



PROJECT FACT SHEET

ROSH PINAH WIND POWER PLANT

This page is left blank intentionally

Introduction and Background

In 2018, Namibia Power Corporation (Pty) Limited (NamPower) crafted its new [Corporate and Strategic Business Plan](#) for the period 2019-2023. In-line with the new corporate strategy and business plan, the NamPower Board of Directors approved the implementation of new generation projects in June 2018 under the “Strategic Pillar, Ensuring Security of Supply”.

These projects were later considered by the Minister of Mines and Energy and a determination was made in October 2018 by the Minister that 220 MW of Power Generation should be developed where:

- 150 MW would be allocated to NamPower;
- 70 MW would be allocated on a competitive procurement basis as per current government procurement laws to IPPs for implementation.

At a Board Meeting on 08 November 2018, the NamPower Board ratified the implementation of the following projects as part of NamPower’s 150 MW allocation.

- 20 MW PV Power Project;
- 40 MW Wind Power Project;
- 40 MW Biomass Power Project; and
- 50 MW Firm Power Project.

NamPower is thus advancing the development of its proposed 40 MW Wind Power Plant near Rosh Pinah. The proposed power plant will be developed as an Engineering Procurement and Construction (EPC) project where the majority of the costs for the project will be funded from NamPower’s balance sheet.

NamPower is committed to supporting and achieving the government objectives as set-out in the national planning policies, and in particular the Harambee Prosperity Plan (HPP) II, the [National Integrated Resource Plan \(NIRP\)](#) and the [5th National Development Plan \(NDP5\)](#).

Considering Namibia’s ideal conditions for wind power plants at certain coastal and inland areas, coupled with the objectives set out in NIRP and NamPower’s strategic roadmap to expand the penetration of renewables within the energy mix; wind power plants are considered ideal for providing energy at competitive tariffs in Namibia.

Project Objectives and Rationale

The objectives of the 40 MW Rosh Pinah Wind Project, herein after referred to as the “Project” are to:

- Reduce the overall NamPower tariff to the end-customer by introducing the most affordable “new-build” renewable energy to the Namibian grid;
- Support renewable commitments prescribed in the Renewable Energy Policy and National Energy Policy as well as Pillar 4 of the HPP II; and
- Provide complementary renewable energy outside of the typical solar PV dispatch profile.

SWOT Analysis

The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for the RPWP is summarised in Figure 1.

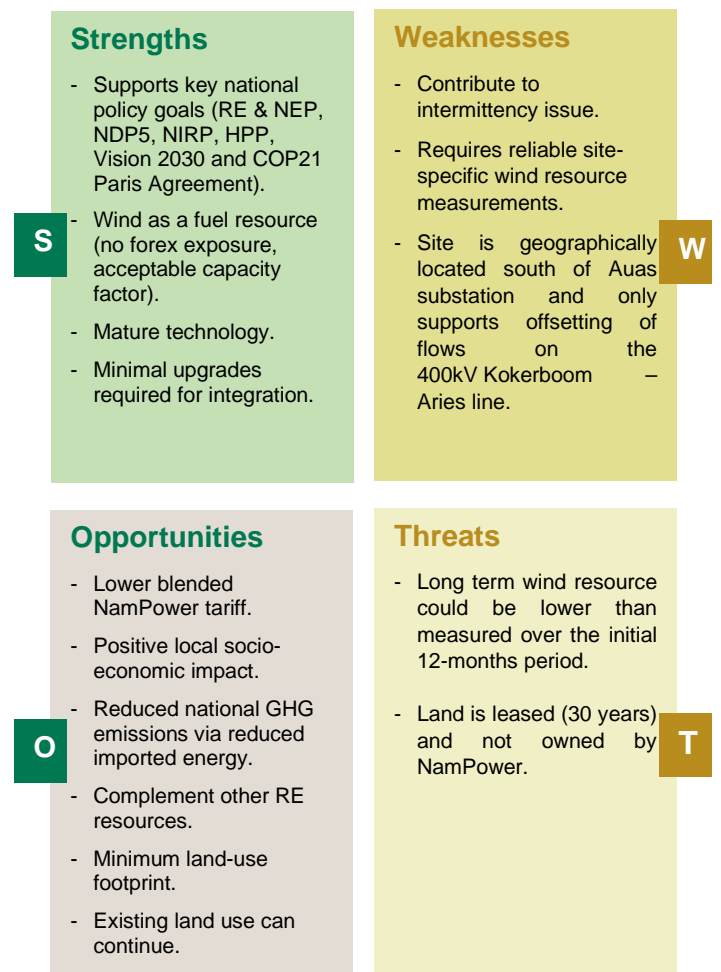


Figure 1: Project SWOT Analysis

Technical Description and Site Details

Following a thorough site selection, with stringent site evaluation criteria, the area on the north of Rosh Pinah and Skorpion Mine, West of the C13 tarred road to Aus was identified as an alternative site for the new 40 MW Rosh Pinah Wind Project development. The construction period of the Wind Power Plant from contract award to completion date is expected to be at least eighteen (≥18) months.

