Economic Impact Assessment of Koeberg Power Station

Eskom Holdings SOC Ltd.
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Prior to the development of Koeberg

—South Africa was highly dependent on coal
—In the 1950s there were discussions on diversification through other means of energy generation and the utilisation of nuclear power
—Nuclear power was seen as a viable alternative due to lower operating costs and lower carbon emissions relative to coal-based power generation
—In 1966, Eskom purchased a farm near Cape Town, which would become Koeberg
—Koeberg, South Africa’s first nuclear power station, became operational in 1985

After the development of Koeberg

—Initially Koeberg supplied 100% of all energy demanded in the Western Cape
—This has changed to 50%, due to changing demand*
—Koeberg is the only nuclear power station in Africa
—Koeberg can accommodate several additional nuclear power reactors, which is under consideration
—Koeberg has the capacity to supply 1860MW to the national grid, which amounts to approximately 5.6% of South Africa’s electricity needs**

*Eskom, Koeberg Power Station, nd. http://www.eskom.co.za/AboutElectricity/VisitorCentres/Pages/Koeberg_Power_Station.aspx
Electricity is a key input for the majority of products and processes in our economy, making Koeberg a direct contributor to economic growth, both in the Western Cape and South Africa. Koeberg’s forward and backward linkages with other industries expands on this direct impact in the form of indirect and induced impacts.

Koeberg’s investment in infrastructure contributed positively towards improving economic development in the Western Cape, as well as the rest of South Africa over the past few years.

2012/13 to 2015/16

Koeberg’s electricity generation and operations contributed to a more efficient and productive economy through the long-term nature of the economic benefit streams it created, especially in downstream user industries.

It is also evident that future investment in Koeberg will continue to have a positive impact on the Western Cape and South African economies.

IRP key targets

Increase generation capacity to 81 350MW by 2030*

Integrated Resource Plan (IRP)

Through Koeberg’s planned investment, Eskom is on track to contribute to achieving this target.

Koeberg’s estimated combined impact

Current (2012/13 - 2015/16)

Estimated economic activity of R53.3 billion

- **R30.2 billion** in Western Cape
- **R23.1 billion** in the rest of South Africa

Sustained on average per year, 1,786 direct jobs and created 14,110 indirect and 19,837 induced jobs

- **19,086** on average per year, in Western Cape
- **16,647** on average per year, in the rest of South Africa

Estimated government revenue of R16.4 billion

- **R7.8 billion** in Western Cape
- **R8.6 billion** in the rest of South Africa

Source: KPMG analysis from 2014 Social Accounting Matrix for South Africa and Western Cape
Estimated economic activity of R52.9 billion

- **R29.6 billion** in Western Cape
- **R23.3 billion** in the rest of South Africa

Estimated to sustain on average per year 1 564 direct jobs and create 14 852 indirect and 20 312 induced jobs

- **19 538** on average per year, in Western Cape
- **17 190** on average per year, in the rest of South Africa

Estimated government revenue of R16.4 billion

- **R7.7 billion** in Western Cape
- **R8.7 billion** in the rest of South Africa

Source: KPMG analysis from 2014 Social Accounting Matrix for South Africa and Western Cape
Koeberg’s estimated contribution to long-term values through future capital investments

Capital investment is important to ensure Koeberg’s sustained existence which includes operational projects as well as plant and machinery.

Every R1 of new investment potentially adds **70 cents** to the Western Cape economy and another **50 cents** to the rest of South Africa’s GDP.

Every R1 new investment potentially adds **36 cents** to national government revenue.

Potential poverty alleviation as **14%** of household income generated in the Western Cape and **17%** in the rest of South Africa will flow to low-income households.

3 jobs in the Western Cape and 1 job in the rest of South Africa per R1 million invested.

Source: KPMG analysis from 2014 Social Accounting Matrix for South Africa and Western Cape
Since GDP represents the total value of all final goods and services produced in the country, it is fundamental to estimate Koeberg’s contribution through day-to-day operations towards economic growth.

Every R1 of spend on operational cost adds **83 cents** to the Western Cape economy and another **64 cents** to the rest of South Africa’s GDP.

Every R1 of spend potentially adds **45 cents** to national government revenue.

2 jobs in the Western Cape and 2 jobs in the rest of South Africa per R1 million spent.

Potential **poverty alleviation** as 12% of household income generated in the Western Cape and 15% in the rest of South Africa will flow to low-income households.

Source: KPMG analysis from 2014 Social Accounting Matrix for South Africa and Western Cape
The government’s identification of the top 100 occupations in high demand in South Africa features many skills associated with the electricity sector that are in short supply.

The semi-skilled and skilled jobs offered by Eskom come with above-average salaries in order to recruit and retain these employees with scarce skills.

Across all sectors in the Western Cape, Eskom employees – and in particular those working at Koeberg – earn more than the industry average.

For each R100 earned for a semi-skilled worker:

- R100: Mining, manufacturing and utilities sector
- R367: Eskom
- R522: Koeberg

For each R100 earned for a skilled worker:

- R100: Mining, manufacturing and utilities sector
- R524: Eskom
- R621: Koeberg

Source: Eskom data and KPMG calculations
Koeberg produces nuclear waste, thus careful waste management and disposal is critical.

### Low-level waste
- Compressed into sealed and marked steel drums
- Initially stored at Koeberg in steel drums

### Intermediate-level waste
- Solidified by mixing it with a cement mixture and then poured into concrete drums
- Initially stored at Koeberg in concrete drums

### High-level waste
- Intermediate storage through underwater storage in fuel racks in the reactor fuel pools or in dry storage casks at Koeberg

### Waste disposal
- Transported from Koeberg to Vaalputs in specially designed trucks for disposal in 10 meter deep trenches
- 500 steel drums arrive at Vaalputs each year

- Transported from Koeberg to Vaalputs in specially designed trucks for disposal
- 1,000 concrete drums disposed each year in 10 meter trenches

- Eventual disposal method of high-level waste is likely to be deep, underground geological disposal

### Vaalputs
- Northern Cape, 500km from Koeberg
- The national shallow land disposal site for Koeberg’s low and intermediate-level radioactive waste
- Necsa manages Vaalputs, while it is financed by fees paid by Eskom
Koeberg is well equipped to handle the safety regulations of their nuclear plants and has operated safely for over 33 years, emphasising their nuclear safety culture.

— **Oversees the safe operation** of nuclear installations at Koeberg and Vaalputs
— Committed to protect people, property and the environment against any nuclear damage by establishing **safety standards and regulatory practices**
— Prescribes **protective measures**, such as frequent public safety forums, a 24 hour emergency line and safety procedures to follow


— **Takes the lead governance role in nuclear technology and safety**
— Minister of Energy is responsible for overseeing Necsa and the NNR
— Eskom’s operations of Koeberg are **commended** by the Director General of the DoE especially in terms of its **nuclear safety record**

As South Africa looks to intensify productivity and bolster economic growth, the full range of role players need to draw on their strengths and synergies.

With so many linkages in the economy through its various activities, Koeberg has an important role to play by contributing to the country’s energy needs and thus, to economic growth more broadly.

For example, the government is currently considering the addition of nuclear capacity as an option to add up to 9 600MW* to the national grid by 2030 in tranches that are affordable.

Koeberg, with its current capacity to supply 1 860MW, ** aligns with South Africa’s energy policy and demands.

In addition, it provides the knowledge base to expand the country’s nuclear capacity through new plants. This is clearly noted in the Nuclear Energy Policy Framework of 2008.

This highlights Koeberg’s role in the South African economy at present, as well as going forward.

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