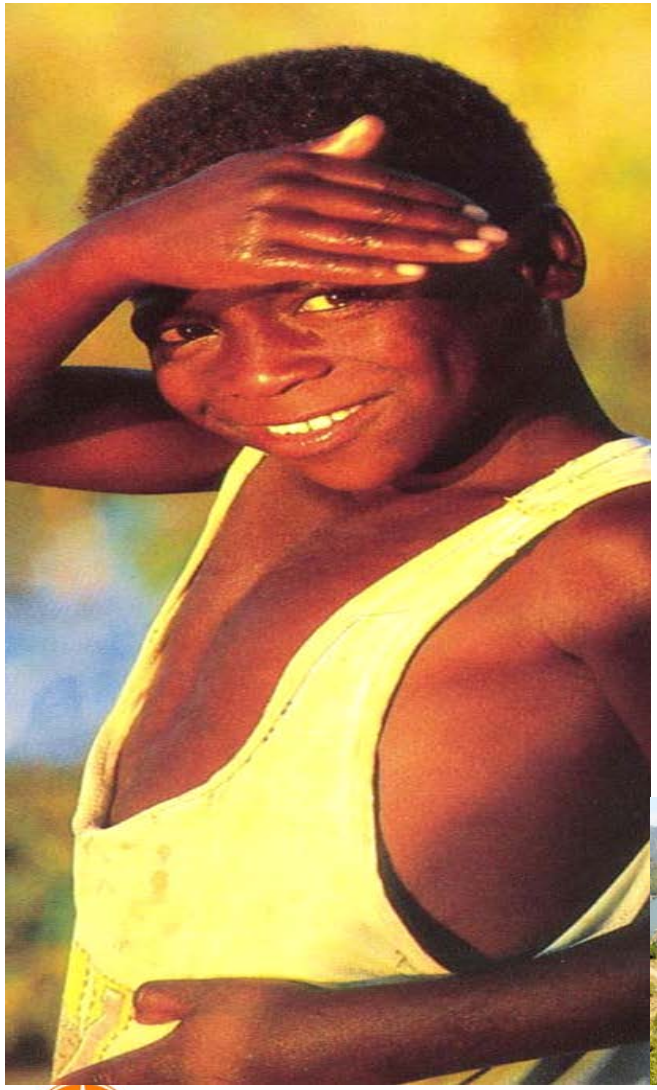


Overview of the Electricity Sector in Mozambique

Japan, July 2019




CONTENTS

ELECTRICITY SUPPLY INDUSTRY (OPERATORS)

Electricidade de Moçambique (EDM): The national power utility wholly owned by the state responsible for the **generation, transmission, distribution and commercialization of electricity** throughout the country.

Hidroeléctrica de Cahora Bassa (HCB): Owned by EDM / Moçambique (92,5%) and REN / Portugal (7,5%) is the **Independent Power Producer (IPP)** responsible for the generation of electricity in Cahora Bassa (2075 MW)

Mozambique Transmission Company (MOTRACO): **Independent Transmission Company (ITC)**, Owned 33.3% by EDM, 33.3% ESKOM and 33.3% SEB with the responsibility to supply electricity to MOZAL and wheel power to EDM and SEB of Swaziland

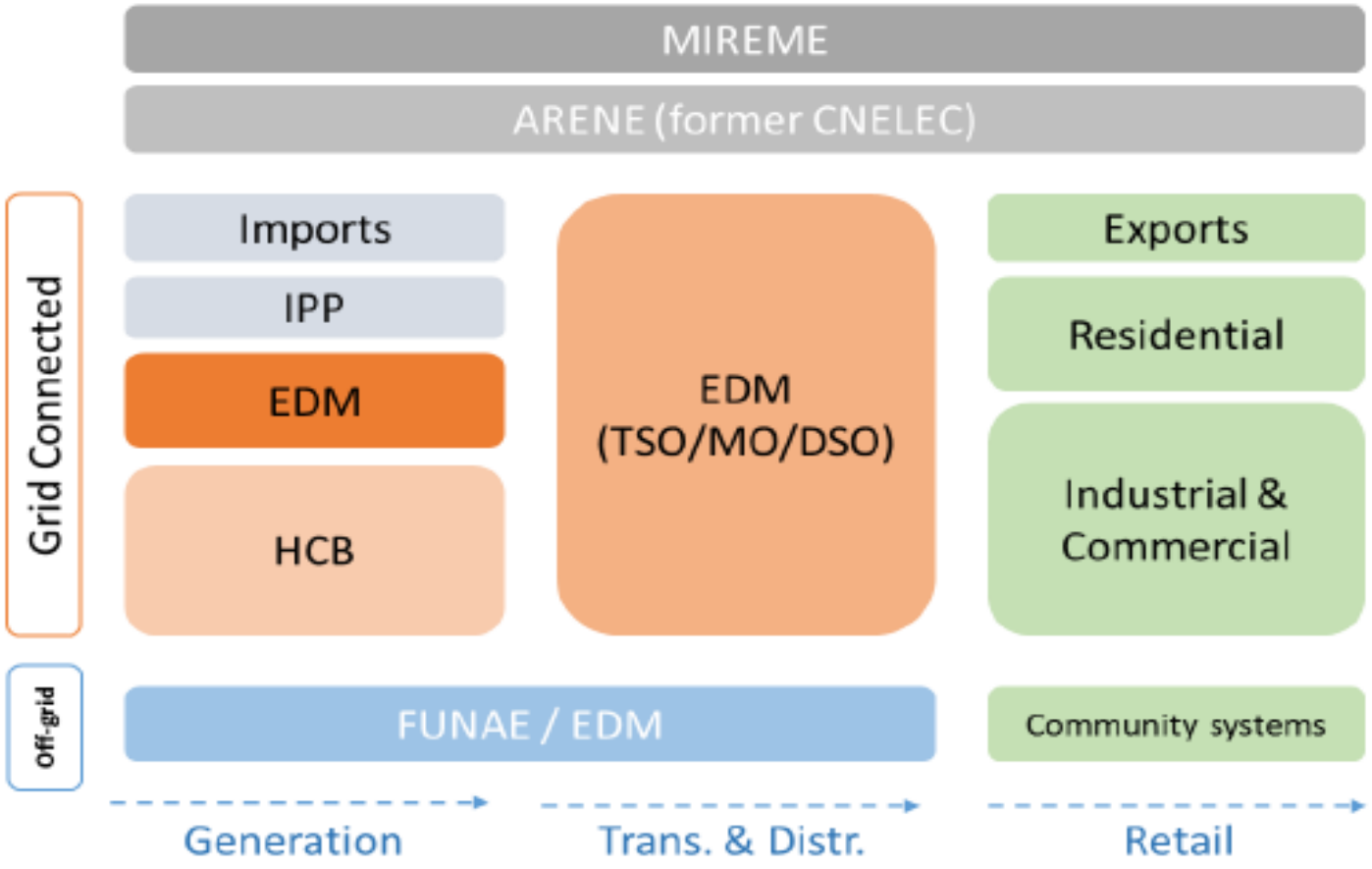
Central Térmica de Ressano Garcia (CTRG):: **Independent Power Producer (IPP)**, Owned 51% by EDM, 49% by SASOL, responsible for the generation of electricity in region south (175 MW)

Central Térmica de Gigawatt:: **Independent Power Producer (IPP)**, Owned Old Mutual, Gigajoule, MGC, responsible for the generation of electricity in region south (120 MW)

Kuvaninga Gas fire power Plant: **Independent Power Producer (IPP)**, Owned by Investec, Eventure and SPI for the generation of electricity in region south (40 MW)

