



ECONOMIC GEOGRAPHY

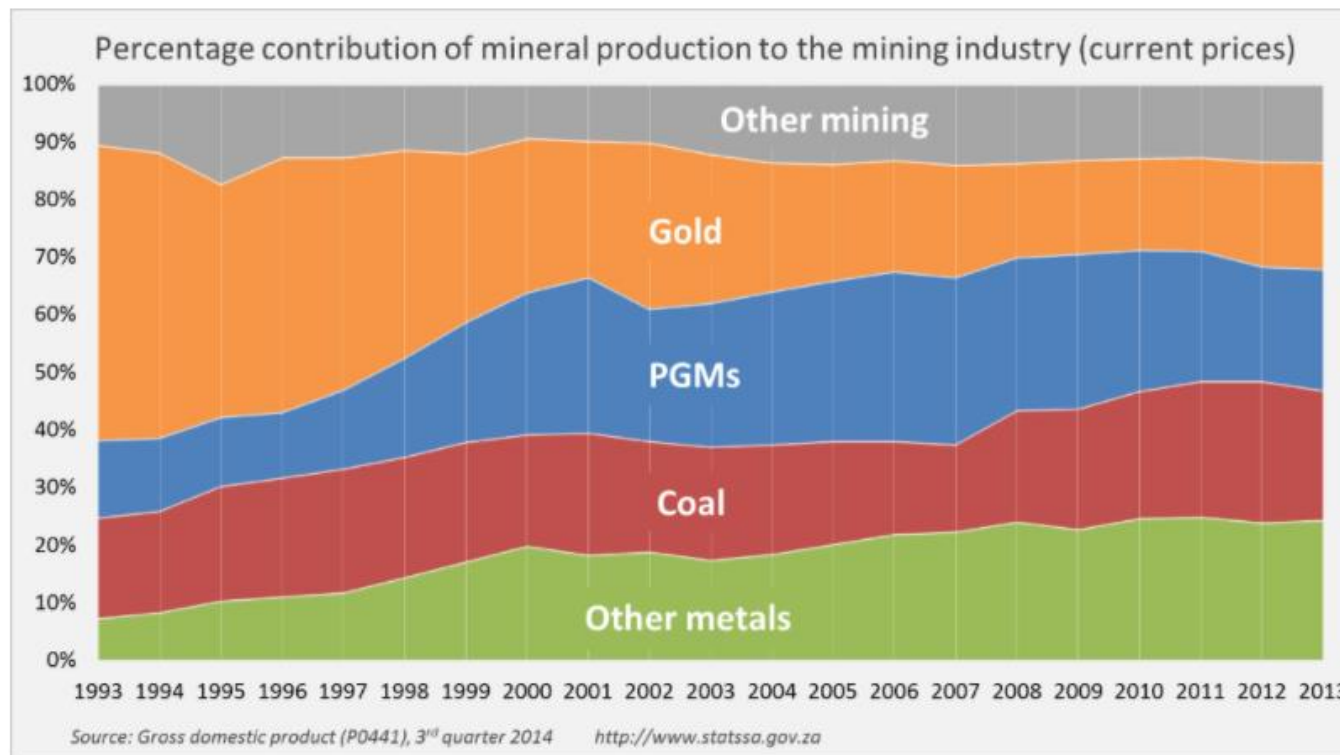


MINING: MAIN PRODUCTS PRODUCED
GOLD, COAL AND PLATINUM

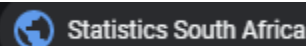
RAJENDRA DAVECHAND



- Main products produced:
 - Coal
 - Gold
 - Platinum
- Apply factors favouring mining in South Africa to main minerals mined
- Apply factors hindering mining in South Africa to main minerals mined



In terms of mineral sales, coal contributed 27% to sales in 2014, followed by PGMs (21%), iron ore (16%) and gold (13%)².

