



Demand and Supply in SAPP

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By

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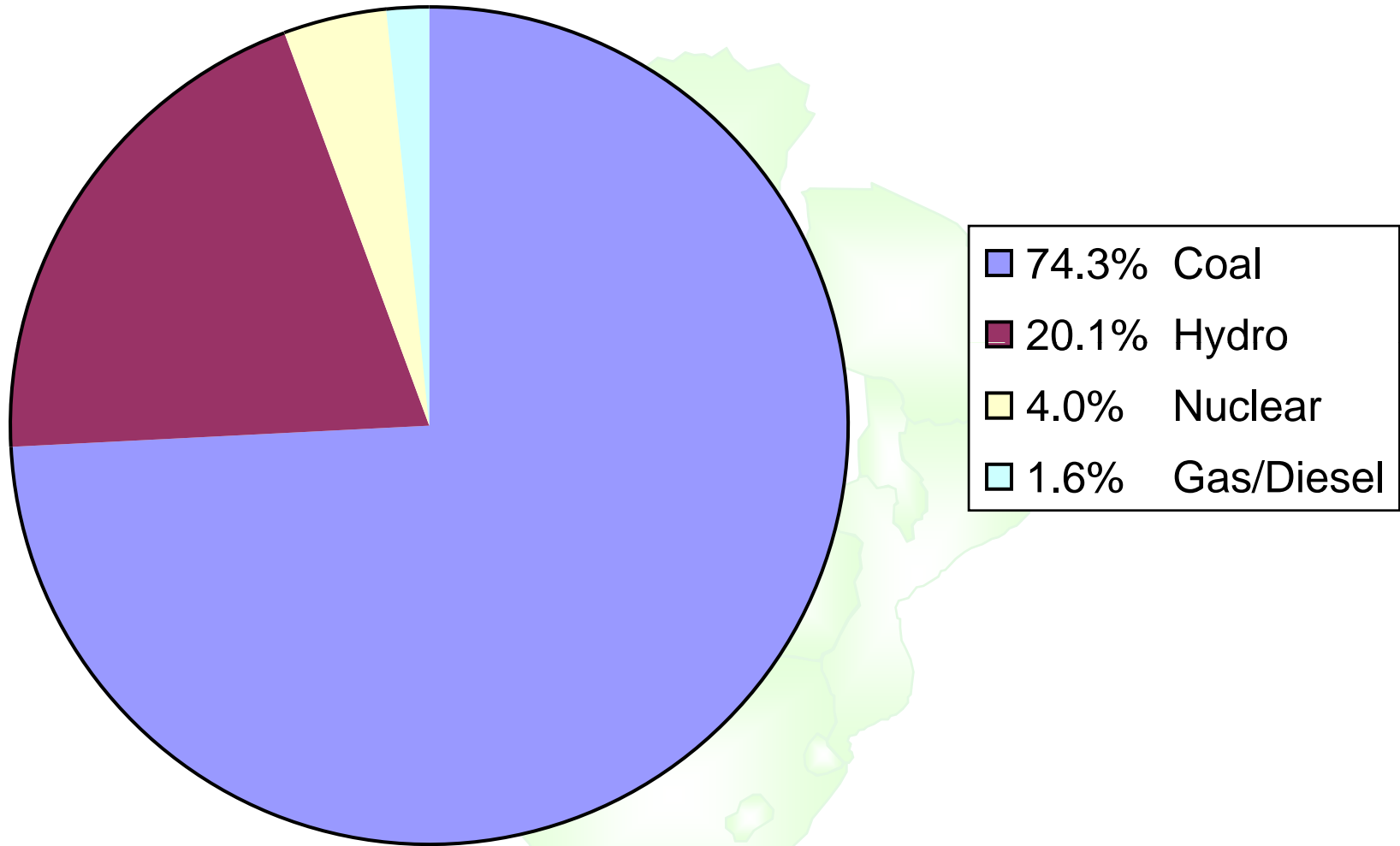