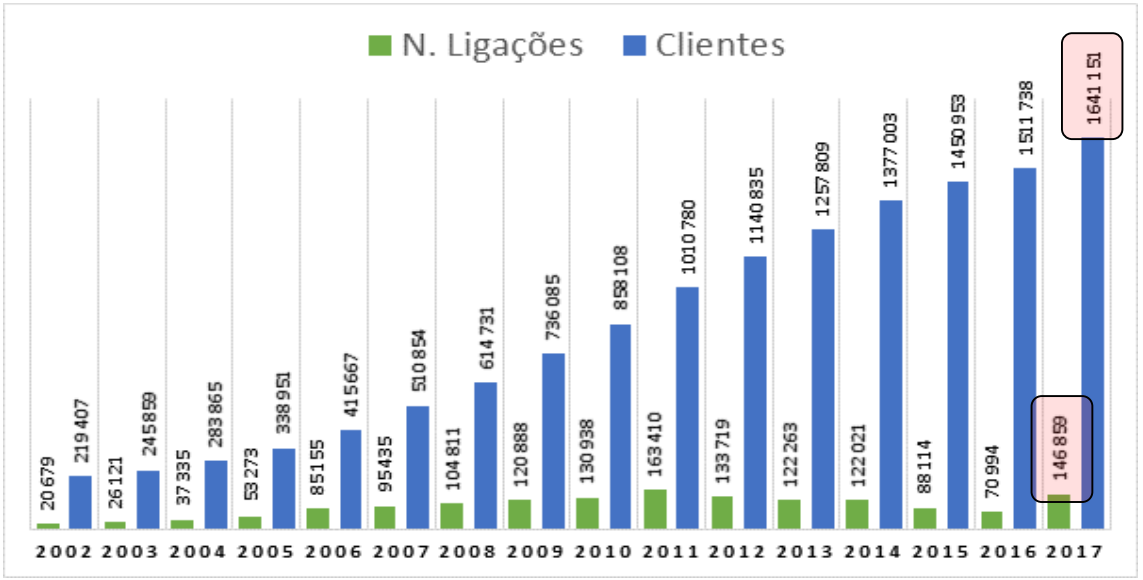
INSTITUTIONAL FRAMEWORK

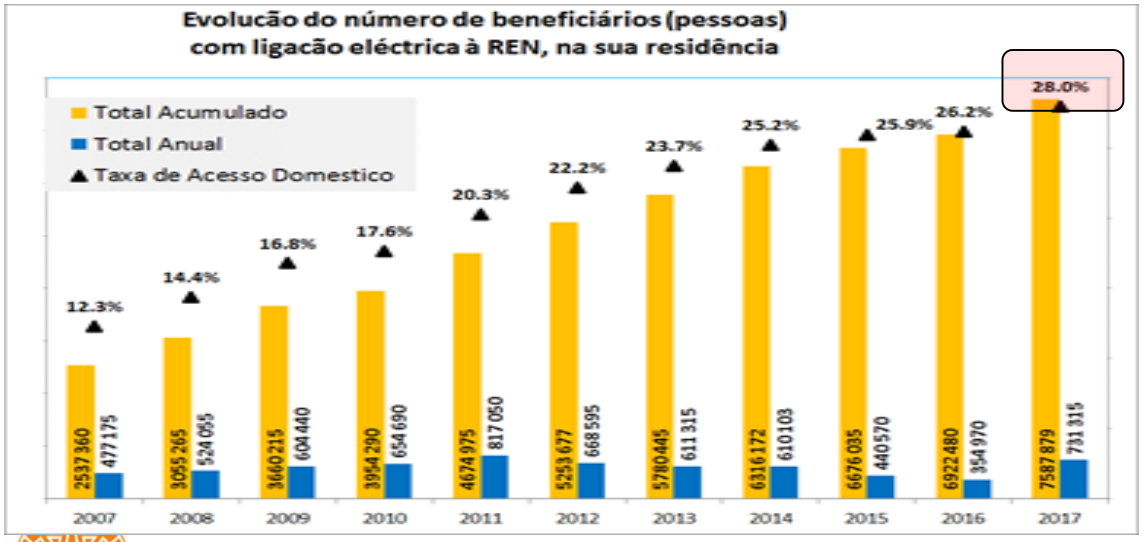
Figure 2.1. Organization of the electric power sector in Mozambique