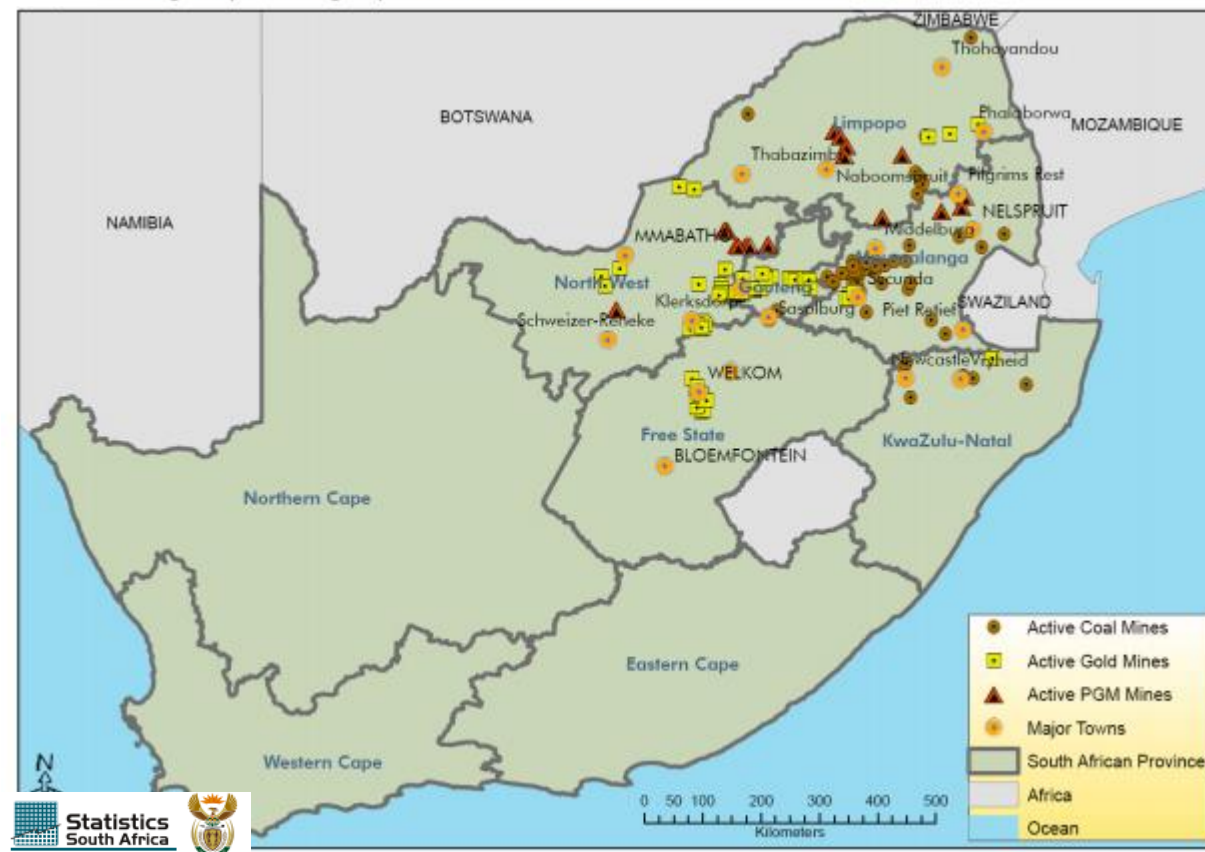


- Gold, coal and platinum (PGMs) are major contributors to the mining industry.
- *Platinum group metals (PGMs) is made up of six metals, all of them silvery-white in appearance, platinum, palladium, rhodium, ruthenium, iridium and osmium.*

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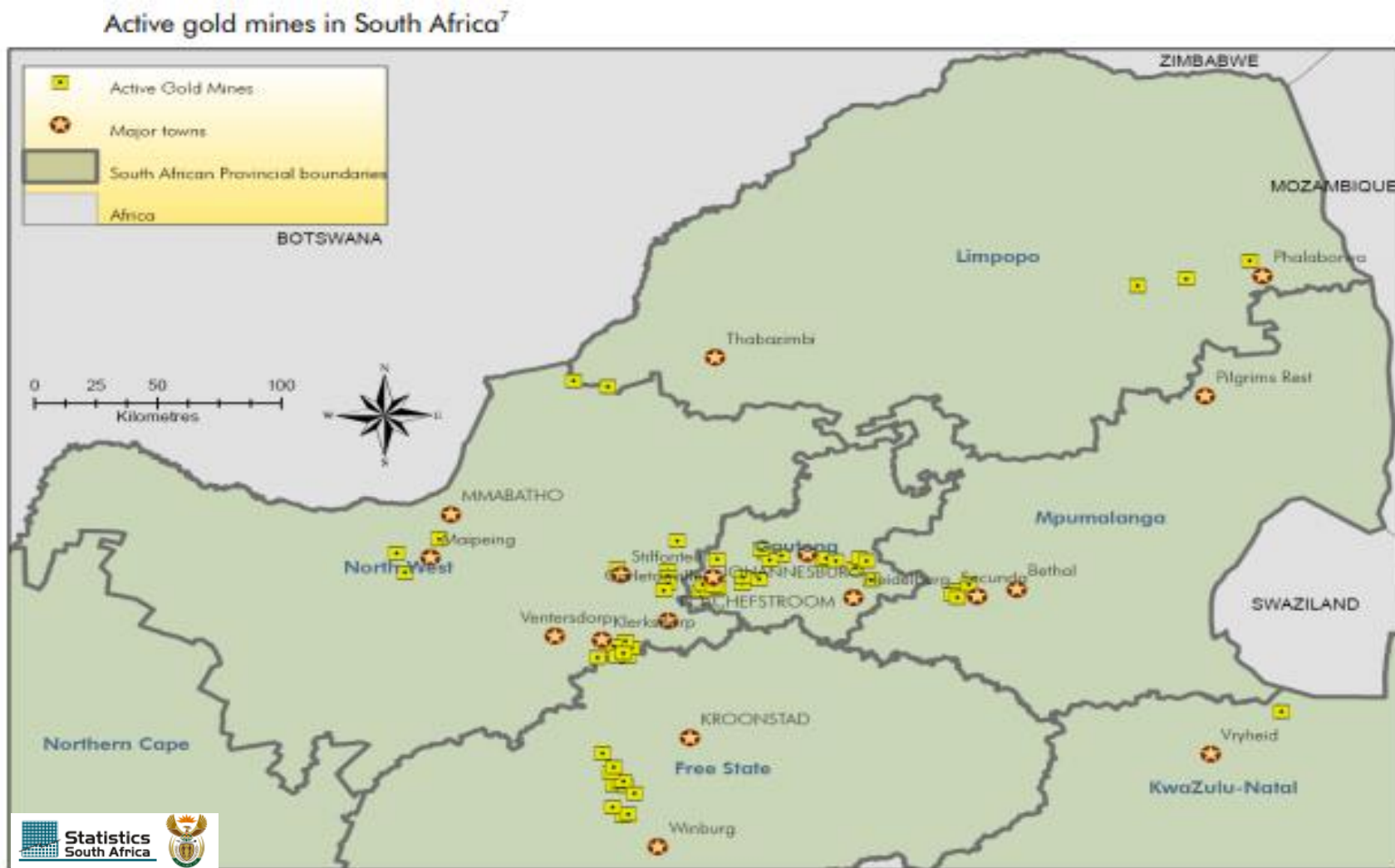
Active gold, platinum group metals and coal mines in South Africa⁷



- Most of the gold, coal and platinum mining (PGM) takes place in the interior of South Africa.



