



Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"



6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

ENERGY DIRECTORATE

ENERGY IN NAMIBIA

Abraham Hangula

Deputy Director: Energy Planning and Research

Promoting Automotive Fuel Efficiency in Namibia Workshop

04 June 2019

MME Auditorium



Ministry of Mines & Energy
"promoting Namibia's mineral, geological and energy resources"

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

Outline

- ☐ Energy Situation
- ☐ Electricity Situation
- ☐ Projections



Energy Situation

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

	Electricity	Oil	<i>Biomass</i>	Coal	LPG	Totals (Excluding Other Fuel oils)
	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]	[GWh]
2013	4238	12668	4479	253	82	21720
2014	4383	13568	4617	255	110	22934
2015	4274	13974	4760	258	114	23380
2016	4506	15318	4903	259	116	25102
2017	4610	16003	5050	267	121	26051
2018	4826	16738	5201	232	122	27120

- Fuel oils: Jet fuels, Kerosene, Paraffin, Bitumen etc.
- Animal Dung (0.4 HH use for cooking)
- Candles (11.2% HH use for lighting)
- Solar Energy (0.4 HH use for water heating)

Energy Consumption

Coal

- Mining (95%)
- Manufacturing and Electricity (5%)

Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Biomass
19%

Biomass

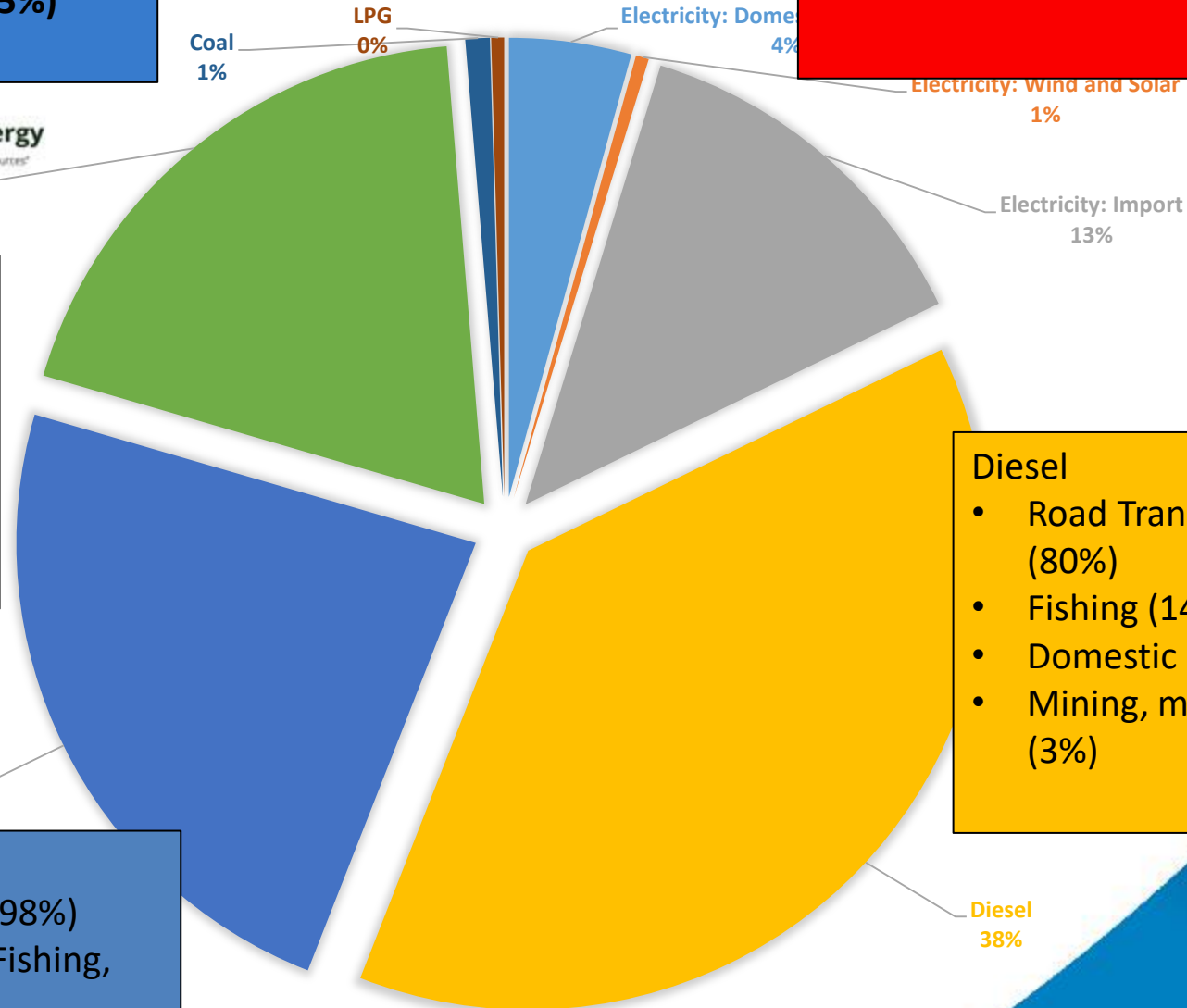
- 48.6% of HH use for cooking (65%)
- Charcoal export (35%)