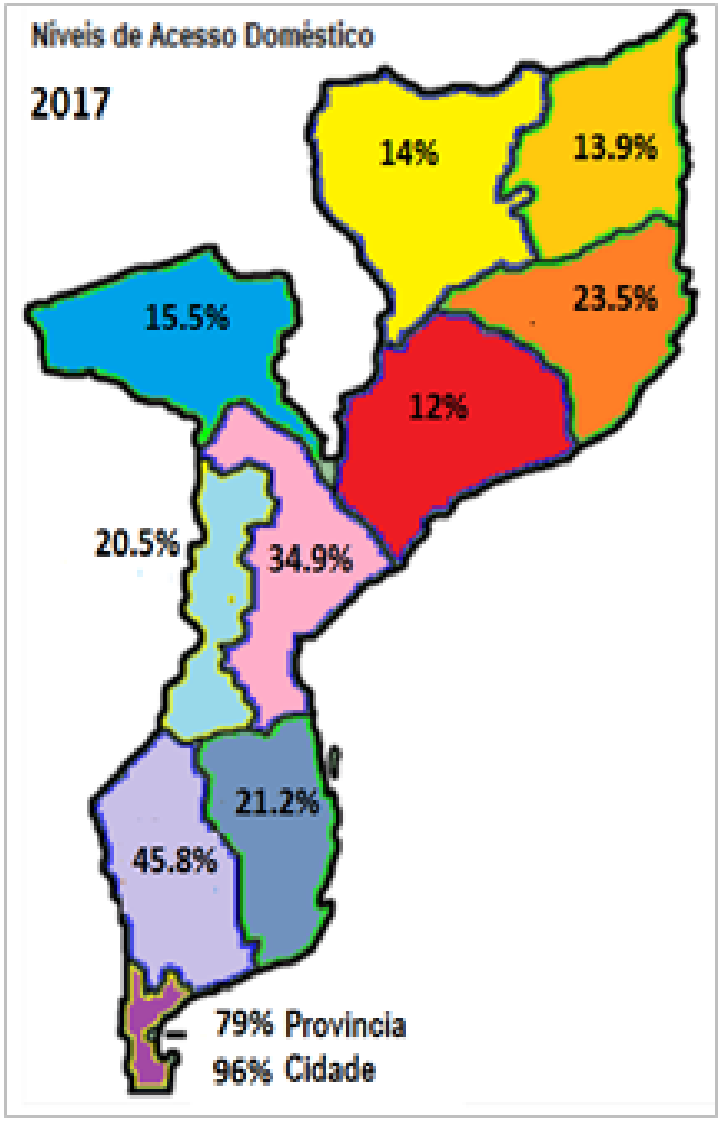


STRATEGIC ROAD MAP

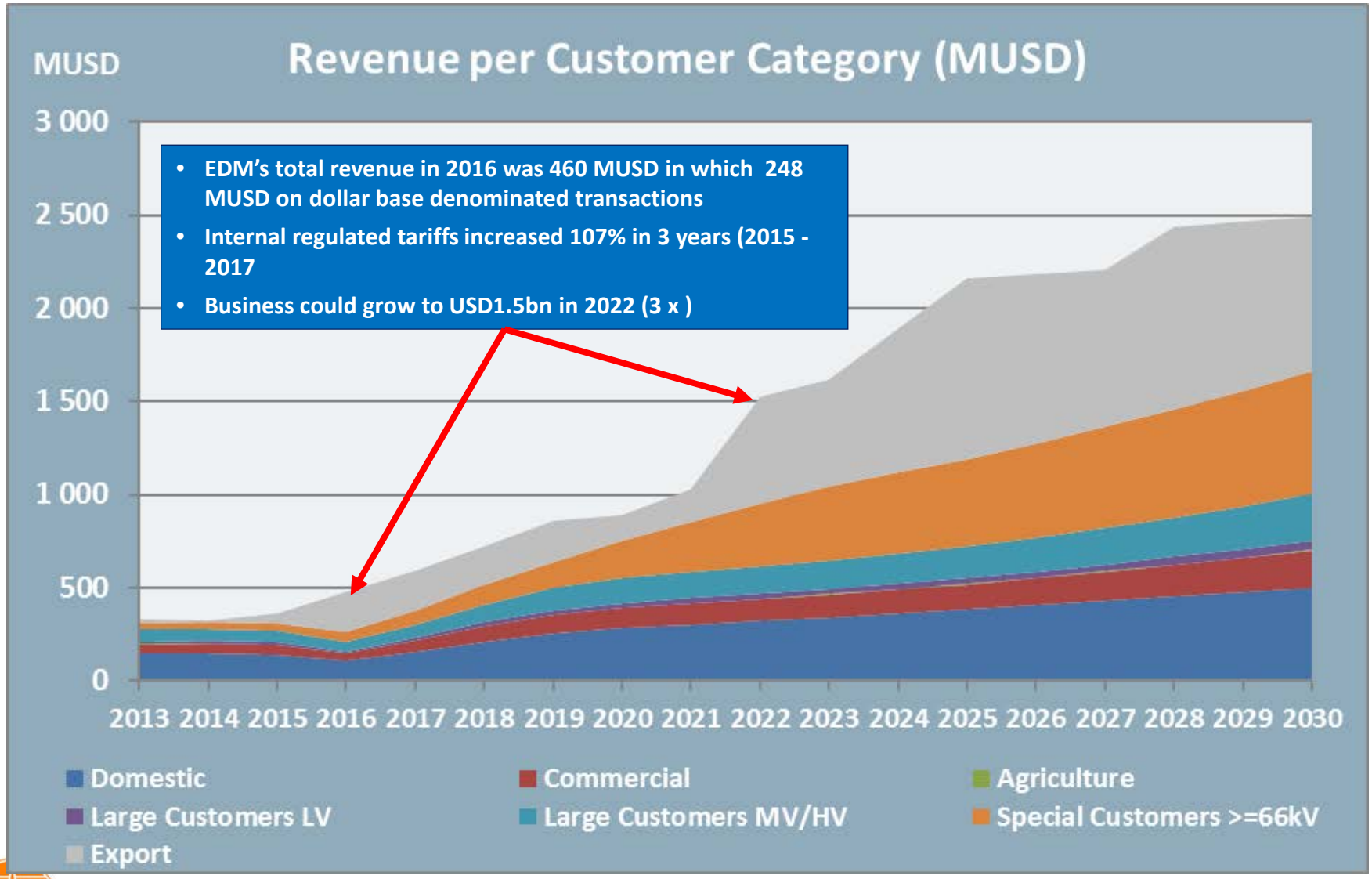
NUMBER OF CUSTOMERS AND NEW CONNECTIONS







REVENUE PROJECTION



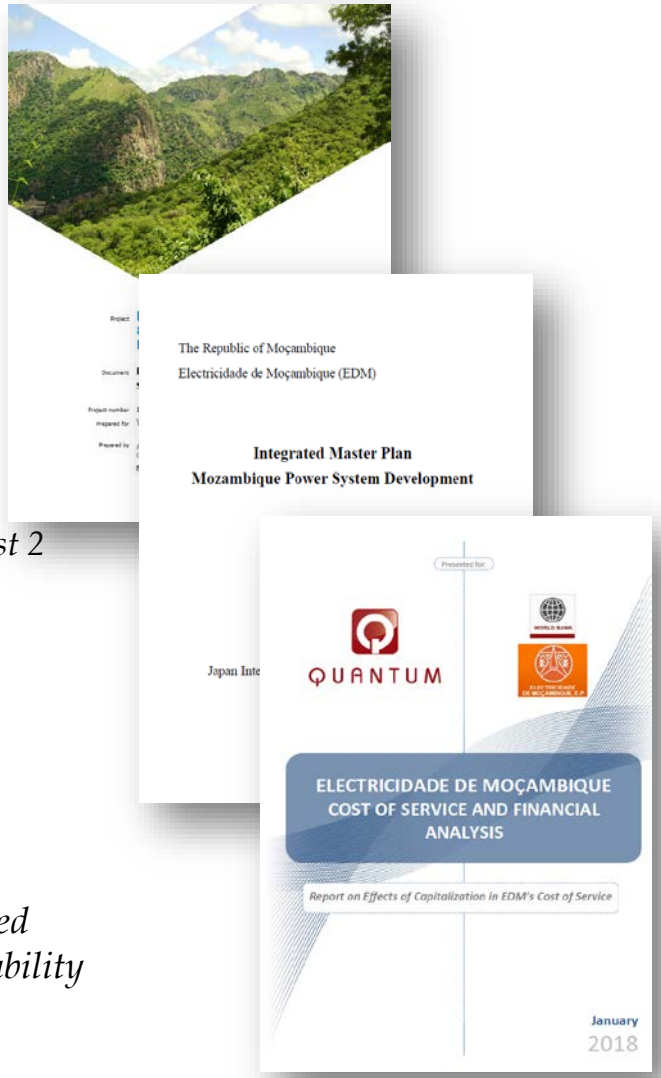
- EDM's total revenue in 2016 was 460 MUSD in which 248 MUSD on dollar base denominated transactions
- Internal regulated tariffs increased 107% in 3 years (2015 - 2017
- Business could grow to USD1.5bn in 2022 (3 x)

FUNDING MOBILIZED 2015 – 2017

INSTITUIÇÃO	PROJECTO	MONTANTE [MUSD]
Islamic Development Bank	Linha Caia-Nacala 400 kV	200
World Bank [PERIP]	[PERIP]	150
IFC, Proparco, FMO, ABSA and AFD	CTRG	270
IFC, SCATEC, Norfund and Norway	Solar Mocuba	80
World Bank, KFW e Norway	Moçambique-Malawi	95
KfW	Beleluane	20.7
JICA	Infulene, Namialo, Master Plan, CTM (LTSA)	130
BEI, KFW, Norway (STIP)	STIP	45
AFD e Proparco (Metoro and Trainning)	Metoro and Trainning	76
GoM(Electrification of New Districts)	New Disctricts	18
HCB (Finicing of the Power Line Marara-Matambo)	New Districts	1.5
Total de Financiamento Mobilizado [MUSD]		**1 086.2**

INSTITUTIONAL TRANSFORMATION

- **NEW BUSINESS MODEL,** social vs. commercial
- **GOVERNANCE**
  - ✓ *New Organisation Structure, New Board*
  - ✓ *Code of Conduct and Ethics*
  - ✓ *Performance base contract for Senior Managers*
  - ✓ *Centralized Procurement with new procedures*
- **FINANCIAL**
  - ✓ *Centralized Procurement, Budget,*
  - ✓ *Process Re-engineering, Cost Centre Accounting*
  - ✓ *Closing of the EDM accounts on time and without qualifications in the last 2 years*
- **HUMAN RESOURCES**
  - ✓ *New Grading structure*
  - ✓ *Career path and remuneration based on performance*
- **POLICY MATTERS** (external consultants remuneration, delegation authority matrix)
- **STRATEGIC STUDIES** (*New National Electrification Strategy, Integrated Master Plan, Cost of Supply study, Asset audit and revaluation, Pension liability study and Delegation Authority Accountability Matriz)*



Key sector indicators

Integrated Electricity Master Plan

Renewable Energy development

Cyclone IDAI (Emergency Aid)

ELECTRICITY MASTER PLAN

The Republic of Moçambique

Electricidade de Moçambique (EDM)

