SECURITY OF POWER SUPPLY

"What is the Situation and What is Namibia Doing?"

A Presentation to the Mining Conference

21 May 2015

Safari Conference Centre
Windhoek, Namibia

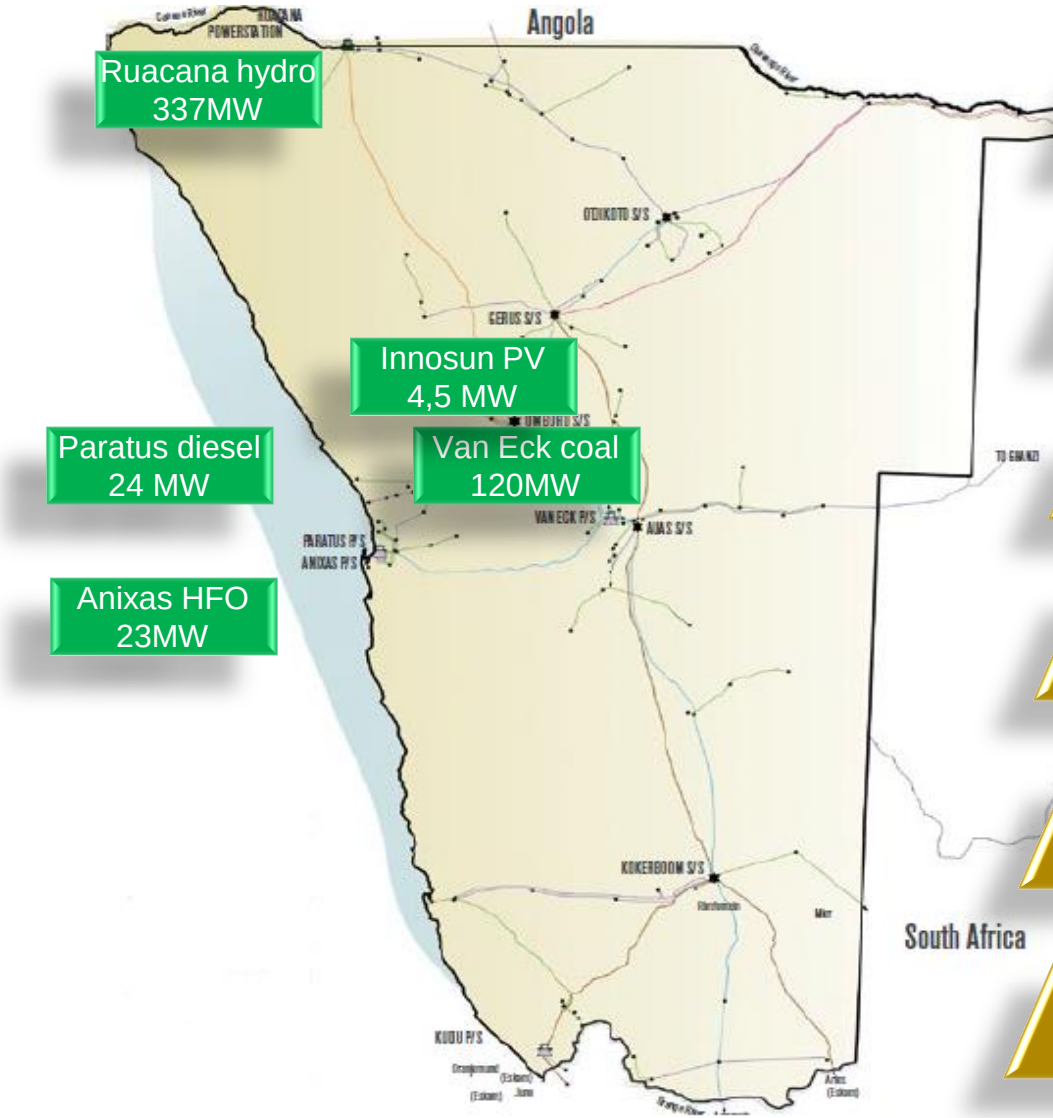
By
Paulinus Shilamba
Managing Director

NamPower

Contents

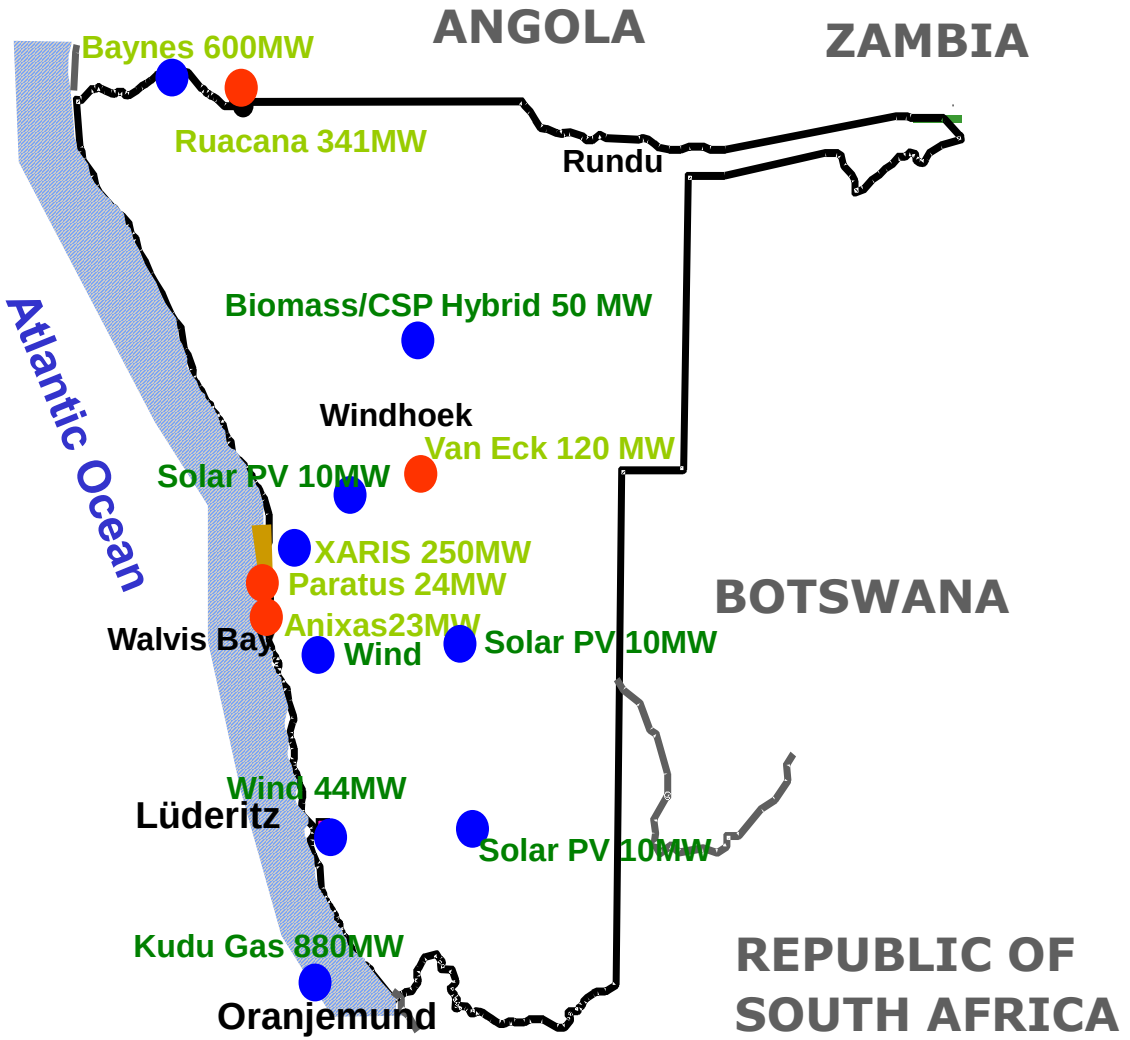
- ✓ Power supply infrastructure
- ✓ Power supply overview, challenges and outlook
- ✓ The new power supply strategy
- ✓ Project portfolio
- ✓ Funding plan
- ✓ Conclusion

NAMPOWER GENERATION & TRANSMISSION ASSETS



- Five power stations – 508 MW
- Maximum demand ~ 550 MW
- Transmission network: ~11 100 km
- Distribution network: ~22 000 km
- PPE: ~US$1.5 billon
- Total assets: ~US$2.3 billion

