



The Southern African Power Pool

www.sapp.co.zw

Overview of the SAPP

by

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MSC Exchange Visit to the USA

23 February 2013 to 2 March 2013



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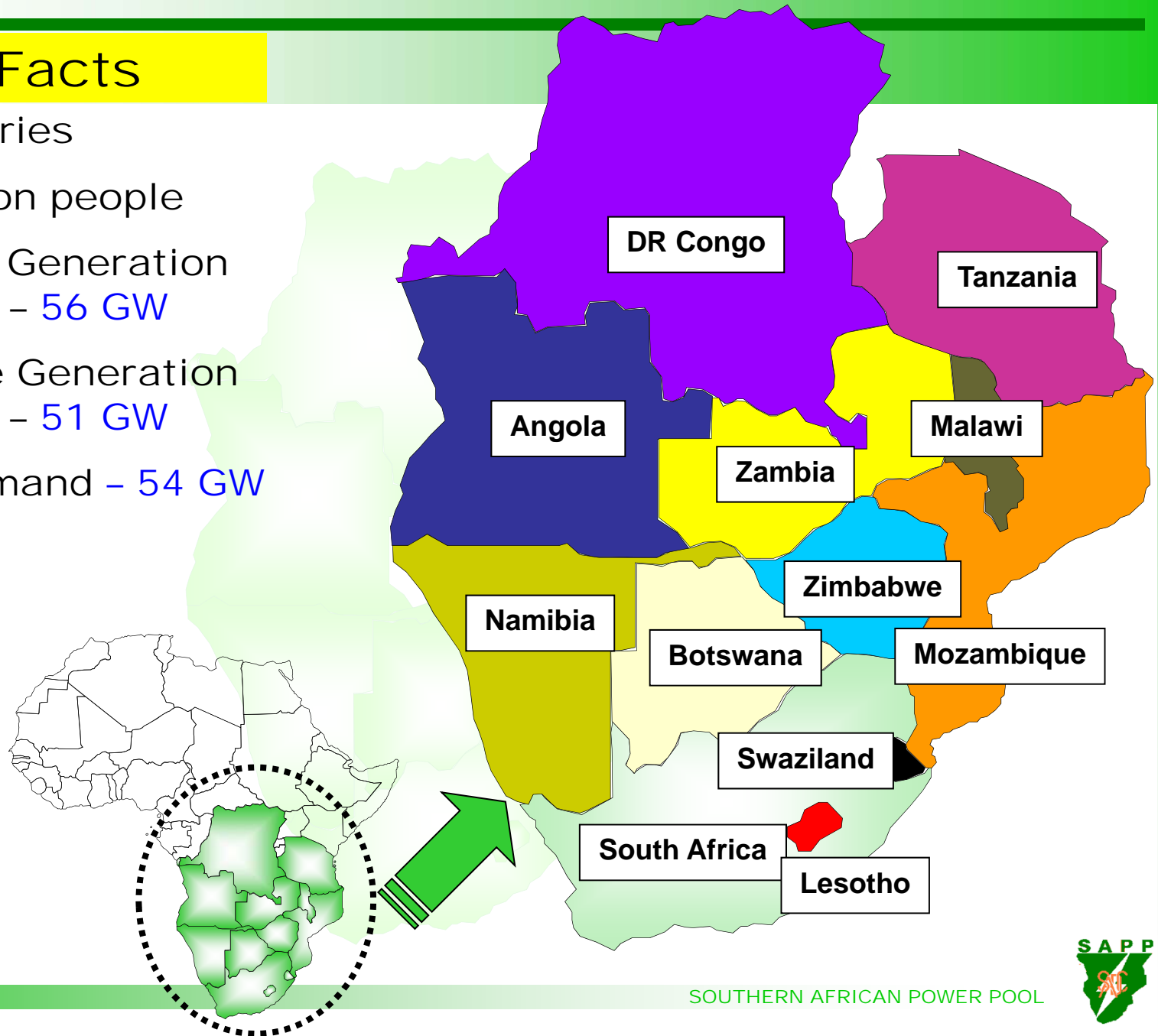
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INTRODUCTION TO THE SAPP

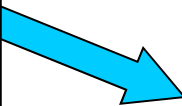
Key Facts

- ❑ 12 Countries
- ❑ 280 Million people
- ❑ Installed Generation Capacity - 56 GW
- ❑ Available Generation Capacity - 51 GW
- ❑ Peak Demand - 54 GW