Petrol

- Road Transport (98%)
- Manufacturing, Fishing, Mining (2%)

LPG

- 10.3% of HH use for cooking (100%)
- Road Transportation



Aviation Road
ate Bag 13297
oek, Namibia
@mme.gov.na
.mme.gov.na
mmeNamibia

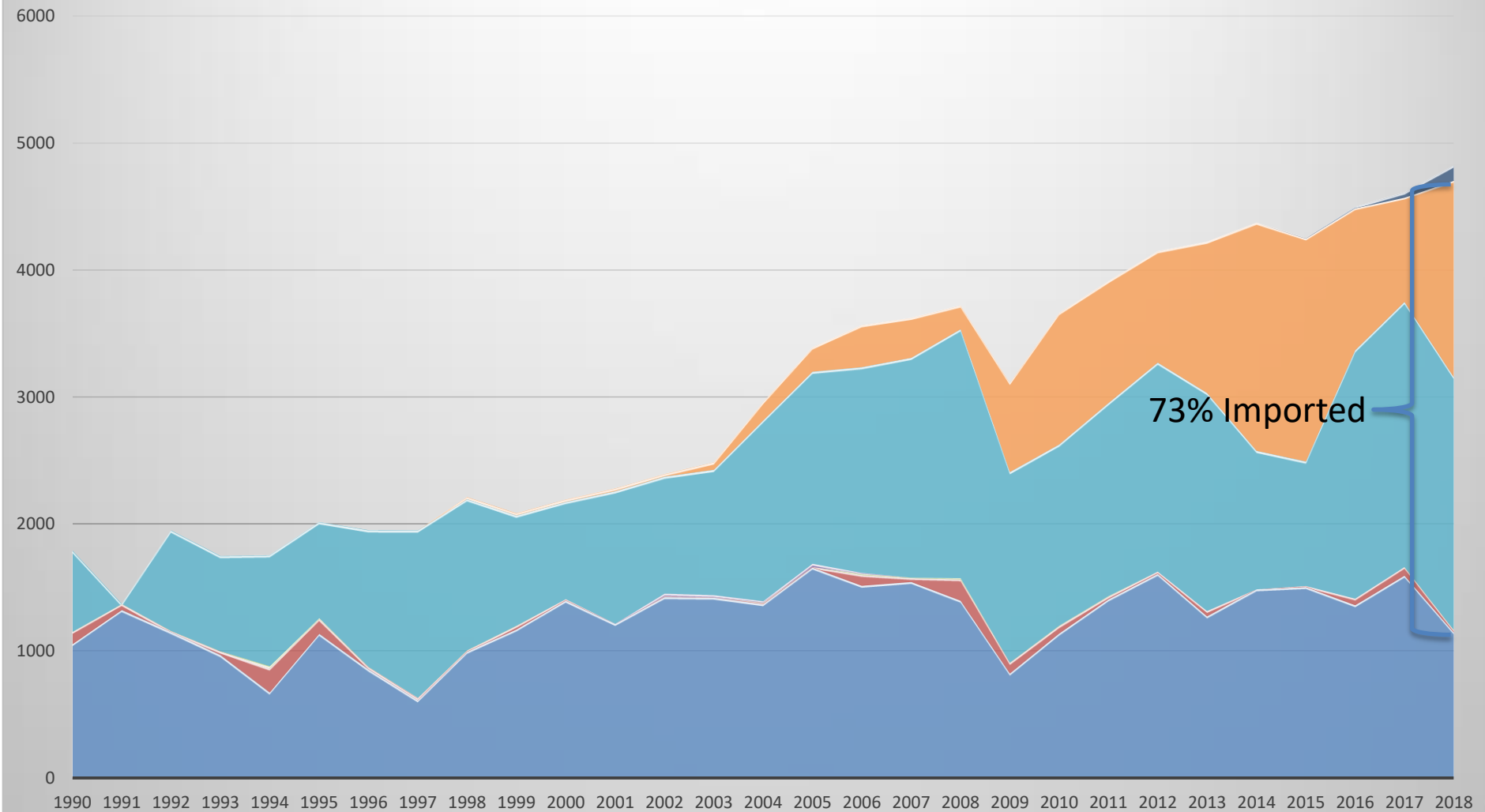


