

NamPower

Strategic Intent

AMEU/AEDU Namibia Technical Conference

13 March 2024



AGENDA

- ❑ Introduction
- ❑ Corporate Strategy
- ❑ Demand & Supply Forecast
- ❑ Projects Update
- ❑ Conclusion

Corporate Strategy





NamPower Strategy Map 2020 - 2025



"To be the leading electricity solutions provider of choice in SADC."

Vision

"To provide innovative electricity solutions, in an evolving market, which satisfy the needs of our customers, fulfil the aspirations of our staff, and, the expectations of our stakeholders in a competitive, sustainable and environmentally friendly manner."

Mission

Unlocking the value of electricity sector collaboration

- Support the development of the electricity industry and the economy
- Develop new products and services (Solutions)
- Support the acceleration of electrification

Ensuring security of supply

- Optimally expand Generation capacity
- Optimally expand transmission capacity
- Leverage regional trading opportunities
- Ensure least-cost electricity supply mix

Optimising financial sustainability

- Increase Sales/revenue (growth)
- Ensure Sound Liquidity
- Grow Shareholder Value
- Maintain Profitability

Driving organisational & operational excellence

- Develop additional capabilities to meet the competitive market requirements
- Achieve and retain top employer status
- Build an ethical, engaging and high-performing culture

Strategic Pillars & Objectives

Customer focus; Integrity; Teamwork; Accountability; Empowerment; Safety, Health, Environment

Values

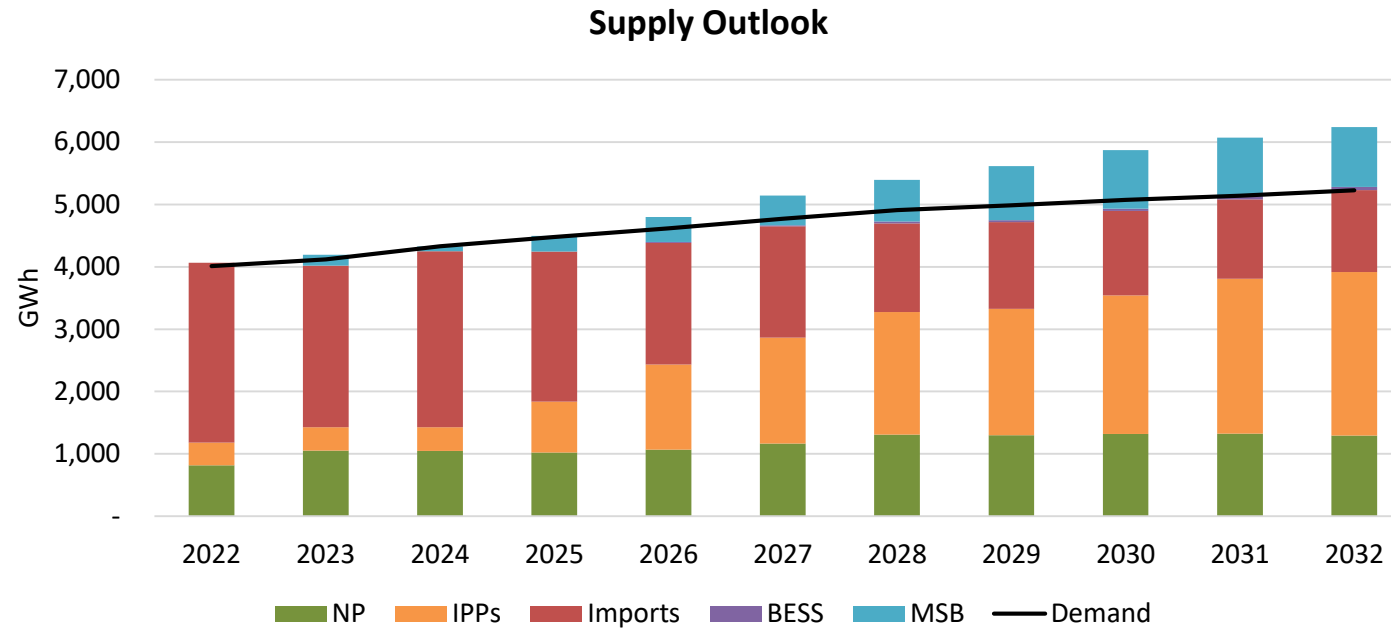
Demand & Supply

INTRODUCTION



- NamPower operating environment is changing rapidly and company's strategy requires modification.
 - National Energy Policy (NEP)
 - Independent Power Producer's Framework (IPP)
 - Renewable Energy Policy (REP)
 - Modified Single Buyer Model (MSBM)
 - National Integrated Resource Plan (NIRP)
- New electricity supply technologies are entering the market space.
- Paris Climate Accord, NIRP - Namibia has made a commitment to attain 70% of its electricity requirements from renewable energy technologies by 2030.
- The current Eskom PPA requires NP to proportionally reduce its imports when load shedding and this mostly occurs during evening peak hours.

CURRENT DEMAND AND SUPPLY OUTLOOK



- Reduction in import PPAs and Increase in Local IPPs / NamPower.
- Continuous Participation in the SAPP market to supplement energy requirement and explore cheaper options and sell excess energy.