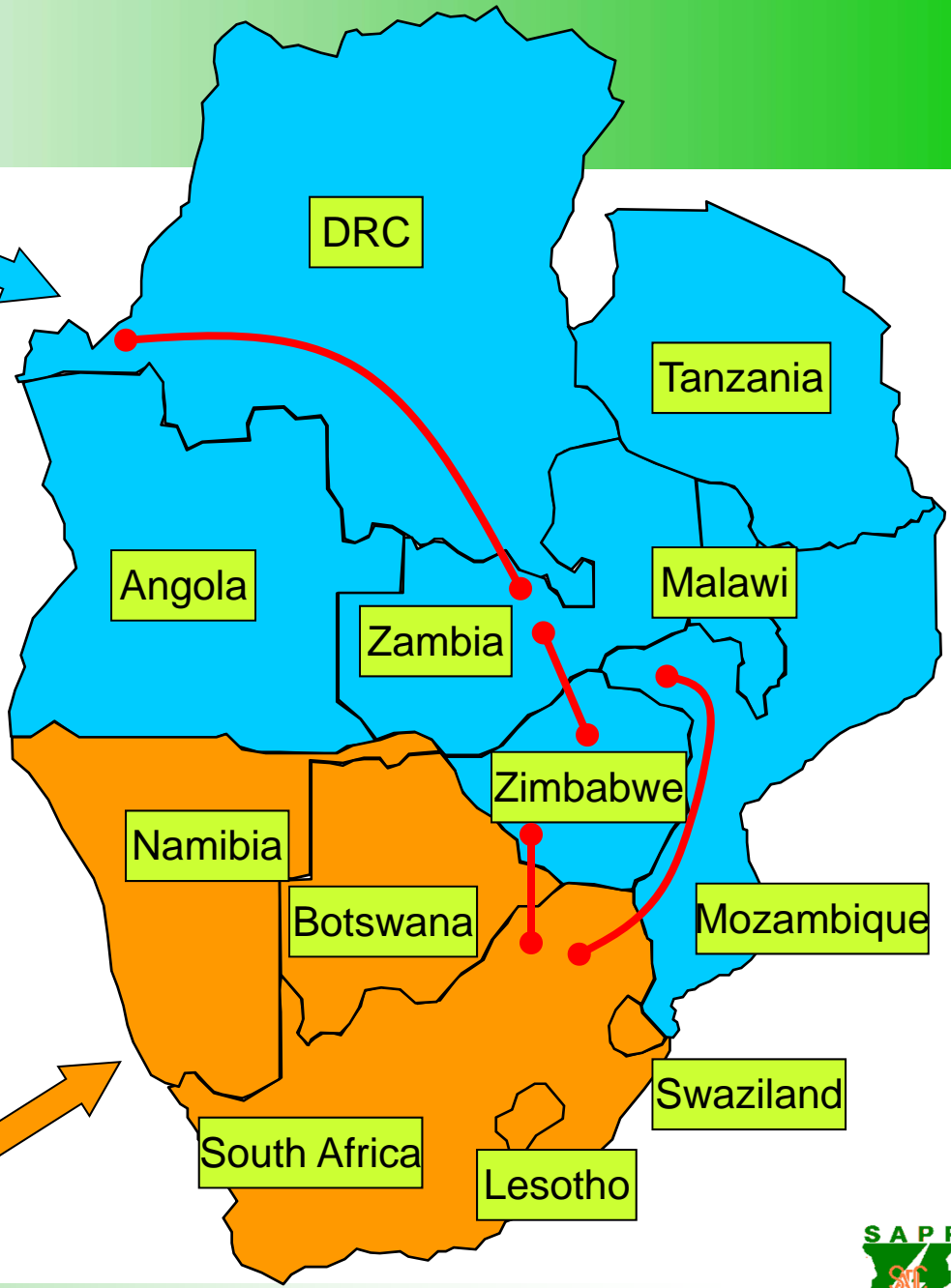
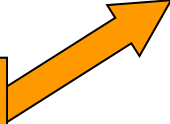


Historic

Hydro Northern Network



Thermal Southern Network



HISTORIC

- The two networks were linked by weak lines **220kV** & **132kV** via Botswana until **1995** when the **400kV** was constructed.
- The interconnection of the northern and southern networks created a platform for **regional trade** and **cooperation**.
- In **1995**, the Ministers responsible for energy in the Southern African Development Community (SADC) signed an Inter-Government MOU that led to the creation of a power pool under the name, **Southern African Power Pool (SAPP)**.
- The Aim was to **optimise** the use of available energy resources in the region and support one another during emergencies.

SAPP Vision

The SAPP Vision is to:

- Facilitate the development of a **competitive** electricity market in the Southern African region.
- Give the end user a **choice** of electricity supply.
- Ensure that the Southern African Region is the region of choice for **investment** by energy intensive users.
- Ensure sustainable energy developments through sound economic, **environmental** & social practices.

SAPP Membership -2013

No	Full Name of Utility	Status	Abbreviation	Country
1	Botswana Power Corporation	OP	BPC	Botswana
2	Electricidade de Mocambique	OP	EDM	Mozambique
3	Electricity Supply Corporation of Malawi	NP	ESCOM	Malawi
4	Empresa Nacional de Electricidade	NP	ENE	Angola
5	ESKOM	OP	Eskom	South Africa
6	Lesotho Electricity Corporation	OP	LEC	Lesotho
7	NAMPOWER	OP	Nam Power	Namibia
8	Societe Nationale d'Electricite	OP	SNEL	DRC
9	Swaziland Electricity Board	OP	SEB	Swaziland
10	Tanzania Electricity Supply Company Ltd	NP	TANESCO	Tanzania
11	ZESCO Limited	OP	ZESCO	Zambia
12	Zimbabwe Electricity Supply Authority	OP	ZESA	Zimbabwe
13	Copperbelt Energy Corporation	ITC	CEC	Zambia
14	Lunsemfwa Hydro Power Station	IPP	LHPS	Zambia
15	Hidro Cahora Bassa	OB	HCB	Mozambique
16	Mozambique Transmission Compamy	OB	MOTRACO	Mozambique

