

Regional Integration in Southern Africa: A Platform for Electricity Sustainability

Gaylor Montmasson–Clair and Bhavna Deonarain
Trade & Industrial Policy Strategies (TIPS)

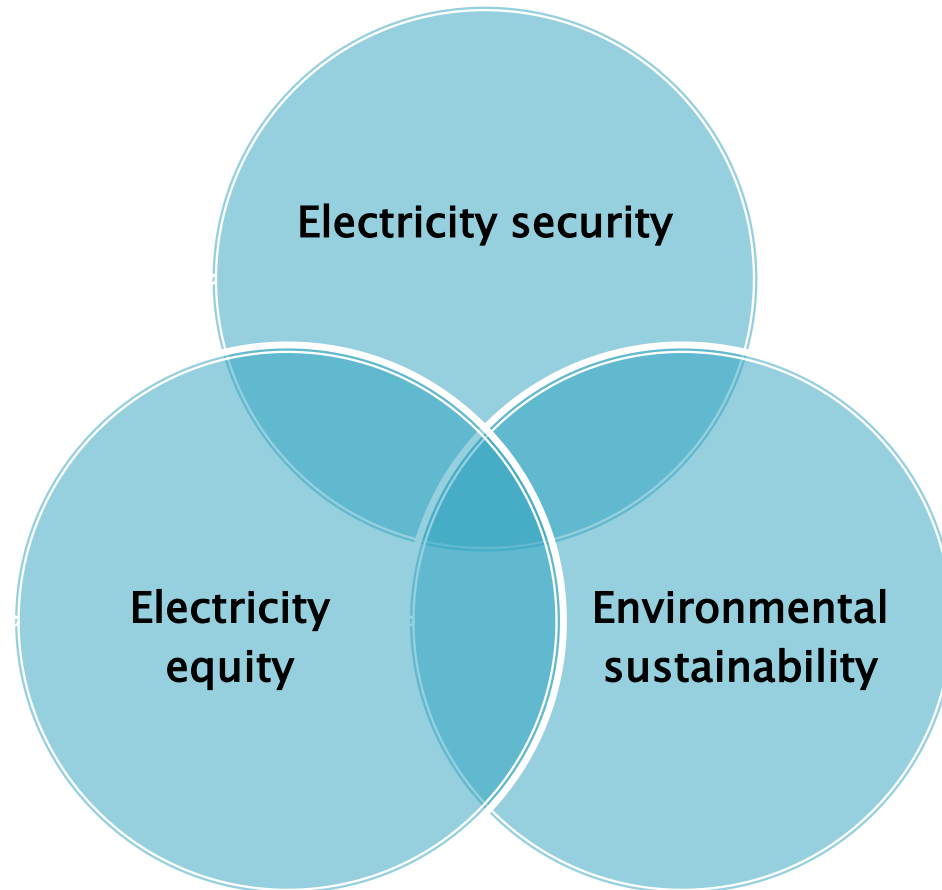


Outline

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- ▶ **The state of play**
 - Matching demand and supply
 - Achieving an affordable access to modern electricity
 - Harmonising policies, frameworks and regulations
- ▶ **The role of regional integration**
 - Harmonising policies, frameworks and regulations
 - Building common institutions and technical infrastructure
 - Fostering the development of human capabilities
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1. Introduction

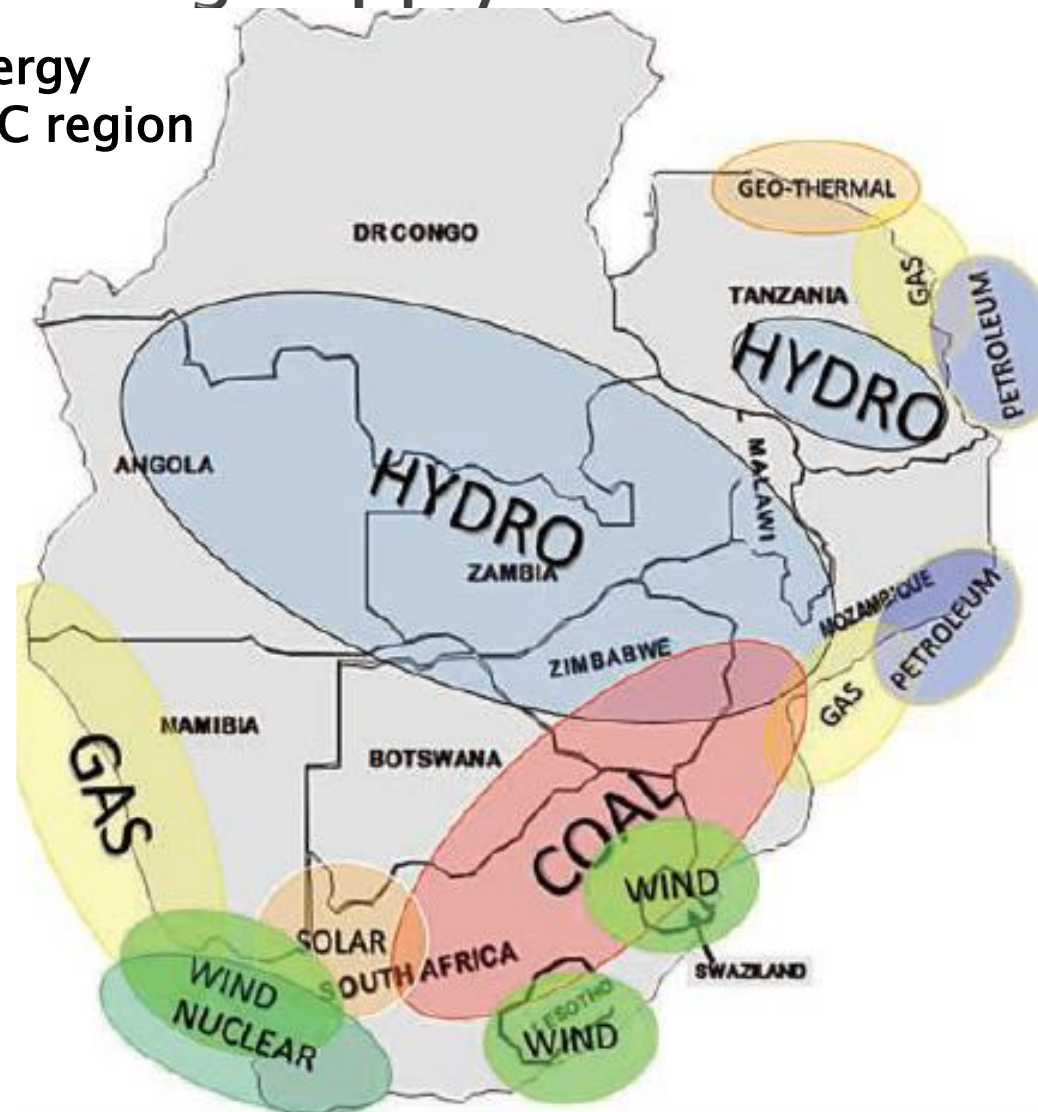
The three dimensions of electricity sustainability