UPDATE ON THE TOTAL GENERATION MIX

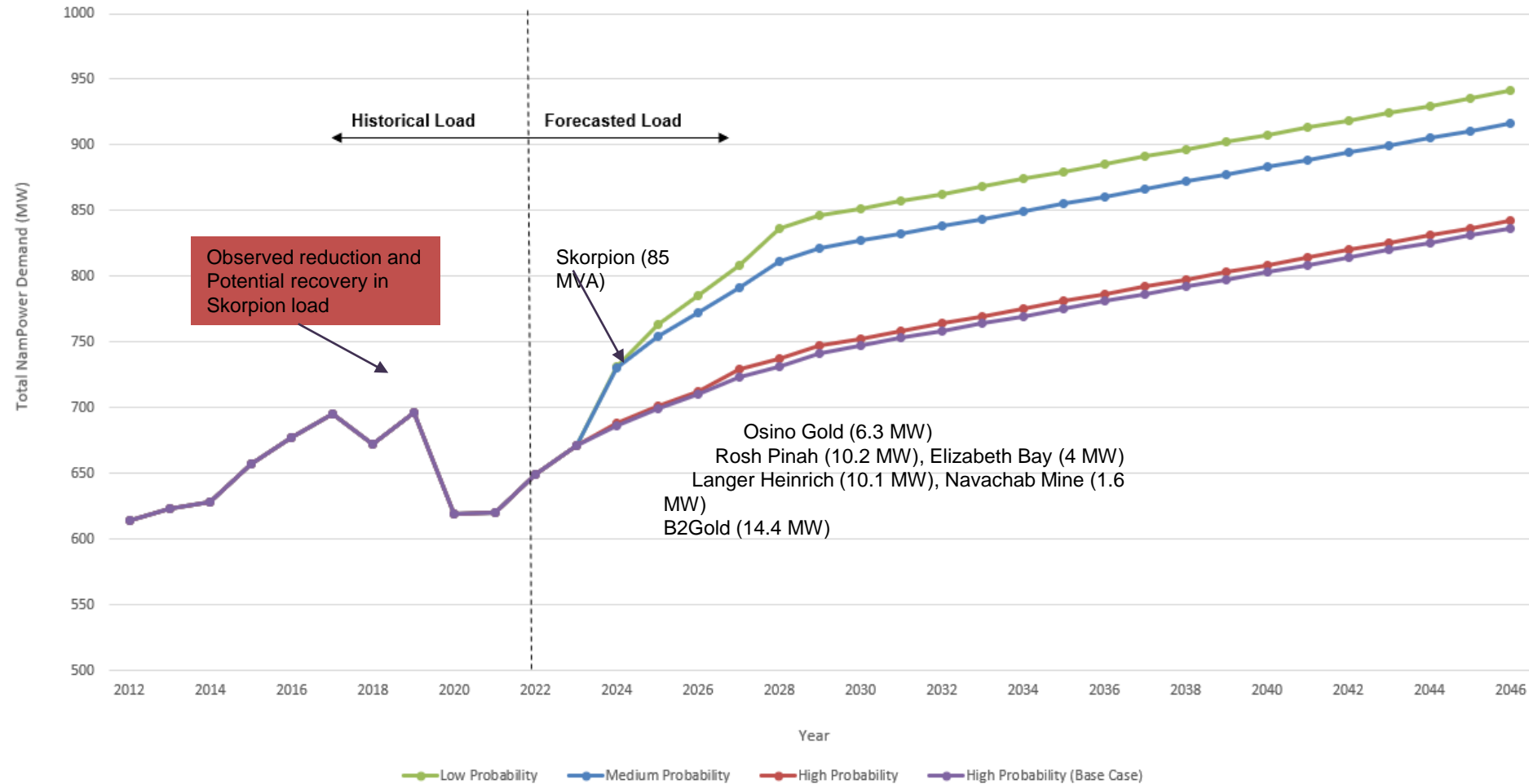


Financial years	2023	2024	2025	2026	2027	2028	2029	2030	2031-2046
NamPower									
Anixas (peak)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Anixas II	-	50	50	50	50	50	50	50	50
Ruacana	347	347	347	347	347	347	347	347	347
Van Eck	30	30	30	30	30	30	0	0	0
NP PV	20	20	20	20	20	20	20	20	20
Existing IPPs									
InnoSun (Solar)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
37 MW Solar PV	37	37	37	37	37	37	37	37	37
Diaz Wind	-	-	44	44	44	44	44	44	44
Green Nam	20	20	20	20	20	20	20	20	20
REFIT	70	70	70	70	70	70	70	70	70
Planned Projects									
IPP PV	-	20	20	20	20	20	20	20	20
IPP WIND	-	-	50	50	50	50	50	50	50
NP PV	-	-	100	100	100	100	100	100	100
BIOMASS	-	-	40	40	40	40	40	40	40
Total Local Gx Capacity	601	621	855	855	855	855	825	825	825
Import PPAs									
ESKOM FIRM	100	100	100	100	100	-	-	-	-
Eskom (Additional Energy)	300	300	300	300	300	300	300	300	300
Zesco	180	180	180	180	180	100	100	100	-
ZPC	80	80	80	-	-	-	-	-	-

NamPower estimated future load demand



2023 - 2045



SALIENT POINTS FROM THE EXISTING PPAs



ESKOM – 2022 to 2025/27

- This is a 100MW firm PPA,
- There is also an additional non-firm 300MW, available when the Eskom system is not constrained.

ZPC – 2015 to 2025

- This is a 80MW PPA at the capacity factor of 50%.

ZESCO (1) – 2020 to 2030

- This is a 100MW firm power supply with minimum uptake of 70%.

ZESCO (2) – 2022 to 2027

- This is a 80MW firm power supply with minimum uptake of 92.5%.

