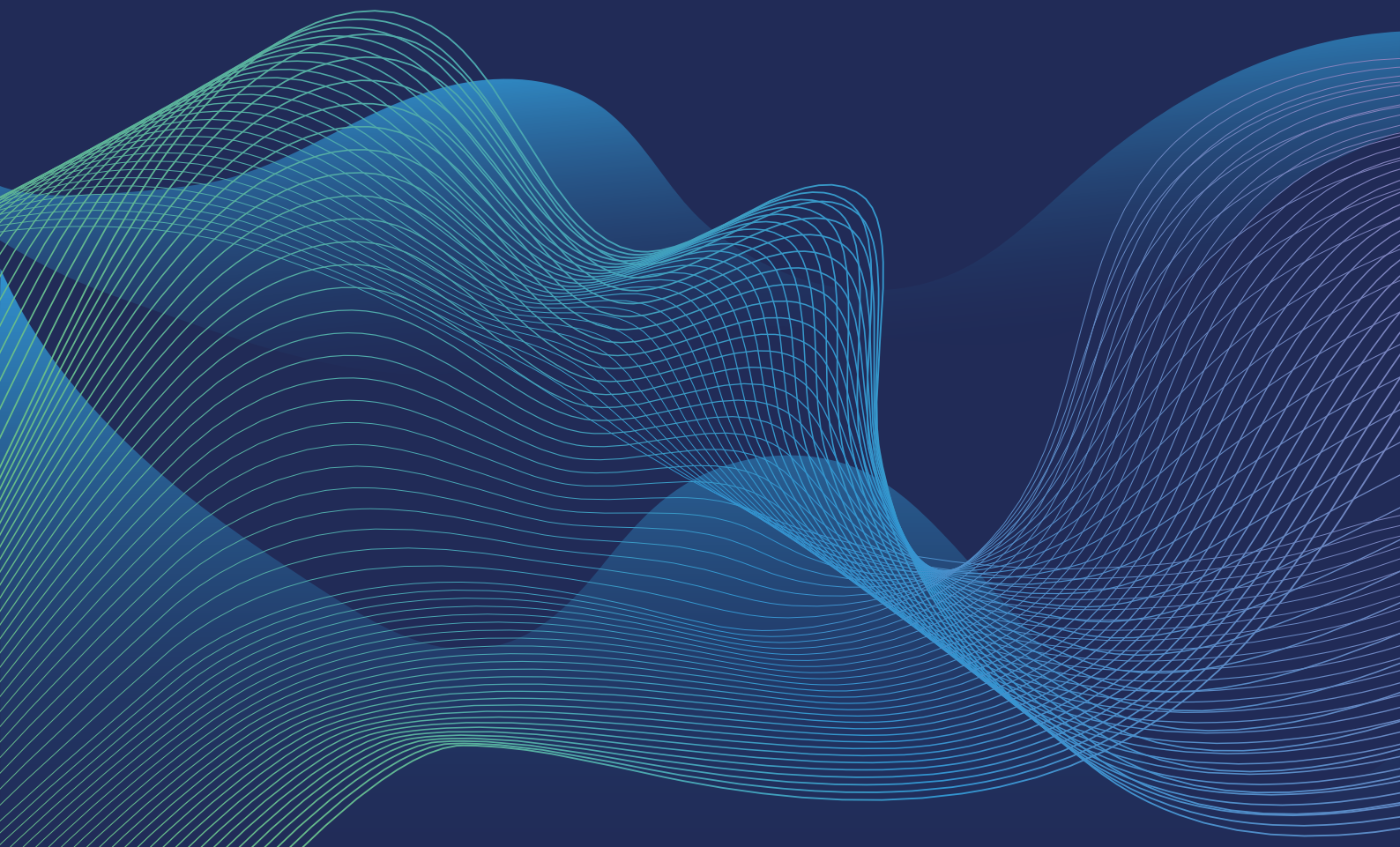
Global Electricity Review 2021
G20 Profile

EMBER
COAL TO CLEAN ENERGY POLICY

SOUTH AFRICA

South Africa tops the G20 for reliance on coal power

March 2021



Authors Euan Graham

Peer Reviewers Jesse Burton, E3G / University of Cape Town

Published date March 2021

About Ember's Global Electricity Review

This annual report analyses electricity data from every country in the world to give the first accurate view of the global electricity transition in 2020. It aggregates generation data by fuel by country from 2000. 68 countries comprising 90% of world electricity generation have full-year data to 2020 and have formed the basis of an estimate for changes in worldwide generation. All remaining countries have full data as far as 2019. G20 countries, which comprise 84% of world electricity generation, each have a separate in-depth country analysis. All the data can be viewed and downloaded freely from Ember's website.