INSTALLED CAPACITY

SAPP POWER SUPPLY AND DEMAND				
<i>Country</i>	<i>Utility</i>	<i>Installed Capacity [MW]</i>	<i>Net Capacity [MW]</i>	<i>2004 Peak Demand, MW</i>
Angola	ENE	742	590	317
Botswana	BPC	132	120	402
Lesotho	LEC	72	70	70
Malawi	ESCOM	305	261	271
Mozambique	EDM	307		
	HCB	2,075	2,250	274
Namibia	NamPower	393	390	470
South Africa	Eskom	42,011	36,208	34195
Swaziland	SEB	51	50	172
Tanzania	TANESCO	591	480	508
DRC	SNEL	2,442	1,170	993
Zambia	ZESCO	1,632	1,630	1295
Zimbabwe	ZESA	1,990	1,825	2069
TOTAL		52,743	45,044	41,036



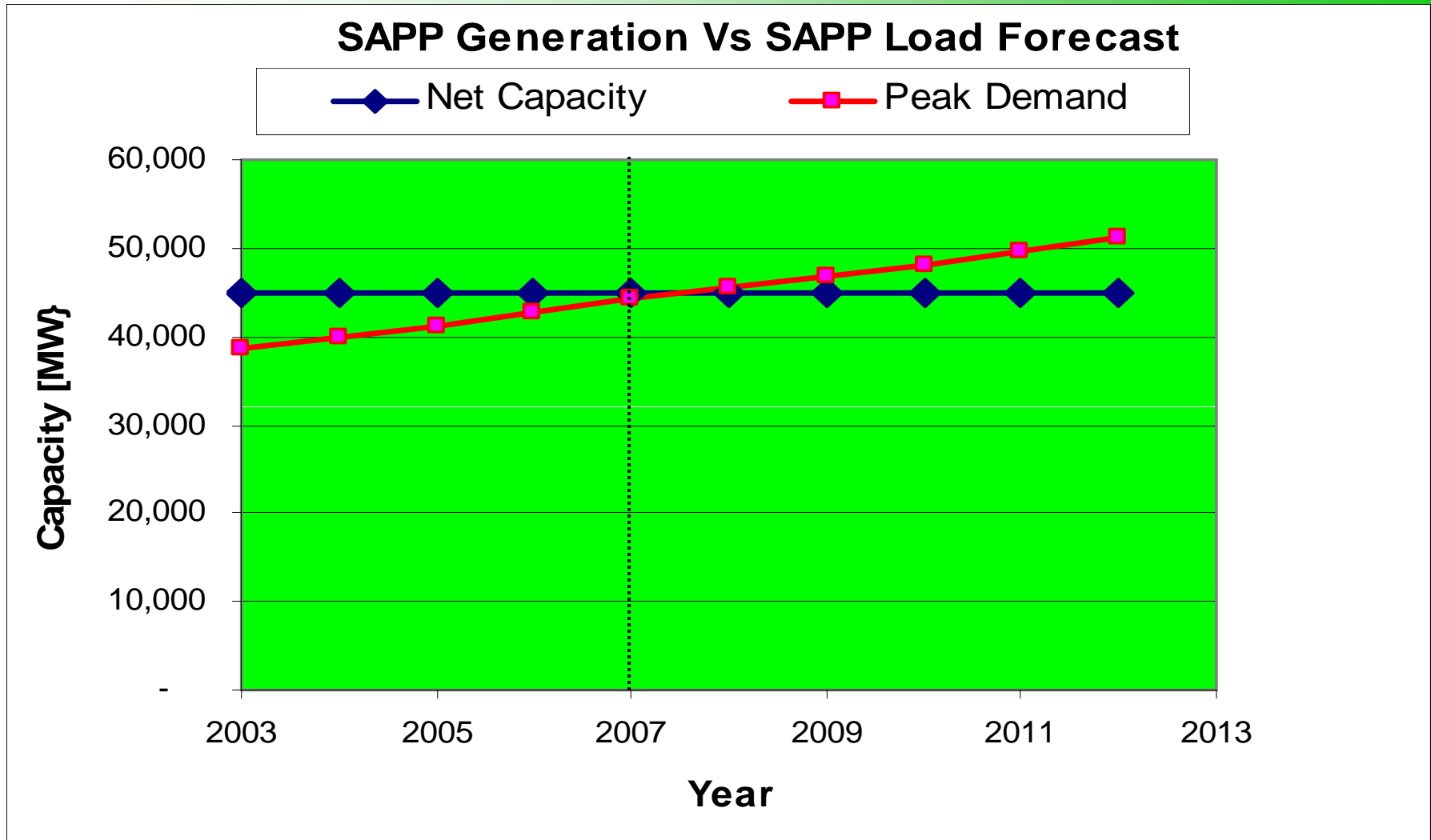
Generation Mix



DIMINISHING GENERATION SURPLUS CAPACITY

The SAPP has noted with concern the **diminishing generation surplus capacity** in the region caused by:

- i. The power demand in the SAPP region has been increasing at a rate of about **three percent** per year in the last six years. The challenge for SAPP is to keep pace in providing new generation capacity with the rising demand.
- ii. If nothing is done (no new generation project) then, it is anticipated that in the year 2007, the SAPP will run out of **generation surplus capacity**.
- iii. There has **not been significant investment** in generation in the last 10-years, despite the rise in power demand.



The SAPP Planning Data is indicating that SAPP runs out of generation surplus capacity after the year **2007**.

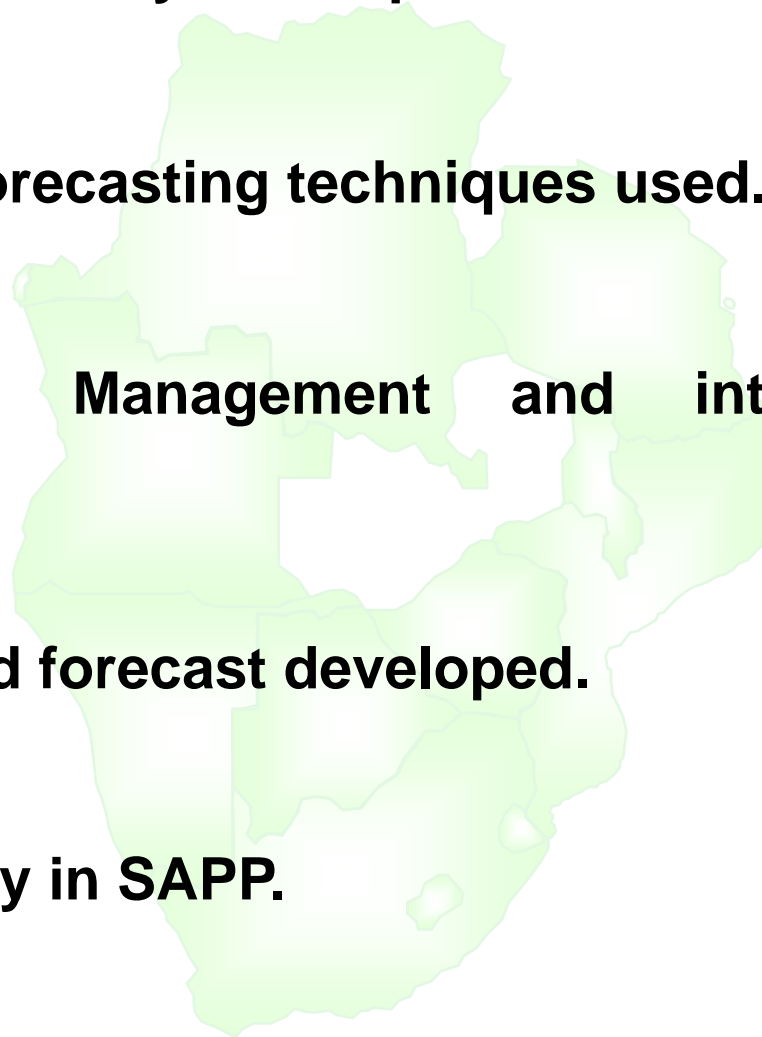


PROJECT PRIORITISATION EXERCISE

- **Project Tracking for generation and transmission expansion projects.**
- **Supply versus load forecast after DSM**
- **Interruptible Load consideration.**
- **Capacity Plan Management activity.**