Integrated Master Plan
Mozambique Power System Development

Draft Final Report

November 2017

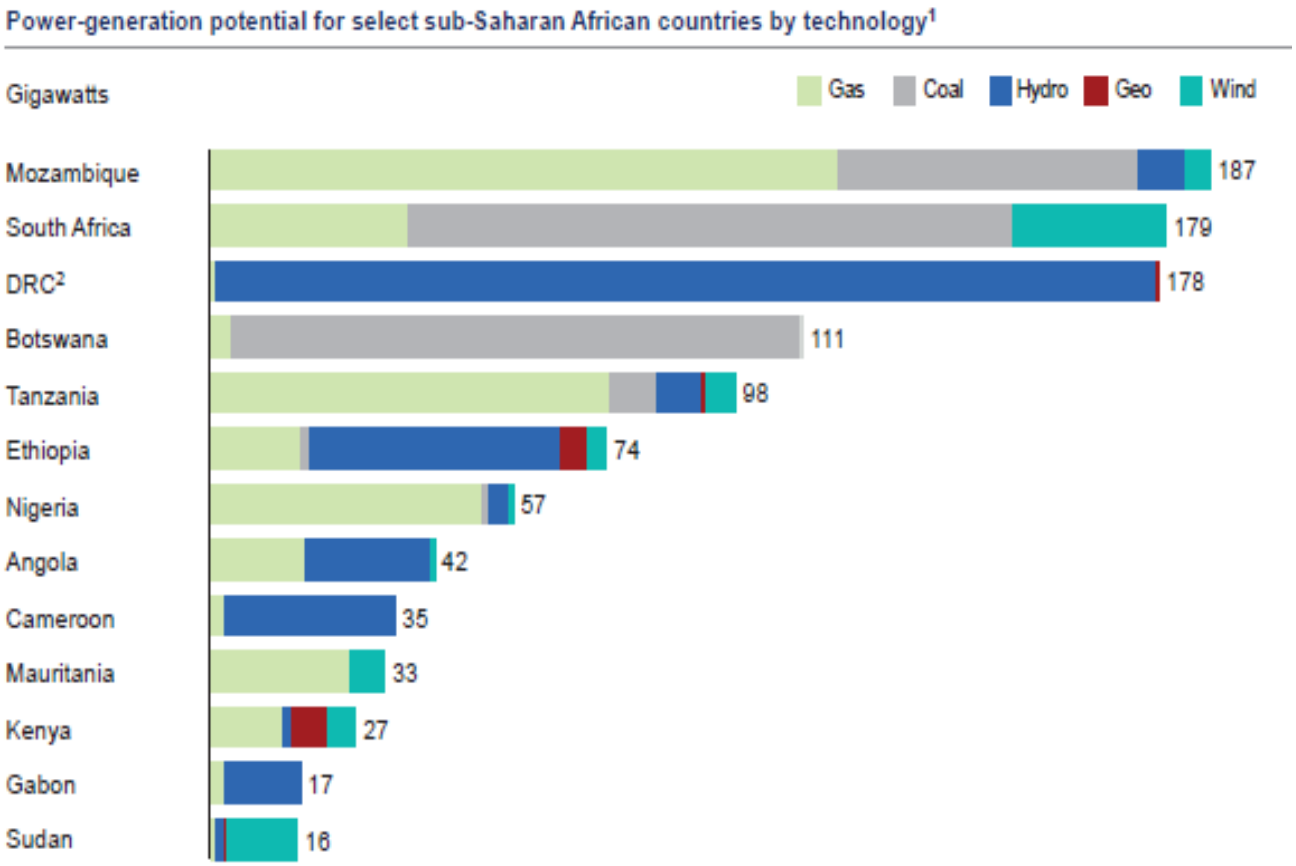
Japan International Cooperation Agency (JICA)

JERA Co., Inc.

As of 20th November, 2017

- The Integrated Electricity Master Plan has just been concluded and establishing the integrated least cost planning electrical infrastructure development from 2018 – 2042
- This study will be updated on a yearly base to capture the macro economics and sector dynamics, opportunity and development of the ongoing activities
- The study was conducted by the international Japanese Consultancy Service in conjunction with EDM and MINISTRY OF MINERAL RESOURCES AND ENERGY and with active participation of all relevant stakeholders

NATURAL ENERGY RESOURCES POTENTIAL



1 Potential from domestic resources only; gas includes all conventional proven/speculative reserves, and hydro includes all technically exploitable potential.
2 Democratic Republic of the Congo.

Source: *Geothermal: International Market Overview Report*, Geothermal Energy Association, May 2012, geo-energy.org; International Energy Statistics, US Energy Information Administration, 2013, eia.gov; *National-Scale Wind Resource Assessment for Power Generation*, National Renewable Energy Laboratory, June 2013, nrel.gov; Rystad Energy database, rystadenergy.com; *World Energy Resources: 2013 Survey*, World Energy Council, October 2013, worldenergy.org

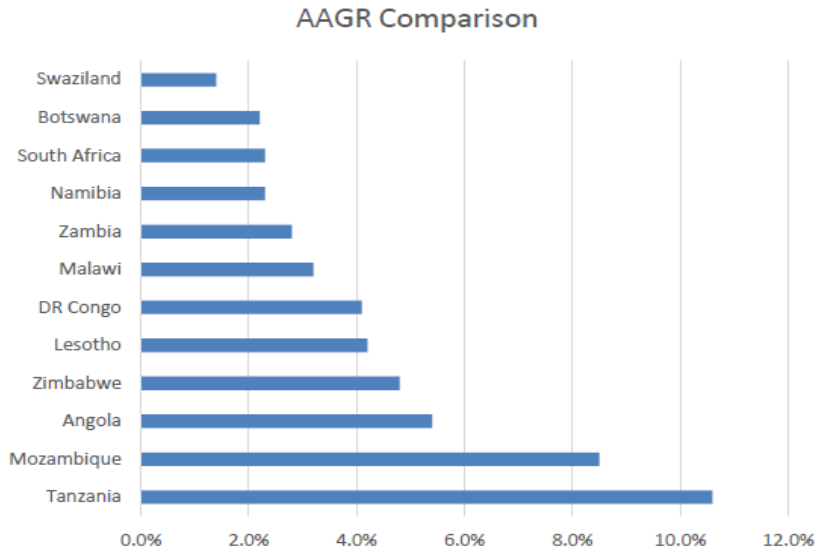
Source: McKinsey

ESTIMATED ENERGY GROWTH DEMAND

Forecast Average Annual Growth Rate Comparison with SAPP Countries

Annual Average Growth Rate (AAGR) from 2016 to 2040 (Energy Base)

Country	AAGR
Tanzania	10.6%
Mozambique	8.5%*
Angola	5.4%
Zimbabwe	4.8%
Lesotho	4.2%
DR Congo	4.1%
Malawi	3.2%
Zambia	2.8%
Namibia	2.3%
South Africa	2.3%
Botswana	2.2%
Swaziland	1.4%

