz have been electrified; therefore, the possibility of distribution lines in certain areas does exist. However, due to the relative size of farms and remoteness of villages the financial feasibility of commercial power supply in this area is very low. It is not envisaged in the current Distribution Master Plan that this area will be commercially electrified within the immediate future.

Where is the route located?

The new 132kV power line will run at a distance varying between 500m and 35m from the existing 132 kV power line between Keetmanshoop and Lüderitz. The 500m distance will be maintained as far as possible in order to avoid simultaneous line outages as a result of lightning strikes in close proximity to both lines. This will enhance the continuity of supply of the system overall. The line will begin at the Kokerboom substation near Keetmanshoop and end at the Namib substation near Lüderitz. NamPower would prefer to construct this new line next to the existing 132 kV line, so that the same access route can be used, and negative impacts can be limited to one corridor. In some cases the line deviates from this route, where there are physical constraints such as rugged terrain dictating a deviation. Adjustments may be made to this proposed route if it conflicts with environmentally sensitive areas.

The proposed route is shown on the locality map overleaf.

Aims of this Study

NamPower has appointed Enviro Dynamics to conduct a route evaluation and environmental impact assessment (EIA) study to:

- comply with Namibia's Environmental Assessment Policy;
- evaluate the route in terms of its potential impacts on the natural and socio-economic environments, while considering technical and economic constraints, and to propose alternatives to the route where appropriate;
- identify possible negative and positive impacts that the line could have on the bio-physical and socio-economic environments;
- propose measures to enhance positive and minimise negative impacts on the environment; and
- compile an Environmental Management Plan that will stipulate what must be done by NamPower to minimize negative impacts and enhance positive ones during the construction and operational phases of the line.

Enviro Dynamics will consult with all the people who are interested in or likely to be affected by the proposed project, so that we have a clear idea of their concerns. In addition to Interested and Affected Parties helping to identify the issues that must be addressed during the evaluation of the route during the EIA, we encourage people to suggest practical measures that can be used to minimise unwanted impacts. Public consultation is a very important part of the EIA process and it is therefore strongly encouraged.

Broad issues and concerns identified to date include:

- Land needed on commercial farms and resulting effects
- The need for two powerlines parallel to each other (existing and new line)
- Visual impact and resulting effects on tourism.
- Loss of vegetation and habitat, and resulting loss of biodiversity.

- Bird strikes and electrocution of birds
- General environmental degradation during construction
- Degradation of important archaeological sites
- Health, safety and technical hazards

How you can become involved

You can be part of this EIA by attending the public meetings as advertised. In addition, you can access information about this project by visiting NamPower's website, www.NamPower.com.na or by emailing us at any time during the EIA process. Please bear in mind that the study will end on 31 May 2004 so it is important that you become involved as early as possible.

**For more information, please contact:
Ms Stephanie van Zyl, Tel 061 223336, Fax 061 240309, E-mail
envirod@africaonline.com.na**