Source: Authors' composition, inspired by WEC, 2013 and IEA, 2016

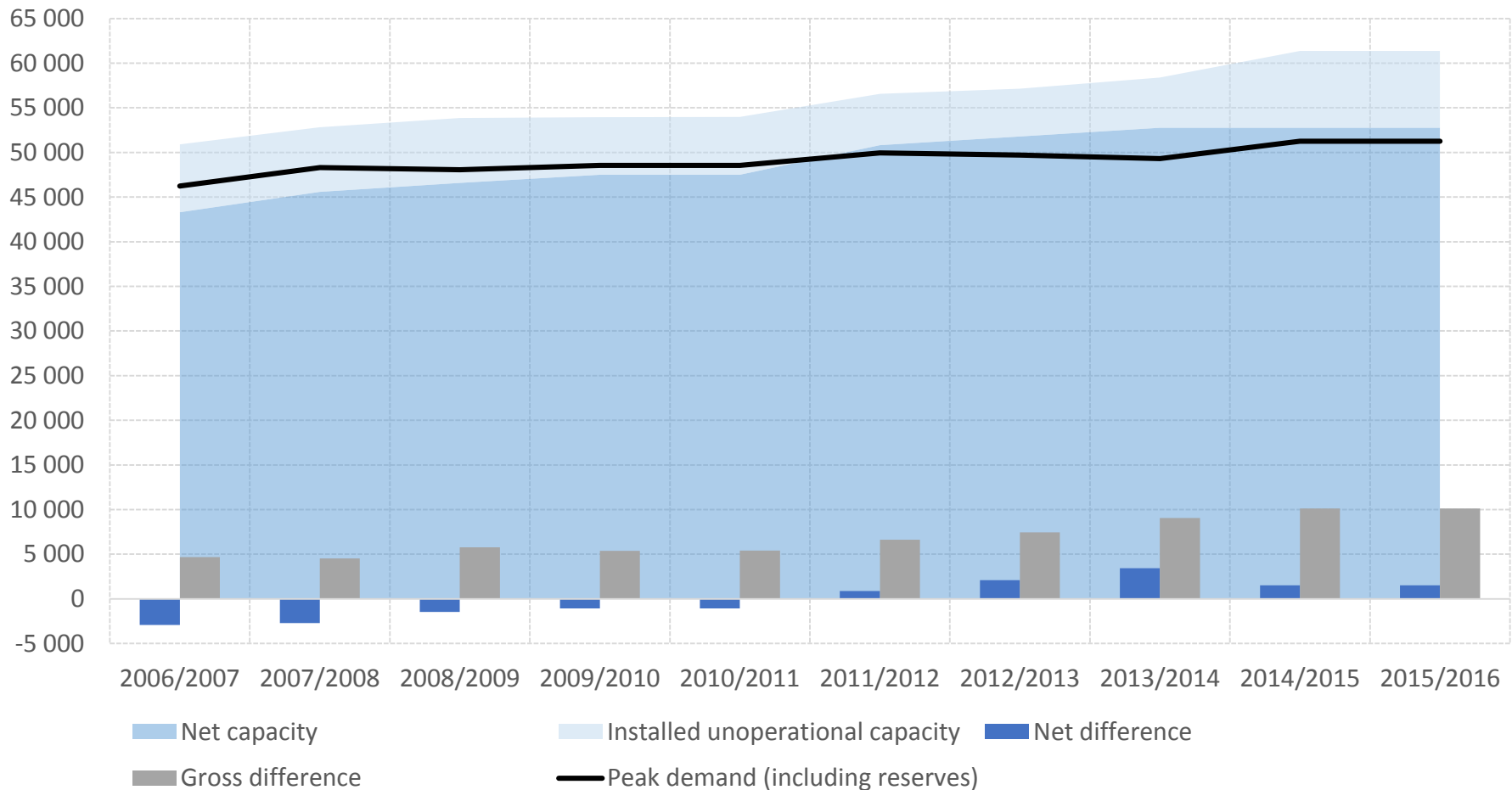
2. The state of play: Matching supply and demand

Illustration of the energy
resources in the SADC region



2. The state of play: Matching supply and demand

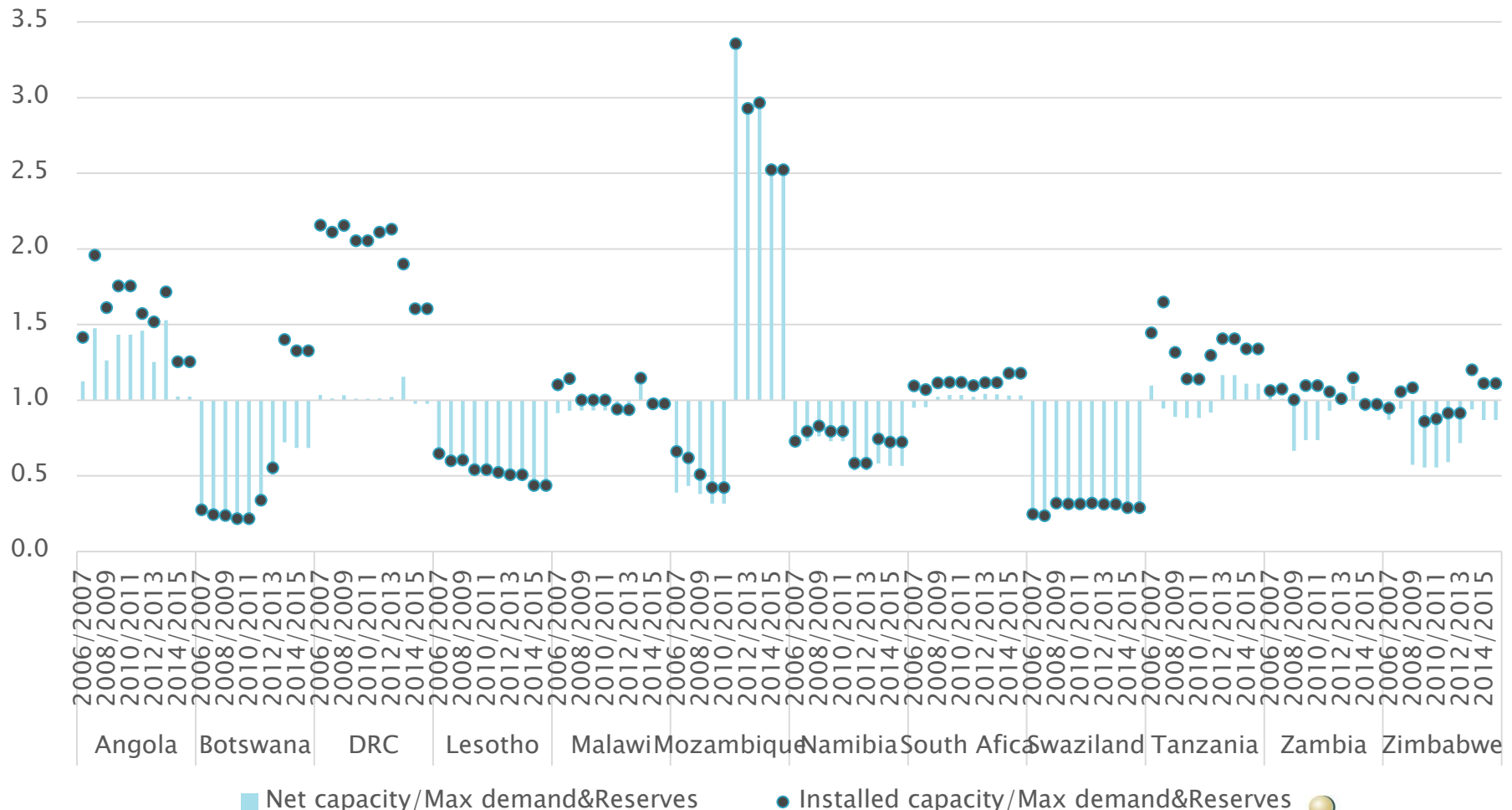
Installed capacity and net capacity over the peak demand and reserve requirements for SAPP countries



Source: Authors' composition, based on data from SAPP Annual Reports

2. The state of play: Matching supply and demand

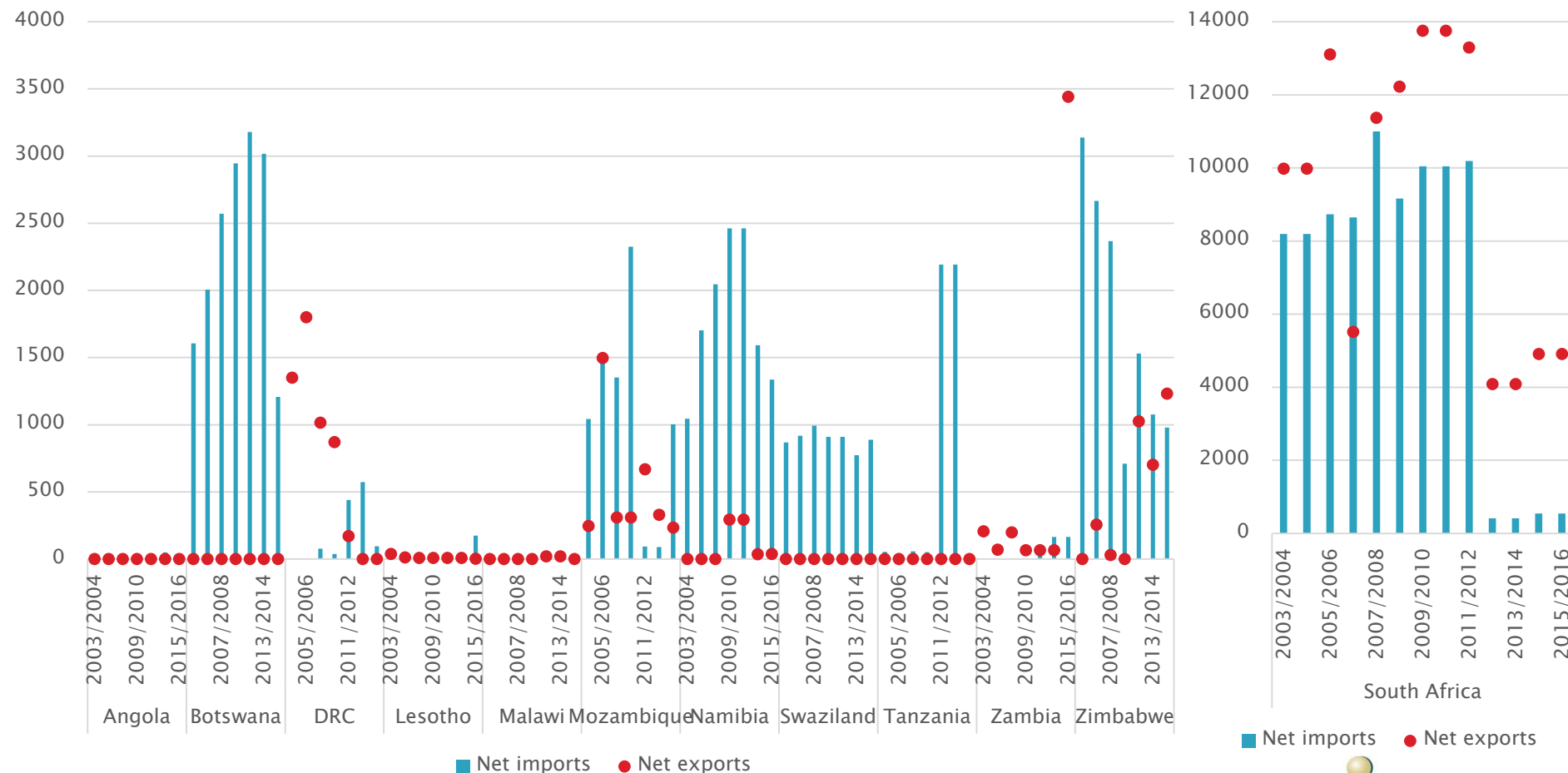
Ratios of installed capacity and net capacity over the peak demand and reserve requirements for SAPP countries