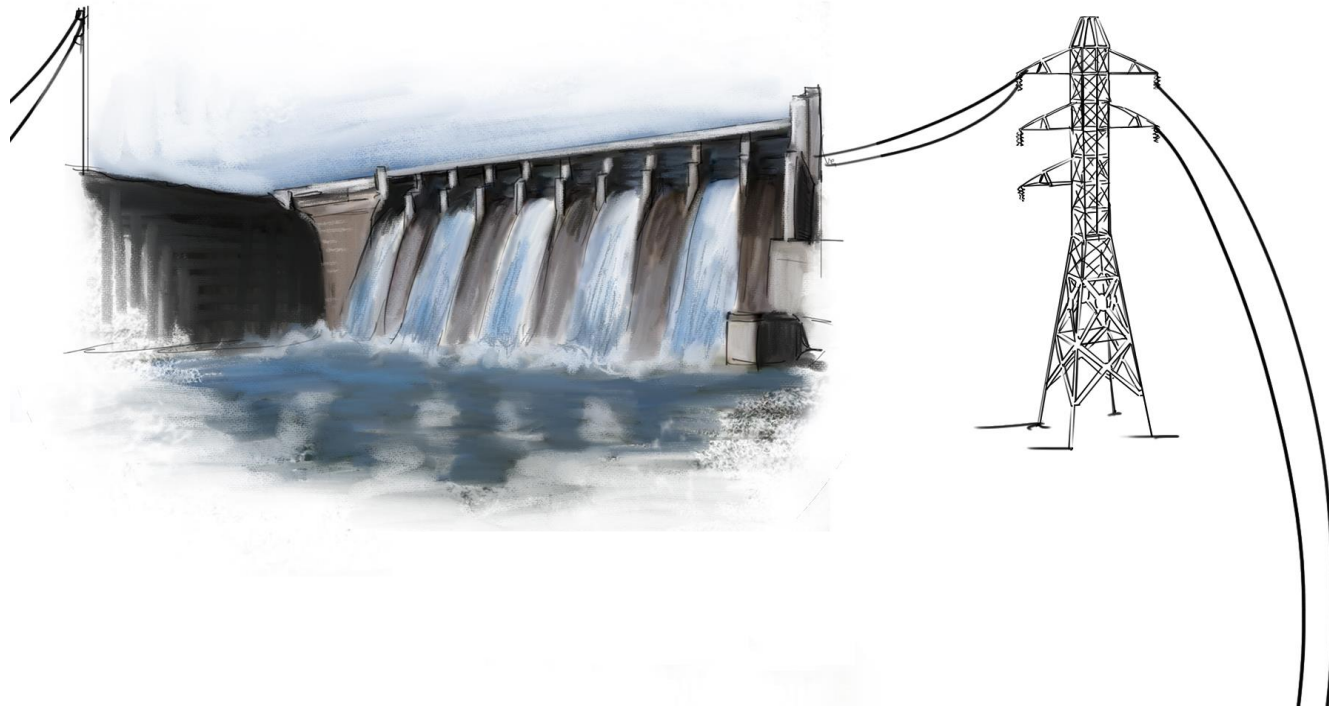
REFITs and Other IPPs

- The tariffs for these PPAs are only effective from COD, the PPA also allows NamPower to benefit from all the environmental credits that these plants may yield in future.