DEMAND SIDE

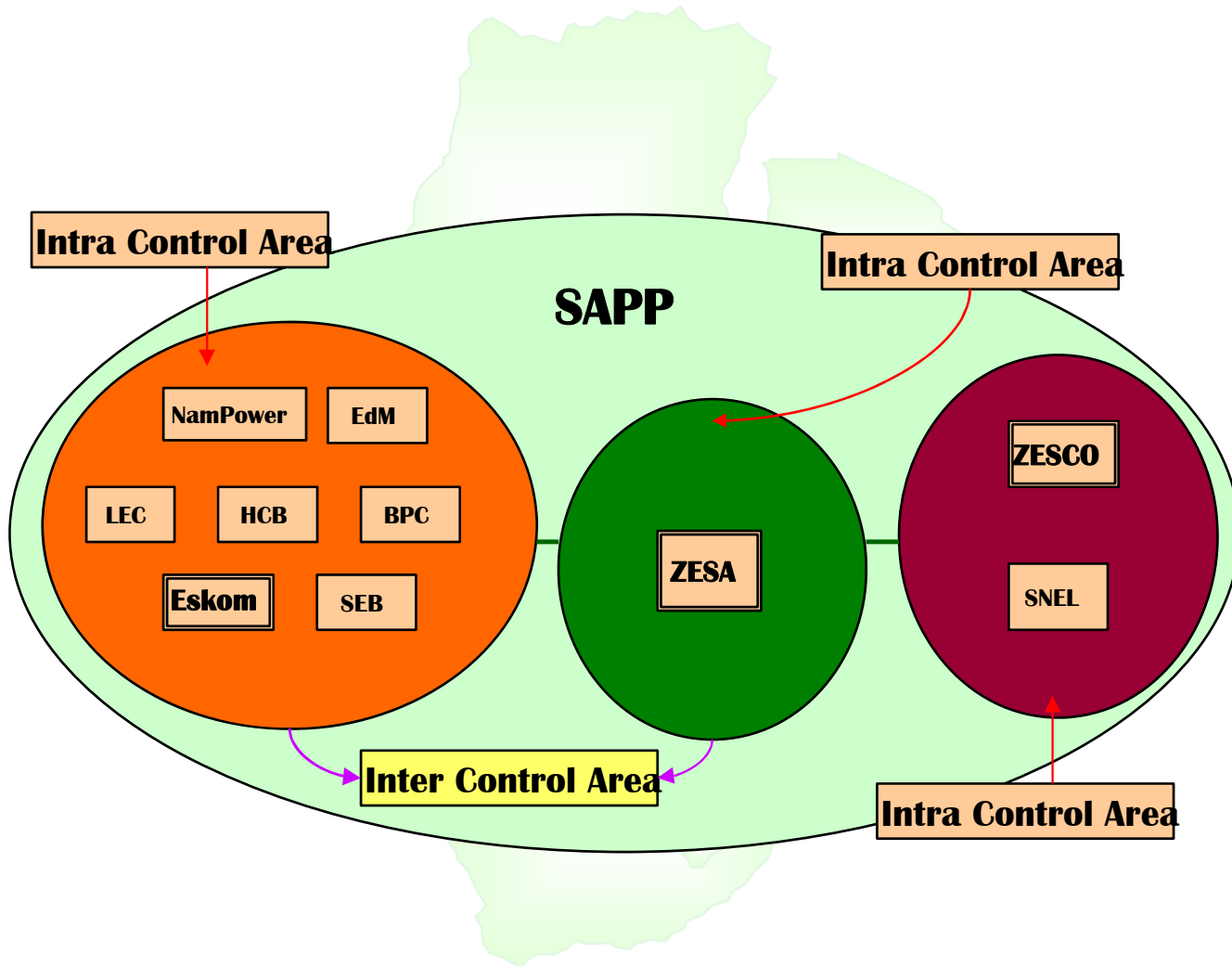
- Utilities independently develop load forecasts.
- Different load forecasting techniques used.
- Demand Side Management and interruptible load considered.
- Aggregated load forecast developed.
- No load diversity in SAPP.