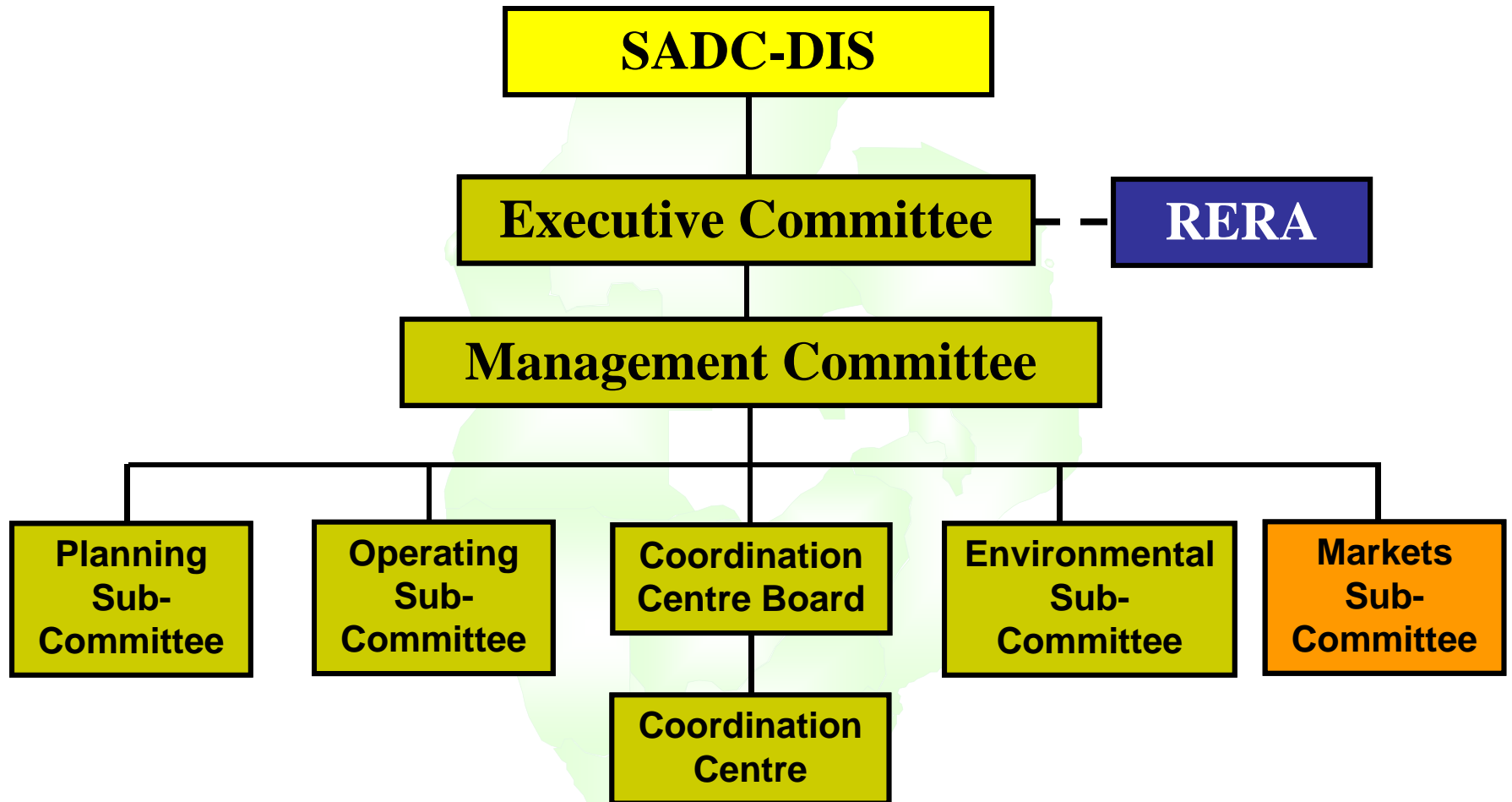
OP: Operating NP: Non-Operating ITC: Independent Transmission Company

OB: Observer

IPP: Independent Power Producer



SAPP Governance Structure



Governing Documents

- ❑ Inter-Governmental MOU
 - Established SAPP.
 - Signed by SADC Member Countries in 1995.
 - Revised document signed on 23 February 2006.
- ❑ Inter-Utility MOU
 - Established the Management of SAPP.
 - Revised document signed on 25 April 2007.
- ❑ Agreement Between Operating Members
 - Signed by Operating Members.
 - Revised document signed May 2008
- ❑ Operating Guidelines
 - Under Review.
- ❑ Market Guidelines (New in the SAPP Hierarchy)
 - Under Development.

