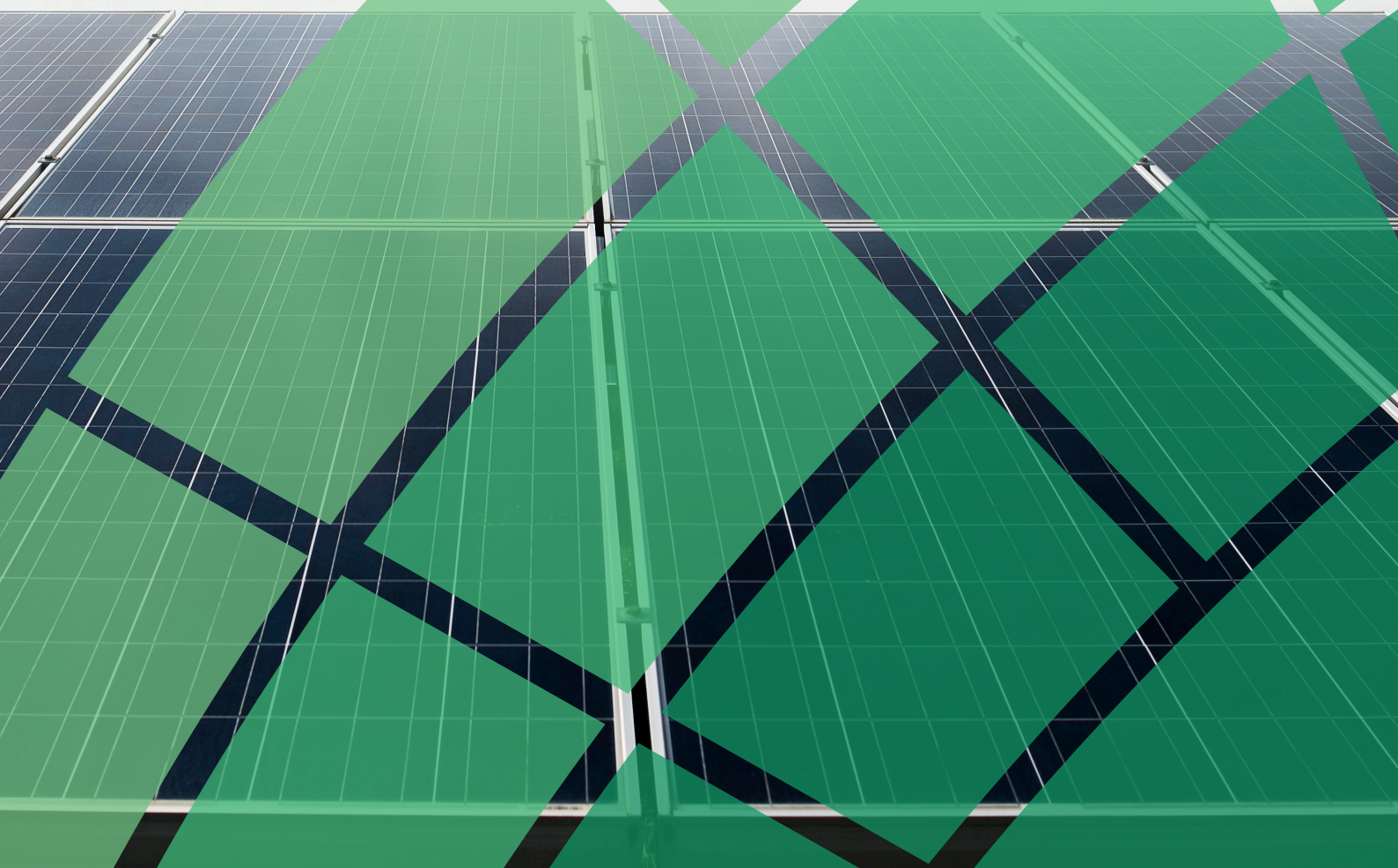




SOES | GAIB
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PROJECT FACT SHEET

**ROSH PINAH 100 MW
SOLAR PV PROJECT**







Introduction and Background

In 2018, Namibia Power Corporation (NamPower) crafted a new [Corporate and Strategic Business Plan](#) for the period 2019-2023. The NamPower Board of Directors subsequently approved the implementation of new power generation projects in June 2018 under the “Strategic Pillar, Ensuring Security of Supply.” A ministerial determination was made in October 2018 for the development of 220 MW power generation projects:

- 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.