Gold



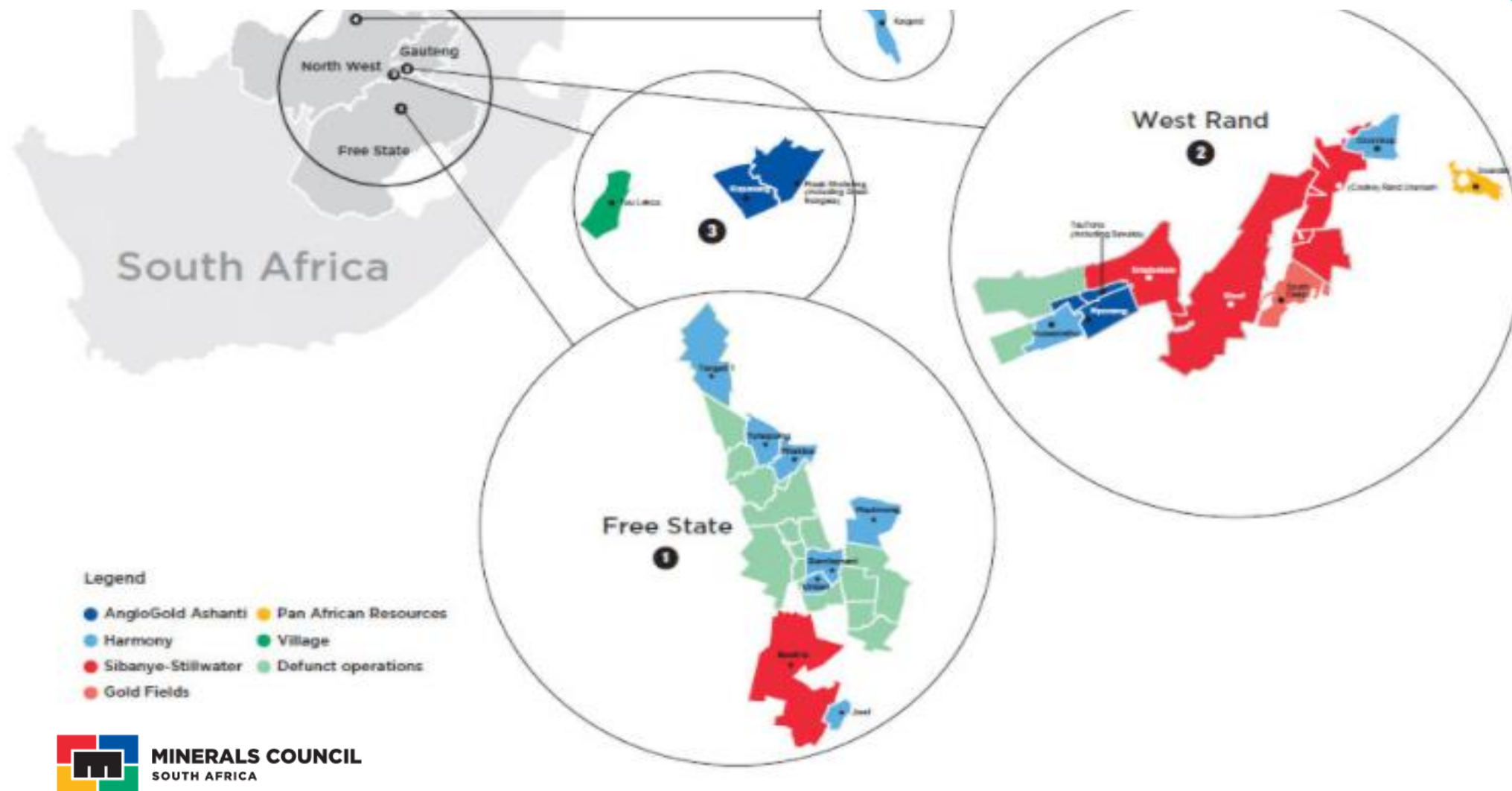
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Geography with Dave



Geography with Dave



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Gold



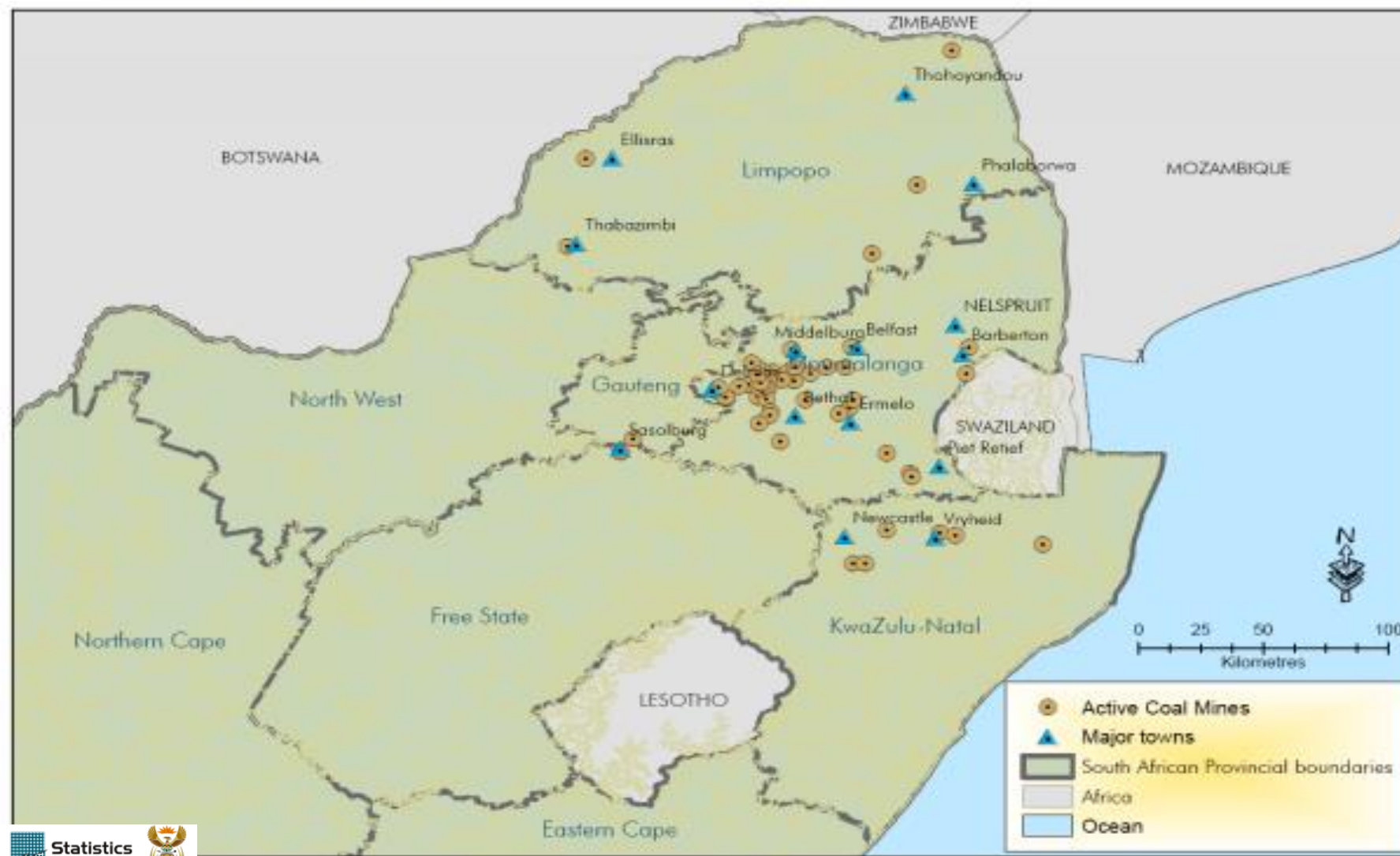
- The Witwatersrand Basin (gold producing area) is one of the world's largest gold producer deposits.
- It stretches over 400km and covering Free State, North West and Gauteng.
- Until 2007 South Africa was the largest producer of gold until China took over.
- South Africa has the world's largest proven gold reserves (6000 tons). The Witwatersrand Basin remains the world's largest gold resource
- Gold has a relatively small domestic market, it is more export orientated.
- Some of the major mining companies are, AngloGold Ashanti, Harmony and Village
- Gold sales for 2019 was R72.6 billion.
- South African gold only accounts for 4.2% of global gold production
- The gold industry employed 95,130 in 2019

