South Africa

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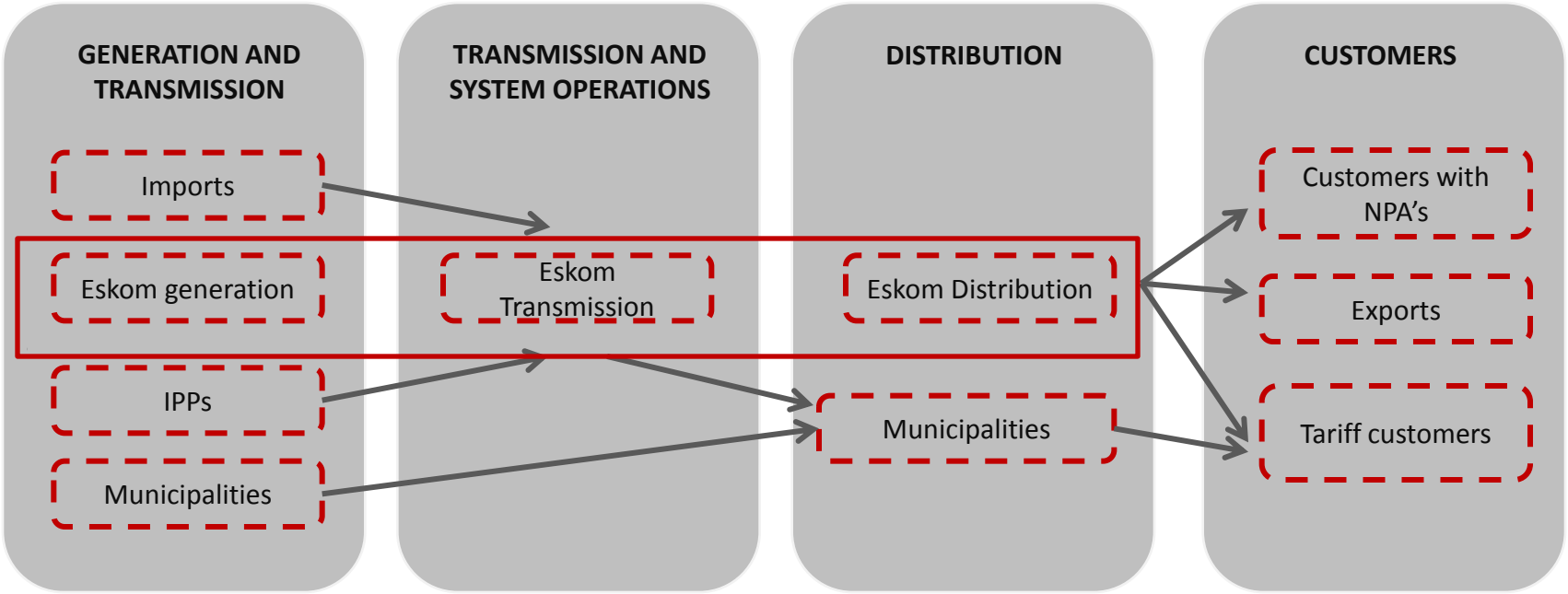
- Expected demand and addition to generation capacity, 2018–2027
- Growth in transmission network and capacity, 2006–2017
- Expected growth in transmission network and capacity, 2018–2027
- Expected investment in transmission network

Electricity industry structure and key players

- South Africa's electricity sector is dominated by the state-owned, vertically integrated power utility Eskom. The company holds a monopoly over transmission, distribution and trade of electricity.
- The Department of Energy (DoE) is responsible for policy making, while the National Energy Regulator of South Africa (NERSA) is responsible for regulating the energy sector and granting licences. To promote private participation in generation, NERSA developed Renewable Energy Feed-In Tariffs in 2009, which were replaced in 2011 by the DoE with a competitive bidding process for renewable energy — Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), consisting of mostly solar and wind power generation technology. IPPs were therefore introduced into South Africa's Electricity Supply Industry (ESI) through the highly successful REIPPPP.
- The DoE's IPP unit is currently expanding the competitive procurement programme to include co-generation, coal and gas-to-power generation projects.