Electricity Supply Mix 2000-2018

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na

Electricity supply in Namibian System 1990 - 2018 (GWh)

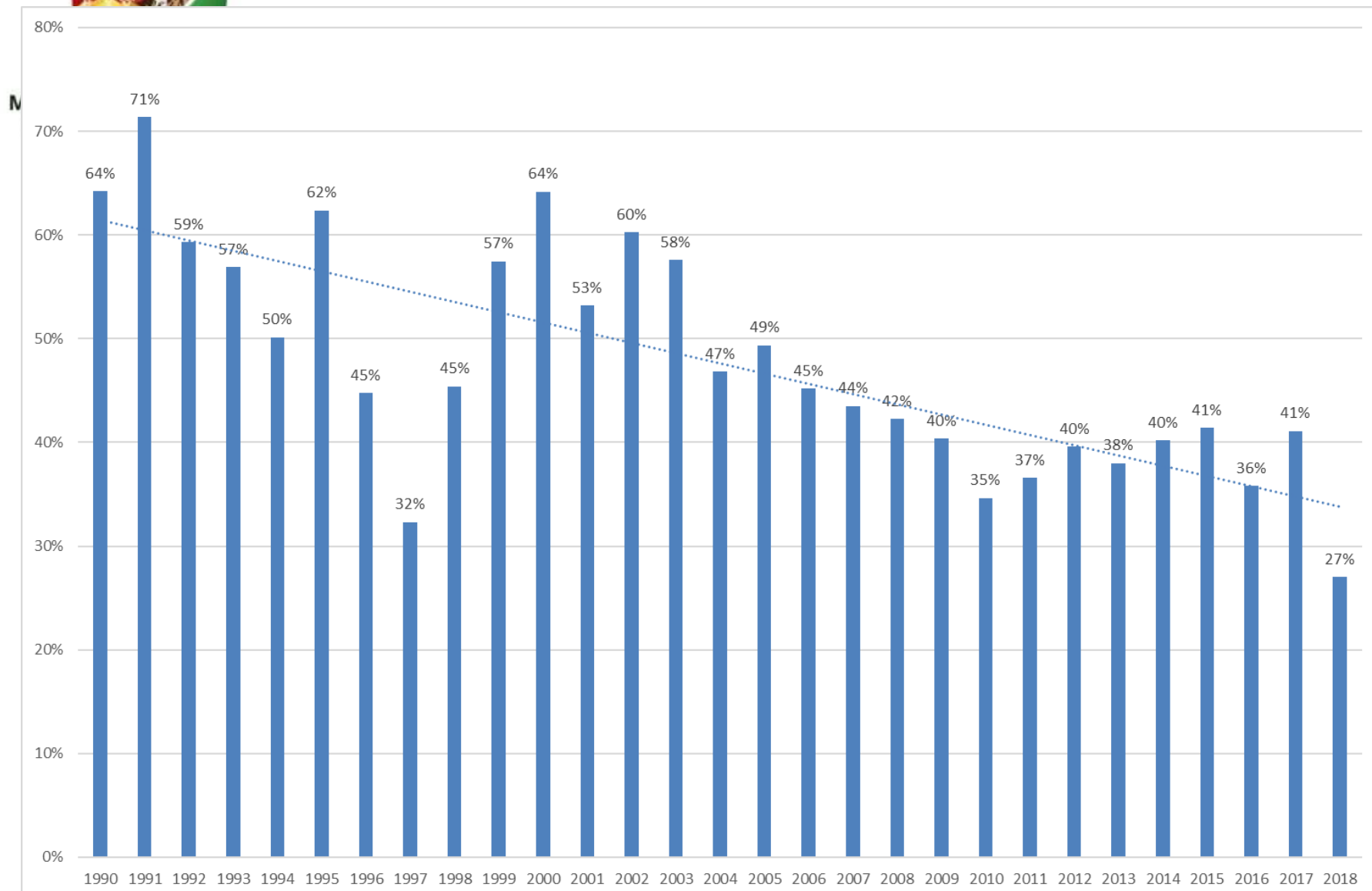
Ruacana Van Eck Paratus Anixas Eskom SAPP IPPs





