

The Chamber of Engineering Technology  
PO Box 1269, Ferndale, 2160  
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## Engineering Technology Keeps The Country Working.



### A Construction site where another building will improve the lives of the people.

The industry is worth approx. R108bn and employs around 800 000 persons of which approx. 70 % are only low skilled. Over the past few years the industry has contracted significantly. The industry has lost R1.7bn in value since the fourth quarter of 2016, falling from R110bn to R108bn in the first quarter of 2018. To rescue the industry, government needs to root out corruption, get state-owned enterprises in order, pay contractors on time and provide policy certainty to kick-start the economy, which has recently just managed to scrape out of a technical recession.

## January 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
		1 New Years Day	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

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The largest solar farm located in South Africa is in the town of De Aar. It is reported as the largest solar power plant located in the Southern hemisphere and the Middle East. It has an installed capacity of 175 MW (megawatt). The solar facility is spread over almost 500 hectares and consists of a number of 700,000 solar panels, but the number of panels will be increased in the near future. The solar power plant was built by Solar Capital, which is a subsidiary of the Phelan Energy Group Ltd. The facility may have created some 75,000 jobs based on manufacturing solar panels locally. Solar Capital invested \$400 million in this solar farm that supplies clean energy to the National Grid, but in the very sunny days, the power plant produces much more power than the grid demands, so the excess energy is wasted. According to the Ministry of Energy, South Africa's total domestic electricity generation capacity is 51,309 megawatts (MW) from all sources. Approximately 91.2%, or 46,776 MW, comes from thermal power stations, while 4,533 MW, or 8.8%,\* is generated from renewable energy sources.

## February 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
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5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

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**A Passenger train.**

Prasa owns 2 280 Kilometres of South Africa's rail network and uses some the 22 000 Kilometres of rail track under the control of Transnet. It has 585 train stations and total fleet of 4 735 coaches, with an overall staff complement of 18 207. Government is spending in the region of R51 billion on New Rolling Stock and R4 billion on new Hybrid Locomotives. To date PRASA has taken delivery on thirteen (13) of the 70 new locomotives. In 2014/15, Government through PRASA transported 2 million passengers and covered fifty five million (55m) passenger trips. The entity refurbished 291 Metrorail and 298 Shosholozza Meyl coaches, and upgraded 27 stations nationally.

**Longest freight train in the world.**

Transnet is moving towards an emphasis on freight, rather than passengers, to keep the rail system profitable. The Sishen–Saldanha railway line, also known as the Ore Export Line (OREX), is an 861-kilometre-long (535 mi) heavy-haul railway line in South Africa. It connects iron ore mines near Sishen in the Northern Cape with the port at Saldanha Bay in the Western Cape. It is used primarily to transport iron ore (60 million tonnes per year) and does not carry passenger traffic. These are 41,400 tonnes total mass, 3780 metres (2.36 miles) long trains, that use 8 locomotives and 342 wagons, are the longest production trains in the world.

## March 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21 Human Rights Day	22	23
24	25	26	27	28	29	30
31						

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South Africa built many power stations around the country to handle the demand of the electricity power for Home, Industries and public use. The power stations are mostly Coal-fired. The Kusile Power Station is the largest Power Station in South Africa which produces around 4,800 MW of electricity power by Coal, located in Mpumalanga. Medupi Power Station and Kendal Power Station are the 2<sup>nd</sup> and 3<sup>rd</sup> largest electricity producing plants both are Coal-fired. Eskom operates a number of notable power stations, including Kendal Power Station and the Koeberg Nuclear Power Station in the Western Cape Province, the only nuclear power plant in Africa. Eskom generates approximately 95% of electricity used in South Africa. Due to failed Government attempts at privatisation and subsequent corrupt and incompetent management officials over the years the power source has suffered blackouts (load shedding) and suffers from being extremely short of funds to operate efficiently. Over a period of 10 years, Eskom's electricity prices have increased by about 356%, whilst inflation over the same period was 74%. This means that electricity prices have increased 4 times faster than inflation over this period.

# April 2019

<b>Sun</b>	<b>Mon</b>	<b>Tues</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
					Good Friday	Holy Saturday
21 Easter Sunday	22 Family Day	23	24	25	26	27 Freedom Day
28	29	30				