Source: Authors' composition, based on data from SAPP Annual Reports

2. The state of play: Matching supply and demand

Net imports and exports from 2003/2004 to 2015/2016
for SAPP countries (in GWh)



Source: Authors' composition, based on data from SAPP Annual Reports

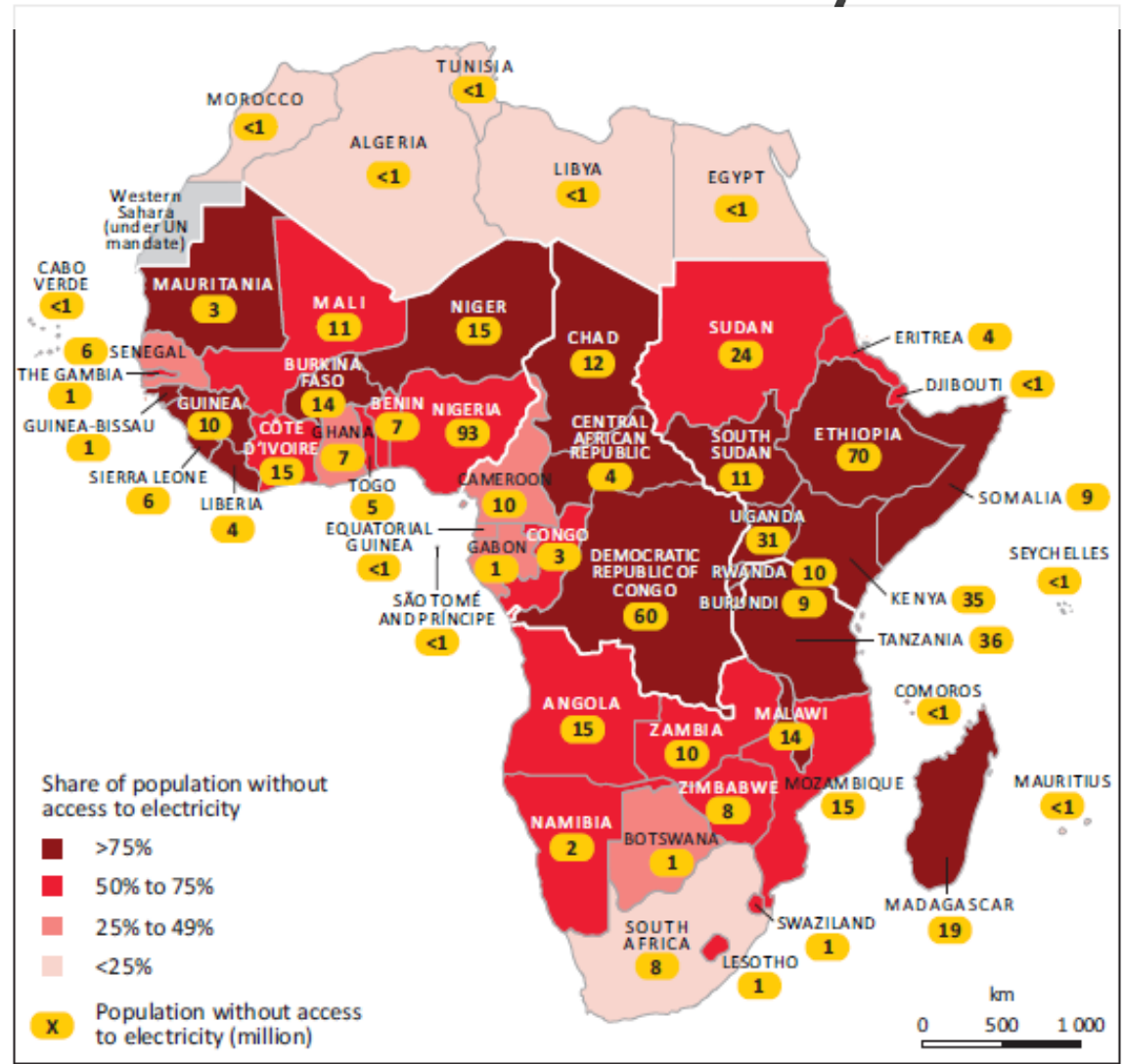
2. The state of play: Matching supply and demand

Table 1: Committed generation projects planned from 2016-2022 in SAPP countries (in MW)

Country	2016	2017	2018	2019	2020	2021	2022	Total
Angola	930	2 545	267	0	0	0	0	3 742
Botswana		120			300			420
DRC	458		150					608
Lesotho								0
Malawi	10	6	72	22	1 006			1 116
Mozambique	360			600	400	600	1 500	3 460
Namibia	40		190			800		1 030
South Africa	1 624	999	2 167	1 445	2 167	723	1 528	10 653
Swaziland				12			300	312
Tanzania		900	1 040	250	1 000			3 190
Zambia	300		27	441	1 450	230	1 200	3 648
Zimbabwe	200		420	837	1 860		1 200	4 517
Total	3 922	4 570	4 333	3 607	8 183	2 353	5 728	32 696

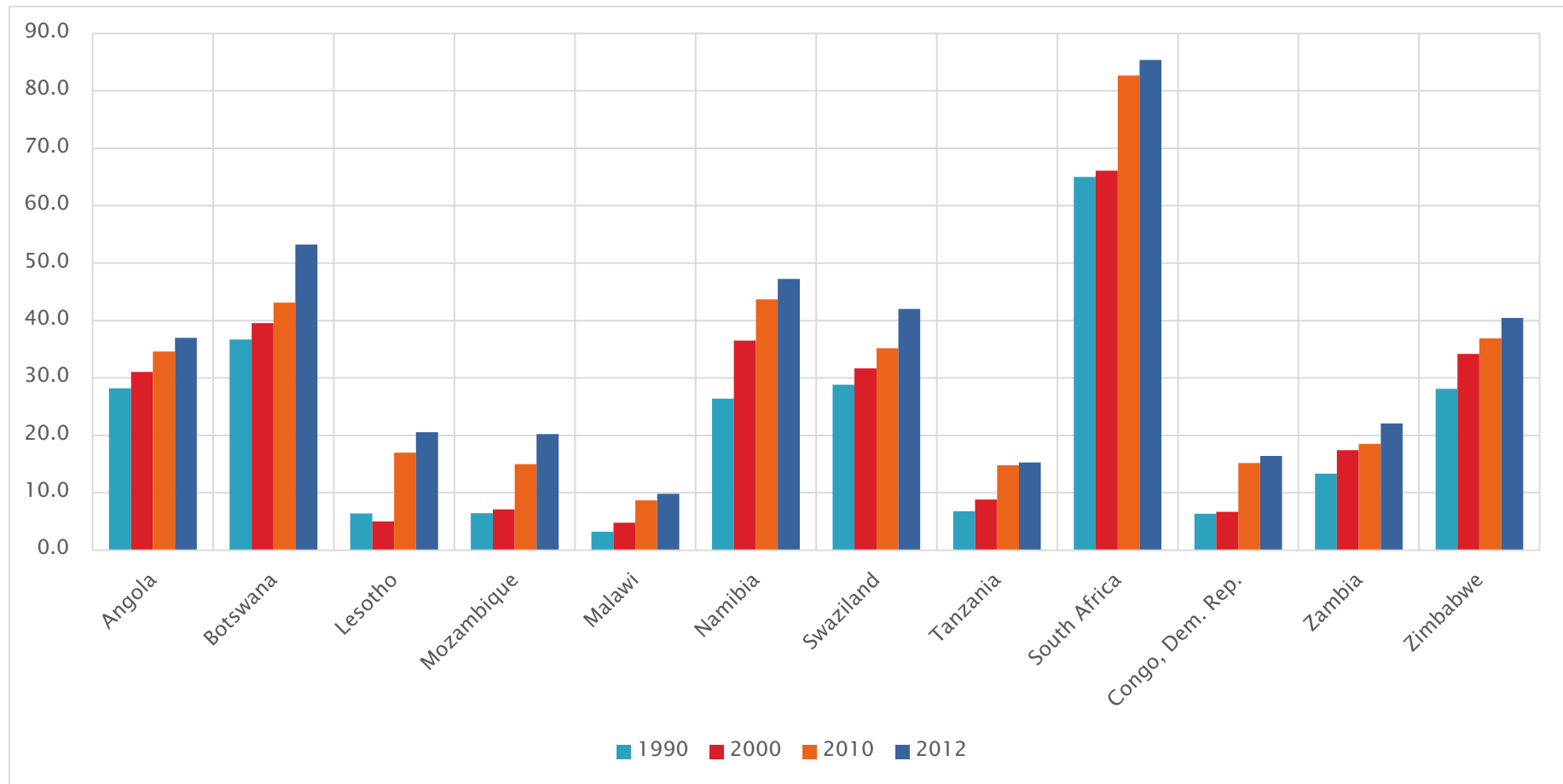
2. The state of play: Achieving an affordable access to modern electricity