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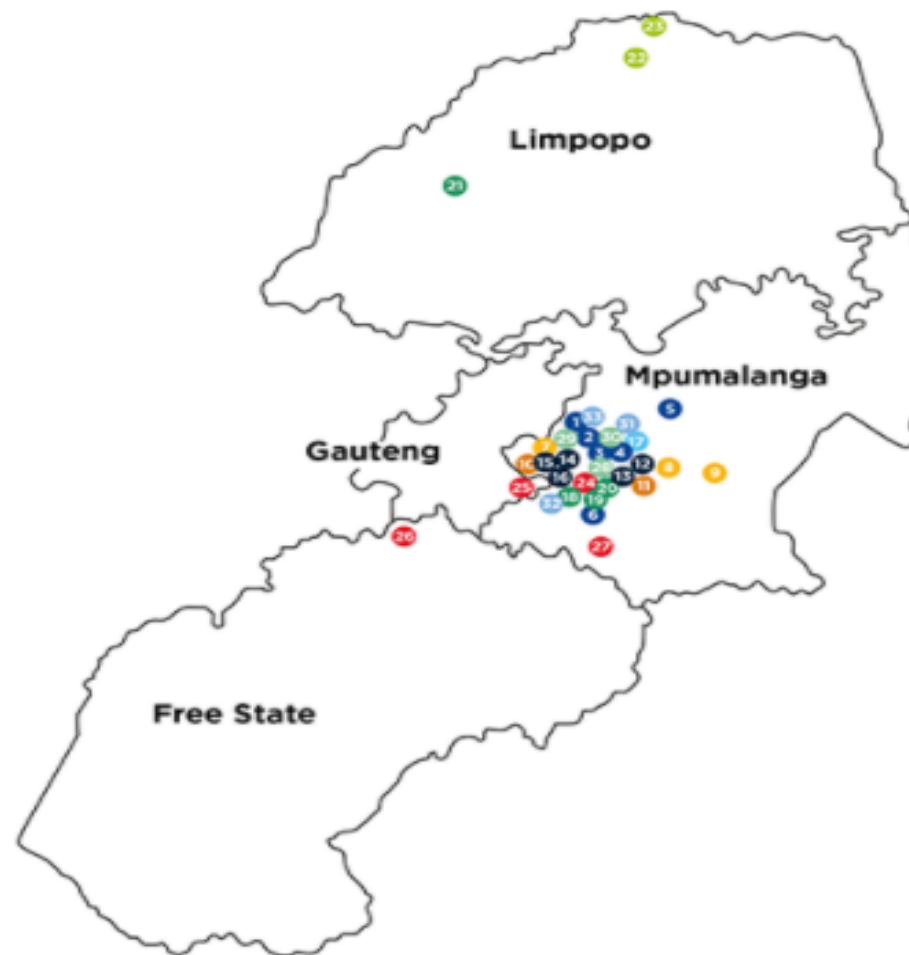
Coal