Current and future power stations



Ruacana
Hydro
Run-of-the-river
Van Eck
Coal fired
Emergency and Standby
Paratus and Anixas
Diesel & HFO
Emergency and Standby
Existing Power Stations
Planned Power Stations

Power supply overview and outlook

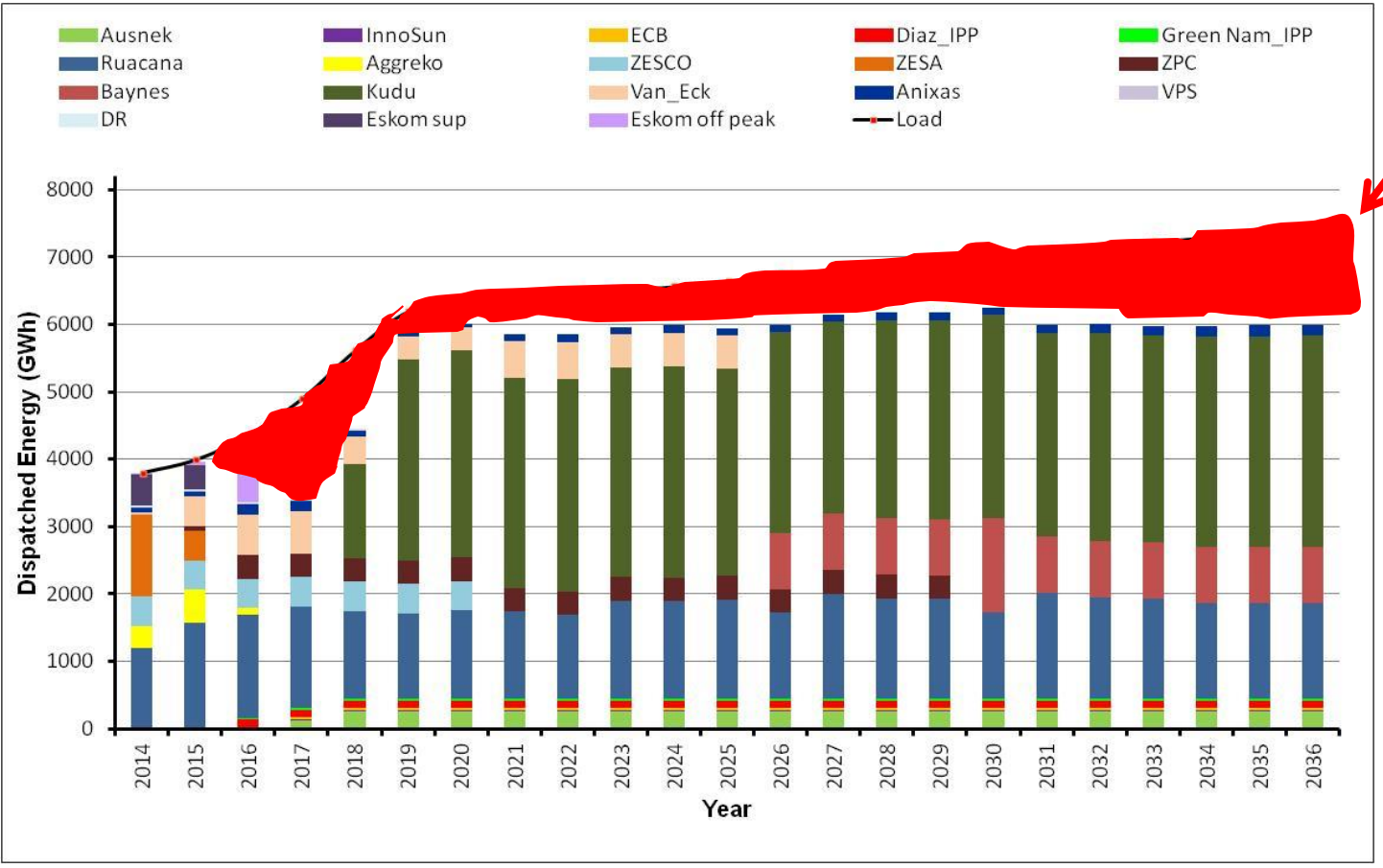
- Namibia and the SADC Region experiencing power supply deficits
- The supply situation in Namibia will remain challenging at least until the commissioning of the Kudu base-load power plant in 2018/19
- 2015 – 2016 : NamPower has secured adequate power supply solutions and no serious power supply disruptions will be expected during this period, unless caused by acts of gods (example loss of power station or transmission power line)
- 2016 – 2018: Serious power supply challenges will be experienced if the proposed solutions are not implemented on time
- 2019 and beyond: Kudu plant in operation; Namibia a net exporter of electricity
- Due to higher cost of imports and new power supply projects electricity tariffs will continue to increase at a high rate after which prices will stabilize, in real terms, after the introduction of Kudu in 2018