Projects Update



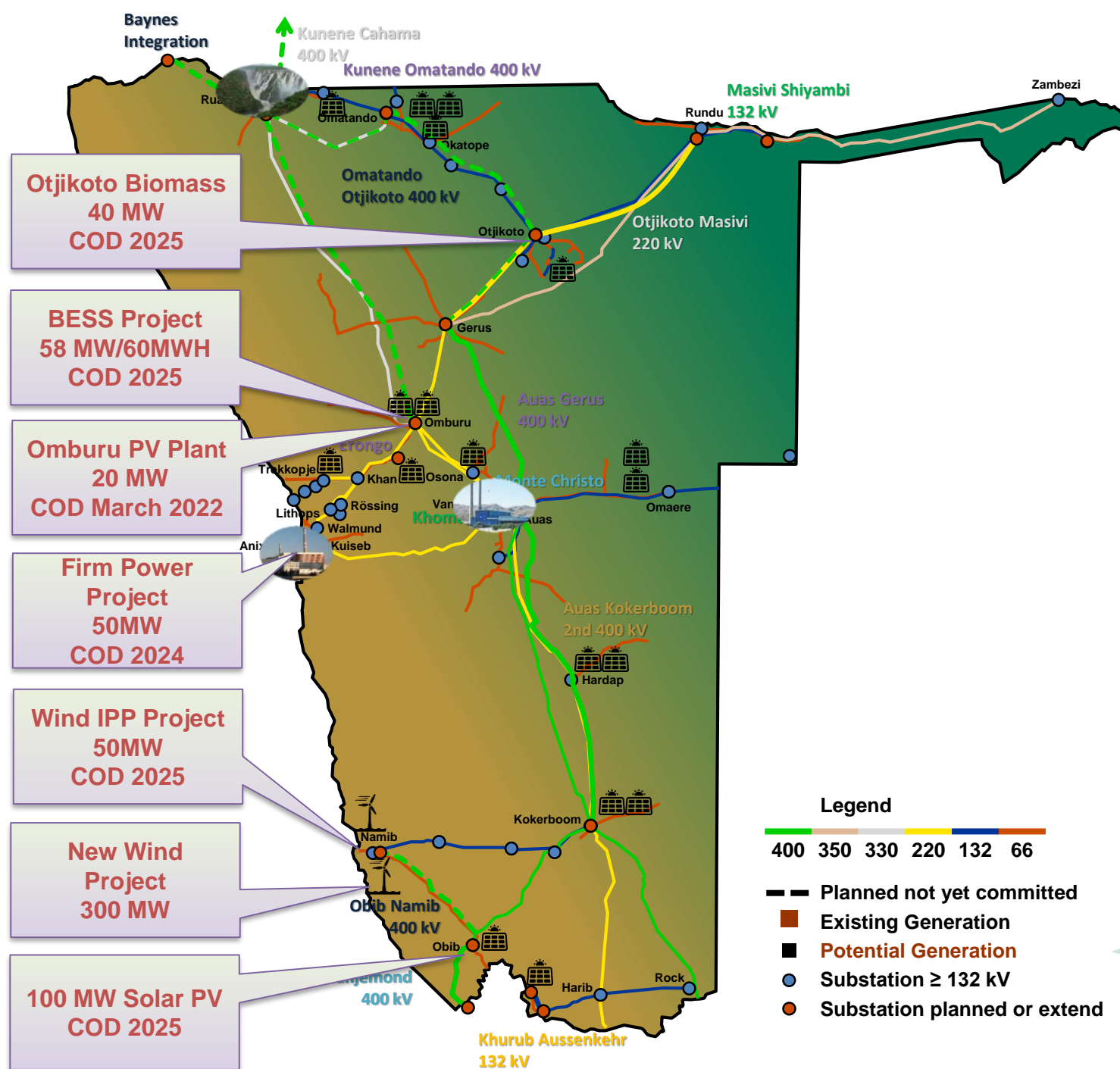
Generation Projects



GX Projects Update

- Omburu 20MW PV Power Project
- 58MW/60MWh Battery Energy Storage System Project at Omburu SS
- 100MW Rosh Pinah Solar Power Project
- 300MW Wind Power Project(New – concept stage)
- 50MW Firm Power (Anixas II) Power Project
- Otjikoto 40MW Biomass Power Project
- 20 MW Khan Solar PV IPP Power Project
- 50 MW Lüderitz Wind IPP Power Project
- 100MW BESS project at Lithops SS

Transmission and Generation



Omburu 20MW PV Power Project

Project Description

Technical:

- Size: 20 MW (export capacity)
- Availability: 99%
- Lifetime: 25 years
- Storage ready

General:

- Nearest Town: Omaruru (\pm 12km)
- EPC Cost: NAD 340 Million
- EPC Contractor: Hopsol Africa/Tulive Private Equity JV



Completed Activities:

- Commercial Operation Date achieved on 29 March 2022

Next Steps:

- Defect Notification Period to be completed on 28 March 2024
- By 7 November 2023, about 100GWh of energy was generated from the PV

Omburu 54MW BESS Project

Project Description

Technical:

- Power Capacity: 54 MW
- Energy Capacity: 54 MWh
- Technology: Lithium-Ion
- Lifetime: 19 years (10 years warranted)
- Utilization: 365 cycles per year
- Round-Trip Efficiency: 75% (Yearly)
- Location: Omburu Substation



General:

- Technical Advisor: Fichtner
- EPC Contractor: SDEE&NARADAJV
- Grant Funding (KfW): EUR 20 million
- N\$ 100 million NamPower contribution (TA/ER, Local and Import Taxes, and Interconnection costs)

Omburu 54MW BESS Project



Project Description

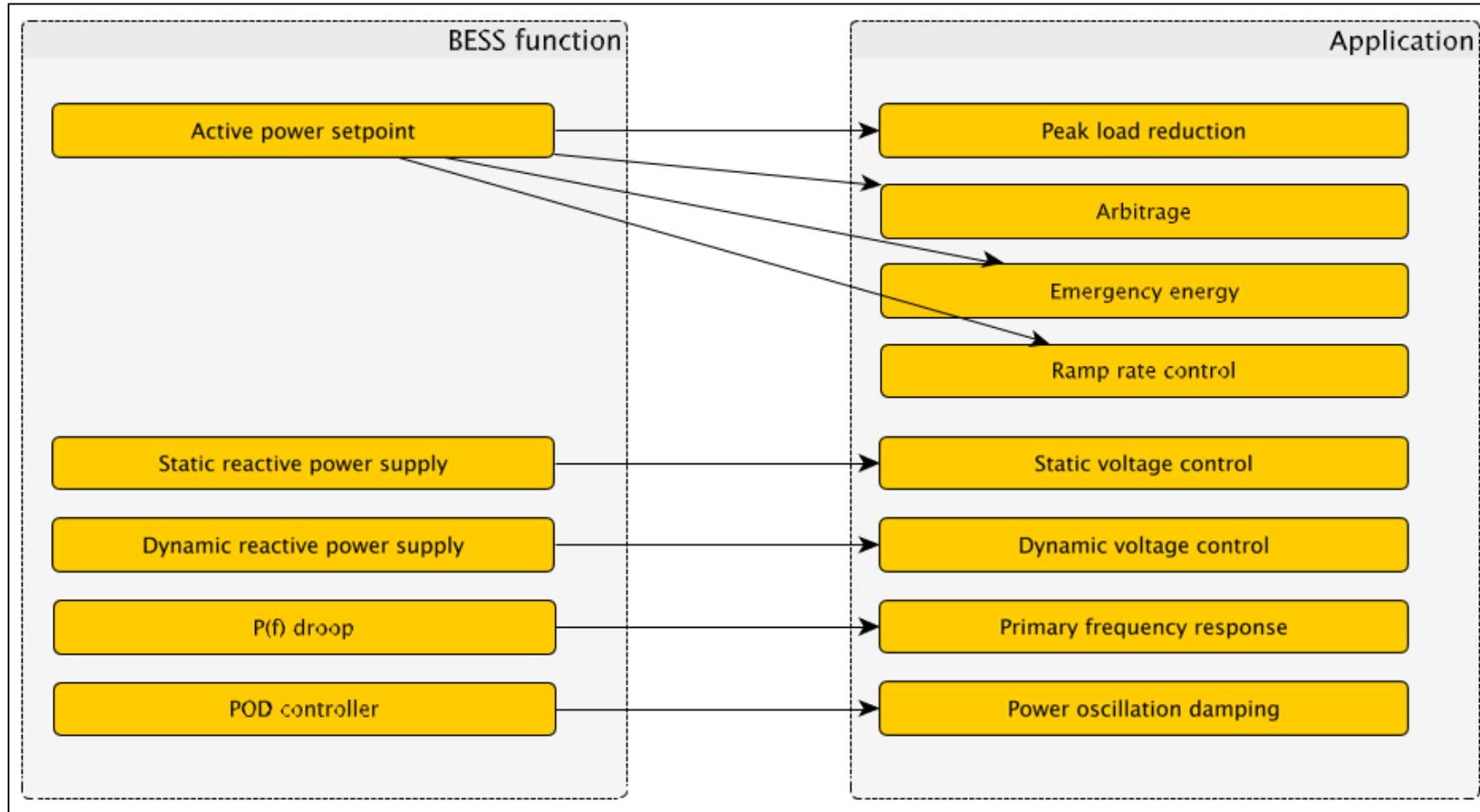
❑ Completed Activities:

- EPC Bidding (RfP) completed in Sep-23
- Contract Awarded to SDEE&NARADAJV in Sep-23
- Contract signed with SDEE&NARADAJV on 13-Dec-23

❑ Next Steps:

- Commencement Date envisaged for 11-Mar-24 (Pending CPs)
- Detailed Design reviews: Apr-24 to Aug-24
- Factory Acceptance Testing for key equipment: Sep-24 to Dec-24
- Installation Works: Jan-25 to Apr-25
- Site Acceptance Testing (SAT) & Commissioning Works: Apr-25 to Jul-25
- Test on Completion and Grid Compliance Testing: Aug-25
- Commercial Operation Date: Sep-25
- Defects Notification Period: Sep-25 to Sep-27

Omburu 54MW BESS Project



Rosh Pinah 100MW PV Power Project

Project Description

Site Characteristics:

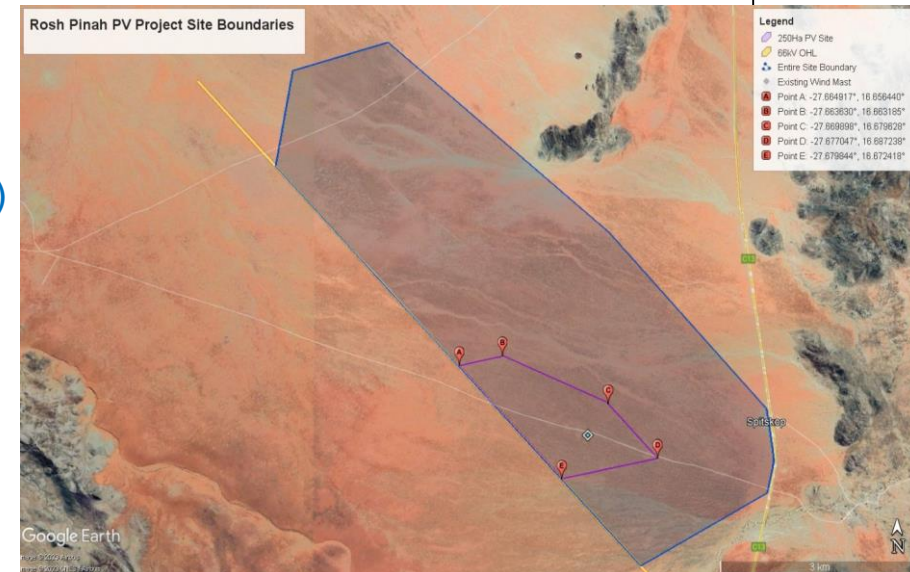
- Solar Resource : GHI – 2390 kWh/m²
- Specific Energy Yield : 2088.8 kWh/kWp
- Nearest Town : Rosh Pinah (± 33km)
- Project Site Area : 2300 ha (250ha for 100MW)

Technical:

- Export Capacity (AC) : 70MW (100 MW) at PF = 0.90, DC/AC ≥ 1.3
- Capacity Factor (CF) : ≥ 35%
- Estimated AEP : ≥214 GWh
- Availability : 99%
- Lifetime : 30 years
- Modules : Bi-facial PERC
- Mounting-Structure : 1-axis tracking with back-tracking
- BESS : ready or PV-BESS Hybrid

Commercial:

- COD : Dec 2025
- CAPEX : N\$1.25bill (N\$1.7bill)
- EPC Procurement : OIB [KfW procurement guidelines are adopted]
- Contract Suite : FIDIC EPC/Turnkey (Silver Book)



50MW Firm Power (Anixas II) Project

Project Description

Technical:

- Plant Net Capacity: 54 MW_{el}
- 3x MAN 18V51/60DF (18.5 MW_{el})
- Fuel:
 - Liquid fuel (HFO/Diesel)
 - Natural Gas
- Lifetime: 25 years
- Availability: >92%
- Capacity factor: <10%

General:

- COD: May 2024 (comm July 2024)
- EPC Cost: N\$1.27 billion



Procurement Method:

- EPC Contractor was procured on OIB utilising FIDIC EPC/Turnkey Projects (Silver Book) Contract Suite. Some other matters we read in the papers last week

40 MW Otjikoto Biomass Power Project



Project Overview:

- ❑ Size: 2 x 20 MWe;
- ❑ Grate fired boiler technology;
- ❑ Fuel: Encroacher Bush Wood Chips ;
- ❑ Availability: 85~92%;
- ❑ Capacity factor: (CF): 60~85%
- ❑ Energy: 210-300 GWh
- ❑ Direct Employment: Construction 300, Operation 62, Harvesting 115 (min)