Active coal mines in South Africa⁷





WHERE COAL IS MINED IN SOUTH AFRICA



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Coal



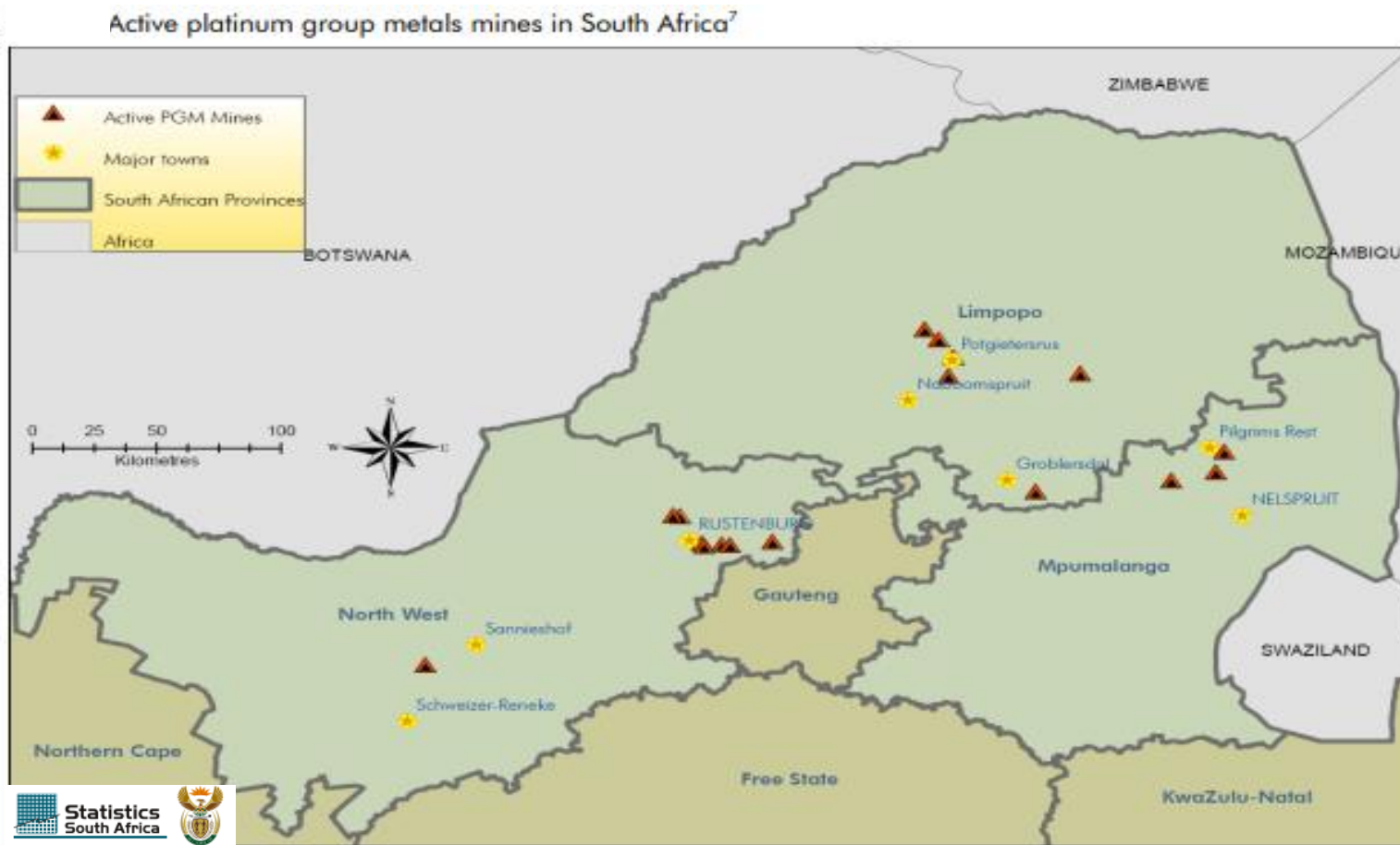
- Coal is found in South Africa in 19 coalfields located mainly in KwaZulu-Natal, Mpumalanga, Limpopo, and the Free State, with lesser amounts in Gauteng, the North West Province and the Eastern Cape.
- South Africa has approximately 30 408 million tons of proven coal reserves, making it the sixth largest holder of proven coal reserves in the world.
- The coal sector employs 92,230 people, which is the third largest group in the mining sector after gold and platinum group metals.
- South Africa produced 258.9 million tons of coal in 2019 with total coal sales of R139.3 billion.
- South Africa is one of the top ten producers of coal.
- Some 25% of coal production is exported internationally, making South Africa the fifth largest coal exporting country.
- The remainder of South Africa's coal production serves local industries, including electricity generation. The key role played by South African proven coal reserves in the economy is illustrated by the fact that Eskom is the 7th largest electricity generator in the world, and
- South African Synthetic Oil Limited (SASOL) the largest coal-to-chemicals producer.
- Richards Bay Coal Terminal (RBCT) serves as the primary export port

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Platinum (PGM)

**Platinum group metals (PGMs) is made up of six metals, all of them silvery-white in appearance, platinum, palladium, rhodium, ruthenium, iridium and osmium.*



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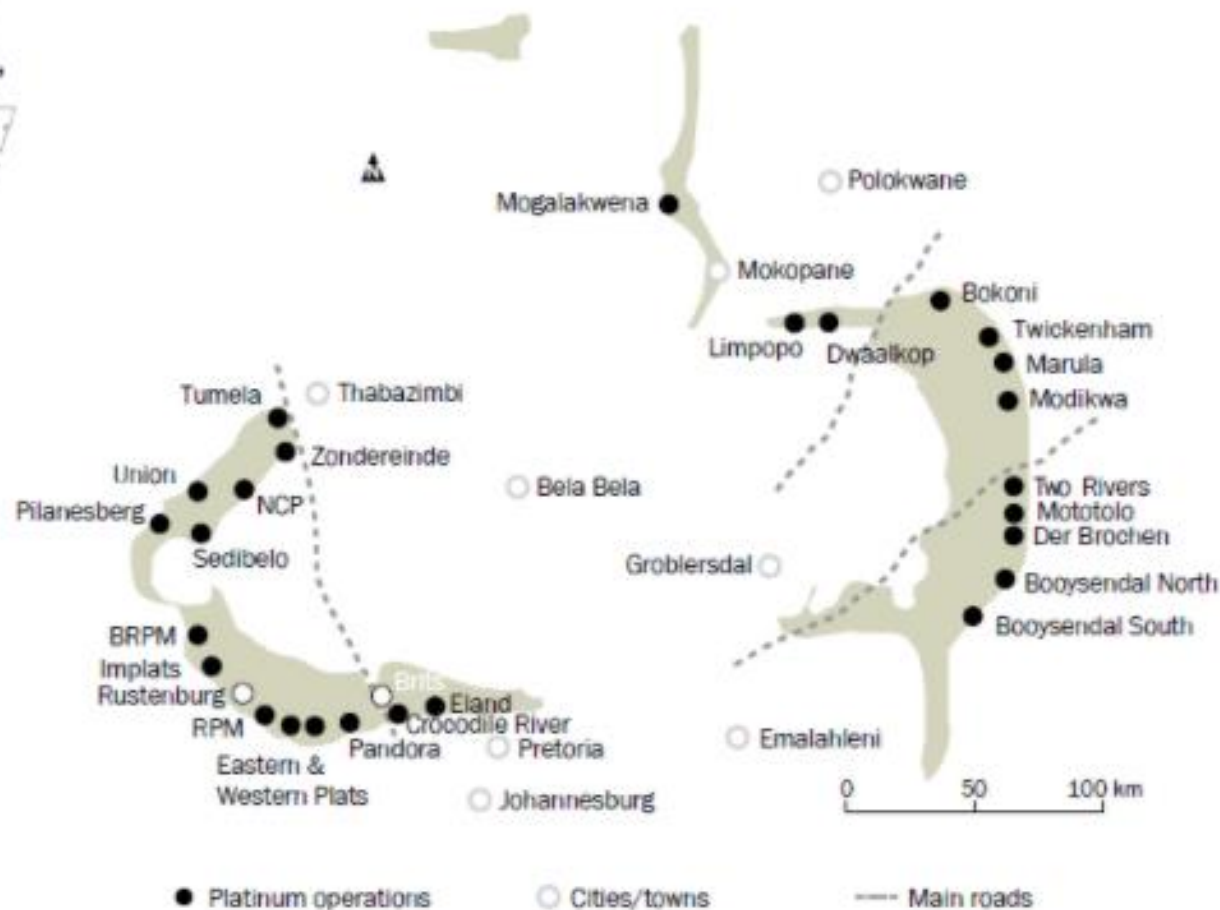