The NamPower Board of Directors has ratified the implementation of the following projects, on 08 November 2018, as part of 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 had initially advanced with the developmental activities of the 40 MW Rosh Pinah Wind Project. However, following an unfavourable 18-month wind Energy Yield Assessment (EYA) and a marginal project viability re-evaluation, a change to PV technology was alternatively preferred for the immediate future, at the same site and with the initially approved project funds. The subsequent decision on change in technology was sanctioned and approved by the Minister of Mines and Energy on 16 November 2022, and NamPower has henceforth embarked on the development of the Rosh Pinah 70 MW Solar PV Project. In March 2024, NamPower received Board approval to increase the plant capacity from 70 MW to 100 MW, along with the additional funding required for the implementation of the additional 30 MW. This increase in capacity was also approved by the Minister of Mines and Energy as part of the Minister’s determination on 22 May 2024.

The proposed solar PV power plant will be developed as an Engineering Procurement and Construction (EPC) project. The solar PV power plant will be owned and operated by NamPower and funded from NamPower’s balance sheet.

NamPower is committed to achieving ambitious governmental objectives set-out in the national planning policies, notably the [National Integrated Resource Plan \(NIRP\)](#) and the [5th National Development Plan \(NDP5\)](#).

Considering the abundance and spatial distribution of the local solar resource and the need for increased penetration of renewables within the energy mix, PV power plants would conceivably provide competitive energy tariffs in Namibia.



Project Objectives and Rationale

The key objectives of the Rosh Pinah 100 MW PV Project, also hereinafter referred to as the "Project", are to:

- Reduce the overall NamPower tariff to the end-customer by introducing an affordable "newbuild" renewable energy to the Namibian grid
- Support the renewable energy commitments prescribed in the Renewable Energy Policy and National Energy Policy – targets for 70% by 2030
- Support ambitious commitments made at COP26 to reduce Namibia's emissions by 91% by 2026; and
- Reduce overreliance on imported energy as per the National Development Plan 5 and Harambee Prosperity Plan II.

SWOT Analysis

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

S	Strengths <ul style="list-style-type: none"> • Supports key national goals (NIRP, NDP5) • Renewable fuel sources (no forex exposure) • Mature technology
W	Weaknesses <ul style="list-style-type: none"> • High intermittency • High supply-demand mismatch in winter and evening peaks
O	Opportunities <ul style="list-style-type: none"> • Viable funding requirements (relative low CAPEX) • Lower blended NamPower tariff • Local socio-economic impact • Future addition of battery energy storage system

Threats

- Exacerbated "duck-curve" phenomenon induced by the Modified Single Buyer Model (MSBM)

Figure 1: Project SWOT Analysis

Technical Description and Site Details

Although the superb solar resource is localised in western regions, the local solar resource is generally abundant and spatially distributed. Hence, the Project Site, located further south near Rosh Pinah in //Karas region, has ample solar resources (Global Horizontal Irradiance: $GHI \geq 2389 \text{ kWh/m}^2$, Specific Yield $\geq 2088 \text{ kWh / kWp/year}$) as shown in Figure 2.