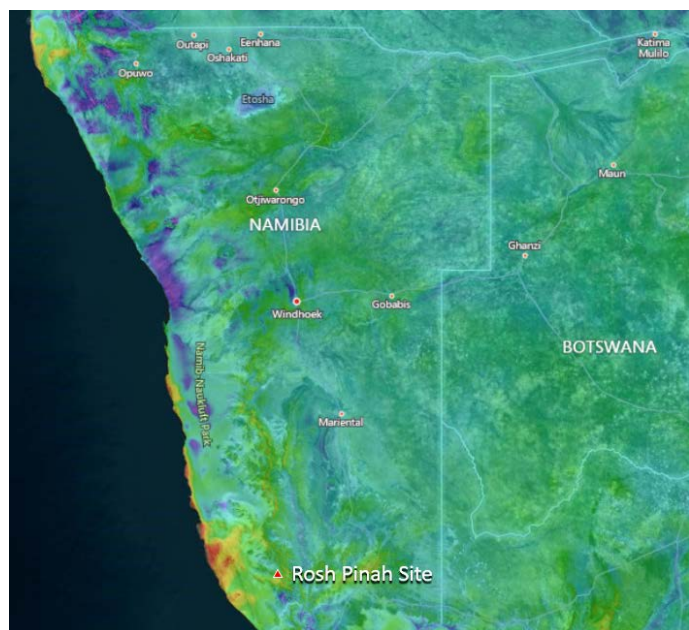


Figure 2: Wind Resource Map of Namibia at 100 m

Certain constraints do exist within the identified Project area (see Figure 3), namely environmental considerations. A micro-siting study was conducted to evaluate the terrain characteristics, land optimisation (site obstructions, soil and weather conditions), turbine placement, accessibility and transmission line routing.

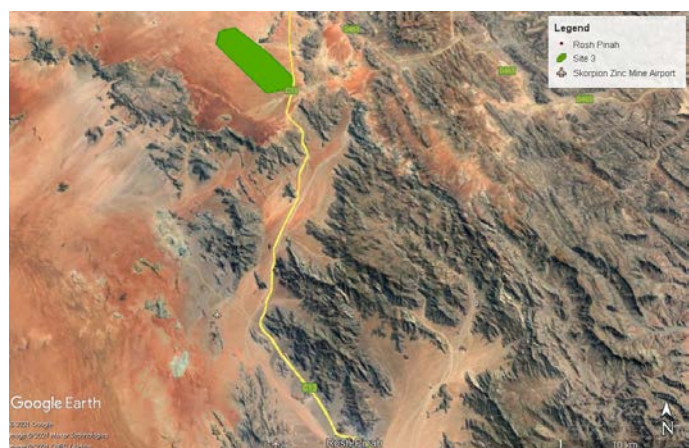


Figure 3: Proposed Project Site Location

The technical description and site details are listed below in Table 1.

Table 1: Location and Description

Location and Description	
Plant Capacity:	40 MW Maximum Export Capacity (MEC).
Location:	Located approximately 33 km North of the town of Rosh Pinah.
Coordinates:	27°40'26.34" S; 16°40'35.65"E
Wind Turbine generator Type:	Horizontal-axis wind turbine (HAWT) generator, up-wind turbines.
Power control:	Pitch & torque regulation, with variable speed.
Distance from nearest main road:	3 km

Wind Resource

Based on satellite data, the Rosh Pinah site presents a good inland wind resource in Namibia, with an annual mean wind speed of 7.23 m/s at 100 m above ground level and estimated (P75) energy production of 127,280 MWh (incl. all losses, availability and future degradation). The wind resource and site parameters of the preferred site are indicated in Figure 4 below.