Funding of SAPP Activities

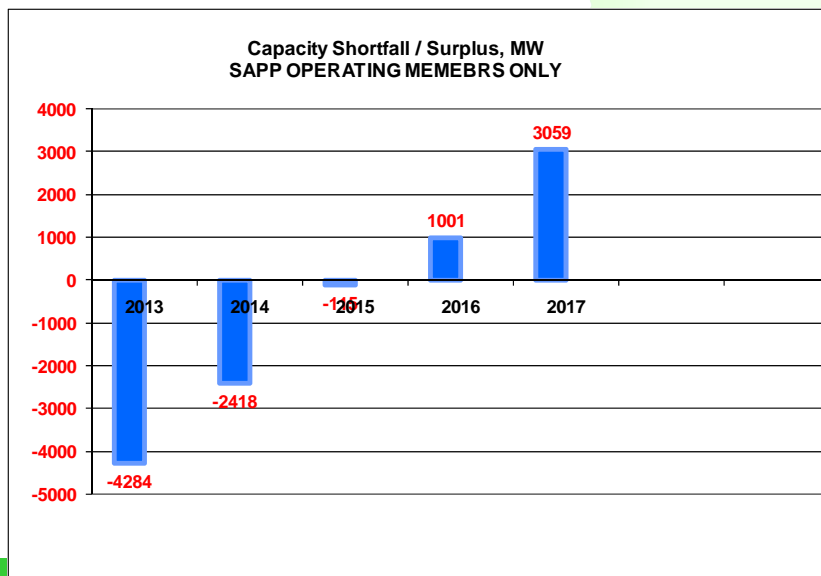
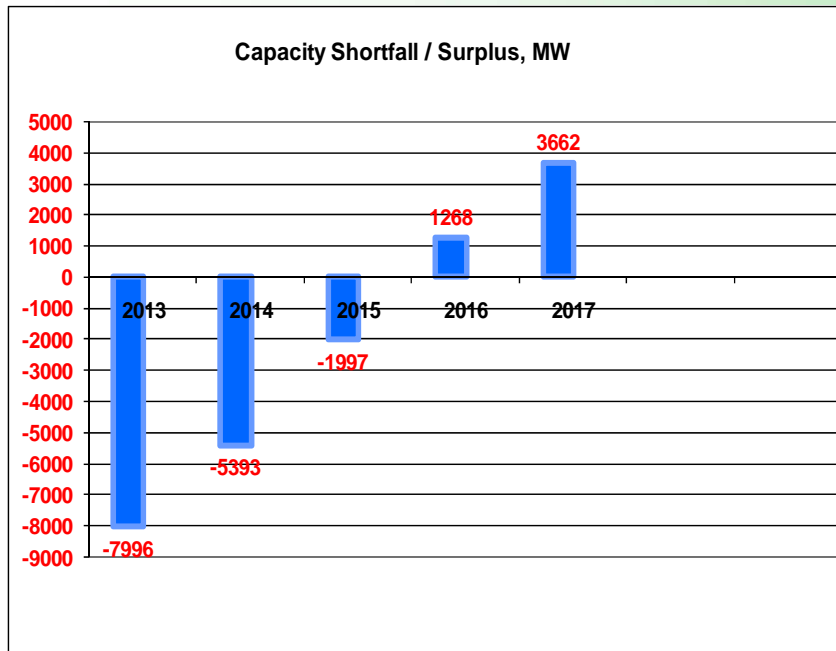
SAPP Coordination Centre activities are funded as follows:

- Annual contribution from Members using an agreed formula.
- Administration fees levied on market participants.
- Donor support:
 - ➔ The Government of Norway (NORAD).
 - ➔ Sida (Sweden)
 - ➔ The World Bank
 - ➔ DBSA, AfDB, USAID, DFID, DANIDA and others

SAPP Demand and Supply Situation

No.	Country	Utility	Installed Capacity [MW] As at Jan 2013	Available Capacity [MW] Jan 2013	Suppressed Demand & Forecast Demand	Capacity Shortfall including reserves, MW	Calculated Reserve Margin, %
1	Angola	ENE	1,793	1,480	1341		
2	Botswana	BPC	352	322	604		
3	DRC	SNEL	2,442	1,170	1398		
4	Lesotho	LEC	72	72	138		
5	Malawi	ESCOM	287	287	412		
6	Mozambique	EDM /HCB	2308	2,279	636		
7	Namibia	NamPower	393	360	635		
8	South Africa	Eskom	44,170	41,074	42416		
9	Swaziland	SEC	70	70	255		
10	Tanzania	TANESCO	1380	1,143	1444		
11	Zambia	ZESCO / CEC/LHPC	1,870	1,845	2287		
#REF!	Zimbabwe	ZESA	2,045	1,600	2267		
TOTAL SAPP			57,182	51,702	53,833	(7,709)	-4.1%
Total Interconnected SAPP			53,722	48,792	50,636	(7,079)	-3.8%