Electricity Self Generation

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia





Electrical Demand and Supply

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

- Maximum demand 2018 – **639 MW** (Incl Skorpion) in June 2018
- Installed capacity 2019 – **619MW**
- Annual energy consumption 2018 – 4285 GWh (4826 GWh into system) **12% losses**
- 2018 Namibia produced only – 1337 GWh
- If 614MW was available all the time = 5400GWh
- System wide **capacity factor** of 25%



Installed Capacity

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia



Ruacana (Hydro)

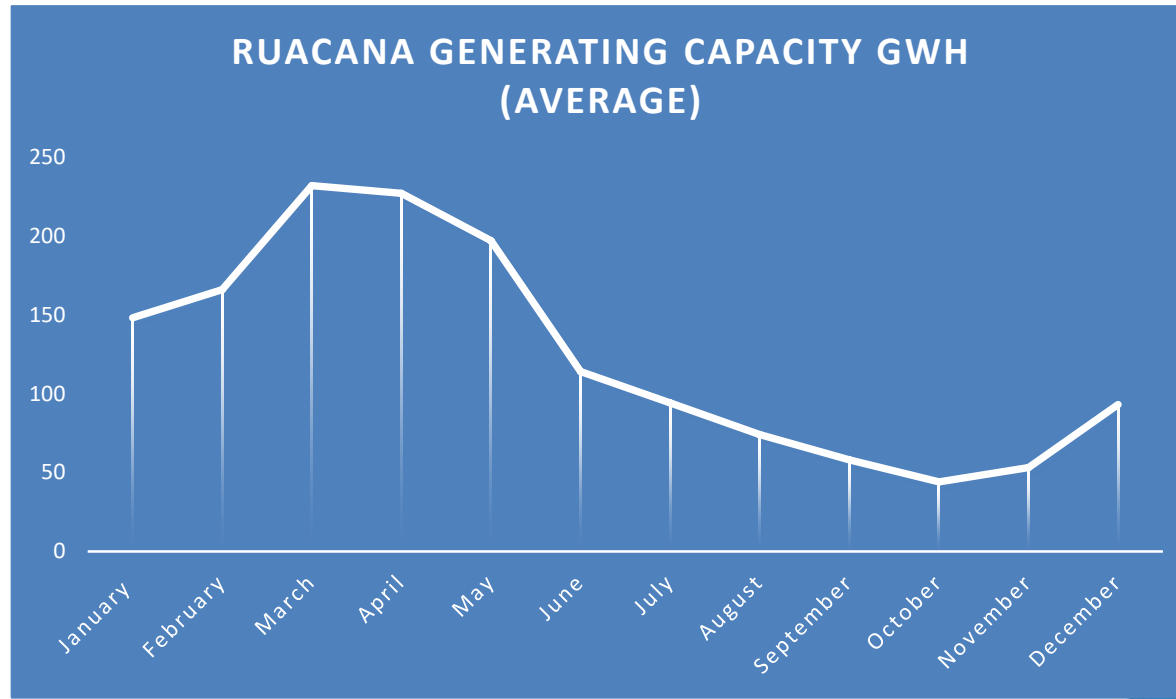
Maximum Plant output: 347 MW (3x85 + 92)