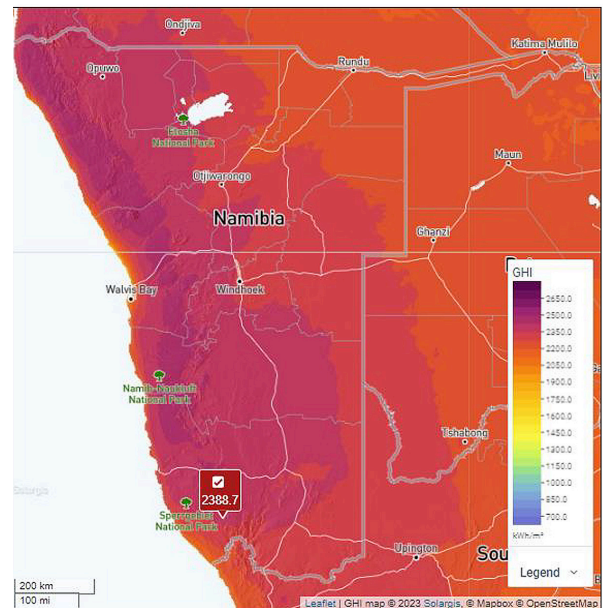


Figure 2: Long-term GHI Solar Resource Map of Namibia



Rosh Pinah is among the localities with ample suitable areas for developing utility-scale PV Projects. The Project site boundary is outlined in Figure 3. The Project site is approximately 33 km northwest of the Rosh Pinah town on commercial farmland and is accessible via the C13 district road, which runs adjacent to the Project site.

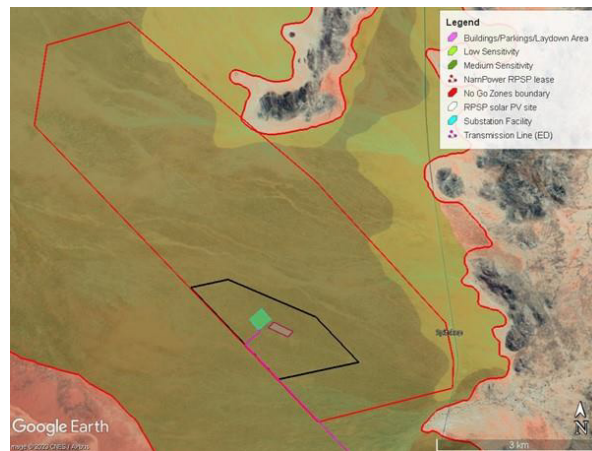


Figure 3: Rosh Pinah PV Project Site Location

The technical description and site details are listed in Table 1. The meteorological site conditions, based on Solargis P50 data (ambient temperature: 17.89°C) and Global Horizontal Irradiance (GHI: 2395 kWh/m², Specific Yield ≥ 2592 / kWp/ year), are summarised in Figure 4.

Location and Description	
Locality and Region	Rosh Pinah, //Karas Region
Site Coordinates	27°40'26.34"S; 16°40'35.65"E
Plant Footprint	≥ 250 hectares
Plant Nameplate Capacity	100 MWac
Planned Commissioning	Second quarter of 2026
Plant Lifetime	30 years (minimum)
Performance Ratio (PR)	≥82%
Capacity Factor (CF)	≥35%
DC/AC ratio at the Point of Connection (PoC) at 0.9 Power Factor	Minimum: 1.13 Maximum: 1.30
PV Module Technology	Bifacial Crystalline Silicon (c-Si)
PV Array Mounting Structure	1-axis tracking (N-S)
PV Module Cleaning Method	Dry-cleaning
Climatic Conditions (Solargis data)	Max. Temperature: 39.7°C Min. Temperature: - 1.30°C Max. wind speed: 15.5 m/s

Table 1: Location and Description

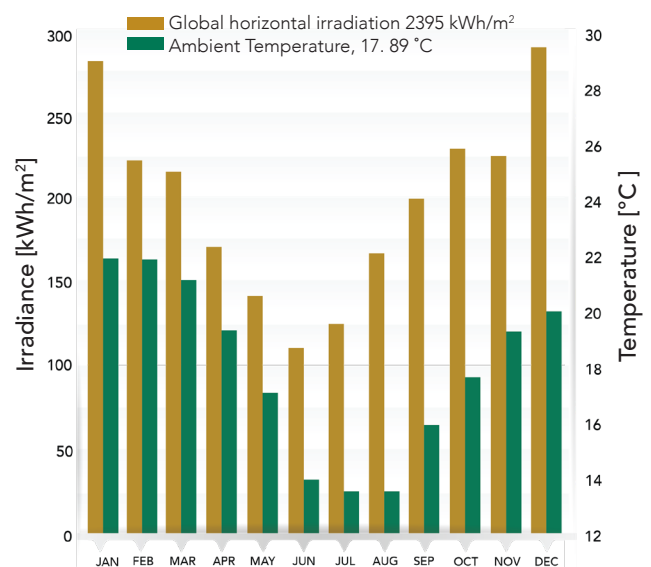


Figure 4: Site Meteorological Conditions (Solargis P50 Data)

Plant Yield Estimate

The preliminary Energy Yield Assessment (EYA), based on the technical description, was performed with PVsyst software. The assessment provides indicative normalised monthly energy yields for the Project, as shown in Figure 5. The Plant will be designed for the provisional modular future integration of a Battery Energy Storage System (BESS).