Fuel Supply Strategy

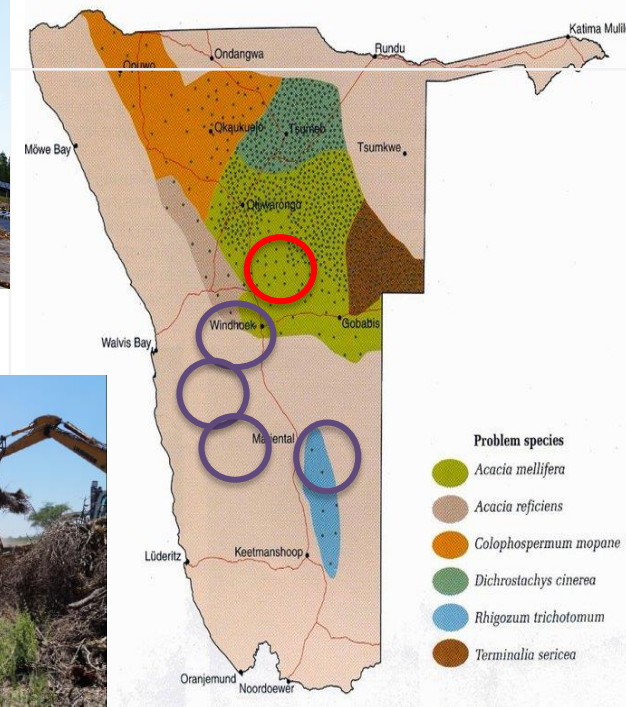
- ❑ ±100 km harvesting radius (± 3.1 mil ha available)
- ❑ Harvesting in accordance with FSC principles
- ❑ Only 12.8% of harvesting area to be used
- ❑ Fuel Requirement: 180 000 – 245 000 t/yr

Project Status

- ❑ EPC and Fuel Supply Notices of Selection issued
- ❑ Loan funding From AFD up to € 100 million
- ❑ Grant Funding from MAF € 25 million
- ❑ GRN capital support N\$ 400 million
- ❑ Project currently in the procurement phase- evaluation done and in standstill period as per Sect 55(4) of the PPA, 2015 as amended



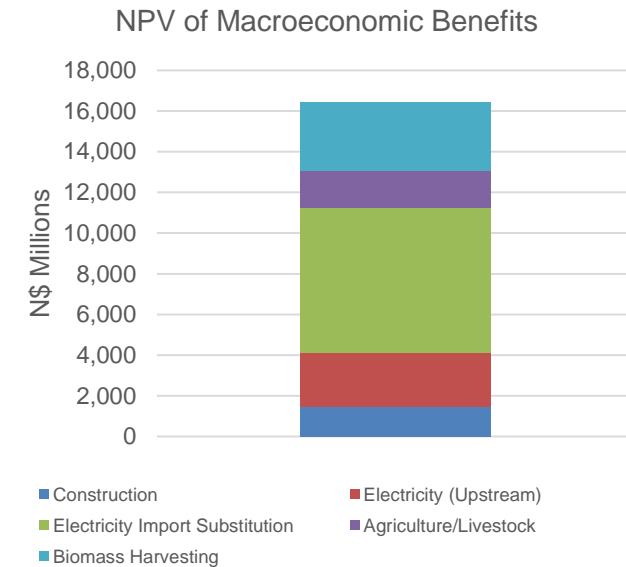
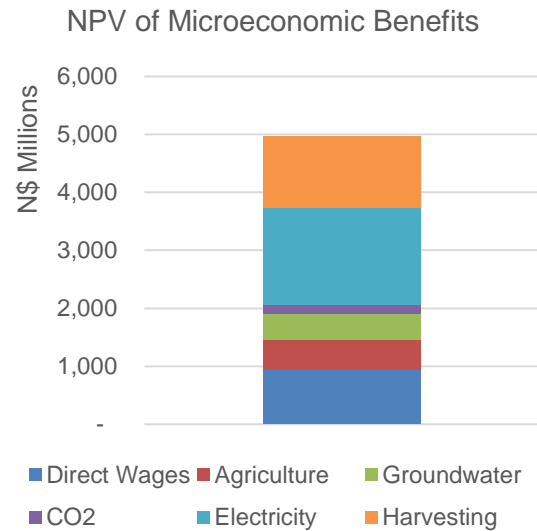
PROBLEM ENCROACHER SPECIES IN NAMIBIA



Project Site & Fuel Harvesting Area

Macro and Micro Economic Impact from the Biomass Plant

- Project results in N\$200-245 million per annum circulating into the local economy in the Oshikoto region
- Minimum N\$20 million in corporate income taxes annually
- Approximately N\$10 million PAYE annually
- N\$5 million direct annual contribution to NEF levy based on Diesel usage
- NPV of Micro Benefits N\$ 5 Billion, Macro Benefits N\$ 16 Billion



Disclaimer: As the project develops, the information contained in this presentation is subject to change without notice.