**Brixton Transmission Tower in Johannesburg - Photos 1962.**

The Brixton Tower construction began in 1961 and was completed in 1962. The tower was designed by Ove Arup & Partners and built by Christiani & Nielsen. A cantilever vertical structure of reinforced concrete cost R300 000 (today over R 300 million) and rests on a foundation of diameter of 26 m, 6 m wide and only 2m deep. The reinforced foundation has a triangular cross-section and stands on Jeppestown shale just under the top level of the Brixton ridge on which the structure is built. Jeppestown shale is brittle but has excellent compression strength and is ideal to carry heavy loads. The tower of 237m was built to withstand winds of 186km/h and gusts up to 200km/h. More than 1 340t of concrete was used in the foundation, with a further 5 684t in the tower. Reinforcing consists of 300t of high-tensile and mild steel bars. In 1962 it was the tallest structure in Africa. The first FM transmission on temporary antenna halfway up the tower, on low power, took place on 22nd December 1961. Full power from the 6 Rhode & Swartz transmitters took place some weeks later when the top mast and all the FM dipoles had been installed. The combiner connecting the 6 transmitters to one common antenna was a world first. This was the start of the extensive grid like network of FM transmitters all over the country which resulted in South Africa having the largest FM grid network in the world. Originally known as the Herzog Tower it soon became known as the Brixton Tower and around 2000 was renamed the Sentech Tower. Up until 1982, an observation deck affording panoramic views of the city was open to the public, but was closed due to security fears and is still closed. Around 1975 it was retooled to also transmit TV Programmes and not just Radio.

# May 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
			1 Workers Day	2	3	4
5	6	7	8	9	10	11
12 Mother's Day	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	





**Manufacturing and Industries.**

Manufacturing contributed 15.2% to South Africa's GDP in 2013, making it the third-largest contributor to the nation's economy.

Manufacturing is dominated by industries such as agro-processing, automotive, chemicals, information and communication technology, electronics, metals, textiles, clothing and footwear. The automotive industry achieved total export sales of vehicles and components worth R164.9 billion in 2017, which represented almost 14 percent of total South African exports. The manufacturing sector provides a locus for stimulating the growth of other activities, such as services, and achieving specific outcomes, such as employment creation and economic empowerment. The sector contributed 15.2% to South Africa's GDP in 2013, making it the third-largest contributor to the nation's economy. Principal international trading partners of South Africa—besides other African countries—include Germany, the United States, China, Japan, the United Kingdom and Spain. Chief exports include corn, diamonds, fruits, gold, metals and minerals, sugar and wool. Agriculture is one of the fastest growing industries in South Africa. Agriculture, including forestry and fisheries, is vital to the country's economy as the sector grew by over 22% and contributed 4% to the country's GDP in the first quarter of 2017

# June 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16 Fathers Day / Youth Day	17 Youth Day Observed	18	19	20	21	22
23	24	25	26	27	28	29
30						

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The Hillbrow Tower is a tall tower located in the suburb of Hillbrow in Johannesburg. At 269 m, it has been the tallest structure and tower in Africa for 45 years, and it was also the tallest structure in the Southern Hemisphere until 1978, when surpassed by the 270m Mount Isa Chimney in Queensland, Australia. Construction of the tower began in June 1968 and was completed three years later, in April 1971. The first 178m went up at an average of 18cm per hour. A laser beam was used for guidance to ensure it went up perfectly vertically. The walls are 84cm thick at the bottom and 38cm thick at the top. Construction cost around 2 million Rand (at the time, US\$2.8 million). The tower was initially known as the JG Strijdom Tower. On 31 May 2005 it was renamed the Telkom Jo'burg Tower. The tower was constructed for South African Posts & Telecommunications, which later became Telkom, South Africa's government run and the country's largest telecommunications company. As the general height of buildings rose in the central business district, it became necessary that the height of the new telephone tower stayed above the height of the buildings surrounding it! This is to ensure that the Microwave transmissions, which travel in straight lines to the next tower some 40 to 50 Kms away, are not blocked. The Tower has been closed to visitors since 1981, primarily due to security reasons. Before the closure, the Hillbrow tower was one of the largest tourist draws in Johannesburg. The public was able to enter six public floors at the top of the tower. One of the floors housed a popular revolving restaurant named Heinrich's Restaurant, as well as another non-rotating restaurant known as the Grill Room and the observation floor which was at 197 m height.

# July 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18 <small>Nelson Mandela day</small>	19	20
21	22	23	24	25	26	27
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**Sasol** is a South African company involved in mining, energy, chemicals and synfuels. It was formed in 1950 and its first plant was commissioned in 1955. Sasol produces petrol and diesel from coal and natural gas using Fischer-Tropsch process. Sasol mines coal in South Africa and produces gas in Mozambique and oil in Gabon. The company has factories at Sasolburg and Secunda and has taken a stake in projects in other countries. Sasol is estimated to have consumed approximately 58 million tonnes of coal in 2006, one third of South Africa's coal consumption, as the feedstock for its synthetic fuel and chemicals production. Coal is used and after being crushed, the coal is blended to obtain an even quality distribution. Electricity is generated by both steam and gas and used to gasify the coal at a temperature of 1300°C. This produces syngas from which two types of reactor - circulating fluidised bed and Sasol Advanced Synthol reactors – produce components for making synthetic fuels as well as a number of downstream chemicals. Gas water and tar oil streams emanating from the gasification process are refined to produce ammonia and various grades of coke respectively. Sasol has 60 years' experience in synthetic fuels production. It had a turnover of R 181 461 million in 2018 and has invested R2 billion in skills and socio-economic development.