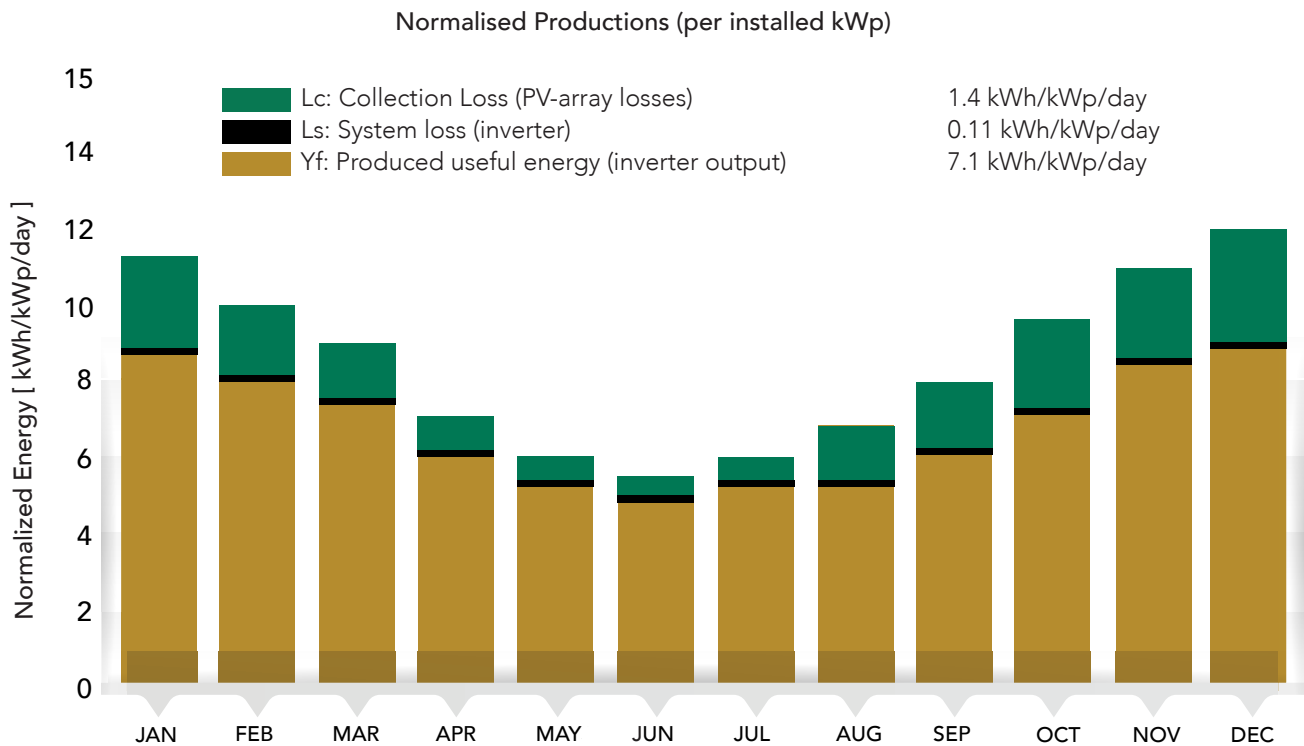


Figure 5: Normalised Monthly Energy Yield Estimate

Project Structure

The intended Project structure is depicted in Figure 6, indicating the key stakeholders involved.