Maximum potential energy output 3039.72 GWh

Actual output between 1035 – 1500GWh/annum

FY 2018 - 1144 GWh (NP Annual report 2018)

CF - 38%





Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Installed Capacity

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

Van Eck (Coal)

Maximum Plant output: 120 MW (4x30)

Net output: 60 MW

Maximum potential energy output 525.6 GWh

Actual output between 15 – 135GWh/annum

FY 2018 – 21GWh (NP Annual report 2018)

CF – 4%





Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Installed Capacity

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia



Anixas (HFO)

Maximum Plant output: 22.5 MW

Maximum potential energy output 192.72 GWh

Actual output between 0 – 100GWh/annum

FY 2018 – 0.15GWh (NP Annual report 2018)

CF – 0.0008%

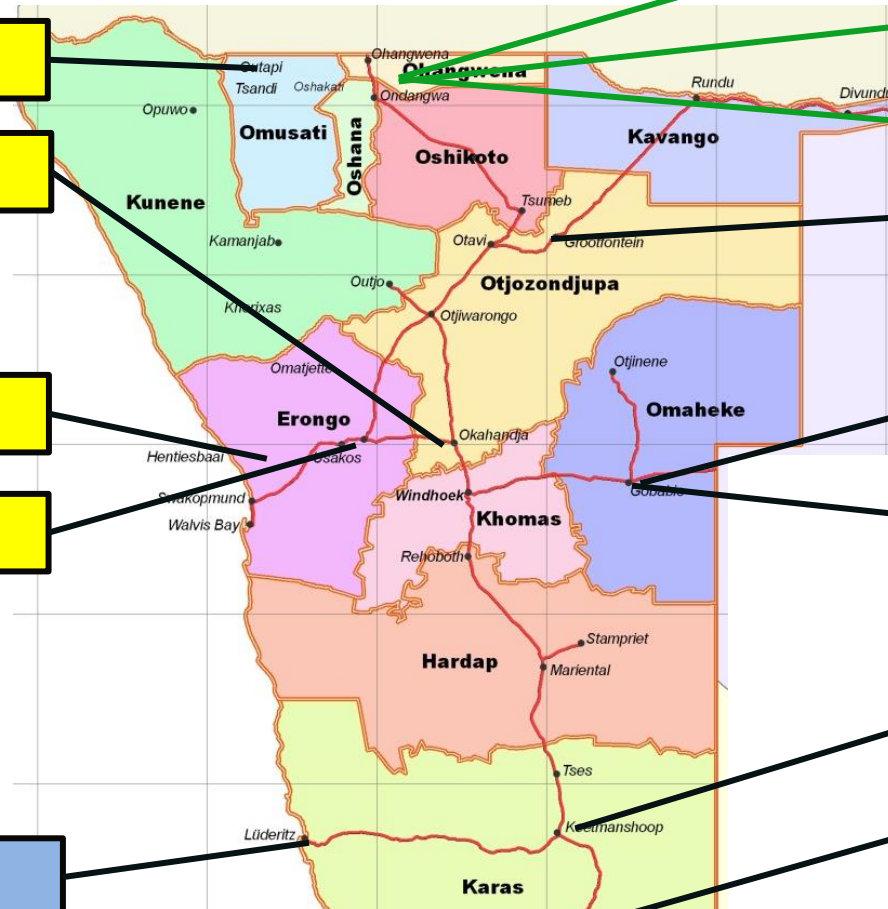


www.facebook.com/mmeNamibia

Alcon: 5MW

Ombepo: 5MW

70MW





6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
ebook.com/mmeNamibia



30 - 70MW Embedded 70 MW Mines

Hardap:37MW

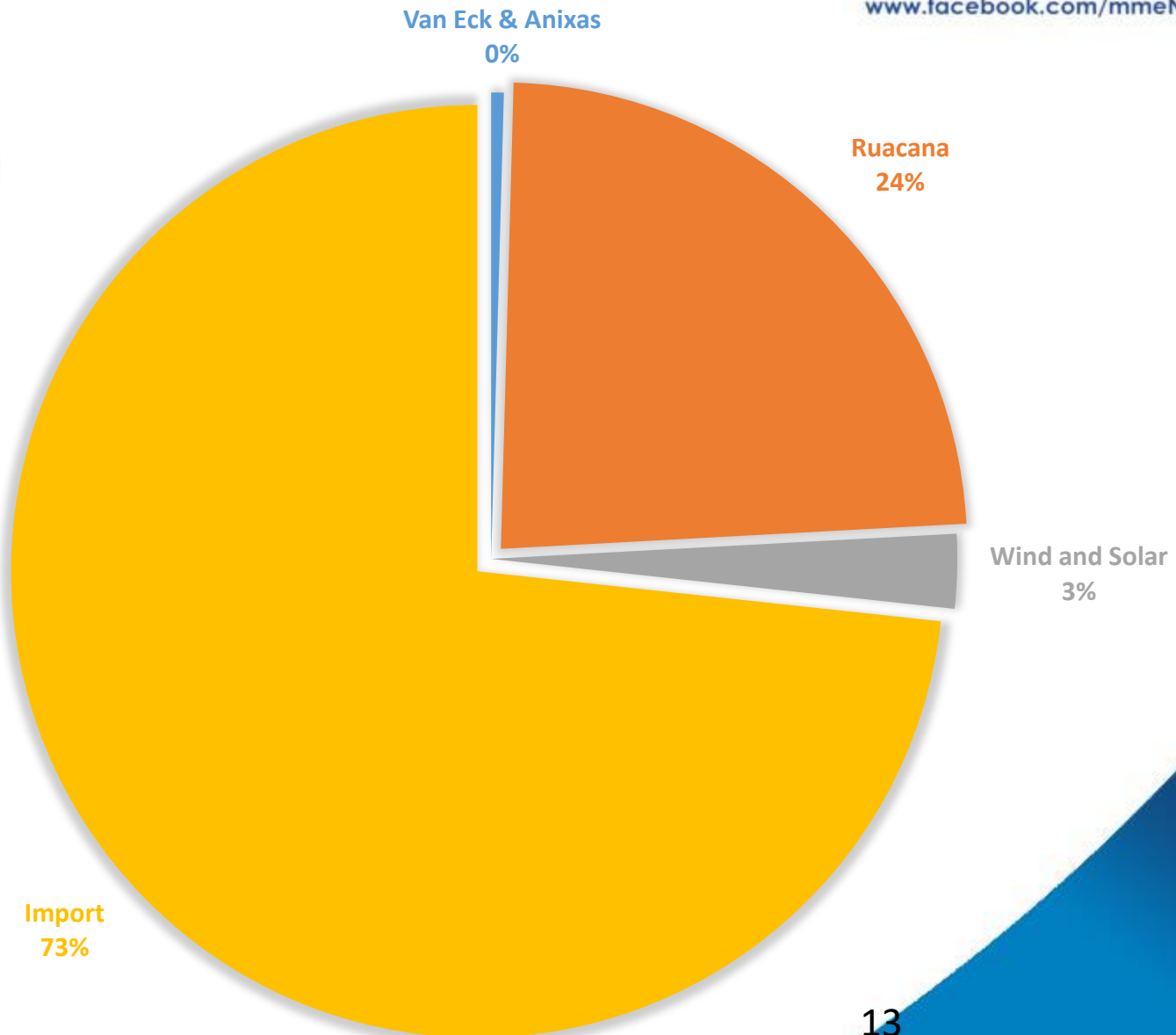
CF (Solar) – 35% and Wind – 45%



Ministry of Mines & Energy