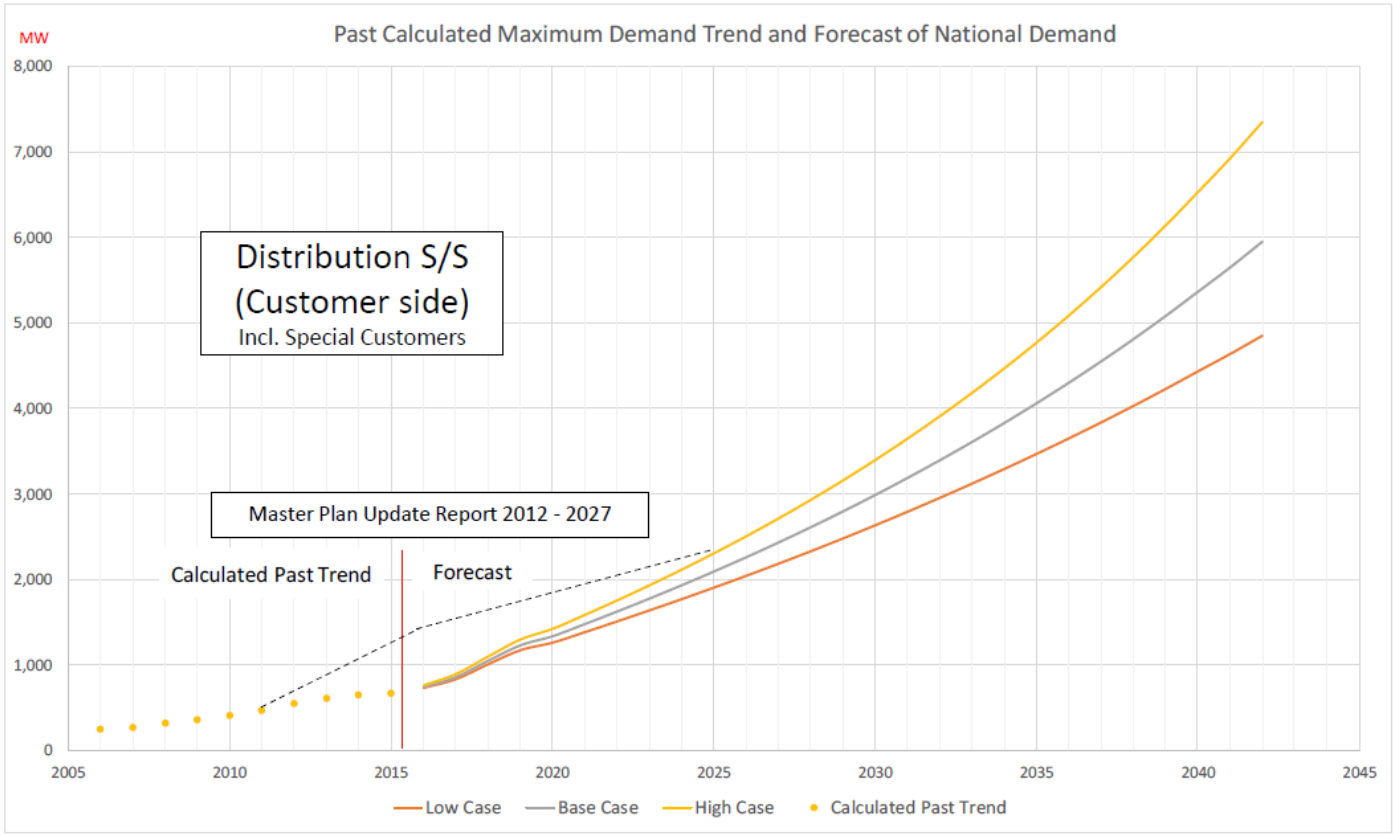


* Levelized Annual Growth Rate (LAGR) from 2016 to 2030, refers to the result of this Master Plan

Source: Data Collection Survey on Southern African Power Pool (JICA Draft Final Report)

ELECTRICITY MASTER PLAN

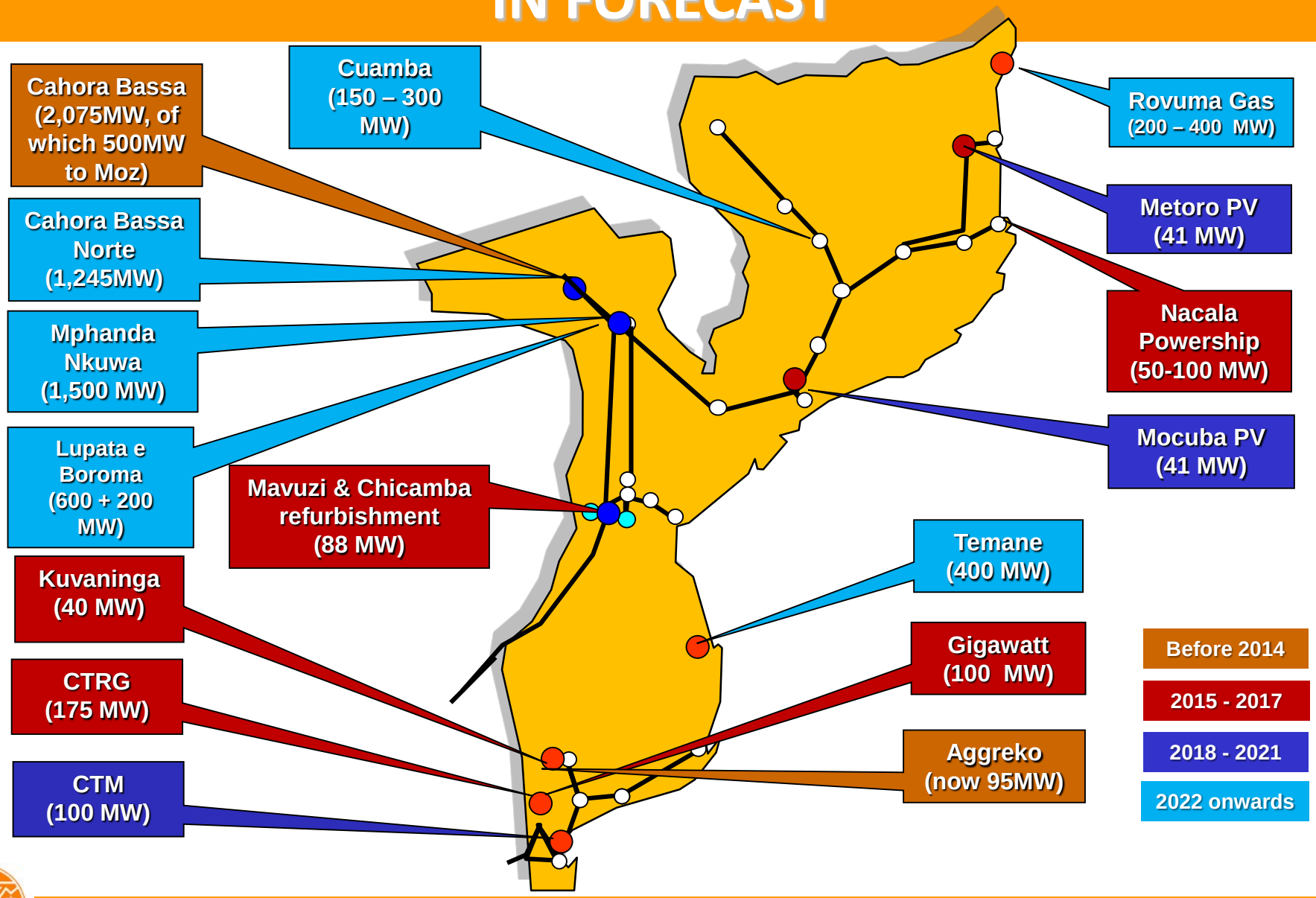
National Total Maximum Demand Forecast



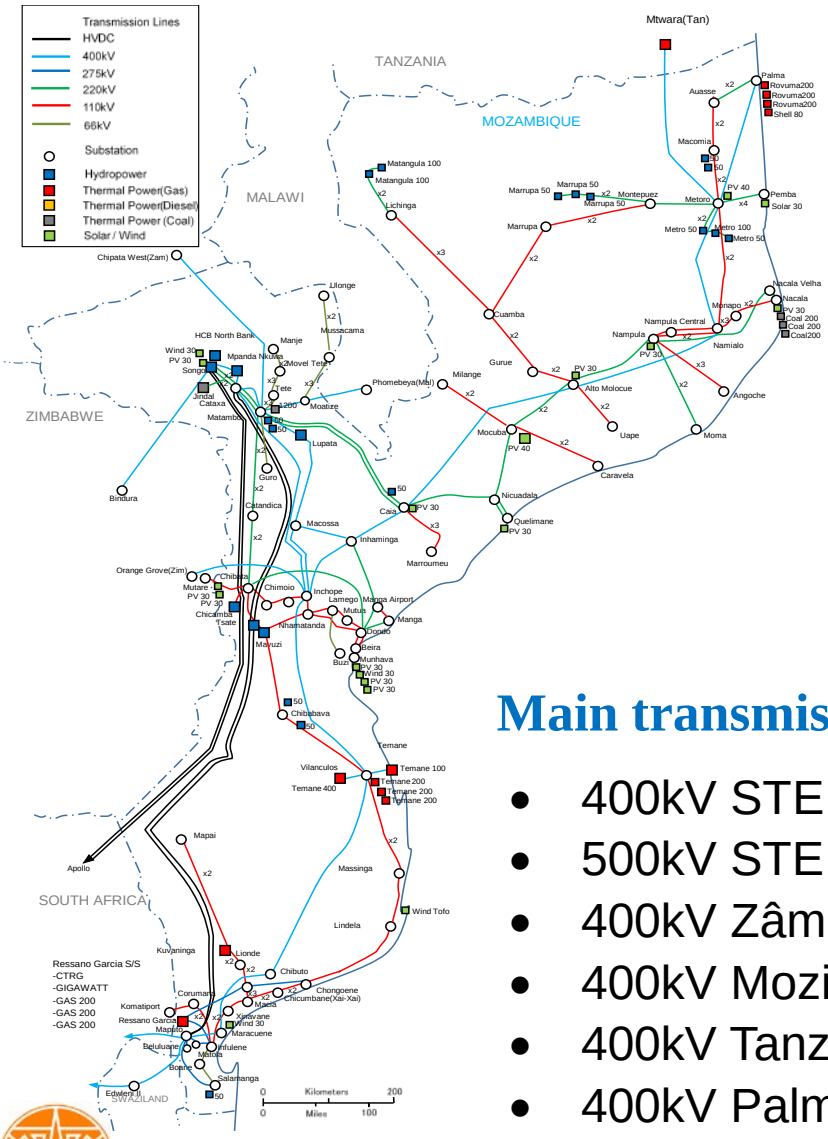
655 MW (2015) >> 5,950 MW (2042)