Growth in capacity, production and consumption

- As of March 2017, South Africa had an installed generation capacity of XXXXX MW, of which almost 88% was thermal and the remaining was based on hydroelectric, nuclear and wind energy. Electricity production decreased at a CAGR of 1.5% between 2011 and 2016, while consumption increased at 2.1% for the same time period.

Table 1: Installed capacity, generation and consumption, 2017

Installed capacity (MW)	XXXXX
Generation (GWh)	XXXXXX
Consumption (GWh)	XXXXXX

Figure1: Installed electricity capacity by technology, 2017 (MW)

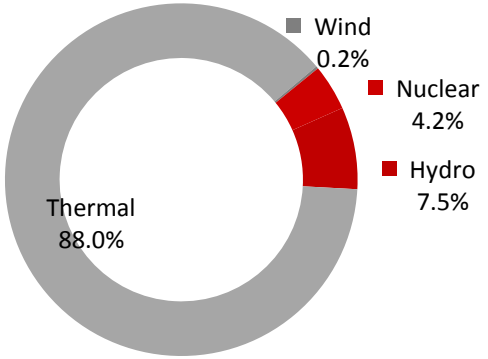


Figure 2: Growth in installed capacity, 2006–17 (MW)

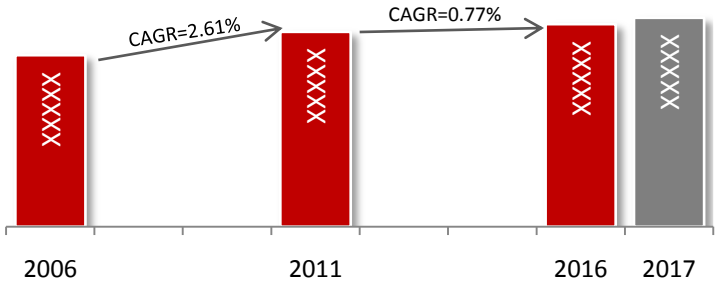
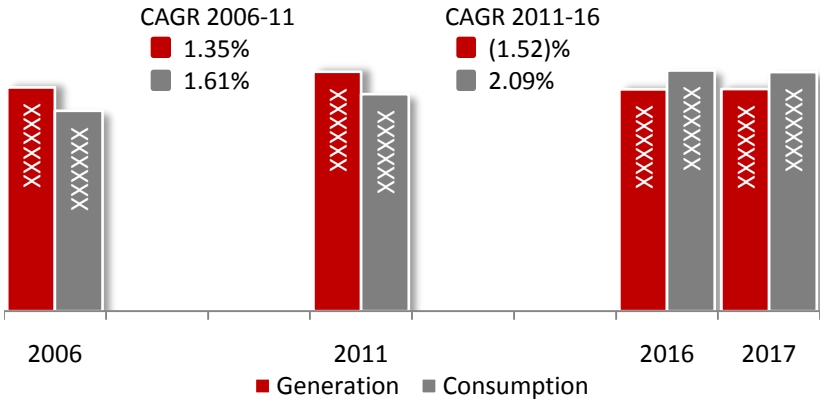


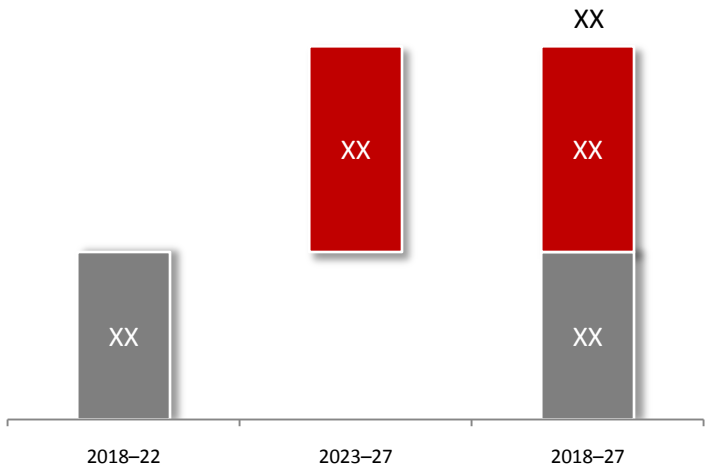
Figure 3: Growth in generation and consumption, 2006–17 (GWh)