"promoting Namibia's mineral, geological and energy resources"

2018 – Electricity Supply

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia





Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Planning (NIRP)

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

- **Definition:**
 - A Dynamic 20-year plan spanning the period 2016 – 2035, projecting expected future electricity demand by identifying the mix of resources required to meet the country's electricity needs in an efficient and reliable manner at the lowest reasonable cost.
- **Objective**
 - To evaluate and balance the expected cost and risk of alternative portfolios combined with long-run public policy goals to choose the portfolio with the best cost-risk combination.
- **Purpose/Intention**
 - To meet forecasted annual peak and commodity demand, and established reserve margin through a combination of supply and demand side resources (existing and new) over a twenty year period.



Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Plan A

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

YEAR	SOLAR - PV	WIND	BIO MASS	CSP	THERMAL
2017	70				
2018	50	49			120
2019					
2020	20				
2021					300
2022		50			
2023					
2024	20		20		
2025					300

Major Highlights

Plan A – Base case : Coal fired base load plant without Kudu and Baynes



Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Plan B

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

YEAR	SOLAR - PV	WIND	BIO MASS	CSP	THERMAL
2017	70				
2018	50	49			120
2019					
2020	20				
2021				50	442
2022		50			
2023			20		
2024	20		20		
2025			40	150	300

Major Highlights

- Plan B - Alternative path:
With Kudu and Baynes



Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

Plan C: High RE Content – Alternative Path

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

- **Major Highlights**

- ☐ High RE Content, subject to international support on which the Nationally Determined Contribution (NDC) is based
- ☐ Plan to achieve 70% annual energy generation from renewables that is put forward as the target by 2030 in the NDC.

NIRP currently being Updated to account for new realities: MSB, Ministerial determination, 220MW and 80% self-sufficiency by 2020 etc...