875 MW (2015) >> 6,770 MW (2042): Sending End

GENERATION SOURCES & PROJECTS INCLUDED IN FORECAST



Mid and Long Term Projects
Power Transmission Lines



MUSD 9,100

Main transmission lines up to 2022

- 110kV Chibabava – Vilanculos (2021)
- 110kV Massinga – Vilanculos (2020)
- 400kV Interligação com Malawi (2021)
- 400kV Caia – Nacala (2022)
- 400kV STE Fase 1-1 (Vilanculos – Maputo) (2022)

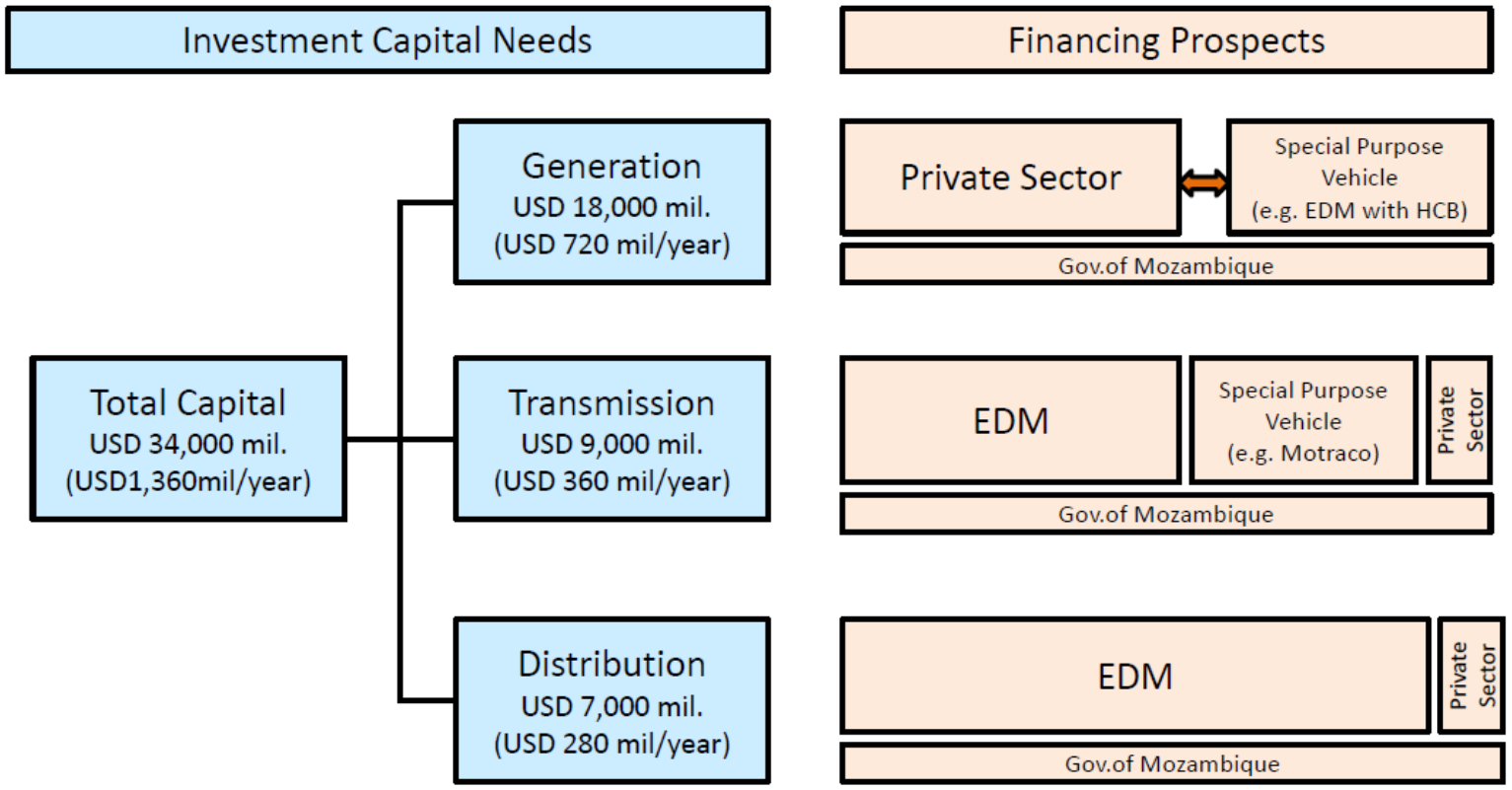
Main transmission lines up to 2032

- 400kV STE Fase 1-2 HVAC (Cataxa – Vilanculos) (2026)
- 500kV STE Fase 1&2 HVDC (Cataxa – Maputo) (2026)
- 400kV Zâmbia interconector (2024)
- 400kV Mozisa project (2025)
- 400kV Tanzânia interconector (2026)
- 400kV Palma – Metoro (2026)

FUNDING STRUCTURE/SOURCES

Discussion Points

Funding Arrangement for Capital Projects
(Year 2018 – 2042)