Demand and Supply Balance Forecast with Planned Projects

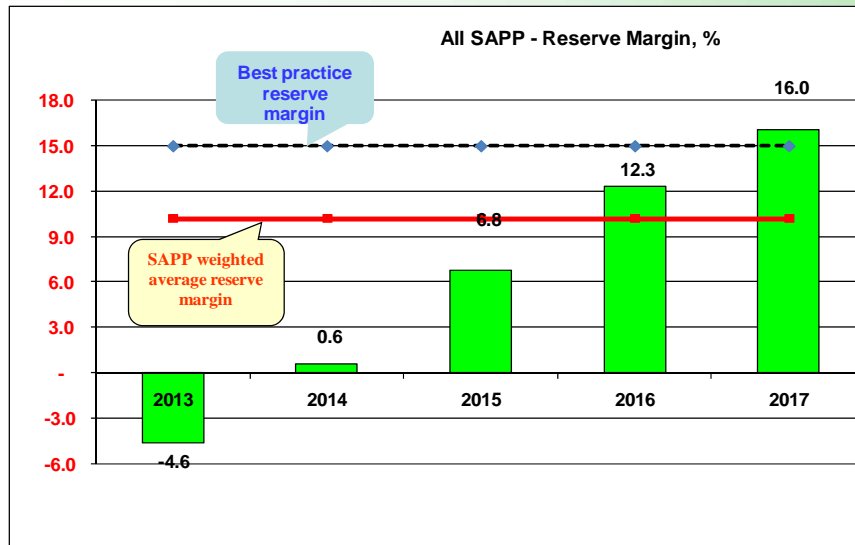


Projects identified to address the challenges

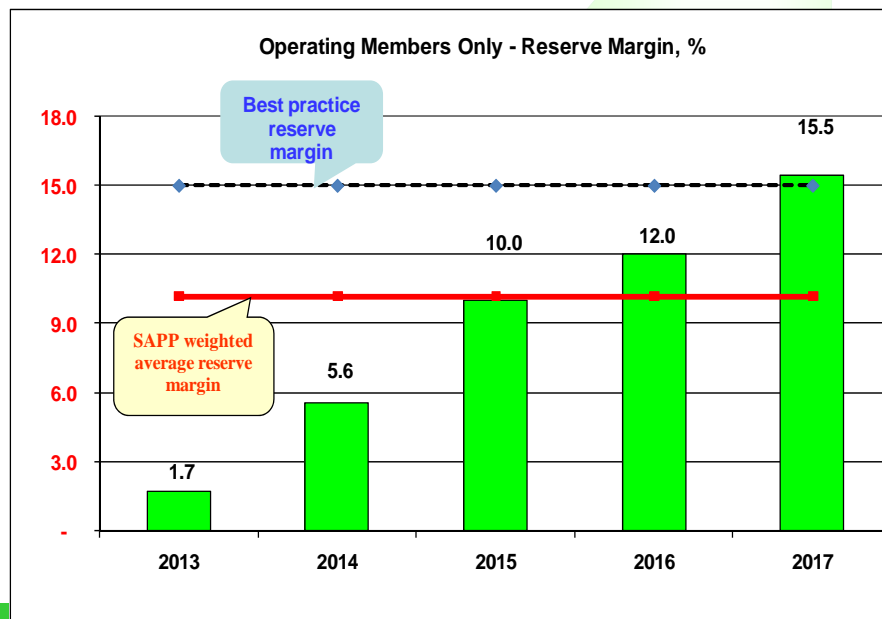
No	Country	NEW GENERATION CAPACITY, MW				
		2013	2014	2015	2016	TOTAL
1	Angola	0	645	550	2415	3,610
2	Botswana	600	-	-	300	900
3	DRC	55	-	580	-	635
4	Lesotho	-	25	300	-	325
5	Malawi	64	-	-	-	64
6	Mozambique	-	150	300	300	750
7	Namibia	60	-	-	-	60
8	RSA	923	3,105	2,543	1,322	7,893
9	Swaziland	-	-	-	-	-
10	Tanzania	60	160	500	1,110	1,830
11	Zambia	230	315	600	164	1,309
12	Zimbabwe	-	300	690	900	1,890
TOTAL		1,992	4,700	6,063	6,511	19,266