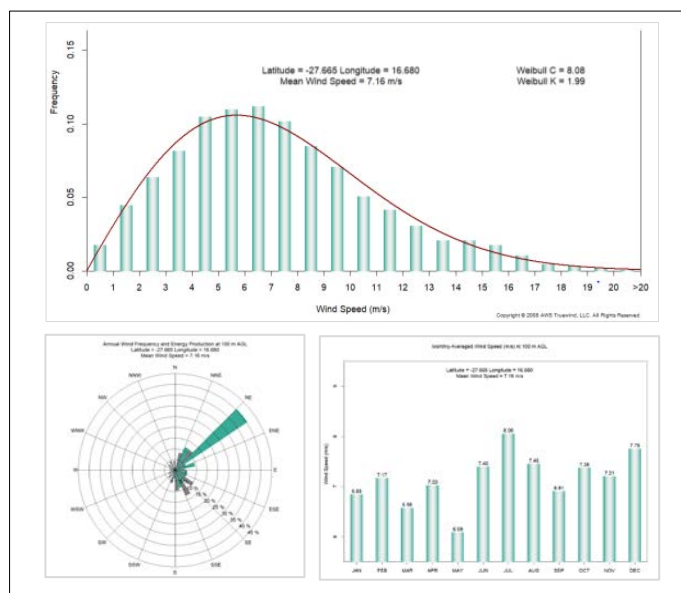


Figure 4: Project Site Wind Data and Site Parameters

Project Structure

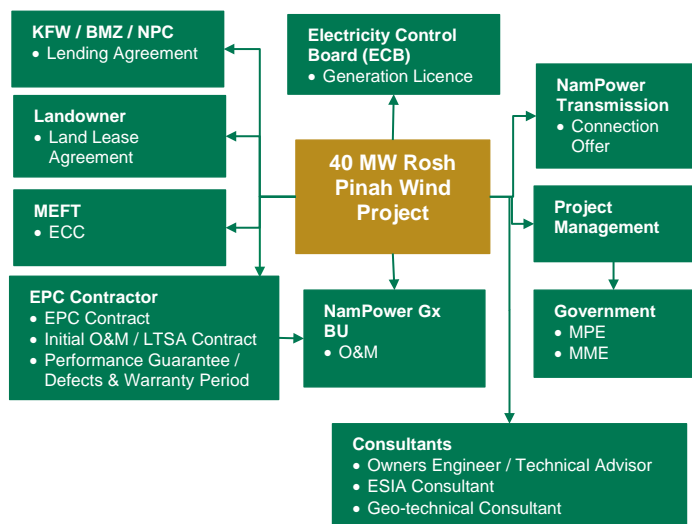


Figure 5: Project Structure

The intended project structure is depicted in Figure 5, indicating the key stakeholders involved.

The Rosh Pinah Wind Power Plant will be developed, owned and operated by NamPower, where NamPower will appoint an Engineering, Procurement and Construction (EPC) contractor to construct the power plant. Figure 5 provides the project structure which illustrates the key stakeholders and the following key agreements:

- Land Lease Agreement (LLA) – The proposed Project Site is situated on a private commercial farmland. NamPower has secured an Option to Lease Agreement with the Landowner for the Project development. A LLA will be exercised upon acquiring 12-months of wind data;
- Lending Agreement – NamPower has engaged KfW / BMZ, as the Preferred Lender, to finance ca. ±80% of the project cost through debt against NamPower's balance sheet to leverage its financial resources. A Lending Agreement will be entered into with the respective Funding Institution;
- Generation Licence – NamPower has applied for a generation licence from ECB to operate the proposed Rosh Pinah Wind Power Plant;
- Transmission Offer (TO) – NamPower Generation Capital Projects (GxCP) has secured and accepted a Transmission Connection Offer from NamPower's Transmission Business Unit for connection of the Rosh Pinah Wind Power Plant to the Namibian grid;
- Consultants – NamPower has procure consultants to assist in providing the following specialised

knowledge and expertise on the development and execution of the 40 MW RPWP:

- Technical Advisor and Owner's Engineer (TA / OE) will provide technical support and assistance in managing the EPC contract to NamPower;
- Environment Practitioner to compile the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) reports, and assist with obtaining the Environment Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT);
- Geotechnical Consultant to assess the geotechnical, hydrogeological and topographical conditions for the site in order to mitigate possible subsoil risk.
- EPC Contract – NamPower will procure an EPC Contractor to engineer, procure and construct the wind power plant through a transparent and open international competitive bidding process. The procurement of the EPC Contractor will follow the Public Procurement Act;
- LTSA – NamPower will enter into a Long-term Service Agreement (LTSA) with the Original Equipment Manufacturer (OEM) to conduct major maintenance and overhaul activities on main equipment.