Platinum (PGM)

Location of the Bushveld Complex, South Africa



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Platinum (PGM)



- Bushveld Complex, in the northern part of South Africa has approximately 80% of PGM-bearing ore of the country.
- South Africa has more than half the world's PGMs.
- South Africa is one of the largest producers of PGM in the world
- Anglo American Platinum (Anglo Platinum) is the world's largest platinum and palladium producer.
- PGM sales in 2009 was R57 782 million with export sales revenue of R53 459 million.
- PGMs are used in computer hard disks, mobile phones, manufacture of anti-cancer drugs, cardiac treatment, implants, dental applications and jewellery..

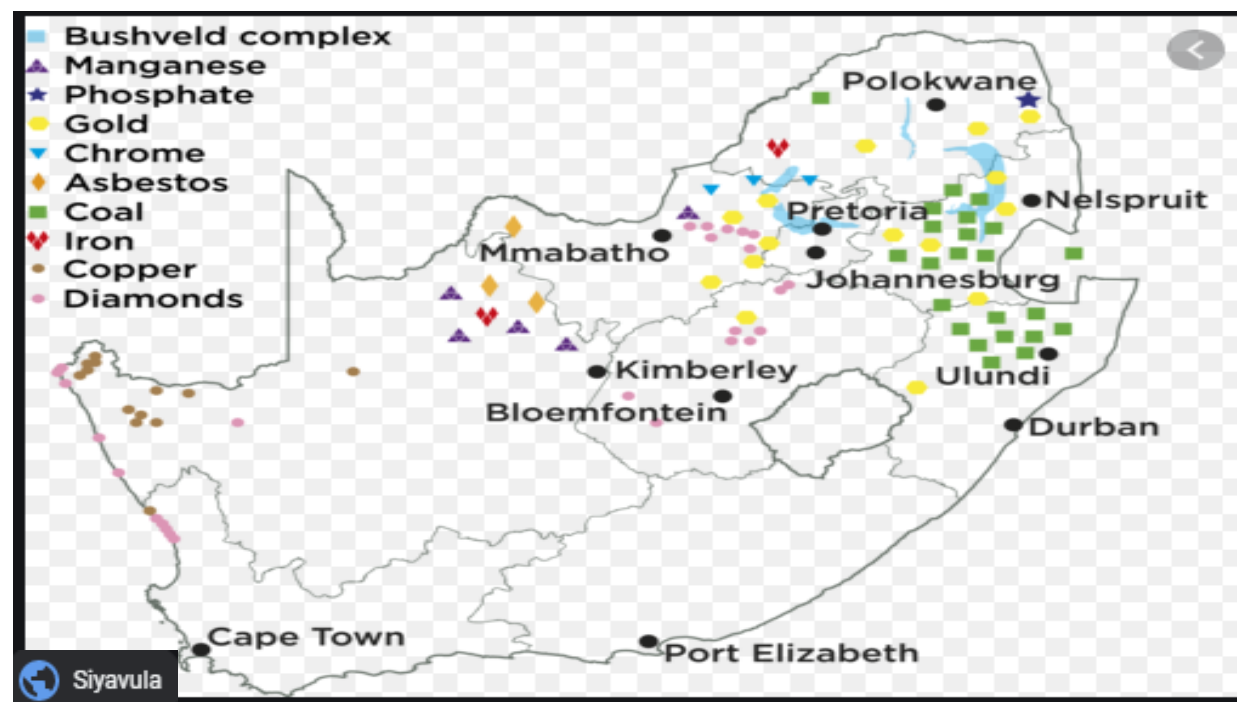
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Factors favouring and hindering main minerals in South Africa are similar. To make factors more specific to each mineral information in presentation can be applied e.g. large mineral reserves e.g. South Africa has the world's largest proven gold reserves (6000 tons).