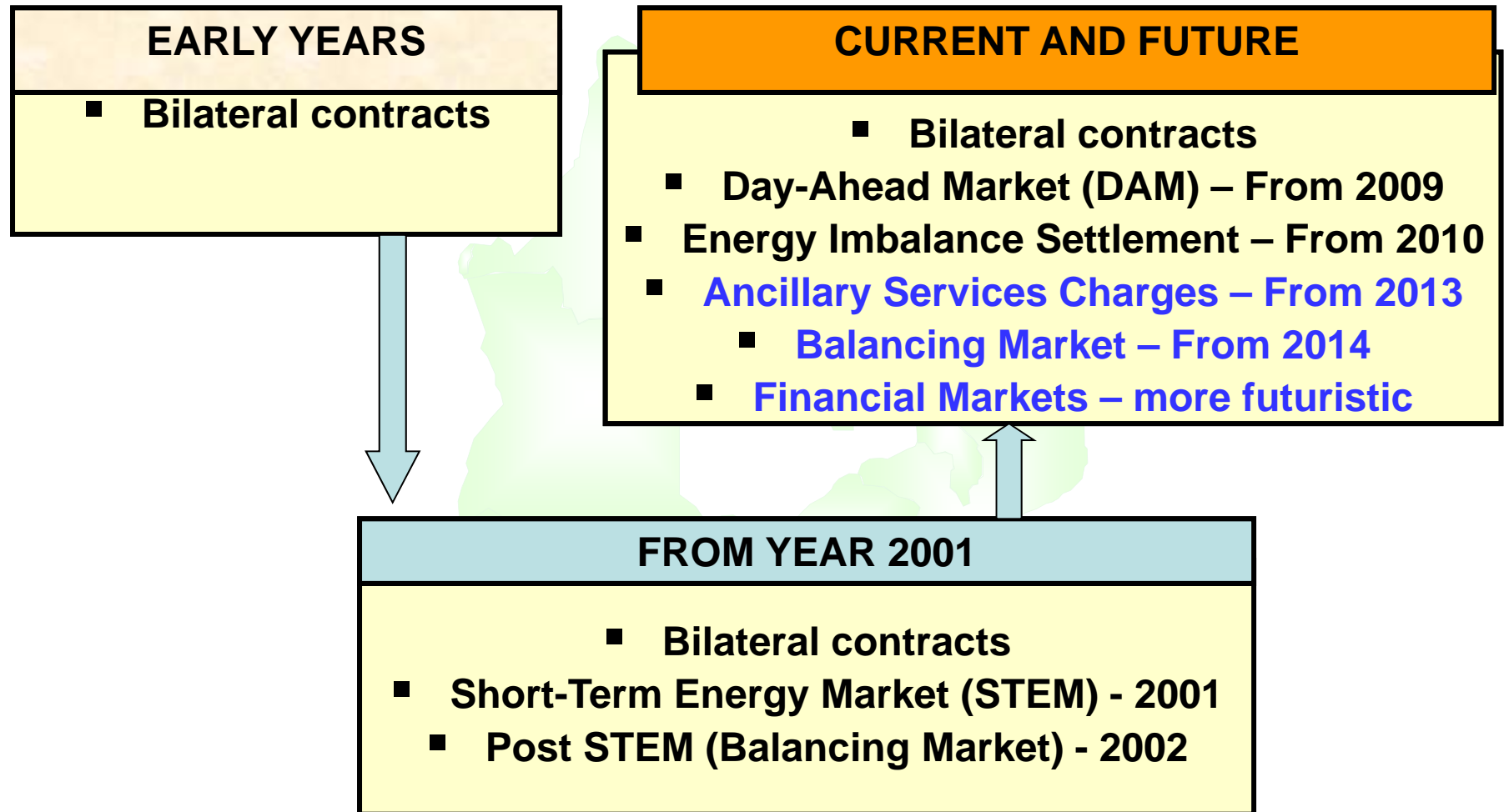
Reserve Margins with Planned Projects



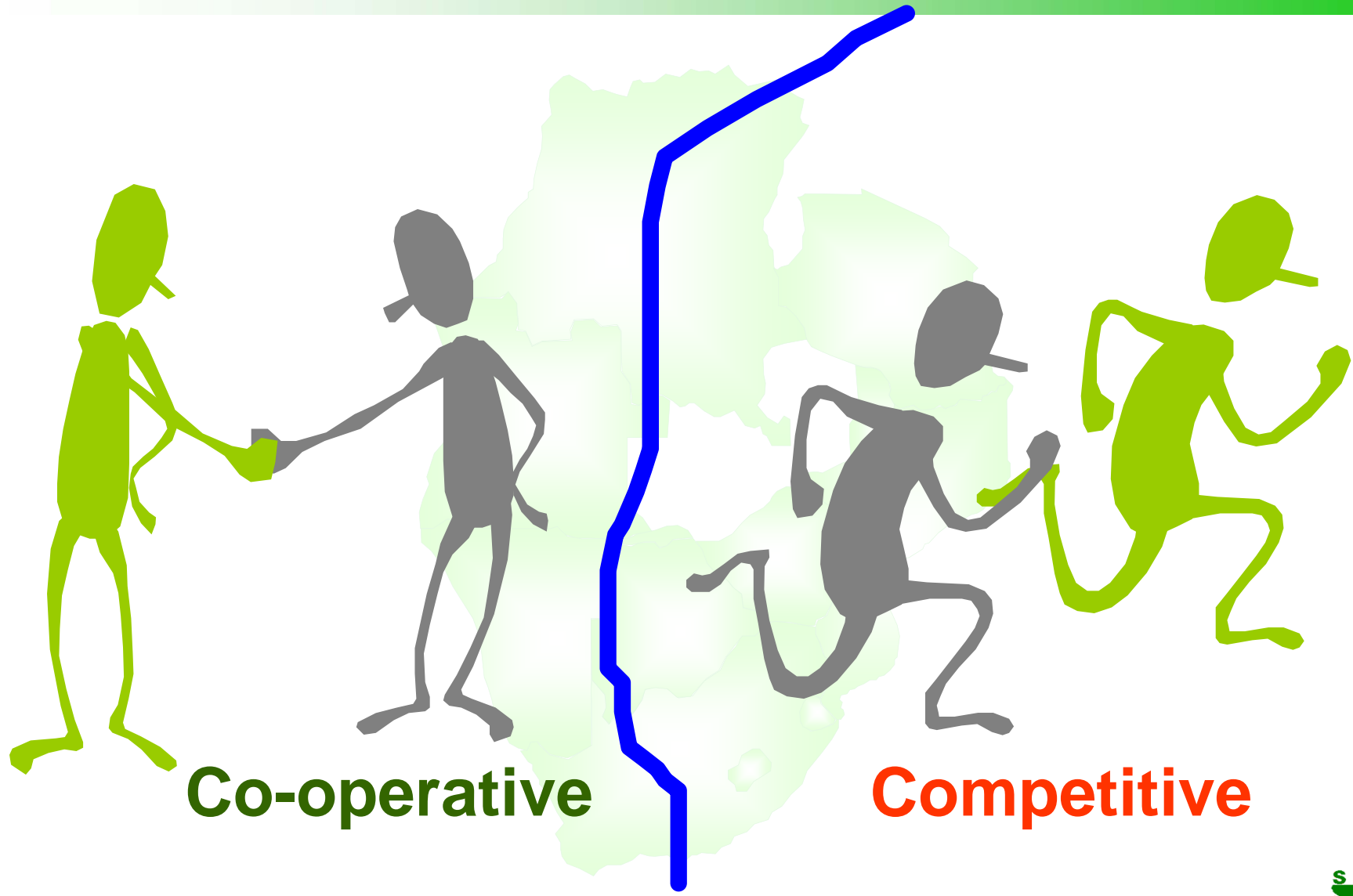
Tight Reserve Margin Position for SAPP Members - Generation Capacity shortfalls up to 2016.