Note: Data is as of March 30 for the mentioned years. Installed capacity does not include 5,027 MW of IPP capacity; generation data does not include electricity generated by IPPs.
Source : Eskom

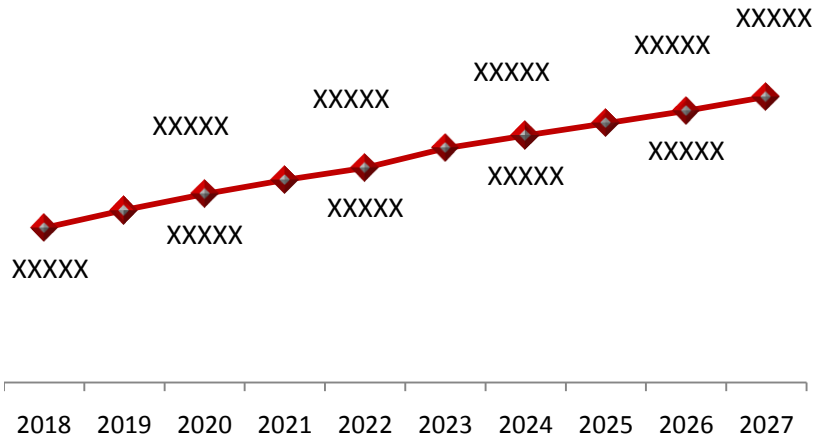
Expected demand and addition to generation capacity

Figure 4: Expected addition to generation capacity (GW)



Source: Eskom Transmission Development Plan, 2018-27

Figure 5: Expected growth in electricity demand (MW)



Source: Eskom Transmission Development Plan, 2018–27

- Eskom's Transmission Development Plan (TDP) for 2018–27 projects electricity demand to increase at a CAGR of 2.7% between 2018 and 2027.
- In response, there are plans to increase the installed capacity by XX GW during the same period. Of the total proposed capacity, around XX GW will be added by 2022 of which Eskom will add X GW and IPPs X GW. Another XX GW of new capacity is proposed to be developed during 2023–27.
- The new generation capacity is being added under Eskom's New Build Programme and DoE's REIPPPP. Over the next decade, four coal-based TPPs of 400 MW capacity each are expected to be commissioned by Eskom under the New Build programme. Under the REIPPPP, 45 projects involving over 2,880 MW of capacity and ZAR1.3 billion investment will be connected to the grid in the next few years.

Growth in transmission network and capacity

- As of March 2017, South Africa's transmission network comprised about XXXXX km of line length and about XXXXXX MVA of transformer capacity at voltage levels ranging from 132 kV to 765 kV. The majority of the network, or about 59% of the total line length, comprises 400 kV transmission lines. South African grid is interconnected with the grids of seven of its neighbouring countries: Botswana, Mozambique, Namibia, Zimbabwe, Lesotho, Swaziland and Zambia.

Table 2: Transmission line length and transformer capacity, 2017

Transmission line length (km)	**XXXXX**
132 kV AC	XXX
220 kV AC	XXXX
275 kV AC	XXXX
400 kV AC[1]	XXXXX
533 kV DC (monopolar)	XXXX
765 kV AC	XXXX
Transformer capacity (MVA)	**XXXXXX**

Figure 6: Transmission line length by voltage (%)