Population without access to electricity in Africa
(in volume and share of total population)



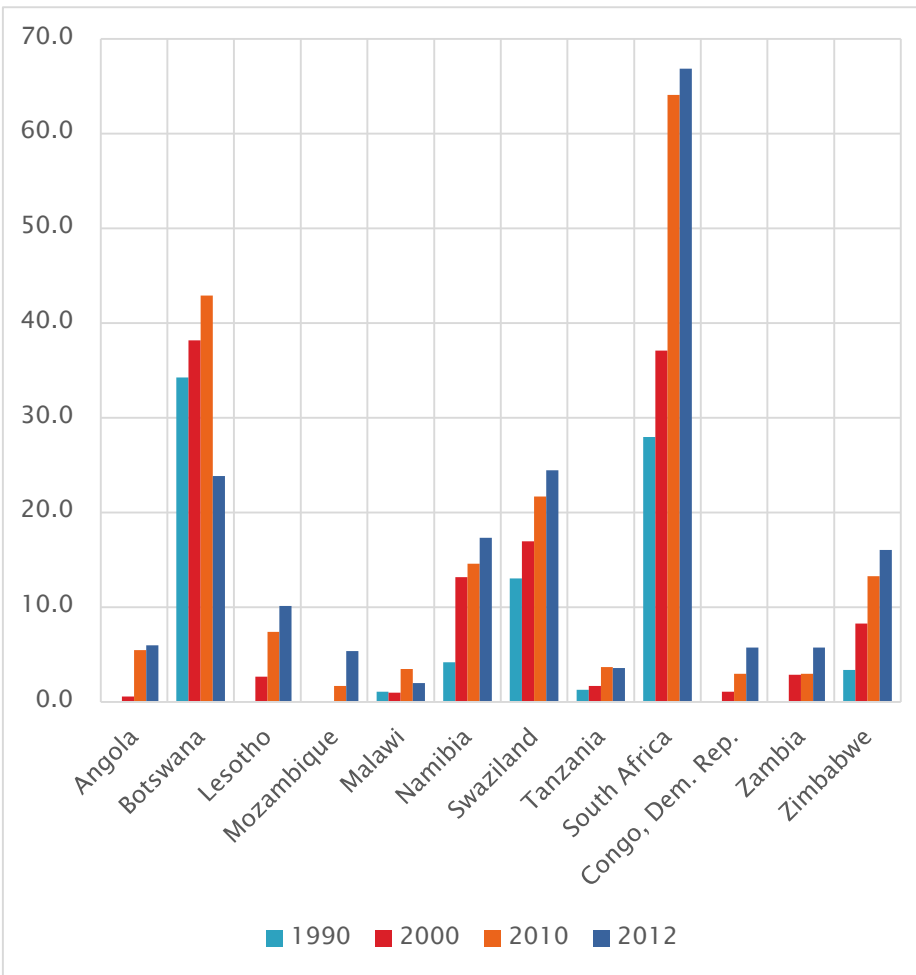
2. The state of play: Achieving an affordable access to modern electricity

Access to electricity in SAPP countries
(in % of population) from 1990 to 2012

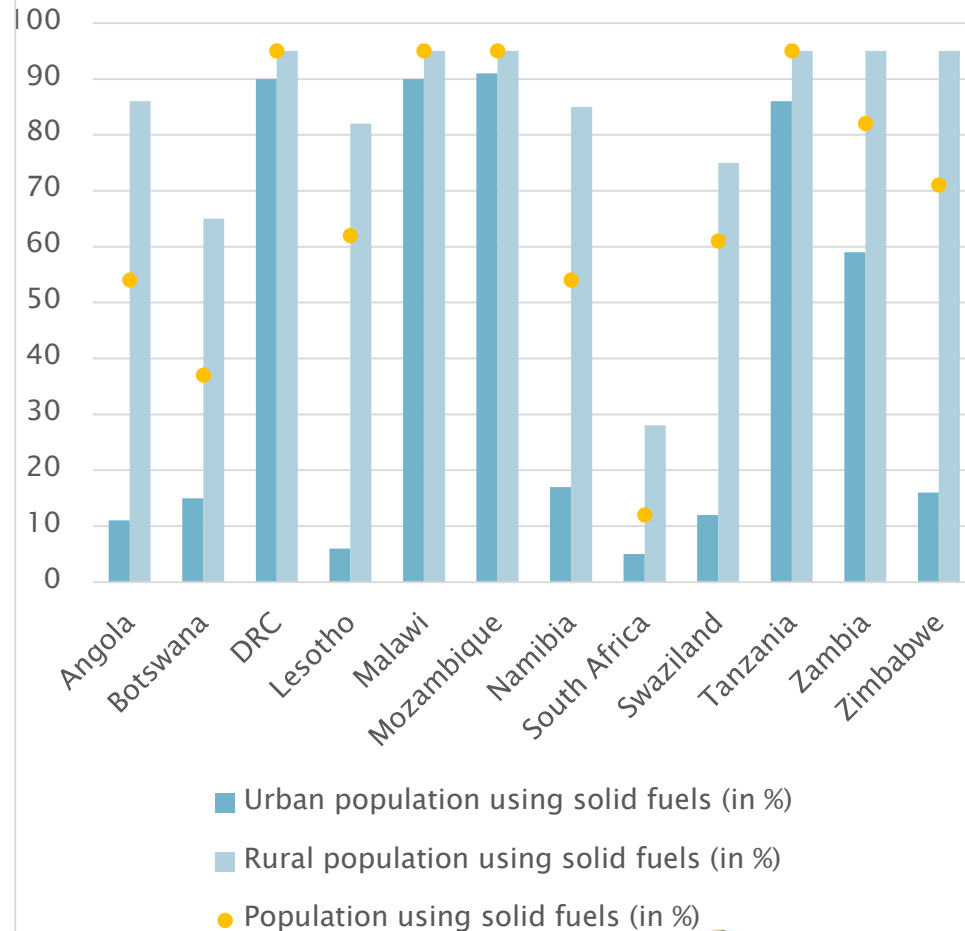


2. The state of play: Achieving an affordable access to modern electricity

Access to electricity in SAPP countries (in % of rural population) from 1990 to 2012

