

# Republic of South Africa

## Short characteristic of Eskom and prosumers' market

Dr hab. inż. Tomasz Jękot  
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# Scope

Production of electrical energy

Installed capacity based on energy sources (2018)

Energy sources in electricity production (2013)

Electrical energy usage

Eskom

- problems

- root causes

- proposed solutions

- consequences

Example of renewable energy initiatives in industry

Renewables – Residential

Remarks

Conclusions

# Installed capacity based on energy sources (2018)

RSA population – 57.5 million

Electrical energy production. - 216.7 TWh (ref. Eskom)

Installed capacity: 51.3 GW

Capacity contribution from sources:

coal	64.7%
oil	21.3%
renewable/waste	7.6 %
gas	2.8%
nuclear	3.5% (Koeberg near Cape Town, 1.8 GW)
hydro	0.1%

There is a plan to contract 19.3 GW based on Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) – Ministry of Energy South Africa, 10/2018)

# Energy sources in electricity production (2013\*)

According to Eskom the electricity production in 2013 was 232.7 TWh, with the following contribution from different sources:

coal	90.44%
hydro	0.46 %
pumped storage	1.27%
gas	0.8%
nuclear	5.03%
renewables	2.0%

\* It has been a challenge to find a reliable source of more recent information related to electricity production

# Electrical energy usage

Usage per economic sector:

industry	36%
transport	26%
residential	18%
mining	7%
commerce	7%
agriculture	3%
others	3%

Ref. Ministry of Energy South Africa, 10/2018

# Eskom – Problems

Financial situation (2019) – servicing the debt of 29 billion US\$ and operational costs are bigger than profit generated

Insufficient stability of energy production and frequency

More than 90% reliance on coal as a source of energy (not taking full advantage of 300 sunny days a year)

Delayed (by some sources by at least 10 years) Renewable Energy Independent Power Producer Procurement Programmes (REIPPPP)

# Eskom – Root causes

## Questionable:

overall strategy (up to 2017 there were plans to built 9 nuclear power stations)

investment/engineering decisions (Medupi and Kusile, two coal power stations not contracted out as turn-key projects)

project management (e.g. Medupi and Kusile by Eskom)

Corruption, mismanagement, neglected maintenance of existing power stations

Commissioning of Medupi 4,76 GW and Kusile 4,8 GW, delayed by 3 to 5 years

Some experienced staff (trained by Eskom) left the entity during the period of corruption and state capture to work elsewhere in the world

NB: In 1994 Eskom was considered one of the five best energy producers in the world in terms of production costs, management and know-how

# Eskom – Proposed solutions

Proposed solutions include:

- Bringing external engineers (mainly from Enel) to address technical problems

- Splitting Eskom into three (still public) companies: production, transmission and distribution and allowing some competition in production and distribution

- Bringing back engineers who were trained by Eskom



# Eskom – Consequences

Frequent load shedding – costing economy between 1.5 – 5 billion US\$ (2018)

Eskom situation is considered as the main risk for economic growth, possibly hindering foreign investments (ref. Goldman Sachs, and others)

Estimated tariff increase by 15% per year for the next 3 to 5 years

Industry and residential property owners install hybrid or off-the-grid PV system to alleviate load shedding or be entirely independent of Eskom

# Renewables – Residential

Multi-step tariff - 100 \$ to 150 US\$ / MWh (in Gauteng province)

Popular: solar heaters and heat pumps

The main reason to install off-the-grid PV systems is to be completely independent of Eskom

Hybrid systems for net users <1 MVA allowed only in Cape Town as of June 2019, ref. [www.capetown.gov.za](http://www.capetown.gov.za)

# Remarks

Meaning of “prosument” in Polish – It is conglomerate of words producer/professional and consumer. It describes an entity involved in consumption and production of “the goods”, which in this case is electricity.

The English equivalent is “prosumer”, however the meaning, according to Cambridge Dictionary is either:

a customer who wants to buy very high-quality technical products or equipment (professional and consumer)

or

a customer who helps a company design and produce its products. The word is formed from the words "producer" and "consumer"

The Polish meaning of prosumer has been assumed in this presentation

# Conclusions

Eskom financial situation and inability to provide reliable electricity supply post the biggest risk to South African economy

Limited opportunities to install hybrid PV systems, connected to the grid, force prosumers to opt for battery based solutions, which are not necessarily the most economical

Growing number of industrial and residential PV systems diminishes demand on Eskom electricity and could lead to oversupply of installed capacity

The investments in hydrogen fuel cells (if successful) could lead to lower transport costs, improved platinum demand therefore assist struggling platinum miners