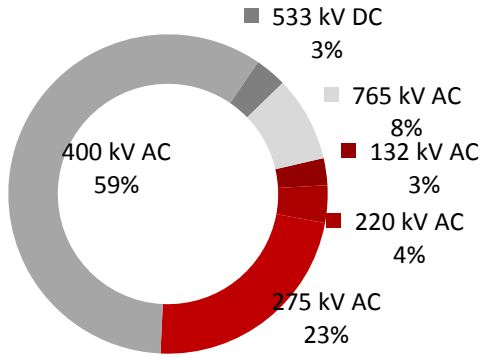


Figure 7: Growth in transmission line network, 2006–17

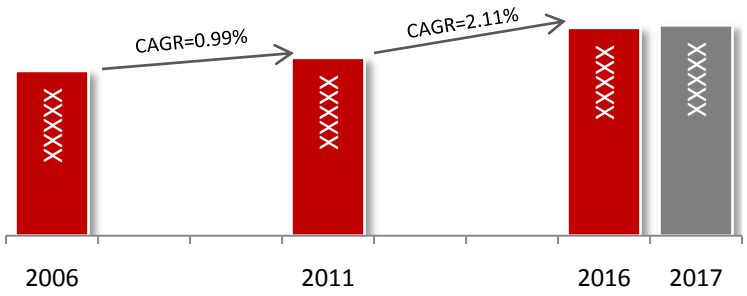
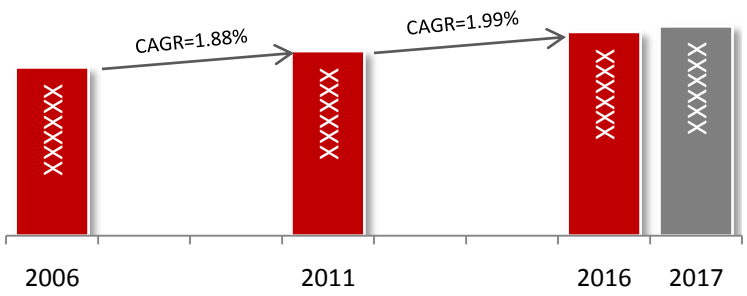


Figure 8: Growth in transformer capacity, 2006–17



Note: Data is as of March 30 for the year mentioned. 1 –-The 765 kV Majuba Umfolozi No 1 line is currently being operated at 400 kV and has been counted at 400 kV level.
Source: Eskom

Expected growth in transmission network and capacity

- South Africa is currently focusing on developing its domestic grid to evacuate power from upcoming generation projects and meet the expected increase in load. Major network reinforcements are foreseen to expand supply to the southern, western and eastern grids.
- According to Eskom's TDP 2018–27, around XXXX km of new transmission lines, XXXXX MVA of transformer capacity and XX new substations will be added to South Africa's grid.

Table 3: Planned transmission network additions, 2018–27

Voltage	2018–22	2023–27	2018–27
Transmission line length (km)	**XXXX**	**XXXX**	**XXXX**
–275 kV AC	XX	XXX	XXX
–400 kV AC	XXXX	XXXX	XXXX
–765 kV AC	XX	XXX	XXX
Transformer capacity (MVA)	**XXXXX**	**XXXXX**	**XXXXX**
Number of substations	**XX**	**XX**	**XX**

Source: Eskom Transmission Development Plan, 2018–27

Figure 9: Planned line length addition (km)

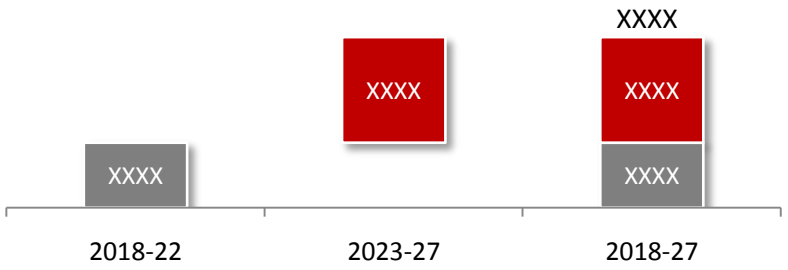
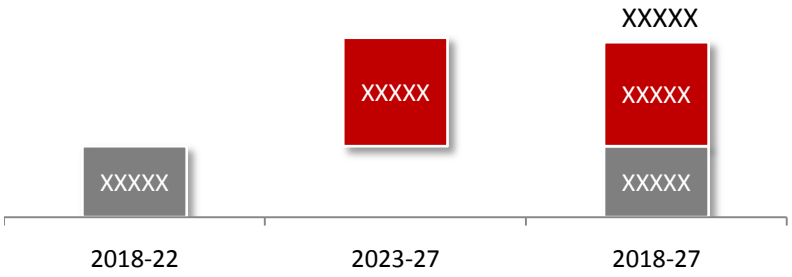