Factors favouring mining in South Africa

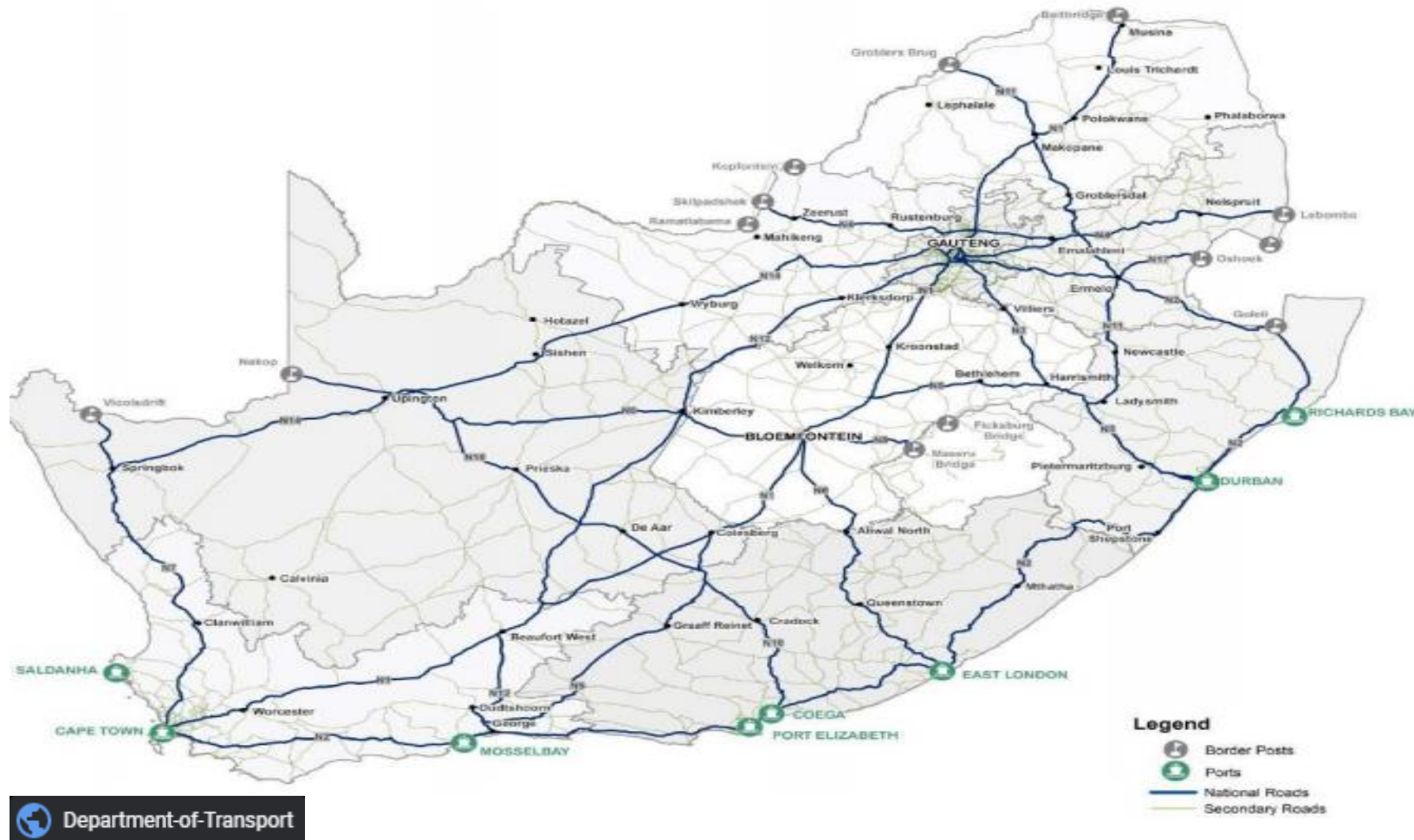
- Have a variety of minerals
- Large mineral reserves.



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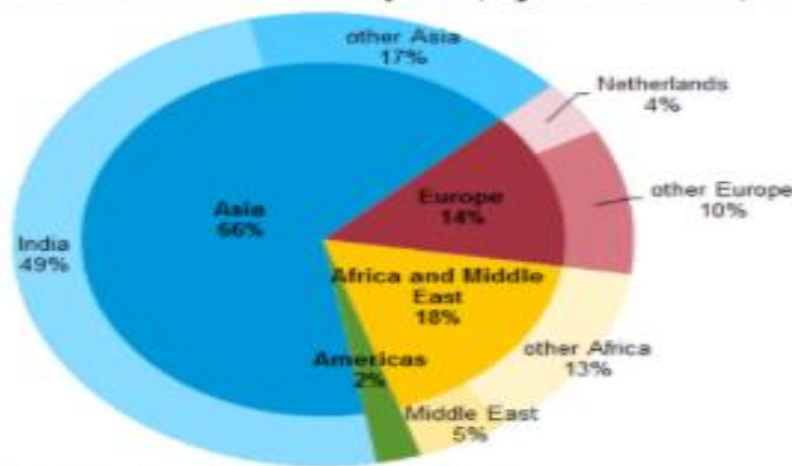
- Large labour supply.
- Efficient transport networks e.g. road, rail, harbours.





- Foreign investment (it must be noted it is decreasing). Important as development of mines are expensive.
- Low geo-thermal gradient, which allows us to mine at further depth.
- Significant amount of minerals are closer to surface, reducing mining costs.
- Mineral seams are thick e.g. coal seams can be up to 7 metres in thickness. This reduces cost of mining
- Efficient electricity supply due to coal availability.
- Markets, domestic and international are available.

Figure 4. South Africa's coal exports, by destination, 2016



International - US Energy Information Administration (EIA)

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Factors that hinder mining in South Africa

- Fluctuating prices (Continuously increasing and decreasing) results in smaller mines closing and reopening. It also effects employment.
- Large distance between mines and harbours resulting in high transport costs.



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- Mining can take place at depth. This can result in high temperatures and high humidity levels in some underground mines creating difficult working conditions and can decrease productivity and levels of safety.
- Increase in costs e.g. labour cost.
- Development of mines are expensive and we are greatly reliant on foreign investment.
- Minerals are non renewable and can result in closure of mines where it is exhausted
- Labour strikes decrease productivity.



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- Mining accident e.g. collapsing of tunnels and explosions could result in loss of life and closure of mines.



- Water problems water shortages create problems e.g. for cooling systems. Flooding can cause closure of mines.