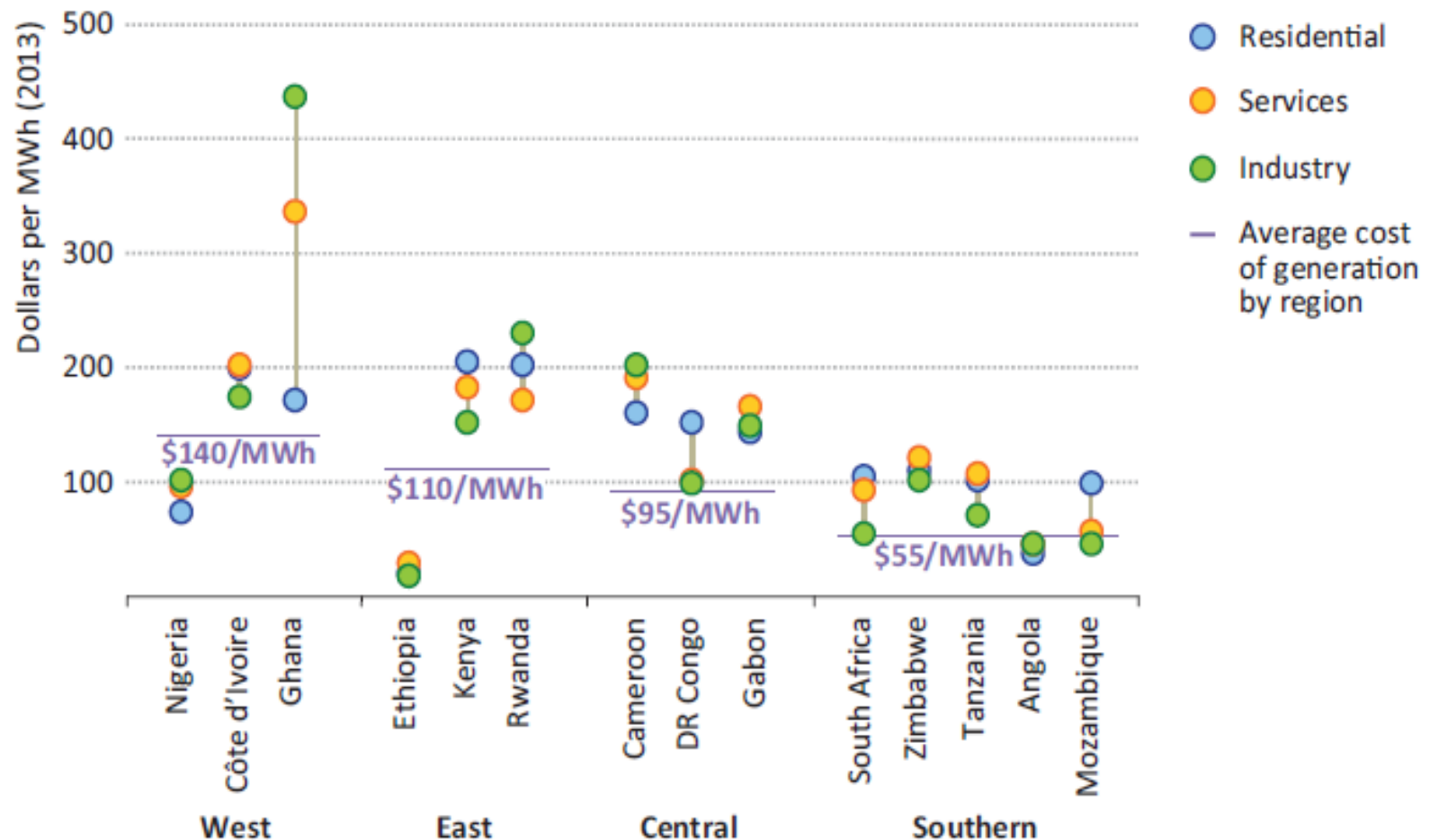


Use of solid fuels in SAPP countries (in %)



2. The state of play: Achieving an affordable access to modern electricity

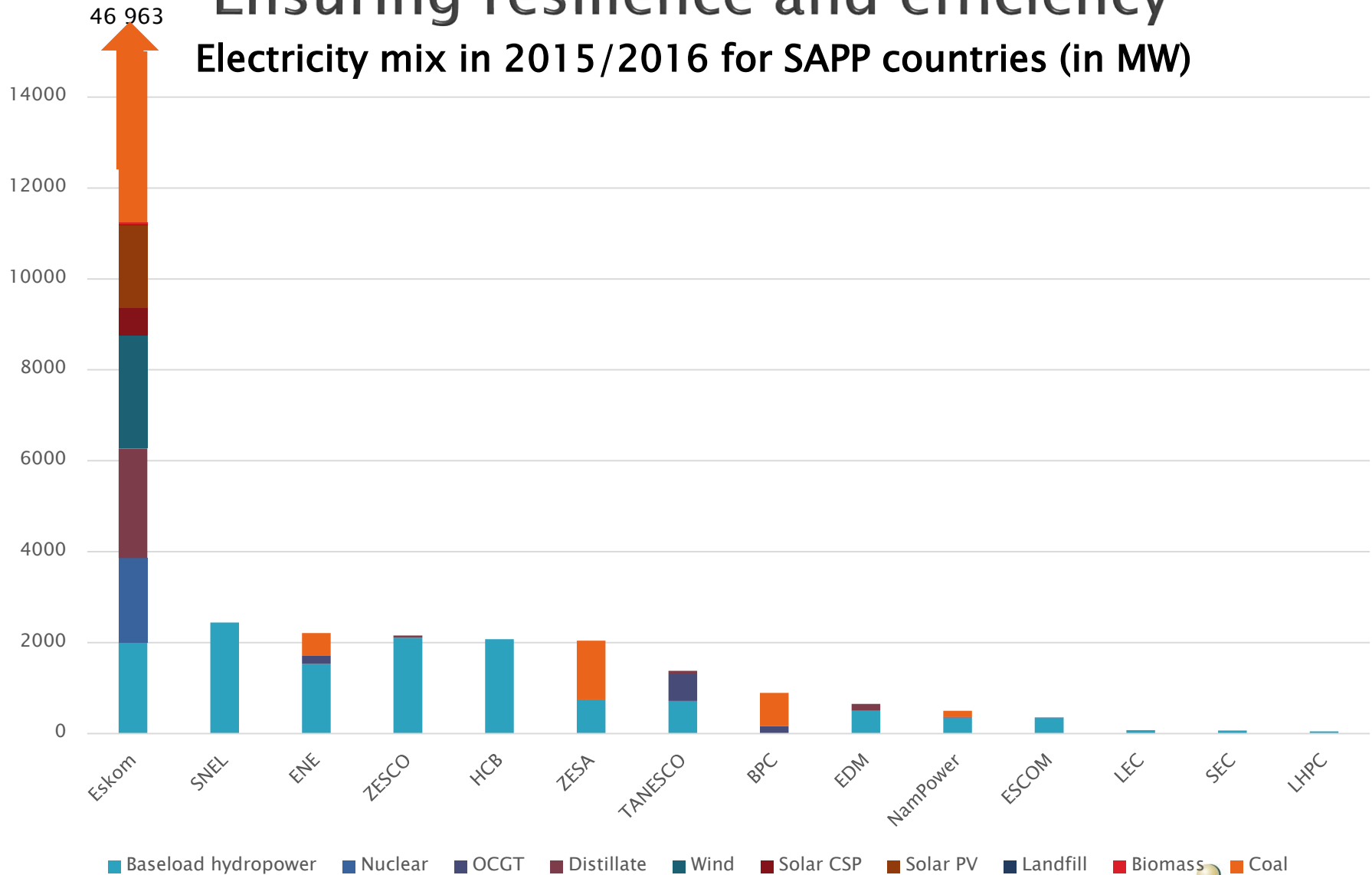
Figure 10: Grid electricity prices by end-use sector in selected countries in 2013



2. The state of play:

Ensuring resilience and efficiency

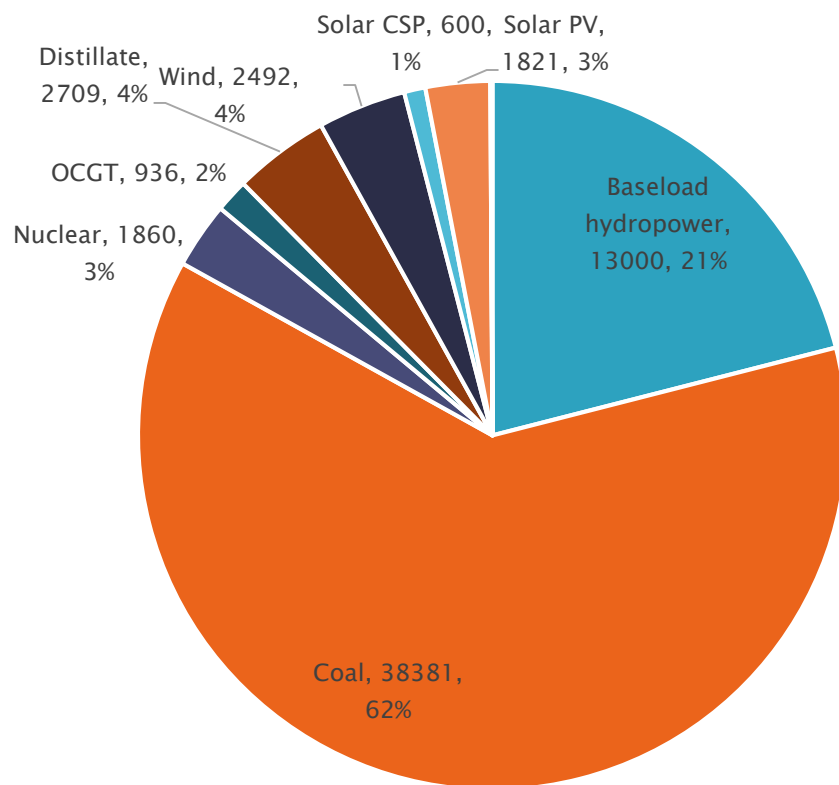
Electricity mix in 2015/2016 for SAPP countries (in MW)