Although the envisaged project structure for the Project relies on the Project being procured on NamPower's balance sheet, a Power Purchase Agreement (PPA) which is in-line with the newly anticipated Modified Single Buyer (MSB) market rules is required by Electricity Control Board (ECB).

Procurement Methodology

The procurement of an EPC Contractor for the Project will be completed within the provisions of the Namibian Public Procurement Act, No.15 of 2015. This procurement falls above NamPower's threshold; however, NamPower is fully exempted from Section 8 of the Act to procure above its threshold for the period of 2 (two) years, effective from 01 May 2021. Hence, the EPC procurement process will be administered by NamPower in-house in accordance with the Act.

The contract between NamPower and the successful bidder (preferred EPC Contractor) will be based on the FIDIC Conditions of Contract for EPC/Turnkey Projects (Silver Book), 2017 edition.

Procurement of the EPC is expected to be an open advertised, two stage bidding process where the first stage will entail pre-qualification of bidders and the second stage the final bidding process. The scope of the EPC Contractor will include the following:

- Design, manufacture, erection, testing and commissioning of a 40 MW Rosh Pinah Wind Power Plant;
- Provide full turnkey-wrap scope of services, including permitting, transportation, insurance, customs and duties, warranty cover and full service Operations and Maintenance (O&M) of the Project during the Defects Notification Period (DNP);
- Subcontract all possible local works/services to Namibian companies in order to achieve a minimum local content spend of 10% - 15% of the total EPC contract value; and
- Ensure that all unskilled and semi-skilled labour which are employed are Namibian citizens.

Plant Operation and Maintenance

The key parameters (at P75) for the Project are provided in Table 2 below. The wind turbine generators are expected to be Horizontal-Axis Wind Turbines (HAWTs) with the appropriate class for the wind conditions on site.

Table 2: Key Parameters

Description	Value	Unit
Export Capacity	40	MW
Annual Capacity Factor (based on export capacity)	36.32	%
Energy per year	127,280	MWh
Expected hub height	100-120	m

The EPC Contractor / OEM will operate and perform the operation and maintenance on the Rosh Pinah Wind Plant under an O&M Agreement during the DNP and overlapping O&M period.

The EPC Contractor will be responsible to achieve the annual performance guarantees and hence deploy requisite supervision and support services as required to meet the annual performance guarantees under the EPC Contract.

Local staff (Namibian citizens) will be trained by EPC Contractor personnel during construction, DNP and/or O&M period to ensure that the necessary knowledge has been transferred in order to enable NamPower to

perform the first line maintenance of the Wind Power Plant during the operation phase.

Environmental Considerations

The preservation of the biodiversity in the Project area and the protection of sensitive fauna (birds and bats) and flora are key considerations in addressing the environmental impacts of the Project. Through consultations with key stakeholders, specific Wind Project guidelines have been proposed to minimize the environmental impact of the Project.

Capital Budget

The majority of the Project costs will be financed via a concessional loan agreement with KfW. NamPower will fund approximately 20% of the Project costs from its balance sheet. NamPower's Financial Statements are reported in NamPower's Annual Report, (Investor Relations section of the NamPower website, www.nampower.com.na).

Value Proposition

The value proposition of the Project is demonstrated in the cost difference between the energy generated by the Project and the corresponding energy imported from Eskom (Figure 6), or alternatively compared to the NamPower ToU future price path, which includes CPI inflation increases. The NPV avoided cost of the Project at various discount rates (on USD exchange rate of 17 NAD) is summarised in Table 3 below.

Table 3: Project Value Proposition

Discount Rate	NPV of Eskom Avoided Cost (mil NAD)
8%	2 424.10
10%	1 867.12
12%	1 466.34
Discount Rate	NPV of NamPower ToU Avoided Cost (mil NAD)
8%	710.14
10%	503.84
12%	359.15