Ministry of Mines & Energy

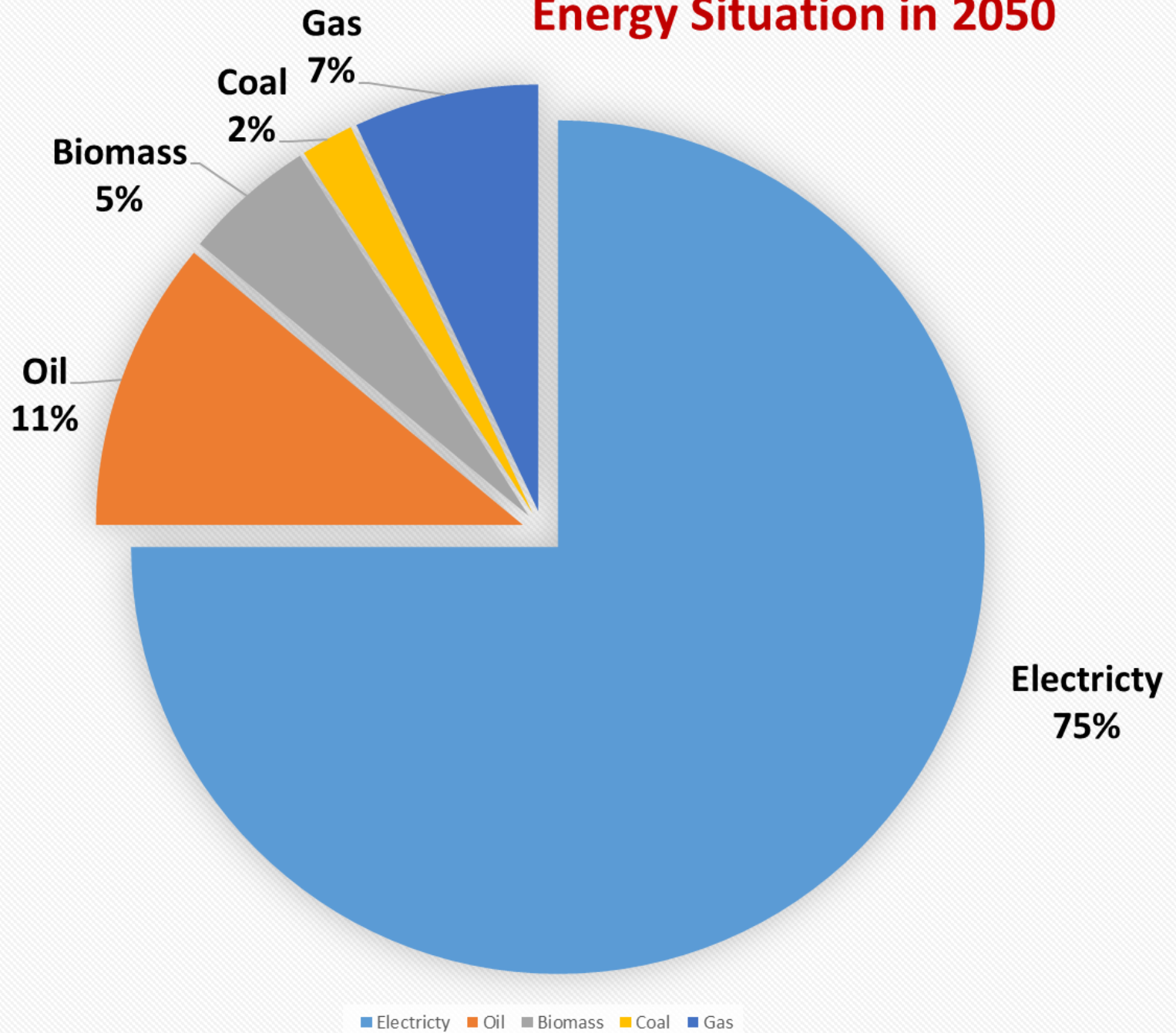
"promoting Namibia's mineral, geological and energy resources"

Long term projections (Guess Work)

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

- Estimated that by 2030, 22% off all transport vehicles will be EV. And by 2050, 60 - 90%
- Climate Change.
- Storage Technology improvements
- Reduction in RET's and Storage cost.
- Move towards energy self-sufficiency (Namibia is aim at 80% electricity self-sufficiency by 2022.)
- Auto-motive industry (Tesla, Nissan, VW, BMW, GM, Chinese makes...

Energy Situation in 2050





Ministry of Mines & Energy

"promoting Namibia's mineral, geological and energy resources"

6 Aviation Road
Private Bag 13297
Windhoek, Namibia
Email: info@mme.gov.na
www.mme.gov.na
www.facebook.com/mmeNamibia

THANK YOU