50 MW Lüderitz Wind IPP Power Project

Project Description

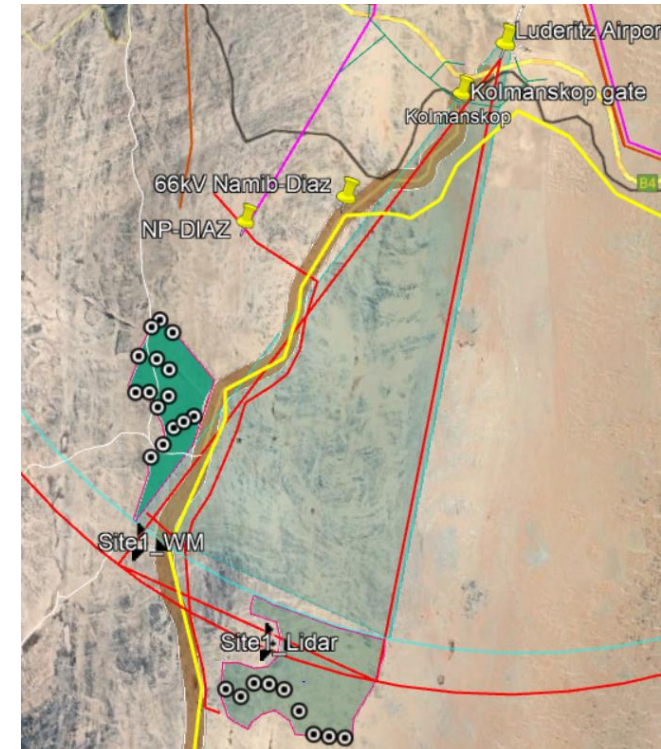
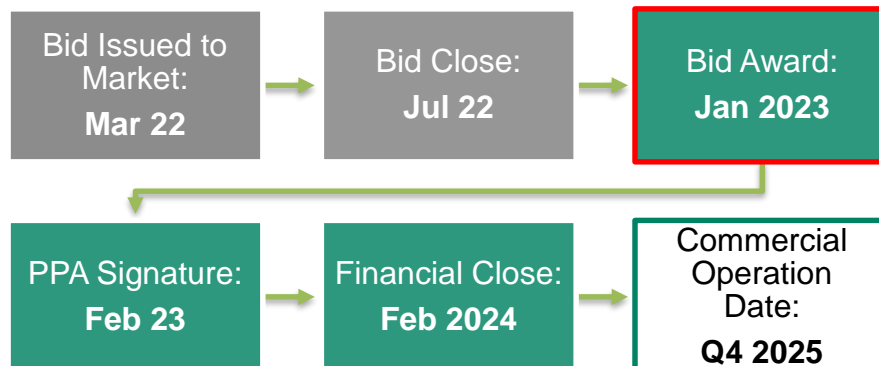
General:

- Open International Bidding
- PPA Term: 25 Years
- Tariff: N\$ 0.8785/kWh, FAER 0.5%
- Estimated Capital Investment: ~N\$ 1,4 Bn

Technical:

- Location: ± 20km South-east Lüderitz Town
- Plant Capacity: 50 MW (export capacity)
- Horizontal Axis Wind Turbines
- Build-Own-Operate (BOO) Based
- Interconnected via 132kV OHL at Namib S/S

Timelines:



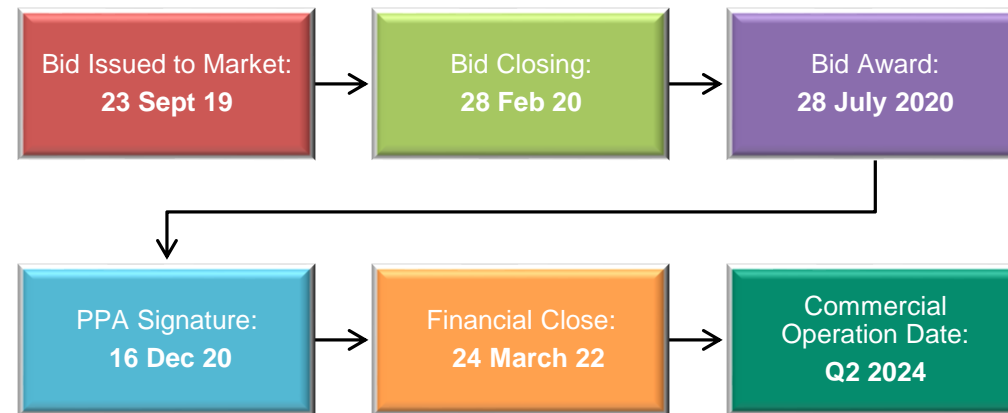
20 MW Khan Solar PV IPP Power Project



Project Overview:

- Size: 20 MW (export capacity)
- Target COD : Q2 2024
- Location: Near to Khan Substation
- PPA Term: 25 years
- Technology : Single-axis tracking, crystalline silicon panels
- Tariff: **N\$ 0,4905 per kWh** and a Fixed Annual Escalation Rate of 3%).

Project Timelines:



Progress:

- AASON achieved financial close on 24 March 2022, HopSol appointed EPC contractor in Dec 2021, EPC Contractor mobilised to site in March 2022;
- Construction is in progress, awaiting delivery of material onsite, although there are delays.

Next Steps:

- Finalise order of key components(Tx Equipment Proforma, Trackers etc);
- Continue construction activities

300MW Megawind project



Technical:

- Project Size : 300MW Wind Farm
- Location : Sperrgebiet Area
- Land size : 8 000 to 10 000 ha
- Constraints : Terrain, buffer zones, environmental, Tx, etc.