ACCREDITED CAPACITY REQUIREMENT

- Each Control Area responsible for generation dispatch.
(No central dispatch in SAPP)
- Local demand requirements and import /export obligations
- SAPP Reserve Criteria requirement - 10.6% thermal & 7.6 hydro
- Accredited Capacity Obligation requirement

Inter/ Intra Control Areas



Generation & Transmission Infrastructure

Priority Projects

The SAPP priority projects have been agreed as follows:

- 1. Rehabilitation & associated transmission projects.*
- 2. Short-term generation projects*
 - *Expected to be commissioned before 2010*
 - *Completed feasibility studies*
 - *Approved Environmental Impact Assessment*
- 3. Transmission projects*
- 4. Medium to Long-term generation projects*
 - *Expected to be commissioned after 2010*
 - *Most have no feasibility studies and EIA*

Rehabilitation & Other Projects in Progress

Country	Project Name	Capacity [MW]	Type	Expected Commissioning Year	Feasibility Study Complete	Estimated Project Cost USD [M]	Category
South Africa	ESKOM_ Camden	380	Coal	2005	Yes	80	R
South Africa	ESKOM_ Arnot	20	Coal	2005	Yes	4.4	R
Zambia	Kafue Upper expand	30	Hydro	2005	Yes	20	R
Zambia	Kariba North Refurbishment	30	Hydro	2005	Yes	20	R
South Africa	ESKOM_ Arnot	40	Coal	2006	Yes	25	R
South Africa	ESKOM_ Camden	380	Coal	2006	Yes	80	R
Swaziland	Maguga	20	Hydro	2006	Yes	30	NG
Zambia	Kafue Upper expansion	30	Hydro	2006	Yes	20	R
Zambia	Kariba North Refurbishment	30	Hydro	2006	Yes	20	R
Angola	Capanda Units 3 & 4	260	Hydro	2007	Yes	344	NG
Angola	Lobito	83	Gas	2007	Yes	-	NG
South Africa	ESKOM_ Arnot	40	Coal	2007	Yes	25	R
South Africa	ESKOM_ Camden	570	Coal	2007	Yes	120	R
South Africa	ESKOM_ Grootvlei	188	Coal	2007	Yes	105	R
South Africa	Open Cycle Gas Turbine	1050	OCGT	2007	Yes	477	NG
Zambia	Kafue Upper expansion	30	Hydro	2007	Yes	20	R
Zambia	Kariba North Refurbishment	30	Hydro	2007	Yes	20	R
TOTAL		3,211				1,410	

R = Rehabilitation, NG= New generation

Short-Term Projects

SHORT-TERM GENERATION PROJECTS (2005-2010)						
Country	Project Name	[MW]	Type	Year	Feasibility Study Complete	Estimated Project Cost USD
Tanzania	Ubungo	60	Gas	2006	Yes	45
Zimbabwe	Gairezi Hydro Generation	35	Hydro	2007	Yes	35
Zambia	Itezhi-Tezhi	120	Hydro	2008	Yes	142
Zambia	Kariba North Bank Extension	360	Hydro	2009	Yes	192
Zimbabwe	Kariba South Extension	300	Hydro	2009	Yes	200
Zimbabwe	Hwange Expansion	600	Coal	2009	Yes	500
Malawi	Kaphichira Phase-2	64	Hydro	2009	Yes	50
Mozambique	Massingir	28	Hydro	2009	Yes	55
Zambia	Kafue Gorge Lower	600	Hydro	2010	Yes	600
Botswana	Morupule Expansion	400	Coal	2010	Yes	600
Mozambique	HCB North Bank	850	Hydro	2010	Yes	771
Namibia	Kudu	800	Gas	2010	Yes	640
TOTAL		4217				3830