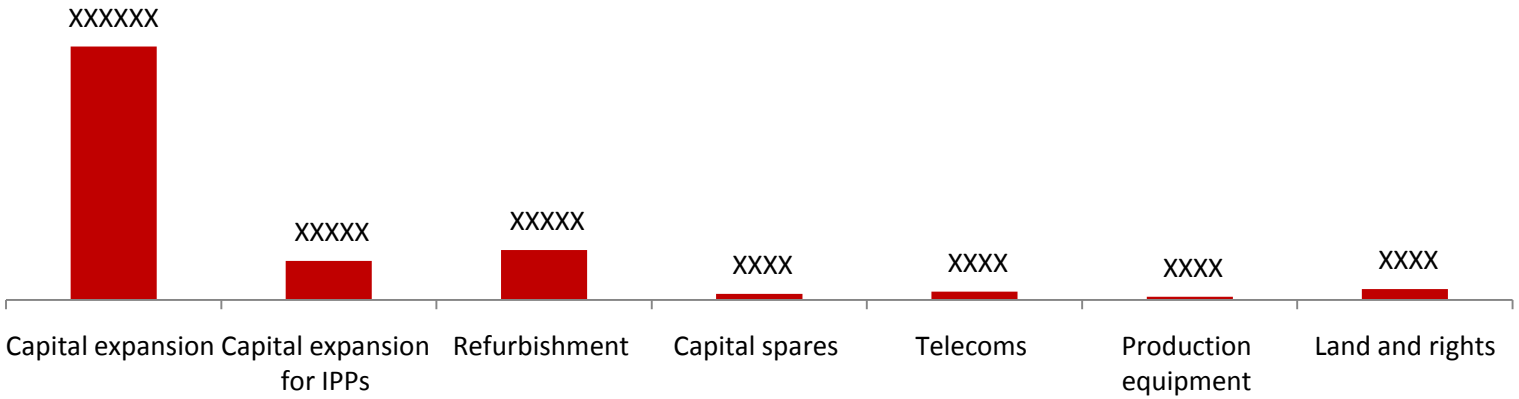
Figure 10: Planned transformer capacity addition (MVA)



Expected investment in transmission network and outlook

- Between 2018 and 2027, Eskom is expected to invest over ZARXXX billion on the expansion of South Africa's grid network. This amount will be spent on capacity expansion, refurbishment, spares, production equipment and land acquisition.
- Of the total amount, about ZARXXX billion is expected to be spent on expansion of the transmission network.

Figure 11: Planned investment in transmission network and capacity for 2018–27 (ZAR million)



Source: Eskom Transmission Development Plan, 2018-27

- Due to years of underinvestment, South Africa is finding it difficult to keep pace with the growing demand for electricity. Most of the power infrastructure is aged, and Eskom is facing challenges to undertake high level maintenance due to low reserve margins. The government has been facing the ire of the public for not ensuring the security of local supply of power as well as for not improving the efficiency of Eskom.
- Currently, private involvement in the power sector is limited. The recently launched REIPPPP has been able to attract IPPs, who have stayed away due to the low tariff rates and a difficult regulatory framework.
- Going forward, South Africa is planning to increase the share of renewable energy in the generation mix to 42% of the total capacity by installing 18.2 GW of renewable capacity by 2030.