CONTENTS

Key sector indicators

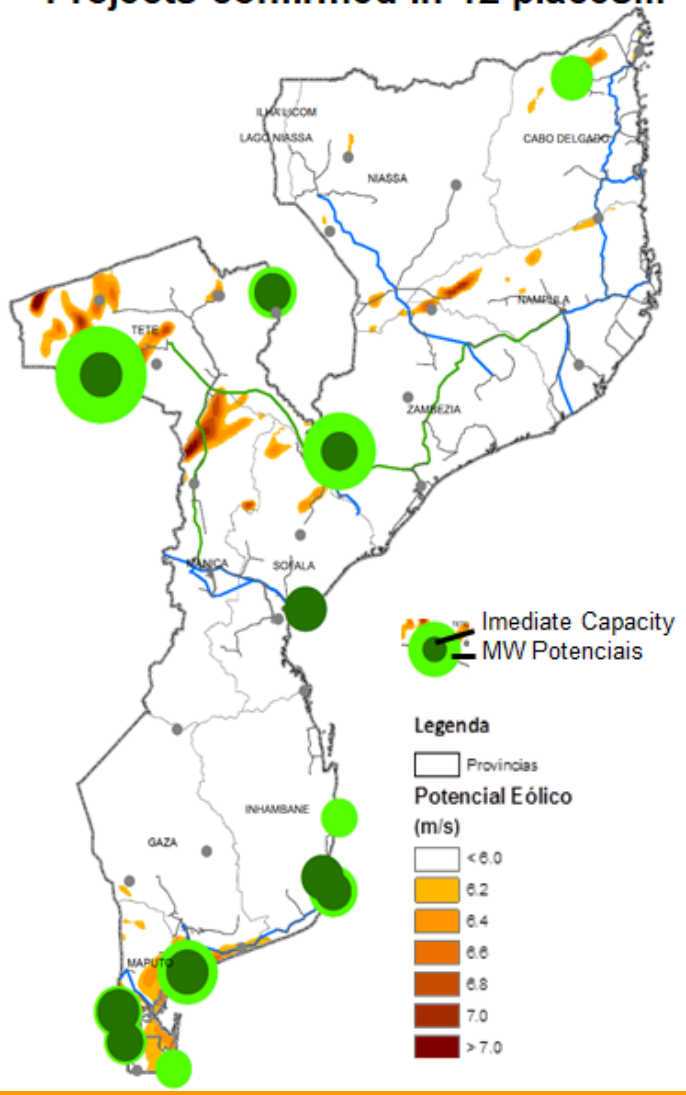
Integrated Electricity Master Plan

Renewable Energy development

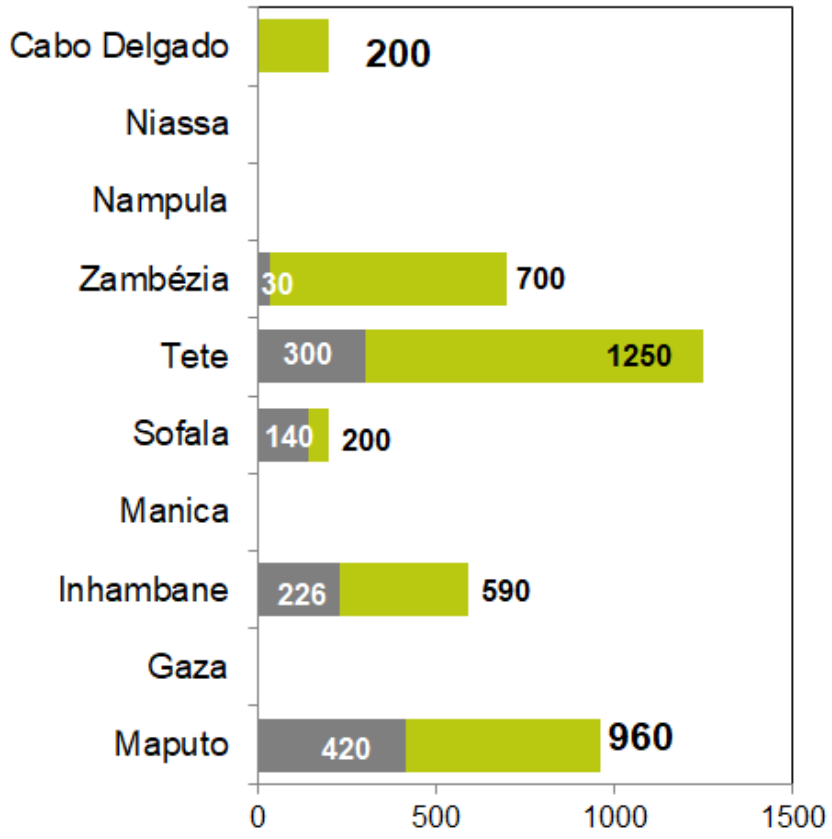
Cyclone IDAI (Emergency Aid to recover)

RENEWABLE ATLAS (WIND POWER)

Projects confirmed in 12 places...



...total of 3.900 MW

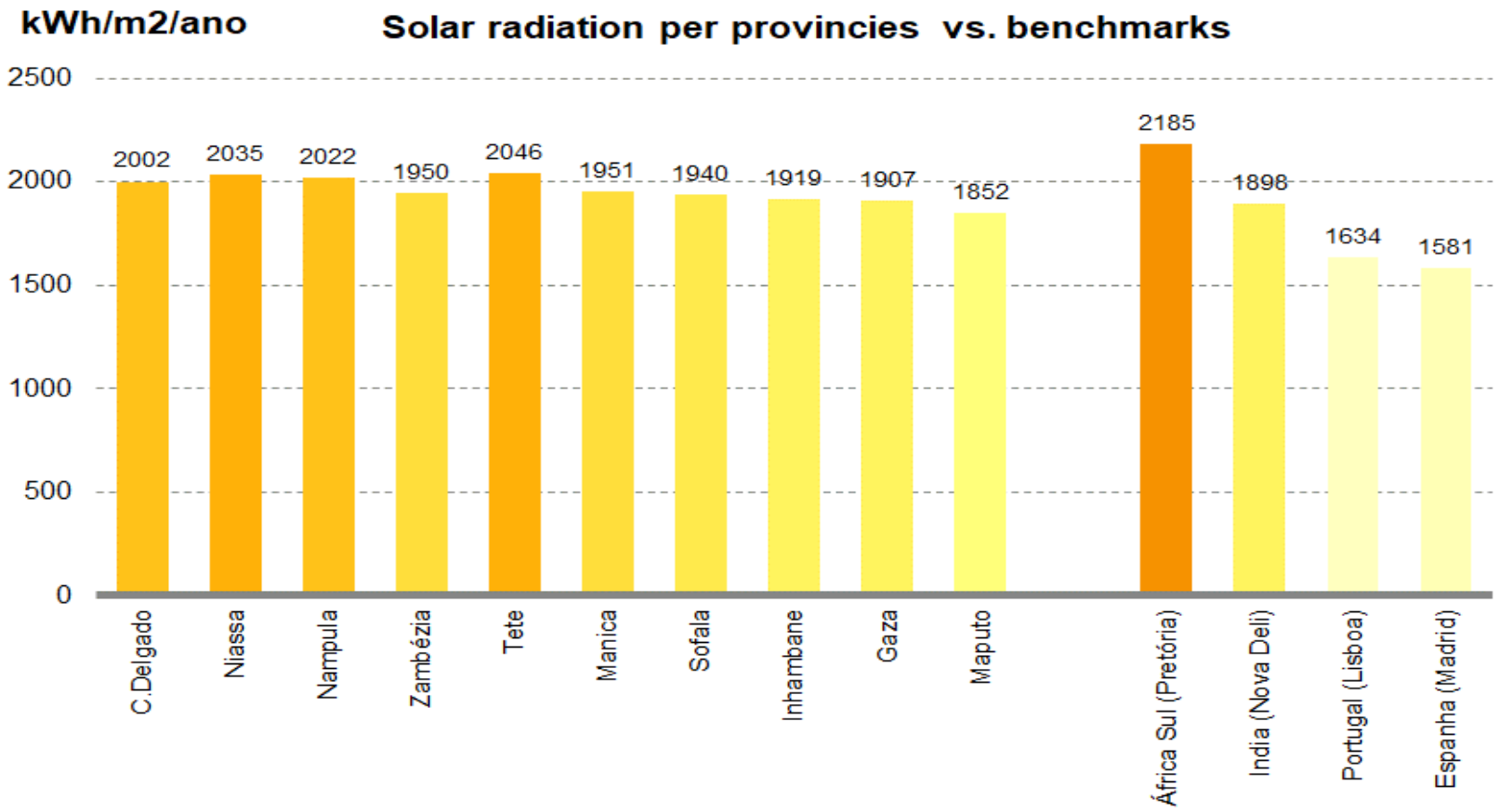


Priority projects **1108 MW**

Total potential **3900 MW**

RENEWABLE ATLAS (SOLAR POWER)

MOZAMBIQUE HAS HIGH SOLAR YIELDS IN MOST OF THE ALL TERRITORY

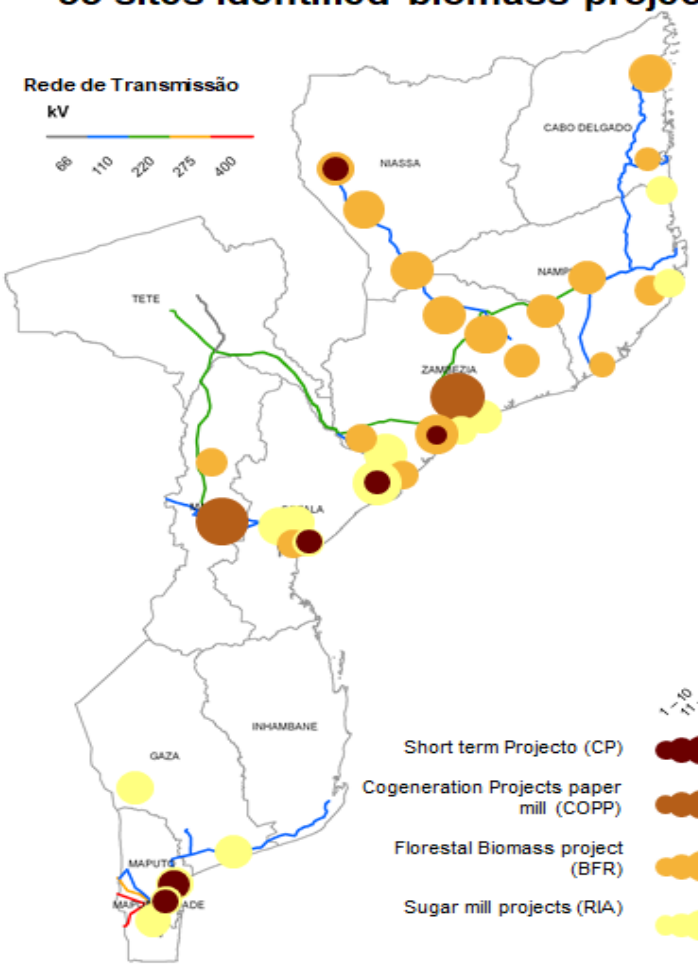


RENEWABLE ATLAS (BIOMASS)