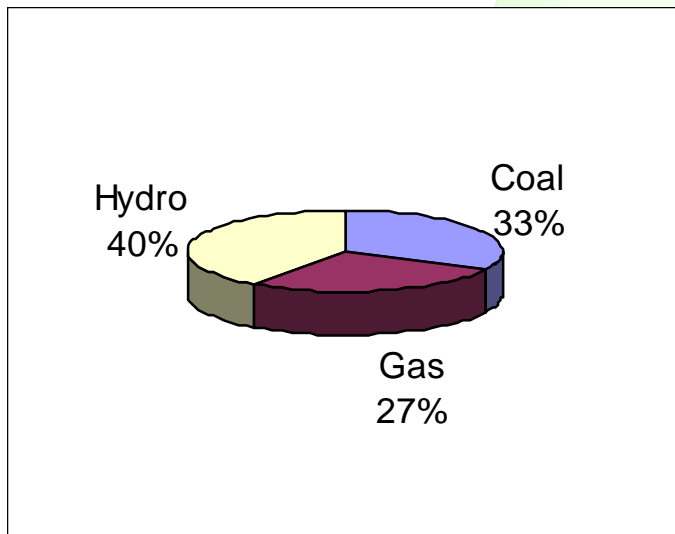
Country Capacity Contribution

GENERATION PROJECTS IN PROGRESS

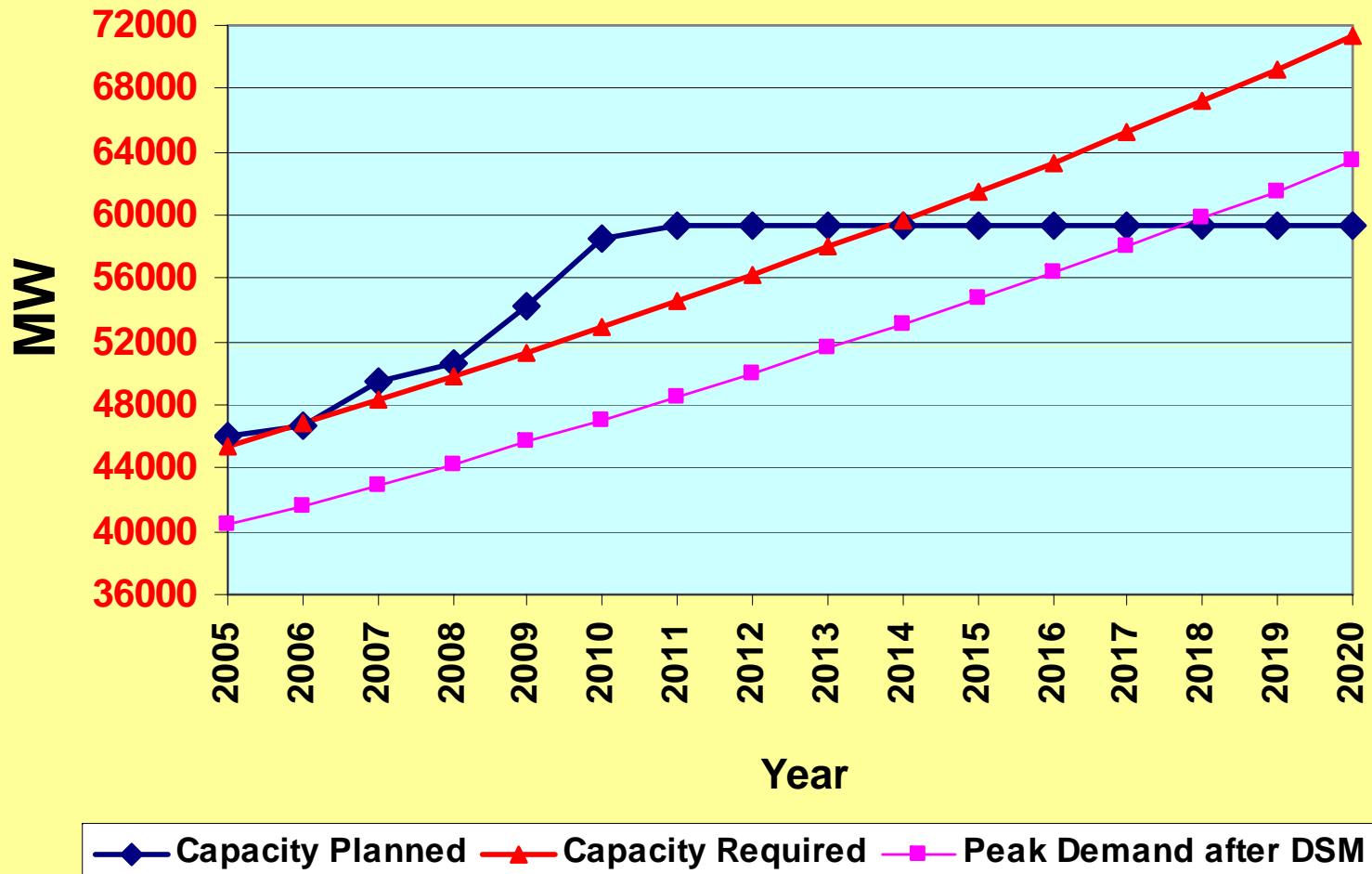
Country	Capacity, MW	Percentage
Angola	343	7.4%
South Africa	4,098	88.3%
Swaziland	20	0.4%
Zambia	180	3.9%
TOTAL	4,641	100