SAPP Trading Arrangements



Migration from pure cooperation to competition

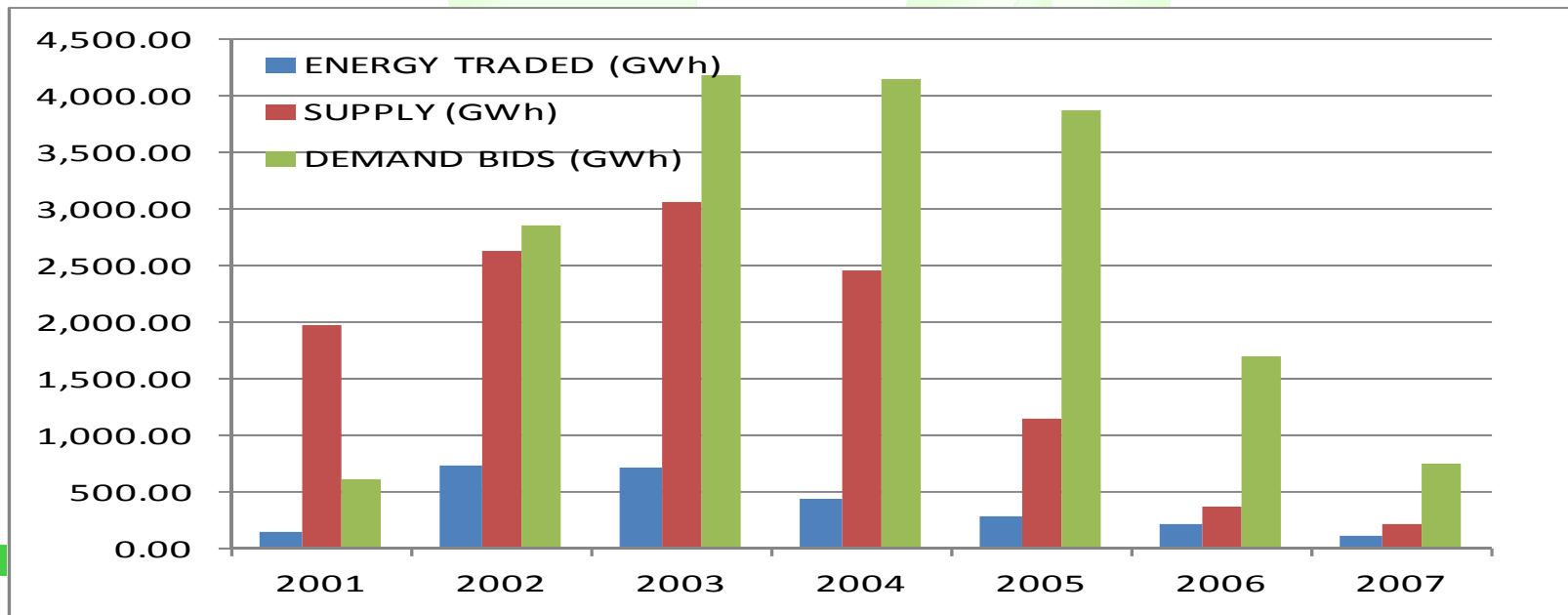


Co-operative

Competitive

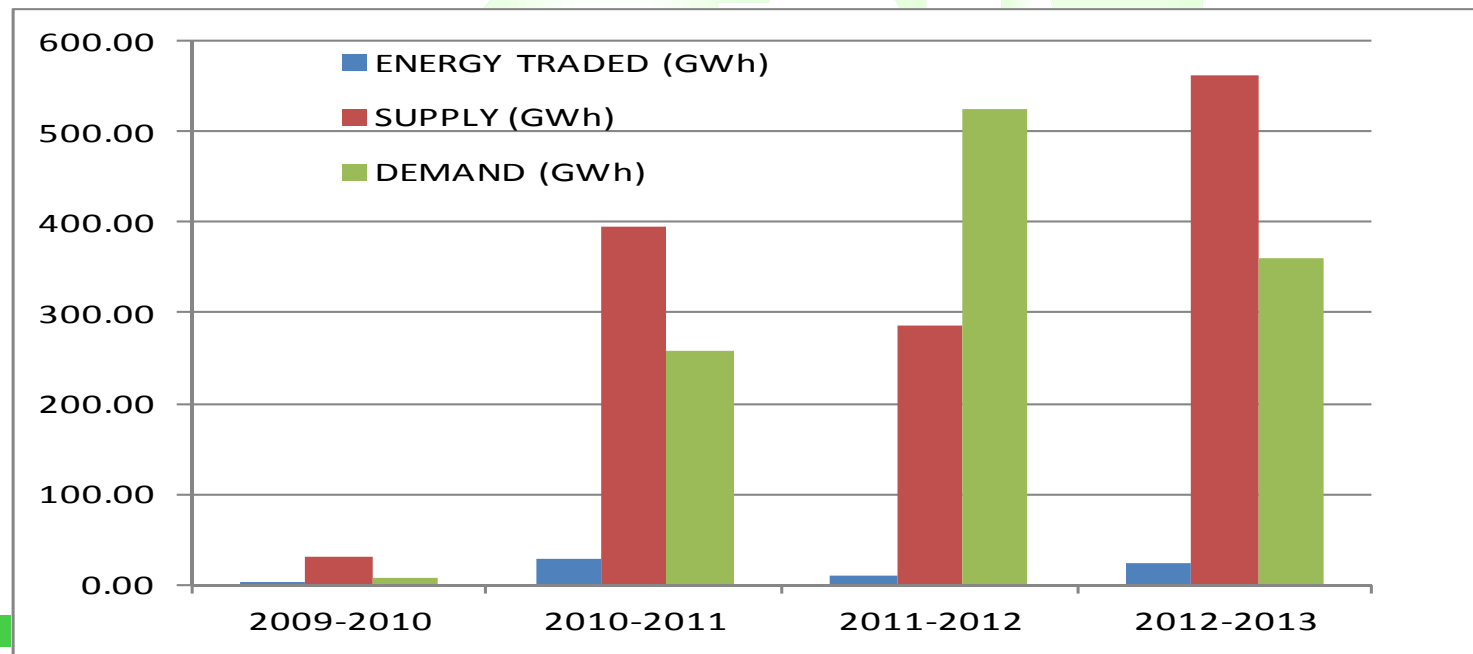
STEM TRADING

TRADED ENERGY SUMMARY			
YEAR	ENERGY TRADED (GWh)	SUPPLY (GWh)	DEMAND BIDS (GWh)
2001	144.19	1,972.89	616.37
2002	738.58	2,634.07	2,853.90
2003	713.34	3,052.28	4,183.67
2004	448.36	2,449.61	4,145.82
2005	291.11	1,137.62	3,857.23
2006	217.20	371.55	1,705.35
2007	107.01	214.00	742.00
Totals	2,659.79	11,832.02	18,104.33