Power supply challenges

- Reliance on imports (up to 80% during dry seasons)
- Regional transmission bottlenecks (especially Zambia and RSA)
- Interruptible and unreliable power supply from the region (Eskom, ZESA)
- Challenges to accommodate IPPs without GRN guarantees
- Termination of most of the existing import contracts, namely:
  - ✓ ZESA: 150 MW – October 2014 (replaced with the 80 MW PPA)
  - ✓ Eskom Supplemental: 200 MW – April 2015 (extension waiting approval from the RSA Government)
  - ✓ Aggreko: 115 MW – August 2015
  - ✓ Eskom Off Peak: 300 MW – April 2016
- Regional utilities experiencing domestic challenges and new import agreements difficult and expensive

Power supply and demand balance

Base Case



Additional generation and imports required to fill this gap before and after Kudu

The new power supply strategy

NAMPOWER NEW ELECTRICITY SUPPLY STRATEGY:

Develop own power stations in the country as main source of supply and use imports to fill gaps only

- Challenges associated with more regional import contracts
  - ✓ dispatch not in our hands (probable disconnection as is the case with Eskom and Zesa)
  - ✓ Power supply not reliable due to transmission constraints (in other countries)
  - ✓ high cost of imports: **N$2,6 billion** in 2015 and over **N$12 billion** over the next 4years
  - ✓ high tariffs based on new power plants being commissioned in neighboring countries
- Benefits related to the development of our own power stations
  - ✓ dispatch in our own hands
  - ✓ creation of national assets and stimulation of economic growth
  - ✓ regulated and sustainable tariff levels (in most cases cheaper than imports)
  - ✓ socio-economic benefits (jobs, taxes, etc.)
  - ✓ Foreign/ Private sector investment (IPPs) in the power sector
  - ✓ Participation of Previously Disadvantaged Namibians [BEE] through partnerships

Status of the options to date

NamPower's proposed new generation options under consideration/ development

Fuel	Option1	Option 2	Option 3	Option 4	Status
Coal	Erongo Coal (300MW)				Project is shelved
Gas	Kudu (880MW)	Walvisbay LNG (250MW)			Kudu ongoing but the 250MW project on hold
Hydro	Baines (600MW)				Under development
HFO/Diesel	IPP (120MW)				Under investigation
Nuclear	None				Driven by GRN
Renewables	CSP (50MW)	IPPs: solar (20 MW) and wind (44 MW)	ECB REFIT: solar, wind, biomass (70MW)	PV Tender (30MW)	At various stages of investigation and development
Imports	EDM (100MW)	ESKOM Supplementary (200MW)	ZPC (80MW)		Currently under investigation

Current power supply projects

NamPower with the help of KPMG and other international consultants identified a short fall of 400 MW prior to Kudu and 250 MW post Kudu, and have developed the following power supply strategy (including a mix of options) to ensure security of supply for Namibia:

- ✓ Refurbish Van Eck Power Station by 2015;
- ✓ Replace Ruacana Runners to improve Ruacana Power Station output by 2015;
- ✓ Implement short term import contracts from EDM (Mozambique) or ZESCO (Zambia) by 2016;
- ✓ Implement a plant of 250MW at Walvisbay or any other project by 2016 as GRN may decide;
- ✓ Implement Kudu by 2018/19;
- ✓ Implement Baynes by 2025;
- ✓ Conclude supply contracts with Independent power producers (solar, wind and biomass) with the combined capacity of up to 150 MW to be commissioned by 2017);
- ✓ Demand side management