REHABILITATION & SHORT TERM PROJECTS

Country	Capacity, MW	Percentage
Angola	60	1.1%
Botswana	400	7.6%
DRC	834	15.8%
Malawi	104	2.0%
Mozambique	912	17.3%
Namibia	800	15.2%
Tanzania	60	1.1%
Zambia	1,080	20.5%
Zimbabwe	1,015	19.3%
TOTAL	5,265	100



Committed - Rehabilitation - Short Term



LONG-TERM GENERATION PROJECTS (Beyond 2010)

No.	Country	Project Name	Capacity [MW]	Type	Expected Year
1	Angola	Cambambe II	260	Hydro	2011
2	Botswana	Mmamabula	3,600	Thermal	2015
3	DRC	Inga-3	3,500	Hydro	2010
		Grand Inga Phase-1	6,000	Hydro	2012
4	Lesotho	Musanga	230	Hydro	2020
5	Malawi	Kholombizo	240	Hydro	2018
		Mpatamanga	260	Hydro	2020
		Fufu	100	Hydro	2012
6	Mozambique	Mepanda Uncua	1,300	Hydro	2012
		Moatize	1,000	Coal	2014
		Massingir	40	Hydro	2016
7	Namibia	Epupa	360	Hydro	2015
		Popa	23	Hydro	2015
8	South Africa	Greenfield	4,000	Coal	2012-2013
		Greenfield	2,500	Coal	2014
		2xCGT	1,500	Gas	2010
		2xPumped Storage	2,330	Hydro	2013
9	Swaziland	Lubombo	1,000	Thermal	Beyond 2010
10	Tanzania	Ruhudji	358	Hydro	2016
		Mchuchuma	200	Coal	2022
		Mchuchuma	200	Coal	2024
		Rumakali	222	Hydro	2027
11	Zambia	Expansion Kariba North	200	Hydro	2020
		Kalungwishi	220	Hydro	2014-2015
12	Zimbabwe	Batoka	800	Hydro	2014
		Gokwe North	1,300	Coal	2020
		TOTAL	31,743		



NEW GENERATION CAPACITY OPTIMISATION

- **Regional Integrated Generation and Transmission Expansion Plan**
- **Economic dispatch of resources**
- **Diversification of supply options.**
- **Regional economic benefits.**