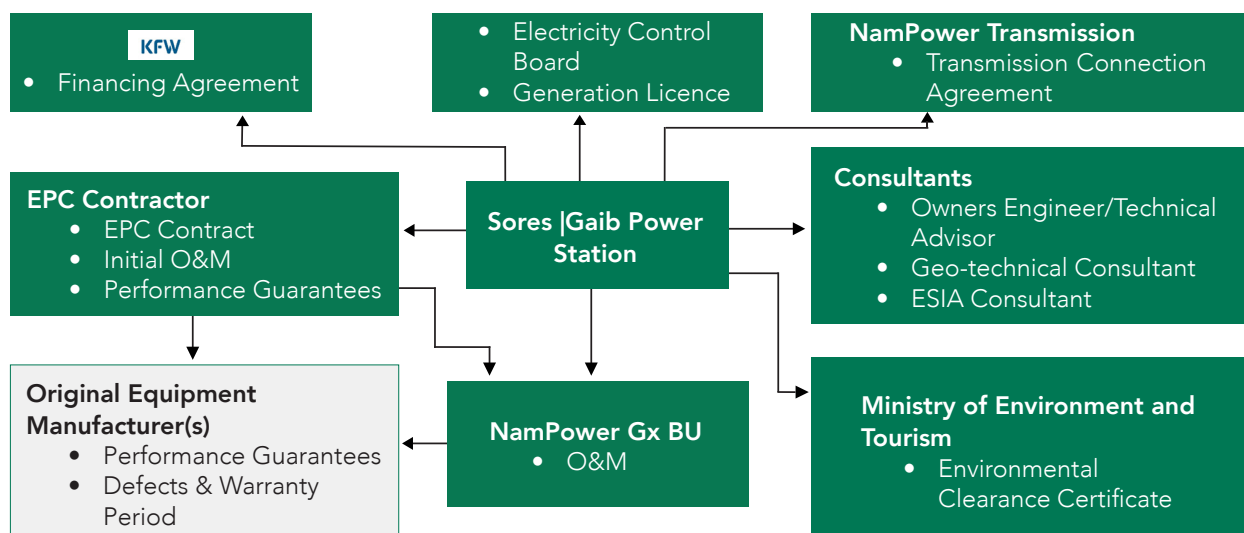


Figure 6: Project Structure

The Rosh Pinah Solar PV Power Plant will be developed, owned and operated by NamPower. NamPower will appoint an EPC contractor to construct the power plant. Figure 6 provides the Project structure illustrating the key stakeholders and the following key agreements:

- Financing Agreement - The project is being funded through a corporate loan of 66 million EUR from the KfW Development Bank
- Transmission Connection Agreement – NamPower Generation will enter into a Transmission Connection Agreement (TCA) with NamPower's Transmission Business Unit for the connection of the power plant to the Namibian grid
- Modified Single Buyer (MSB) registration – NamPower Generation will register the Rosh Pinah PV Power Plant with the MSB office to comply with the new local electricity industry regulatory framework
- Power Purchase Agreement – NamPower Generation will enter into a Power Purchase Agreement (PPA) with the Modified Single Buyer Office (MSBO), to export energy onto the grid and operate under the MSB market rules
- Consultants – NamPower procured consultants to assist in providing the following specialised knowledge and expertise on the development and execution of the Rosh Pinah Solar PV Power Project:
 - Technical Advisor and Owner's Engineer will provide technical support and assistance in managing the EPC contract to NamPower
 - Geotechnical Consultant assessed the geotechnical, hydrogeological and hydrological conditions for the site, to mitigate possible subsoil risk
 - Environmental and Social Impact Assessment (ESIA) Consultant developed the project ESMP to obtain the Project Environmental Clearance Certificate (ECC); and
 - Topographical Consultant surveyed the Project site and generated the survey or drawing.
- EPC Contract – NamPower procured an EPC Contractor through a transparent and open international competitive bidding process. The procurement of the EPC Contractor followed the Public Procurement Act.

Procurement Methodology

The contract between NamPower and the EPC Contractor is to be based on the FIDIC Conditions of Contract for EPC/Turnkey Projects (Silver Book), 2017 edition. The EPC procurement process was an open advertised bidding process through two phases. The first bidding phase entailed pre-qualification of bidders, and the second phase was the final bidding process. The scope of the EPC Contractor will include the following:

- The engineering, procurement and construction of the Project under a turnkey contract (FIDIC Silver Book)
- Provide full turnkey-wrap scope of services, including transportation, insurance, customs and duties of a 2-year Defects Notification Period (DNP) as per FIDIC
- Subcontract all possible local works/services to Namibian companies, to achieve a minimum local content spend of more than 10% of the total EPC contract value
- Ensure that all unskilled and semi-skilled labour who are employed are Namibian citizens; and
- Supervise (as required) the O&M of the Plant during the first two (2) years of operation.