CAPEX:

- Power Plant : N\$ 7.5 billion
- Transmission : N\$ 2 billion

Schedule:

- Development Phase : 2.0 years
 - Land acquisition, Feasibility, Bankable Resource Measurement, ESIA, Geotech, Transmission - Tx, etc.)
- Implementation : IPP/EPC split??
- EPC Procurement : 1 Year
- Construction Phase : 2.5 years
 - (>60 WTGs, 400kV Tx - line)

Transmission Projects



Master Plan...Transmission



2022/2023
 2023/2024
 2024/2025
 2025/2026
 2026/2027
 > 2027

Transmission Projects



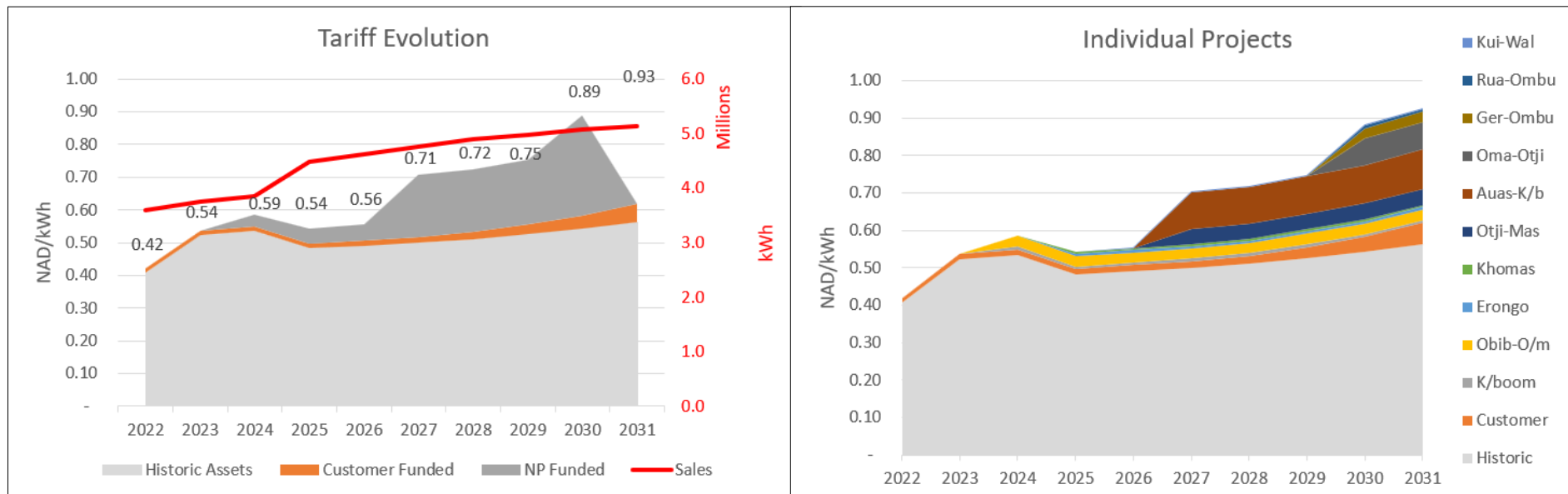
The following 4 transmission projects, should they be implemented, will add 25c/kWh to the overall projected transmission tariff

	Project Name	Year	Estimated Capital Cost (N\$ mil)	Motivation	Impact of not having Project
1	Otjikoto-Masivi 220 kV Line	2027	N\$ 1,073.74	<ul style="list-style-type: none"> Line to improve reliability of power supply and cater for future load growth in the Kavango East and West regions and surroundings. The second Otjikoto-Masivi 220kV line alleviates the outage risk of the existing Otjikoto-Masivi 132kV line. Loss of the existing line leads to the power supply to Masivi Substation and the areas it supplies being cut off as the substation will be disconnected from the rest of the NamPower network. 	<ul style="list-style-type: none"> Loss of the existing line leads to the power supply to Masivi Substation and the areas it supplies being cut off as the substation will be disconnected from the rest of the NamPower network.
2	Auas-Kokerboom 2 nd 400 kV Line	2027	N\$ 2,701.13	<ul style="list-style-type: none"> Loss of the existing 400kV Auas -Kokerboom line causes voltage collapse which leads to a blackout. 2nd line provides sufficient support to avoid a system collapse in the event of a single contingency on Auas – Kokerboom 400kV line. 2nd line offers many benefits: improved reliability of & security of supply in the NamPower network, increases power transfer capacity, increased uptake of Variable Renewable Energy (VRE) and reliable electricity wheeling and trading levels with neighbouring countries in the SAPP region beyond what is currently possible in the existing NamPower network. 	<ul style="list-style-type: none"> Loss of the existing 400kV Auas -Kokerboom line causes voltage collapse which leads to a blackout.
4	Omatando-Otjikoto 400kV Line	2030	N\$ 1,772.25	<ul style="list-style-type: none"> To cater for full dispatch of the Ruacana generation during an N-1 emergency condition involving loss of the Omburu - Kunene 330kV line, it is recommended that the Omatando - Otjikoto corridor be strengthened by connecting the Omatando – Otjikoto 400kV line. 	<ul style="list-style-type: none"> Failure to connect the 400kV line results in Ruacana generation being curtailed.
5	Gerus-Omburu 400kV Line	2030	N\$ 679.85	<ul style="list-style-type: none"> To cater for future electricity exports >229MW to ZESCO, it is recommended to strengthen the Gerus – Omburu 220kV corridor by connecting a Gerus – Omburu 400kV line between Gerus and Omburu substations and operating the line at 220kV. The line is not required should future ZESCO exports be envisaged to be less than 229MW. 	<ul style="list-style-type: none"> Future export capacity to ZESCO limited to 229MW.

Transmission Projects



- Tariff projected to grow to 93c/kWh with "historic" tariff at 56c/kWh in 2031 (should all projects be implemented)
 - 37c/kWh (40%) is for Master Plan projects,
 - 11c/kWh is for Auas-Kokerboom 2nd 400 kV line,
 - 7c/kWh is for Omatando-Otjikoto 400kV line, and
 - 4c/kWh is for Otjikoto-Masivi 220 kV line.





Thank you