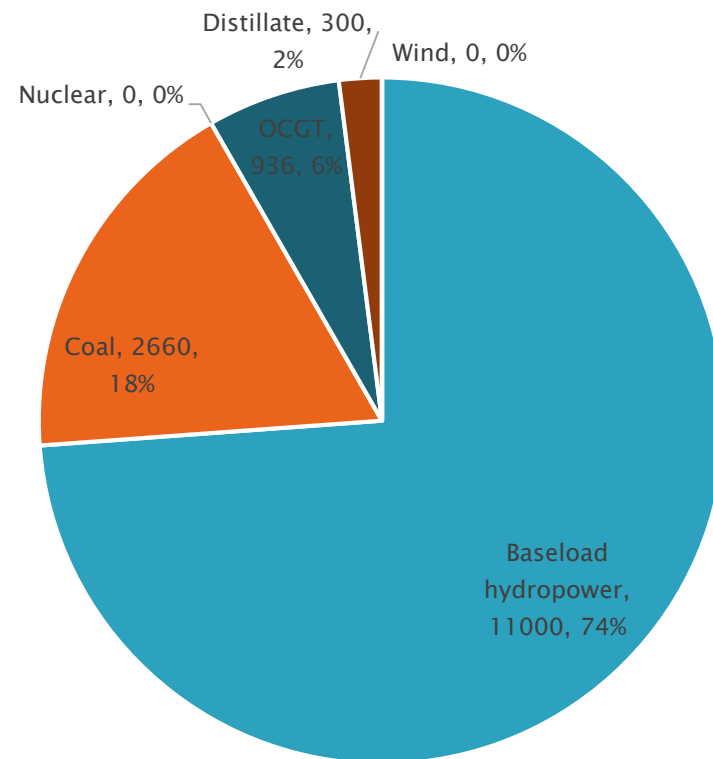
Source: Authors' composition, based on data from SAPP Annual Reports

2. The state of play: Ensuring resilience and efficiency

Electricity mix in SAPP countries in 2015/2016 (in MW and %)



SAPP countries

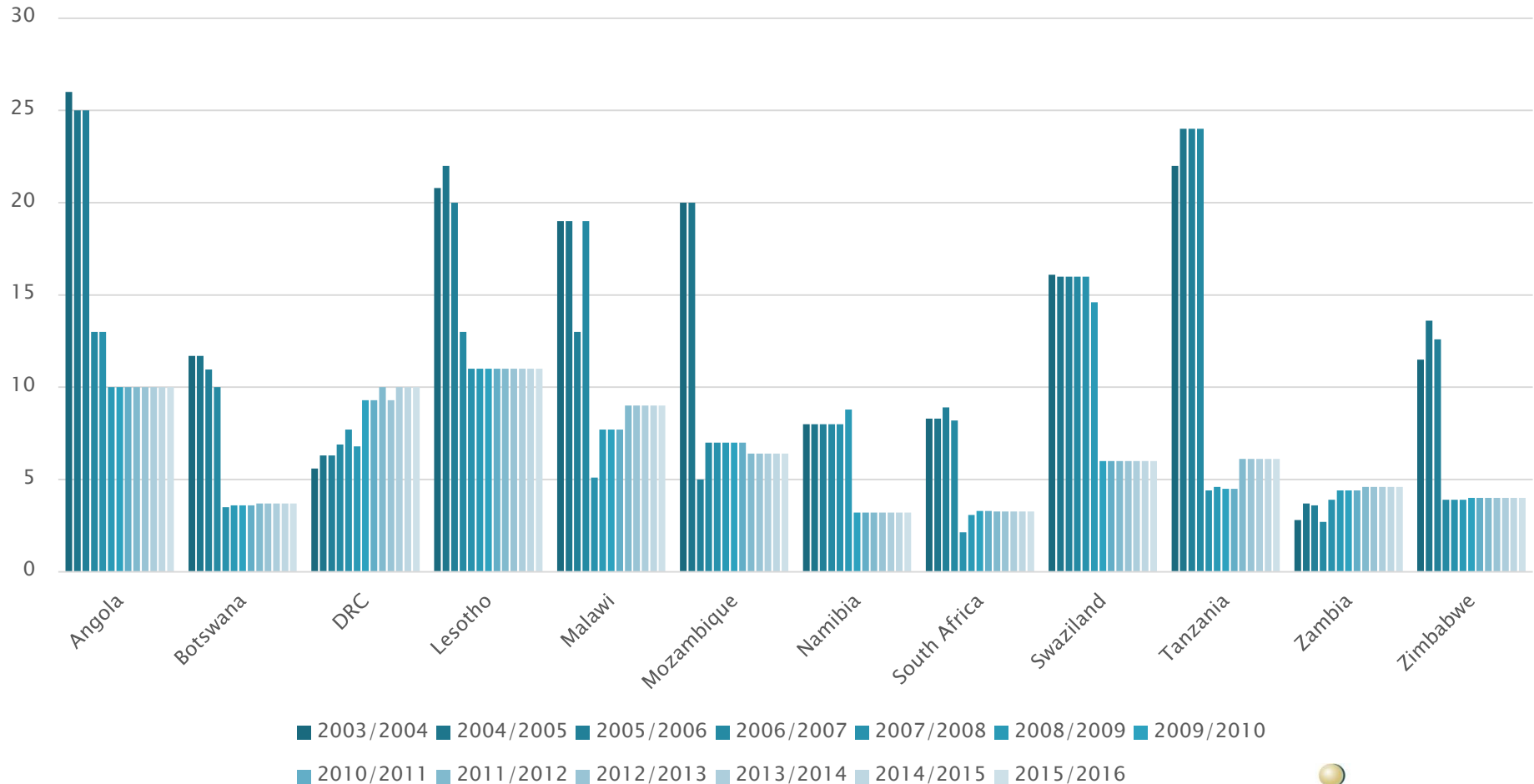


SAPP countries, excl. SA

Source: Authors' composition, based on data from SAPP Annual Reports

2. The state of play: Achieving an affordable access to modern electricity

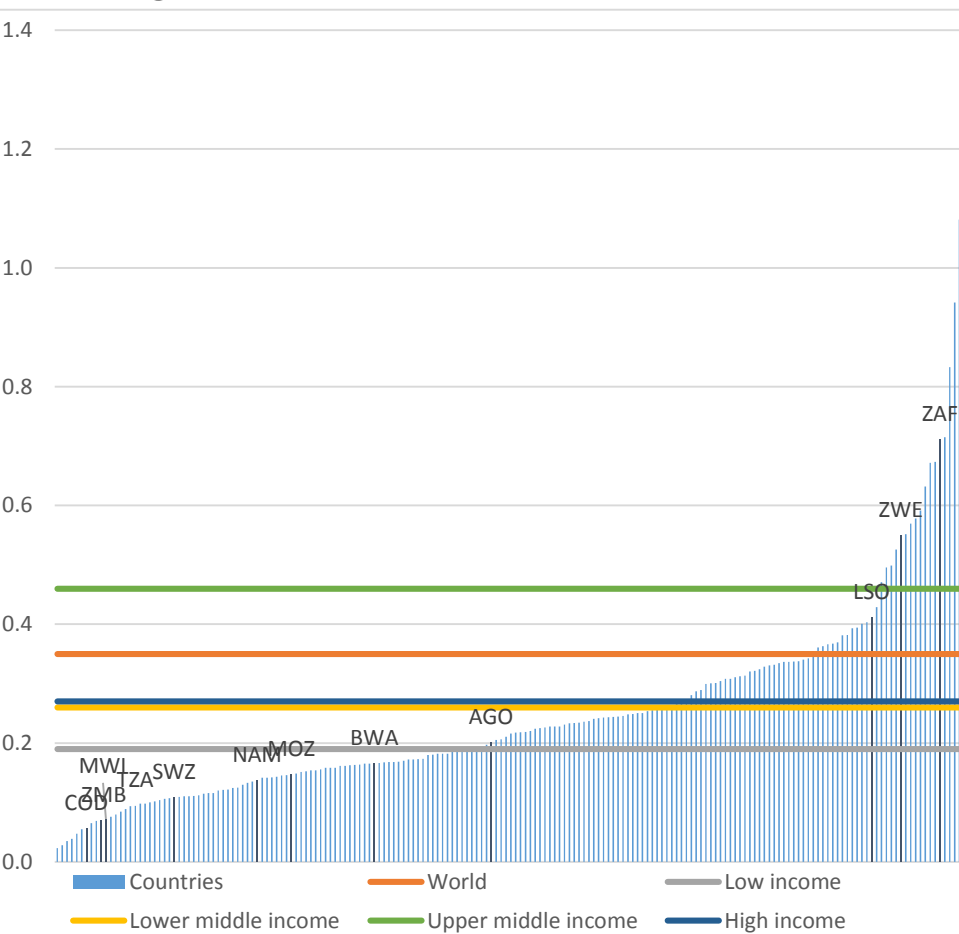
Transmission losses from 2003/2004 to 2015/2016 for SAPP countries (in %)