DAM TRADING

TRADED ENERGY SUMMARY			
Year	ENERGY TRADED (GWh)	SUPPLY (GWh)	DEMAND (GWh)
2009-2010	0.55	31.45	7.73
2010-2011	27.40	395.64	258.42
2011-2012	10.41	285.68	525.10
2012-2013	22.45	563.81	360.08
Totals	60.80	1,276.58	1,151.32

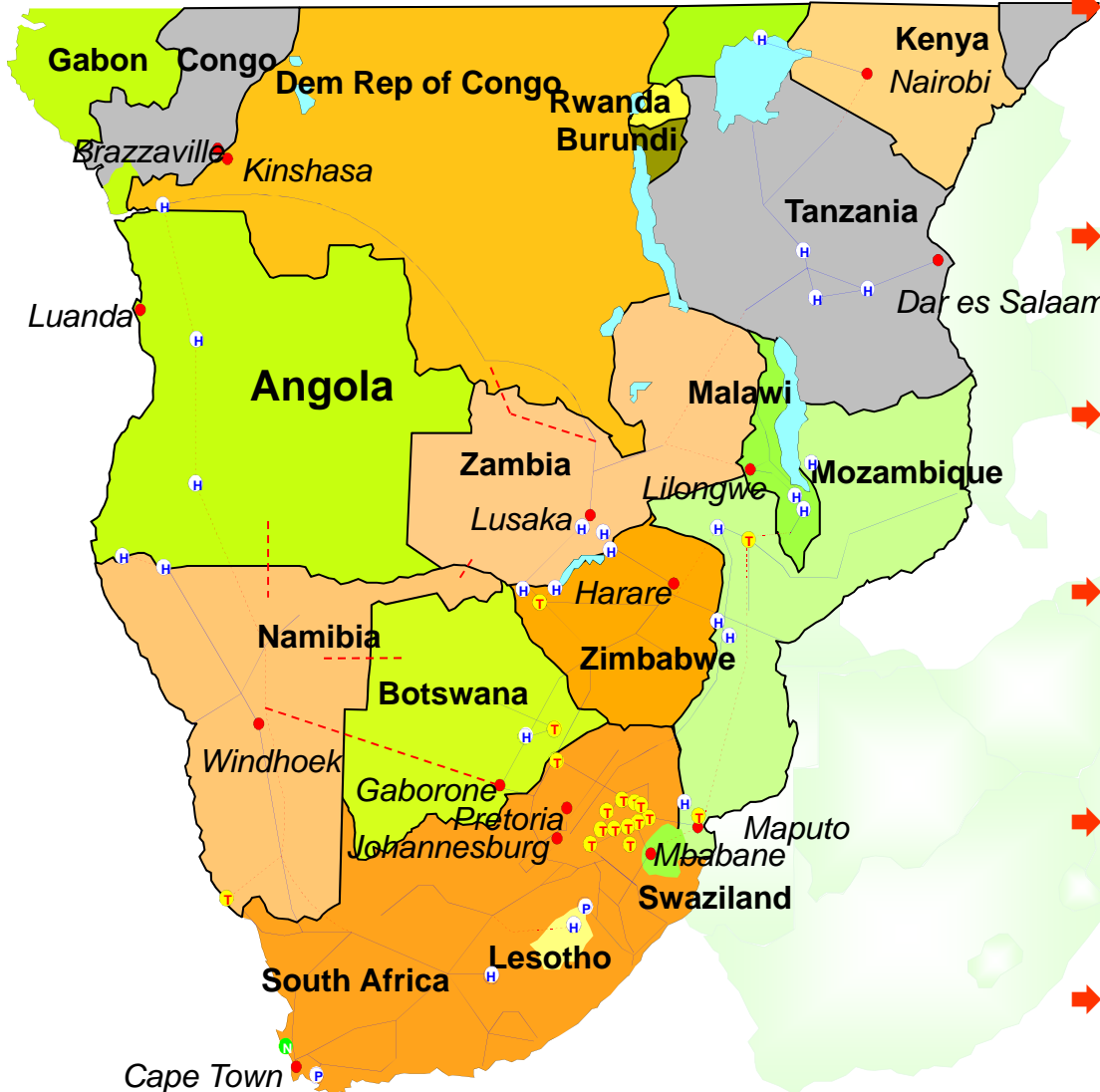


CHALLENGES

The SAPP is faced with the following main challenges:

- a. The migration from a **cooperative** to a **competitive** pool.
- b. The implementation of a competitive market at a time that the region is running out of generation reserve surplus capacity – **difficult for members to trust short term markets e.g DAM.**
- c. **Generation shortfall and Transmission Capacity Constraints**
 - To address the problem of diminishing generation surplus capacity, the region would need to:
 - ✓ Create an enabling environment for investors to invest in generation and transmission infrastructure.
 - ✓ Embrace the principle of **cost reflective tariffs**, and
 - ✓ Adopt **regulatory principles** that would enhance cost reflective tariffs.
- d. The restructuring of the SAPP and the recognition and admission of new members into the SAPP.

Challenges of Operating the Transmission Grid



Transmission Interconnections covering large geographical area.

Adherence to operational discipline vital.

Transmission Congestion Management critical.

Good metering and telecommunication systems needed.

Trust and transparency needed

Transmission capacity challenges – how to prioritise allocation

Conclusions

SAPP believes that the creation of a competitive market would:

- ❑ Help to **optimise** the use of regional resources
- ❑ Assist in determining the correct electricity price in the pool
- ❑ Send signals for **investments** and real time utilization of existing assets; transmission, generation and consumption.
- ❑ Enable the demand side to respond to the supply side price signals.