## August 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9 National Women's Day	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31



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The **South Africa National Space Agency (SANSA)** was formed by an act of parliament in 2009. The intent of the agency is of consolidating space-related research, projects and research in South Africa and to assume the role as a regional center for space research in Africa. Throughout the 1950s to 1970s lunar and interplanetary missions conducted by NASA had been supported from a tracking station at Hartebeeshoek where the first images of Mars were received from the Mariner IV spacecraft in the first successful flyby of the planet. In 1999, South Africa launched its first satellite, SunSat from the Vandenberg Air Force Base in the USA. A second satellite, SumbandilaSat was launched from the Baikonur Cosmodrome in Kazakhstan in 2009. The latest satellite, the ZA Cube 2, was launched in December 2018. Cubesats are nanosatellites, which can be as small as 10cm wide and weighing 1kg. ZACube 2 comprises three 10 cm cubes and in in orbit some 600km above the Earth. It was designed and built mainly by postgraduate students in South Africa. At a fraction of the cost of medium sized satelltes South Africa is viewing nanosatellites as an area to develop space and high technology skills. ZACube-2, which weighs approx 4kg is expected to help advance SA's ocean economy and monitor veld fires. It will track ships off the country's coastline using an automatic identification system. This is not only aimed at improving the logistics of registered and legally operating ships, but also to detect trespassers.

## September 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24 Heritage Day	25	26	27	28
29	30					

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**Telecommunications** infrastructure in South Africa provides a modern service to urban areas, including cellular and internet services. In 1997, Telkom, the South African telecommunications parastatal, was partly privatised and entered into a strategic equity partnership with a consortium of two companies. In exchange for a monopoly to provide certain services for 5 years, Telkom assumed an obligation to facilitate network modernisation and expansion into the unserved areas. A Second Network Operator was to be licensed to compete with Telkom across its spectrum of services in 2002, although this license was only officially handed over in late 2005 and then began operating under the name of Neotel. In the 1990s, South Africa launched a mobile operations project, underwritten by Telkom in partnership with Vodafone. This subsidiary grew to be Vodacom, which Telkom sold in late 2008 in preference for its own 3G network. Cellular companies provide service to over 45 million subscribers, with South Africa considered to have the 4th most advanced mobile telecommunications network worldwide. The five cellular providers are Vodacom, MTN, Cell C and Telkom and from early 2018 Rain (Pty) Ltd. Operators have come under criticism in late 2009 by government and the public for high interconnect charges. This issue was discussed by the Parliamentary Committee on Telecommunications and some reduction of charges may occur in 2019. In 2004, the Department of Communications redefined the Electronics Communications Act, which consolidated and redefined the landscape of telecommunications licensing. The Independent Communications Authority (ICASA) currently licenses more than 400 independent operators with the Electronic Communications Network License (with the ability to self-provision) as well as issuing Electronic Communications Service Licenses for service deployment over infrastructure in the retail domain. Telkom is no longer the single operator in South Africa, and faces competition from the other operators.

# October 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
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The **Bloukrans Bridge** is an arch bridge located near Nature's Valley in the Western Cape. It was constructed between 1980 and 1983. The bridge stands at a height of 216m above the Bloukrans River. Its central span is 272m and the bridge is 451m in length in total. Its primary use is that of a road bridge, carrying national route the N2. Bloukrans Bridge is the site of the world's highest commercial bridge bungee jumping. The Bloukrans River below forms the border between the Eastern and Western Cape provinces and is located in the Tsitsikama region of the Garden Route which is a popular tourist route.

## November 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

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The **Gariep Dam** was commissioned in 1971 and was renamed to its current title in 1996. The dam is on the Orange River about 48 kilometres north-east of Colesberg and 208 kilometres south of Bloemfontein. It is in a gorge at the entrance to the Ruigte Valley some 5 kilometres east of Norvalspoor. The wall is 88 m high and has a crest length of 914 m and contains approximately 1.73 million m<sup>3</sup> of concrete. The Gariep Dam is the largest storage reservoir in South Africa. The Dam has a total storage capacity of approximately 5,340,000 megalitres (5,340 hm<sup>3</sup>) and a surface area of more than 370 square kilometres when full. The hydro-electrical power station houses four 90 MW generators, giving a maximum output of 360 MW of electricity at a water flow rate of 800 m<sup>3</sup>/s.

# December 2019

Sun	Mon	Tues	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16 Day of Reconciliation	17	18	19	20	21
22	23	24	25 Christmas Day	26 Day of Goodwill	27	28
29	30	31 New Year's Eve				