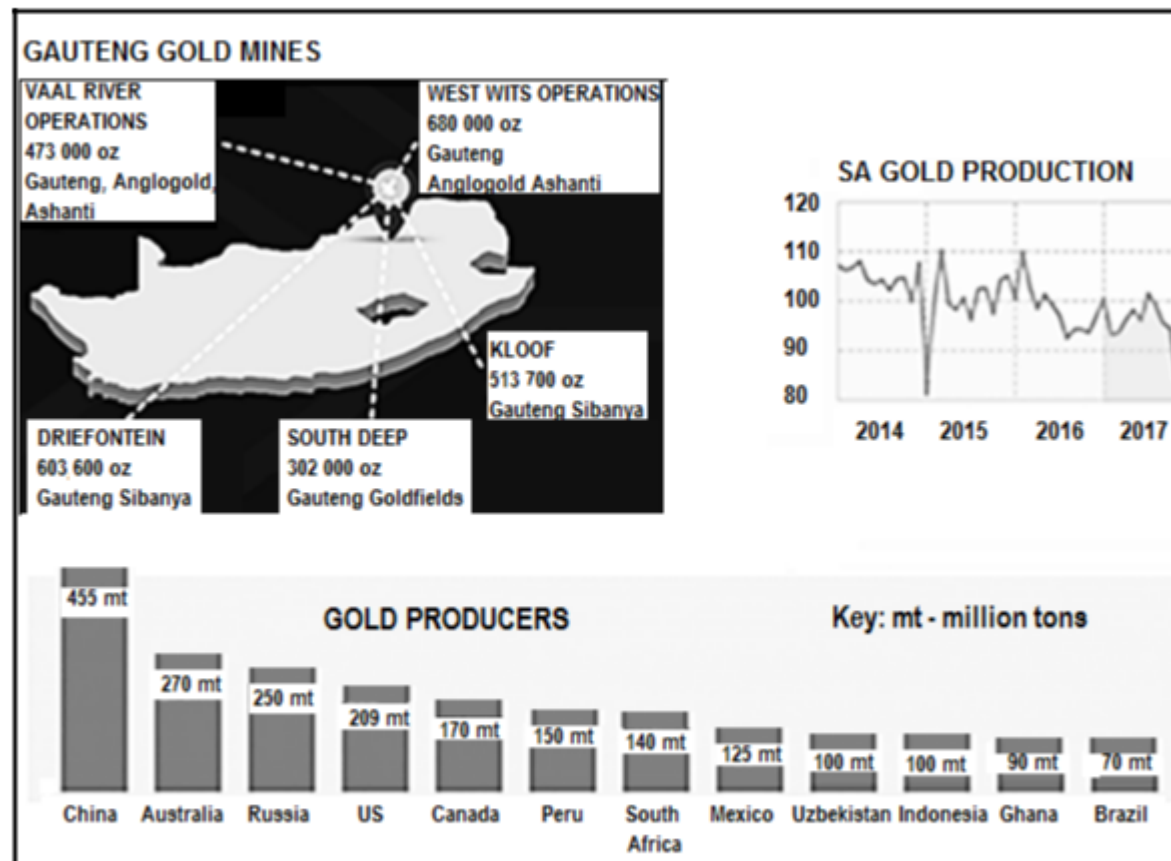


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FIGURE 4.2: GOLD MINING STATISTICS FOR 2017



[Adapted from http://www.kitco.com/ind/Media/images/South_Africa.jpeg and http://www.statssa.gov.za/wp-content/uploads/2018/02/Infographic_v04-1]



4.2 Refer to FIGURE 4.2 showing statistics on gold mining in January 2017.

4.2.1 Name the province where the most gold is mined in South Africa.

4.2 4.2.1 Gauteng (1)

4.2.2 Which gold mine in Gauteng produces the most gold per ounce (oz) in South Africa?

4.2.2 West Wits Operations (1)

4.2.3 Name the mining company that produced the most gold.

4.2.3 Anglo Gold Ashanti (1)

4.2.4 Name the country with the highest production of gold in the world.

4.2.4 China (1)

4.2.5 What is the ranking of South Africa in terms of gold production in the world?

4.2.5 7th (1)

4.2.6 Calculate the contribution that Africa made to the world's gold production in January 2017.

4.2.6 $140 + 90 = 230\text{mt}$ (1)

4.2.7 At the end of which year did South Africa's gold production drop to its lowest point?

4.2.7 2014 (1)

4.2.8 Is the most recent production of gold in South Africa showing an increasing or decreasing trend?

4.2.8 Decreasing (1)

(8 x 1) (8)



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FIGURE 4.6: MINING

MARIKANA MINERS' STRIKE

*Lonmin owns a platinum mine near Marikana in Rustenburg. A recent strike for increased wages has led to a breakdown of trust between the union and workers. There has been much violence and killing of workers over the past few months.

According to the Bench Marks Foundation, the benefits of mining are not reaching the workers or the surrounding community. They claim that workers are exploited and exposed to safety hazards such as falling rocks, dust, high noise levels and dangerous fumes.

*Lonmin is the British producer of platinum group metals.

[Source: Adapted by examiner]

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4.6 FIGURE 4.6 captures the instability at Lonmin's Marikana mine. The instability has had a negative impact on South Africa's GDP.

4.6.1 What initiated the Marikana strike? (1 x 1) (1)

4.6.1 Workers need for an increase in wages/salary/conditions of service/the need for better working conditions/rivalry between two unions/deadlock between employer and employees (1)
[ANY ONE] (1 x 1) (1)

4.6.2 State TWO safety hazards that the miners are exposed to. (2 x 1) (2)

4.6.2 Falling rocks (1)
Exposure to dust (1)
High noise levels (1)
Dangerous fumes (1)
[ANY TWO]



4.6.3 Besides industrial activities, discuss why the instability at Lonmin's Marikana mine will impact negatively on the GDP. (3 x 2) (6)

4.6.3 Fewer raw materials to be exported (2)
Loss of income (2)
Loss of production (2)
Negative balance of trade (2)
Loss of tax revenue (2)
Striking employees could lose jobs resulting in unemployment (2)
South Africa will attract less foreign investment thus lowering the GDP (2)
The currency will be devalued thus creating economic instability (2)
There will be a lack of infrastructural development which also decreases South Africa's economic growth(2)
[ANY THREE ACCEPT OTHER] (3 x 2) (6)



4.6.4 How can the owners (Lonmin) of the Marikana mine improve working conditions at the mine? (3 x 2) (6)

4.6.4 Improved communication is required between mine managers and workers (2)
Improved relations between mine managers and unions (2)
Better working conditions for workers especially high risk employees (2)
Investment in the local community especially in areas of education and social development (2)
Profit sharing options to mine workers (2)
Compliance to safety regulations (2)
Bring about gender parity (2)
Skills development and training facilities in order for miners to be skilled in their work environment (2)
[ANY THREE. ACCEPT OTHER] (3 x 2) (6)