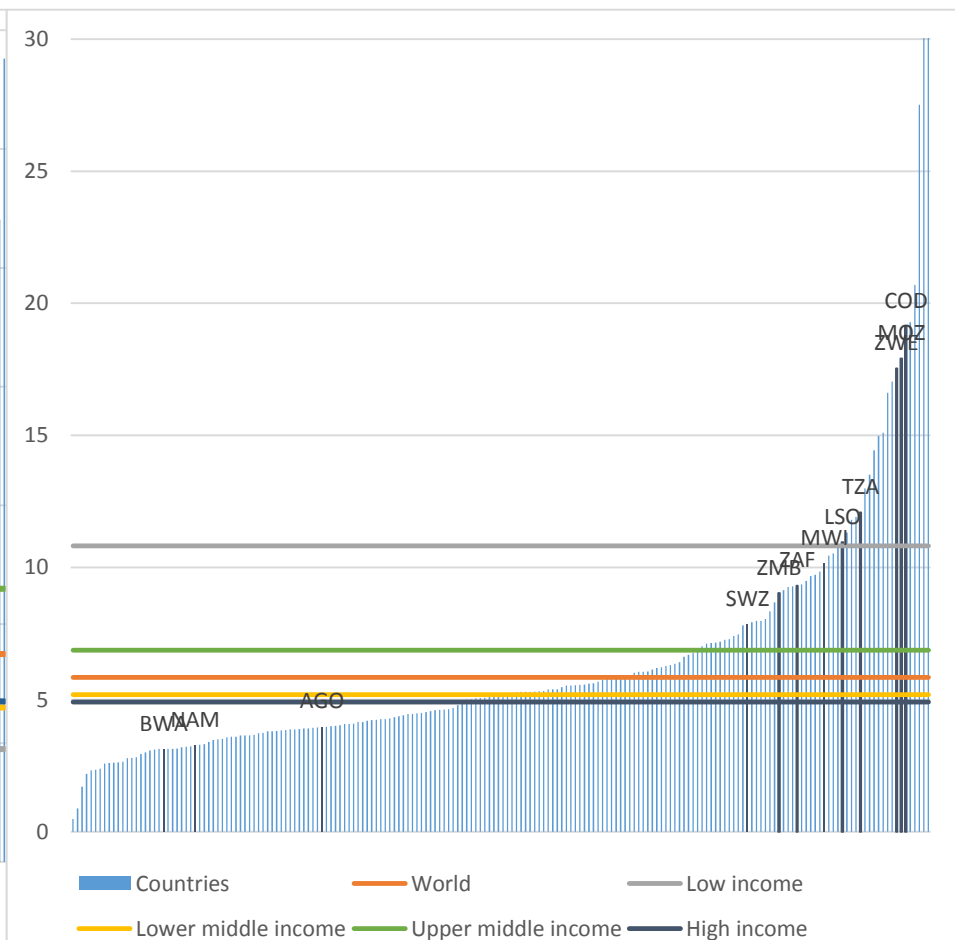
Source: Authors' composition, based on data from SAPP Annual Reports

2. The current state of play: Energy and carbon intensity

CO2 emissions per country
(in kg per 2011 PPP USD of GDP)



Energy intensity per country
(in MJ per 2011 PPP USD of GDP)

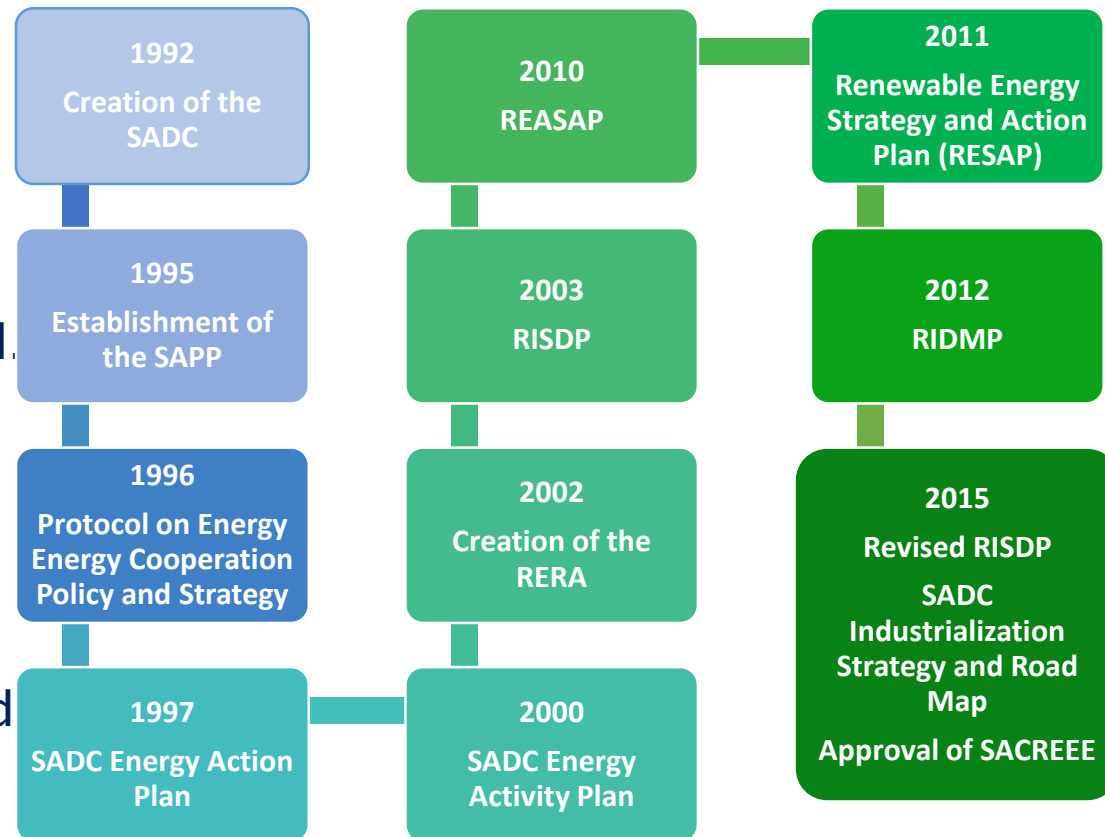


3. The role of regional integration: Harmonising policies, frameworks and regulations

- ▶ **Energy regulation is still nascent in the region** and lacks independence, capacity and skills
 - ▶ Energy policy appears fundamentally inadequate, with long-term planning being largely outdated in time and best practice, and lagging in implementation.
 - ▶ **Energy policy is not integrated at the regional level:** more a collection of national situations than an integrated regional framework.
 - ▶ Concerns on the physical security of transmission infrastructure and contract security.
- ▶ The RERA was launched in 2002, with the following objectives:
 - Capacity building and information sharing
 - Facilitation of ESI policy, legislation and regulations
 - Regional regulation cooperation
 - ▶ RERA developed “**regulatory guidelines**” for cross-border deals
 - ▶ While noteworthy, these guidelines have no formal legal status and remain voluntary.
 - ▶ Focus on large-scale/long-term transactions, perpetuating and further entrenching the domination of long-term, bilateral transactions

3. The role of regional integration: Harmonising policies, frameworks and regulations

- ▶ The SADC has developed **numerous regional plans and strategies** in the energy space to attempt to remedy the situation
- ▶ Common implementation frameworks are furthermore being progressively developed.
- ▶ The implementation of such plans, strategies and frameworks remains however problematic.
- ▶ The SADC has limited clout to fast-track implementation and ensure adopted initiatives are adequately resourced and funded.