Plant Operation and Maintenance

During the Defects Notification Period (DNP), NamPower will undertake the Operation and Maintenance (O&M) of the Rosh Pinah PV Power Plant, acting under the supervision and instruction of the EPC Contractor and in accordance with the O&M manuals. The EPC Contractor will be responsible for achieving the guaranteed annual power plant performance. Hence, the EPC is expected to deploy requisite supervision and support services to meet the annual performance guarantees under the EPC Contract.

NamPower personnel will be trained by the EPC Contractor to ensure the necessary knowledge transfer prior to the Date of Completion.

Environmental Considerations

A comprehensive ESIA study, including sensitivity screening, scoping, impact assessments, and stakeholder engagements, was completed in 2022. A project ESMP was resultantly developed and the ECC was obtained in September 2022, valid until September 2025. Preservation of identified sensitive areas is the key consideration. Thus, specific PV Project guidelines have been proposed to minimise the consequential environmental impact of the Project and ensure effective ESMP implementation (continuous compliance monitoring and reporting) during the construction, operation and decommissioning phase. The project site’s biophysical characteristics are summarised in Table 2.

Biophysical Characteristics	
Habitat	Succulent Karoo Biome (critical habitat).
Climate	Hyper-arid (sparse rainfall events).
Viewshed	Pristine viewshed semi-desert (significant viewshed to tourism traffic route).
Geology	Sandy soils.
Topology	Flat terrain with gentle westward slope, shallow and wide southward braided drainage lines to the Orange River.
Hydrology	Low-yield groundwater.
Flora	Low, succulent-leaved shrubs, few grasses, and few tall shrubs and trees.
Fauna	High biodiversity and endemism (i.e., mostly reptiles and insects).
Avifauna	High likelihood occurrence of priority bird/bat species.
Archaeology	Archaeological sites are merely located nearby inselbergs, beyond the project site boundary.
Land-use	Small livestock commercial farming.

Table 2: Project Site Biophysical Characterisation

Stakeholder Engagement

A project-specific Stakeholder Engagement Plan (SEP) has been developed, including the Communication Management Plan (CMP) and the Grievance Mechanism (GRM), to ensure effective internal and external engagements. A summarised GRM is accessible via the NamPower website under the corresponding generation project.

Capital Budget

The Project will be corporate financed through NamPower’s balance sheet. NamPower’s Financial Statements are reported in NamPower’s Annual Report (Investor Relations section of the NamPower website, www.nampower.com.na). On 09 September 2024, NamPower secured a Loan from KfW for EUR 66 million to finance the Project.

Value Proposition

The value proposition of the Project is demonstrated in the cost difference between the energy generated by the Project and the energy replaced for the respective NamPower time of use (ToU) period at the current NamPower ToU tariffs. Table 3 summarises the expected Net Present Values (NPV) at different discount rates.

Discount Rate [%]	NPV of NamPower ToU Avoided Cost [mil NAD] at USD exchange rate of 19 NAD
8	5,581.07
10	4,433.55
12.5	3,419.32
15	2,713.18

Table 3: Project Value Proposition

Rosh Pinah 100 MW PV Price Path (nominal)