Kudu Gas to Power Project

- The 880 MW CCGT power flag ship project for the country
- FID by July 2015, FC by November 2015 and commercial operation by 2018/19
- Milestones achieved to date
  - ✓ PDA signed with upstream parties
  - ✓ JDA signed with CEC, and PXA under discussion with CEC and Eskom
  - ✓ GSA, PPA and Transmission connection negotiations on-going
  - ✓ Government support package confirmed (through Cabinet resolution)
    - Funding for Namcor and NamPower obligations (equity and infrastructure)
    - Provision of guarantees
  - ✓ Tender evaluation
    - MLA appointed
    - EPC and LTSA initialled
    - SEP and O&M contractors shortlisted and to be appointed soon
  - Estimated capital cost for power station and transmission lines: U$1,3 billion

Baynes Hydro Power Project

- A 600 MW Hydro power project on the Kunene River
- A Joint Venture project between the governments of Angola and Namibia
- Techno-economic & EIA studies completed and approved by the 2 governments
- Outstanding work
  - ✓ Creation of the project office
  - ✓ Planning of supporting infrastructure (transmission lines, roads, housing, etc)
  - ✓ Drafting of a water regulation bilateral agreement
  - ✓ Conclusion of negotiations with the affected communities
- Project cost (dam and power station): U$1,3 billion

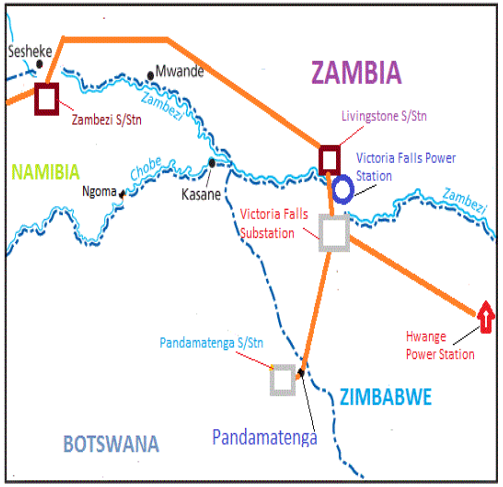
Renewable Energy Projects

- Wind (44MW at Luderitz)
- Large Solar PV and CSP
  - 4.5 MVA Omburu Solar PV plant due for commissioning in May 2015
  - 30 MW (3 x 10MW) Solar PV tender currently in the market
  - 70 MW (14 x 5MW) allocated through the REFIT program
  - No Implementation Agreement will be provided by Government
  - Feasibility study for the 50 MW CSP plant commenced
- Biomass (Invader Bush)
  - National biomass study with financial support from KfW
  - Feasibility study launched
- Demand side management (DSM)
  - Procurement and free distribution of 1 million LED bulbs
  - Subsidised installation of 20,000 domestic solar water heaters

Transmission Projects

❑ Zizabona

- ✓ Linking Zimbabwe, Zambia, Botswana and Namibia
- ✓ Joint Venture project by the four utility companies
- ✓ SPV registered in Namibia (NP a hosting utility)
- ✓ Shareholders Agreement to be concluded soon
- ✓ Project cost U$230 million
- ✓ Expected operation: 2018



❑ Transmission master plan

- ✓ High demand growth especially in Northern Namibia
- ✓ Upgrading of transmission backbone to 400kV
- ✓ Estimated investment cost: U$700 million

Funding plan

NamPower's Funding Plan 2014 - 2020

- **Capital requirements for new generation and transmission projects over the next 5 to 6 years: N$40 billion**
  - ✓ NamPower: N$15 billion (N$5 billion debts)
  - ✓ IPP (equity and loans): N$25 billion

- **NamPower source of funding**
  - ✓ Cash reserves
  - ✓ Cash generated from operations
  - ✓ Debt (DFIs, Bonds)
  - ✓ Shareholder (equity capital and revenue support if necessary)

Conclusion

- The power supply situation in the country will remain challenging at least until 2016 when a Walvis Bay plant will be commissioned. Supply will stabilise once Kudu is commissioned in 2018/19;
- NamPower has put measures in place to ensure that power supply in the country remains sustainable today and into the future;
- Customers requested to support our programmes, and to meet us half way by reducing their electricity usage by a minimum of 10 percent, especially during peak hours - from 06h00 to 09h00 in the morning and from 18h00 to 21h00 in the evenings

End

I thank you