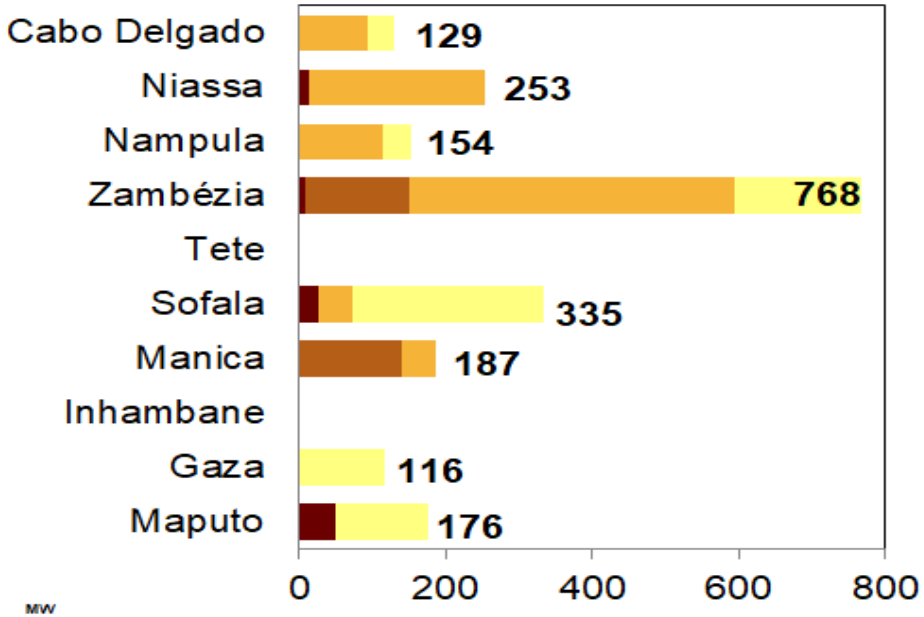
2 GW OF BIOMASS ENERGY POTENTIAL

WITH ONLY 98 MW VIABLE IN SHORT TERM

33 sites identified biomass projects ...



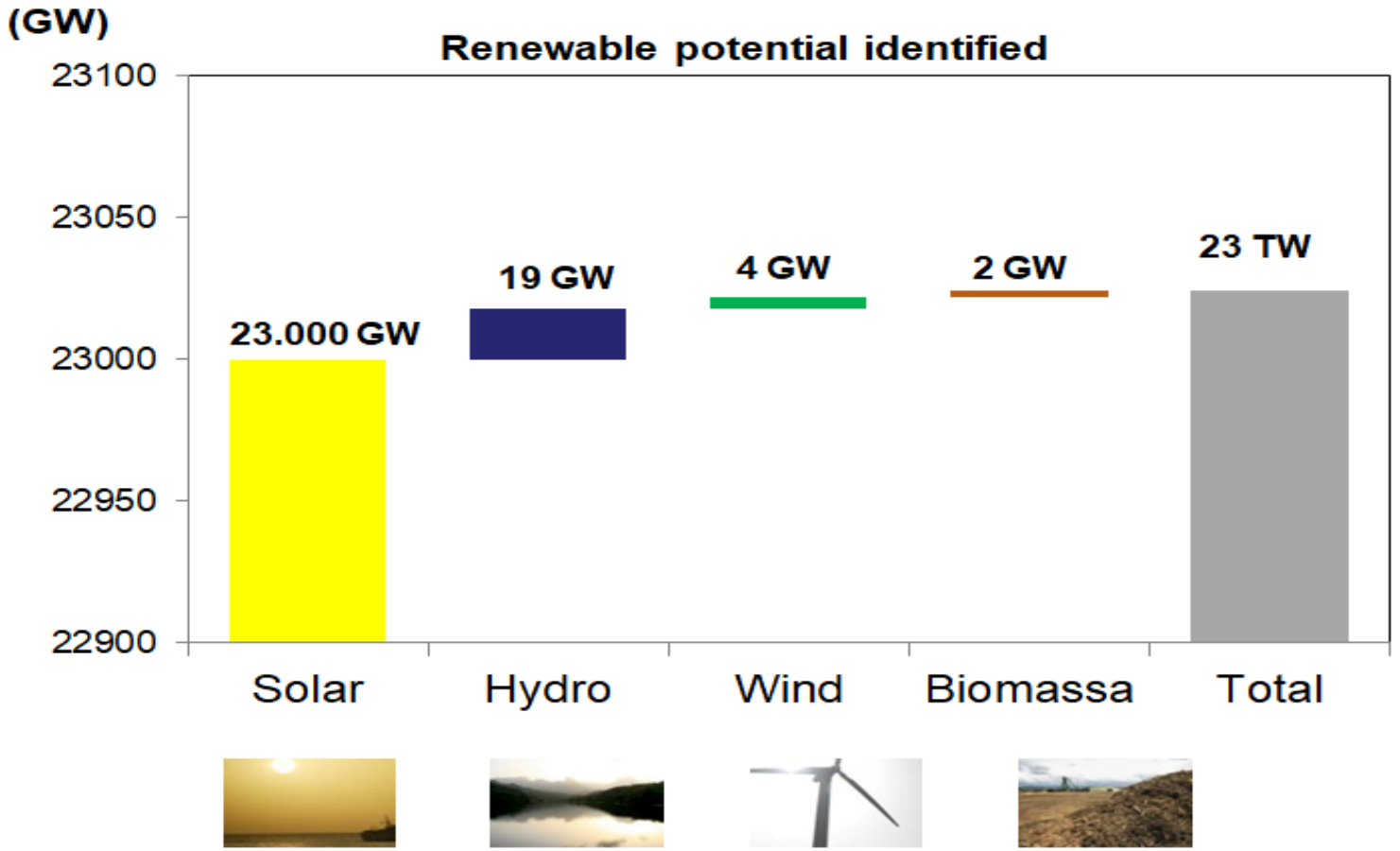
... In a total of 2.118 MW



	Potential	Priority
Cogeneration celulose	280 MW	0 MW
FlorestaL Biomassa	1.006 MW	22 MW
Sugar factory	832 MW	76 MW

RENEWABLE ATLAS (SUMMARY)

THE SOLAR ENERGY IS THE MOST AVAILABLE RENEWABLE ENERGY IN MOZAMBIQUE...



IPP Experience for Renewable Energy Projects

- Following the experience from the developments of the 40 MW by Scatec in Mocuba (under construction) and 30 MW by NEOEN in Metoro (start construction this year) the experience for IPP renewable energy projects is changing.

- EDM is now looking to establish bidding mechanisms for renewable energy projects that will provide further transparency and foster competitiveness by providing a standardized approach.

Standard Approaches for Renewable Energy Projects

- GET FiT Programme aims to fast-track the development of smaller renewable energy generation projects through a comprehensive set of tools, including tariff viability gap funding, targeted technical assistance, risk mitigation against off-taker risk, and renewable grid integration support.
- PROLER: Launching a public tender process with pre-feasibility studies and comprehensive set of tender documents (technical and financial) for four Renewable Energy projects (3 solar + 1 wind) with capacities between 30-50MW by the year 2024 (the project lasts 4 years).

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