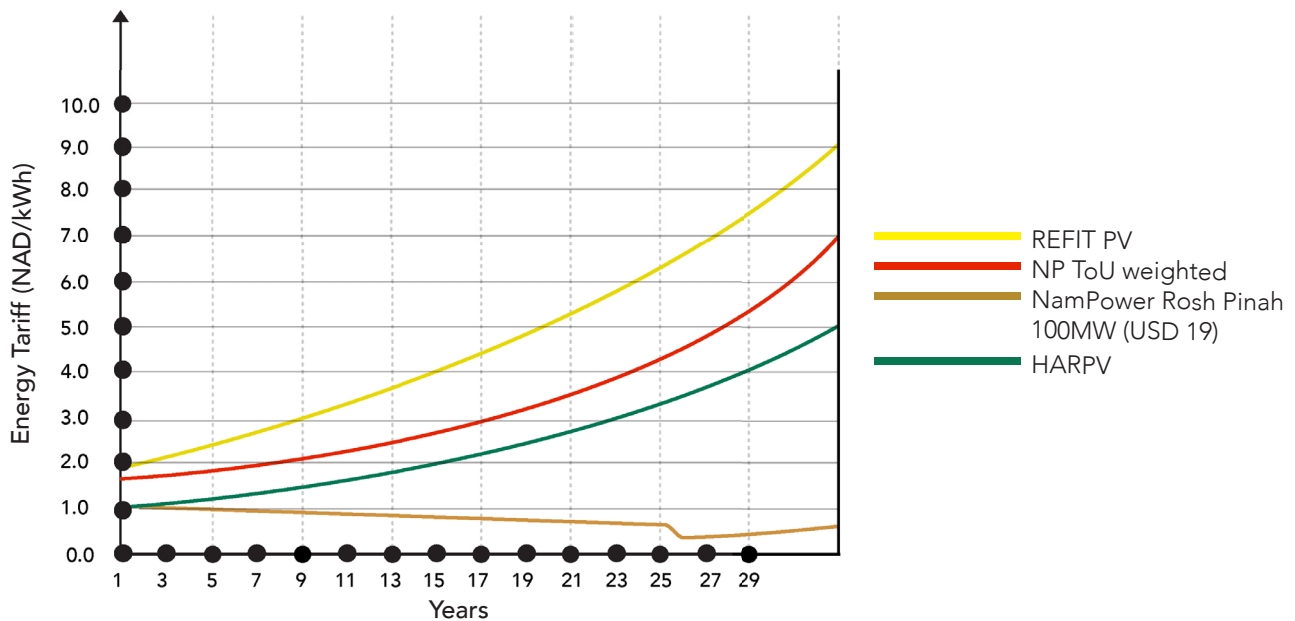


Figure 7: Expected Project Tariff compared to NamPower Time of Use (ToU)

Risk Assessment

A Project Risk Workshop was conducted on 12 July 2023 with NamPower internal stakeholders and the Technical Advisor (TA). The Risk Register is updated quarterly, with the next update scheduled for the construction phase. A second risk assessment workshop will be held with the EPC contractor to update the risk register during the construction and operation phases of the Project.

Project Schedule and Progress

The next steps listed in Table 4 are required to bring the project to its execution phase:

Key Next Steps
Obtain the generation license from ECB
Execute TCA and finalise MSB Registration
Execute the Power Purchase Agreement
Implement the Project Stakeholder Engagement Plan
EPC Commencement Date 16 December 2024
Time for Completion of EPC Construction 548 days
Commercial Operation Date 17 June 2026

Table 4: Key Next Steps for the Project

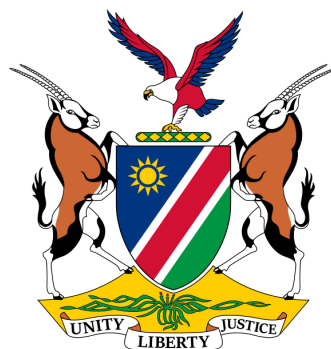


The completed tasks of the Project are summarised in Table 5.

Completed Tasks	Completion Date
NamPower Board approval of the change in technology	Nov 2022
NamPower Board and Ministerial approval on final Project technology and capacity	Nov 2022
Finalisation of Geotechnical Study	Sep 2022
Finalisation of Topographical Survey	May 2021
ECC issuance by MEFT	Sep 2022
Option to lease concluded	Feb 2022
Finalisation of Project Implementation Plan	May 2023
Submission of Generation License Application to ECB	Jun 2023
Issuance of EPC Contractor Prequalification (PQ) into market	Jul 2023
Issuance of EPC Bidding Documents to Pre-qualified Applicants	Jan 2024
Minister of Mines and Energy Determination on additional 30 MW	Mar 2024
NamPower Board approval of the increase in plant capacity from 70 MW to 100 MW	Mar 2024
EPC Contract Signed	Sep 2024

Table 5: Project Completed Tasks

In partnership with



KFW

This project forms part of the inter-governmental agreement and development cooperation between the Namibian Government and the Federal Republic of Germany.

NOTES

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