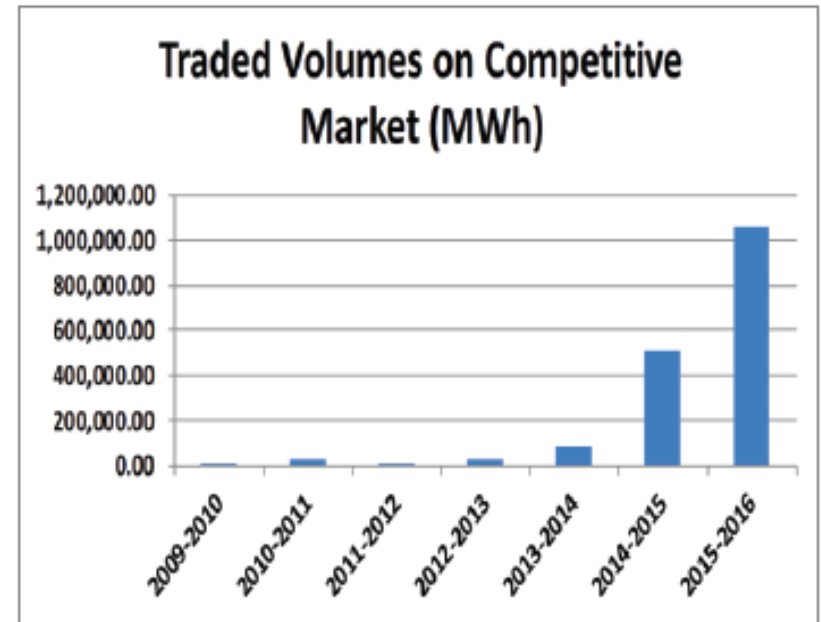
3. The role of regional integration: Harmonising policies, frameworks and regulations

- ▶ Going forward, the **implementation** of the plans and frameworks arises as the priority for the region from a policy and regulatory perspective.
- ▶ Necessary regional planning and upward, development-focused harmonisation of the policy frameworks
 - But forego pre-conceived ideas on market structures and tariff methodologies
- ▶ Calls for **strengthening of the role and functions of the regional institutions** to allow them to have more authority on issues of energy development in region
- ▶ Need for SADC to play a stronger role in effectively **securing funding for local-level sustainable energy projects** in the region
- ▶ Creation of effective linkages between the **energy and industrial development frameworks** in the region

3. The role of regional integration: Building common institutions and technical infrastructure

- ▶ Notable progress has been made in developing the regional electricity infrastructure since the creation of the SAPP in 1995
- ▶ The role of regional trading mechanisms however remains limited.
- ▶ Furthermore, when turning to the region, countries tend to favour a bilateral approach, striking long-term supply agreements.

Total energy traded on the DAM and PDAM from 2009/2010 to 2015/2016



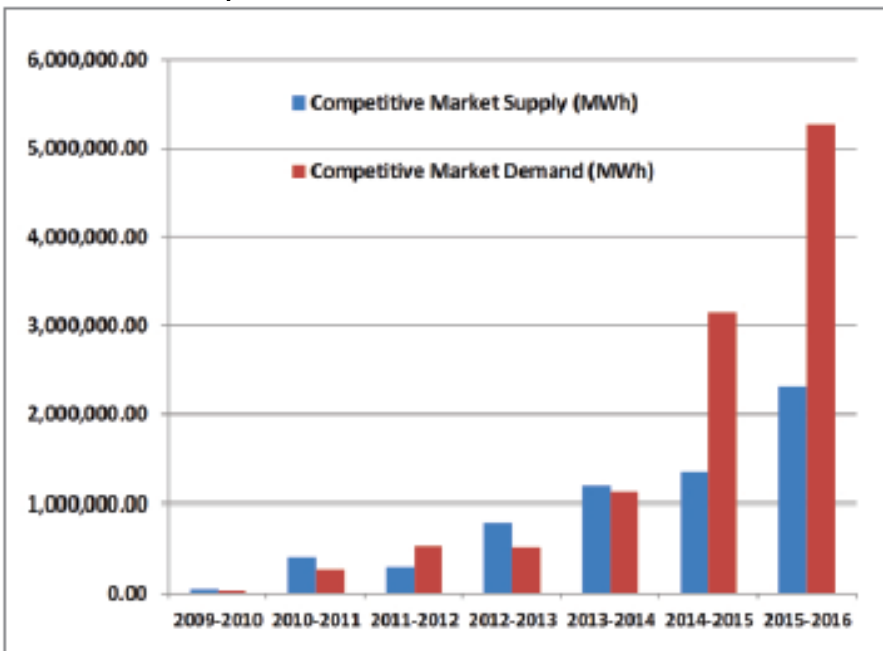
Source: SAPP, 2016

Share of energy traded	2013/2014	2014/2015	2015/2016
On the competitive market	0.9	6	14
Bilaterally	99.1	94	86

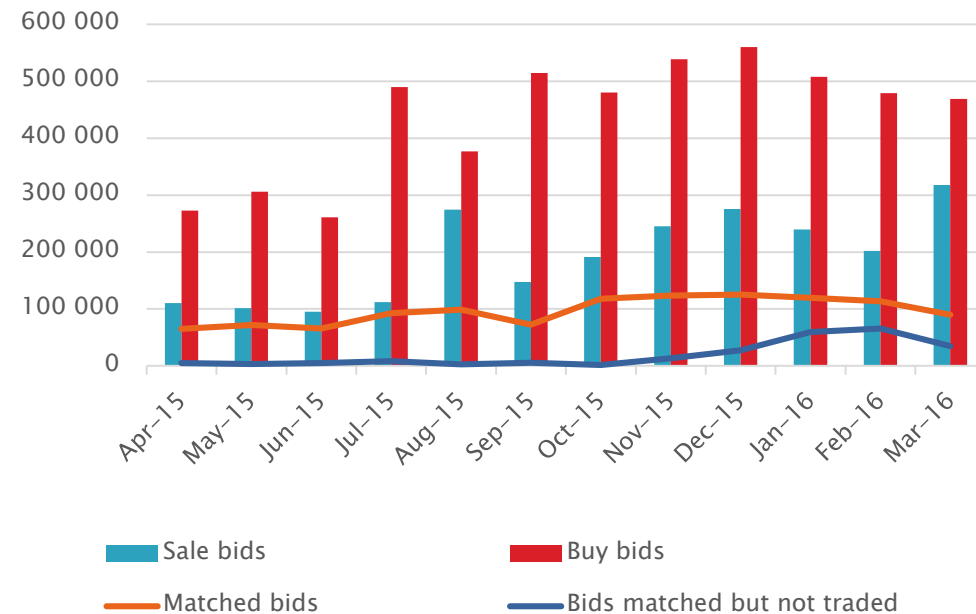
3. The role of regional integration: Building common institutions and technical infrastructure

- ▶ Excess of demand vs. supply reflecting the issues around electricity security
- ▶ Structural constraints due to infrastructure limitations

Demand and supply trends on the competitive market from 2009/2010 to 2015/2016



Bids submitted and matched on DAM in 2015/2016 (in MWh)



Source: SAPP, 2016

Source: Author's composition, based on data from SAPP 2016 Annual Report



3. The role of regional integration: Building common institutions and technical infrastructure

- ▶ Going forward, need to overcome the national deadlocks through regional and local action
- ▶ Pursue planned cross-border projects, with a focus on connecting Angola, Malawi and Tanzania to the regional grid and enhancing key backbone links.
- ▶ Further investigate the **role of super-grids**, which consist of HVDC transmission networks.
- ▶ Pursue the **deepening of the regional mechanisms**. The limited but growing role of regional trade (compared to bilateral deals) is promising.
- ▶ Support the local rollout of smart and micro-/mini-grids, particularly in support of rural electrification and local economic development
- ▶ Move towards increased representativity of the regulatory framework to ensure inclusive growth

3. The role of regional integration: Fostering the development of human capabilities

- ▶ The **policy mandate** to create a regional market for skills and competences is clear
- ▶ **Some capacity building and experience sharing** is organised at the regional level
- ▶ Most SADC's frameworks, plans and strategies emphasise the need to **build data and information databases** and repositories
- ▶ Little progress has been made to develop **national and regional skills and knowledge**.
- ▶ Most capacity building programmes target existing human resources in the sector, higher education institutions and decision-makers.
- ▶ **Very little investment in building the capacity of communities** or building a network of community practitioners, especially those engaged in the delivery of decentralised electricity systems.
- ▶ **Information and data**, on energy like many other topics, remains very scarce and of poor quality in the region.

3. The role of regional integration: Fostering the development of human capabilities

- ▶ Need for a **regional cooperative framework** to develop the 'human infrastructure' at all levels

- ▶ Development of **regional knowledge programmes** (harmonisation of regional curricula; mutual recognition of certifications)
- ▶ Establishment of **regional educational, training institutions**
- ▶ Creation of a **regional free movement area**
- ▶ Facilitation of **enhanced cooperation** between R&D institutions on energy issues.

- ▶ **Increased action-orientated capacity building** to develop new initiatives at the local and regional levels
- ▶ **Lesson drawing** activities from successful stories and failures (iterative process)
- ▶ **Foster data- and information-related initiatives** (one-stop information system, platforms to reach communities)
- ▶ **Improve mapping and diagnostic tools** to answer the needs of populations in terms of energy sustainability

4. Conclusion

- ▶ The road to electricity sustainability in Southern Africa remains long and difficult.
- ▶ The deepening of regional energy integration offers a platform to fast-track progress towards electricity sustainability.
- ▶ **Existing initiatives provide the necessary building blocks** for regional integration to meaningfully help countries meet their energy challenges.
- ▶ Ultimately, regional integration however remains conditioned on the **willingness and engagement of member countries and national institutions** as well as robust, inclusive and transparent governance systems.
- ▶ The task at hand is evidently complex and ambitious, but the **long-term benefits** associated with **sustainable development-focused regional integration** are at the core of Southern Africa's prosperity.

Thank you! Looking forward to your inputs



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Gaylor Montmasson-Clair
Senior Economist
gaylor@tips.org.za
+27 12 433 93 40

www.tips.org.za