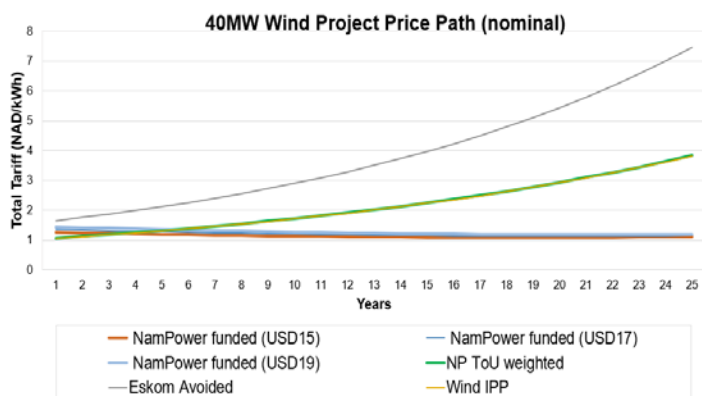


Figure 6: Expected Avoided Tariff

Risk Assessment

In 2018, NamPower conducted a risk assessment workshop with internal stakeholders to identify all the anticipated Project risks in terms of the risk category (i.e. environmental, commercial, legal and technical) and in terms of the project phase (i.e. procurement, construction and operation). The key risks identified during the development phase of the Project are listed as follows:

- Construction delays due to windy conditions;
- Site acquisition delays in an event that land cannot be secured at the preferred site location where the resource or Transmission evacuation capacity is optimal;
- Procurement delays due to COVID-19 global pandemic;
- Adverse exchange rate fluctuations; and
- Potential procurement delays by Development Finance Institutions due to differing procurement requirements and approval processes.

A risk assessment workshop will be held with the successful EPC Contractor to update the risk register for the construction and operation phases of the Project.

Project Schedule and Progress

Completed milestones of the Project are provided in Table 4 below.

Table 4: Project Completed Tasks

Completed Tasks	Completion Date
Procurement of a Contractor for Wind Resource Measurement (WRM) campaign.	11-July-19

Completed Tasks	Completion Date
Procurement of the TA / OE.	01-Nov-19
Complete micro-siting study.	22-Nov-19
Procurement of ESIA Consultant.	06-Feb-20
ESIA Screening Report.	29-Jun-20
Avifauna Screening / Scoping Report.	29-Jul-20
Wind Mast with Lidar System installation & commissioning (commencement of WRM campaign).	02-Feb-21
ESIA Specialist Studies (desktop and fieldworks).	12-May-21
Pre-construction Bird Monitoring Study.	18-June-21
Bat Monitoring Study commencement.	15-Sep-21
ESIA Scoping Report.	15-Sep-21
Public Engagement Meetings.	07-Oct-21
EPC Pre-qualification (Phase I) commencement.	25-Oct-21

The following next steps are required to bring the Project to its execution phase:

Table 5: Key Next Steps for the Project

Key Next Steps
Finalise wind resource measurement campaign.
Procure the Geotechnical and Hydrological Consultant to perform the required site surveys and studies.
Finalise the ESIA Specialist Studies, ESIA Report and ESMP.
Procurement of the EPC Contractor.

Project Key Milestones

The key milestones of the Project are summarised in Figure 7.

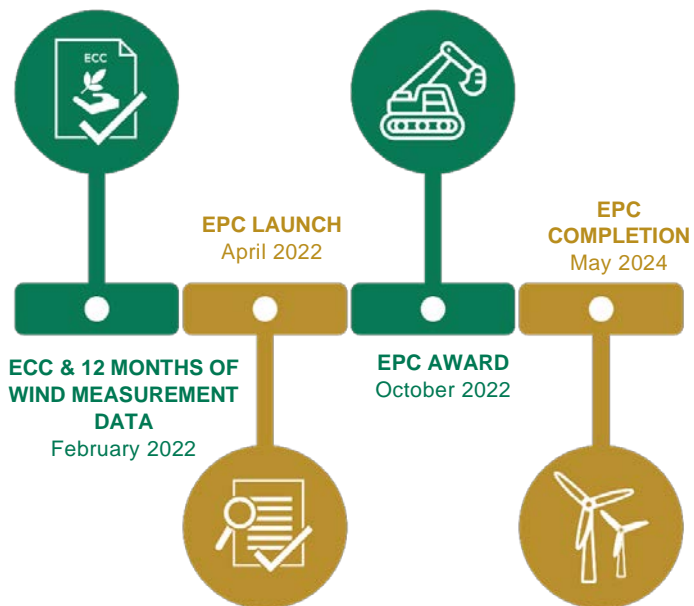


Figure 7: Project Development Timeline

Contact Details

Dr Grant Muller

Head – Generation Capital Projects

+264 (61) 205 2393

Grant.Muller@nampower.com.na

wind@nampower.com.na

Joe Mukena

Senior Manager: Strategic Finance and Treasury

Tel: +264 61 205 2752

Joe.Mukena@nampower.com.na

NamPower Centre, 15 Luther Street,

PO Box 2864, Windhoek, Namibia,

www.nampower.com.na