Transmission Projects

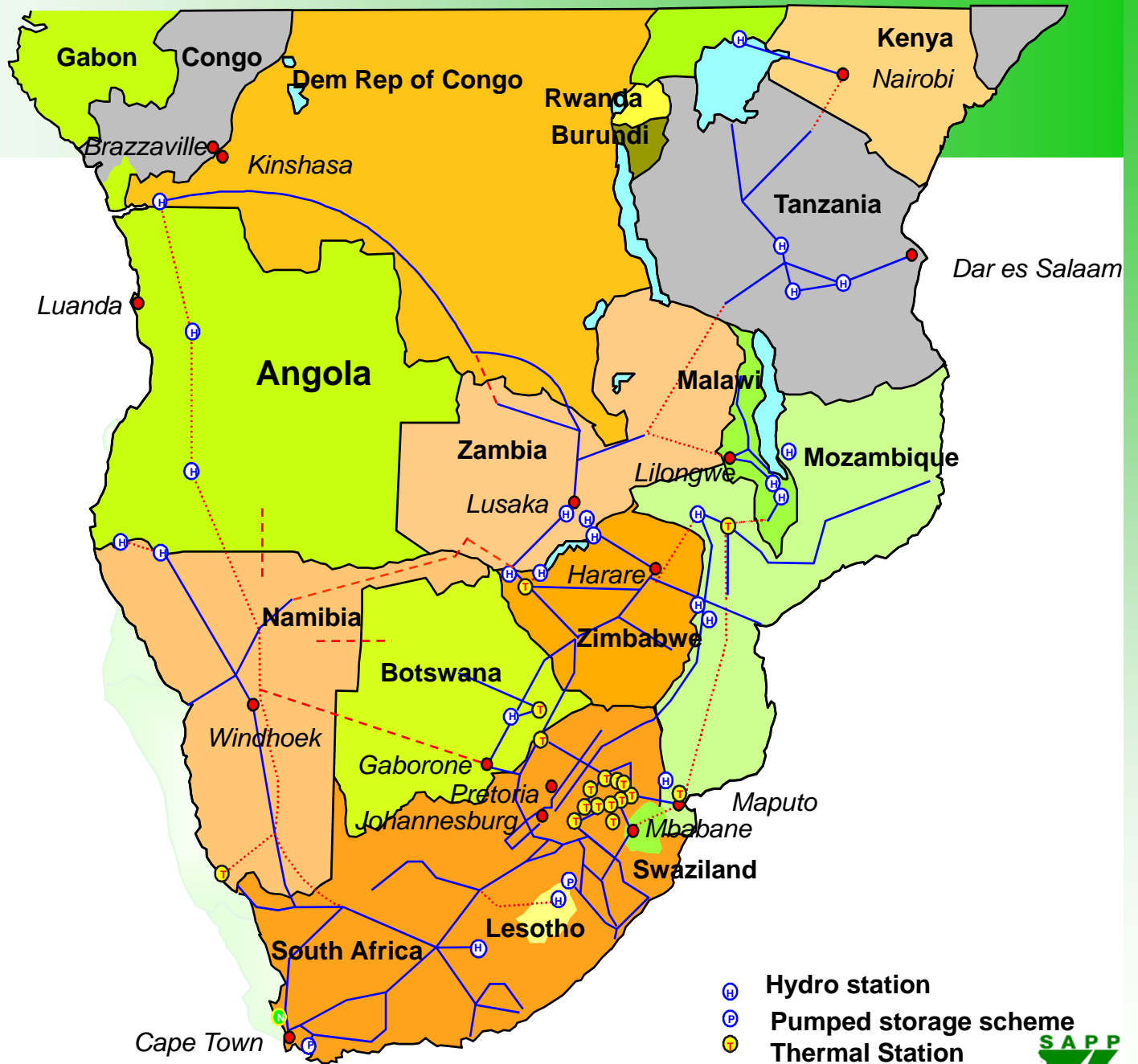
Transmission projects are divided as follows:

- ❑ *Outstanding transmission interconnectors whose aim is to **interconnect non-operating members** of the SAPP:
 - *Malawi-Mozambique interconnector,*
 - *Zambia-Tanzania-Kenya Interconnector, and*
 - *Westcor project.**

- ❑ *Transmission interconnectors aimed at **relieving congestion** on the SAPP grid, and*

- ❑ *New transmission interconnectors aimed to **evacuate power from generating stations** to the load centres.*

SOUTHERN AFRICAN GRID



SOUTHERN AFRICAN POWER POOL



THANK YOU