www.ember-climate.org/global-electricity-review-2021

Disclaimer

The information in this report is complete and correct to the best of our knowledge, but if you spot an error, please email info@ember-climate.org

Document design & layout by Designers For Climate

EMBER COAL TO CLEAN ENERGY POLICY

Contents

SOUTH AFRICA

South Africa tops the G20 for reliance on coal power

The country must embrace cheap renewables to exit its electricity crisis and phase out coal

"South Africa already faces a tough challenge in successfully decarbonising its coal-heavy grid. But any continued investment in coal generation will make the scale of this challenge harder, and further entwine the fate of the economy with that of the coal sector. The government's recently stated ambition to reach net-zero by 2050 is a welcome announcement, but massive deployment of cheap wind and solar is crucial to pursuing an orderly transition away from coal, while navigating a path out of the current electricity crisis affecting the country."

Euan Graham

Electricity Tracking Analyst

Key findings

1

South Africa's electricity has the highest share of coal in the G20

In 2020, 86% of South Africa's electricity came from coal, compared to the global average of 34%. It is significantly ahead of the next highest G20 member, India, which generates 71% of its electricity from coal.

2

Meanwhile, wind and solar only make up 6% of South Africa's electricity

Generation from wind and solar has almost tripled from the 2% of South Africa's electricity from wind and solar in 2015. However, this is still notably below the global average of 9.4%.

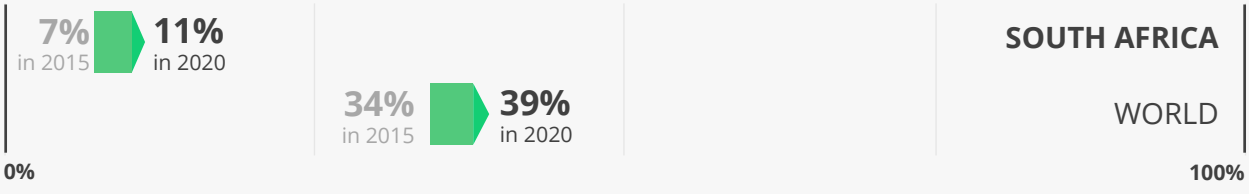
3

South Africa is experiencing an unprecedented electricity crisis, which has seen electricity demand fall by 5.4% since 2015

Spiralling costs of new coal plants have placed the state-owned utility Eskom in dire financial situation, leading to increased electricity tariffs which have caused electricity demand to stagnate. At the same time, a lack of maintenance at older coal plants has led to rolling blackouts due to unplanned outages. This has acutely affected industry in South Africa, and slowed growth and socio-economic development.

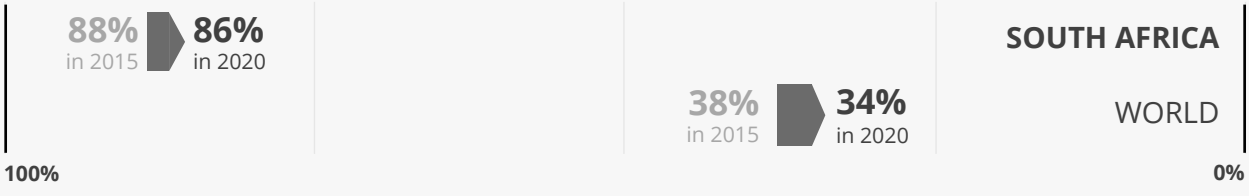
Progress to 100% clean electricity

Percentage of all renewables & nuclear in total generation



Progress on phasing out coal

Percentage of coal in total generation

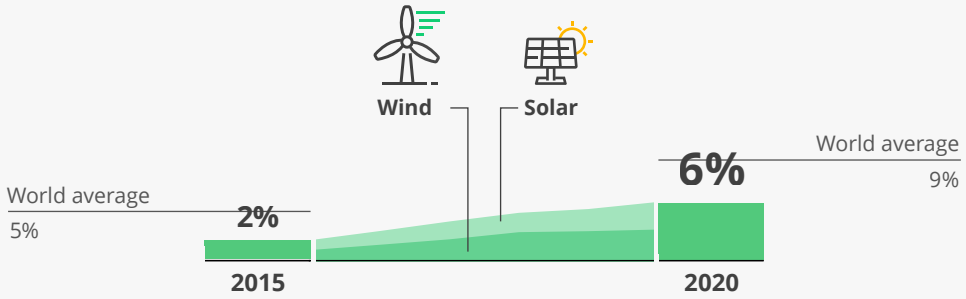


South Africa's electricity transition in the spotlight: 2015-2020

Wind and solar starting to play a role, but lagging on global average

Wind & solar in electricity mix

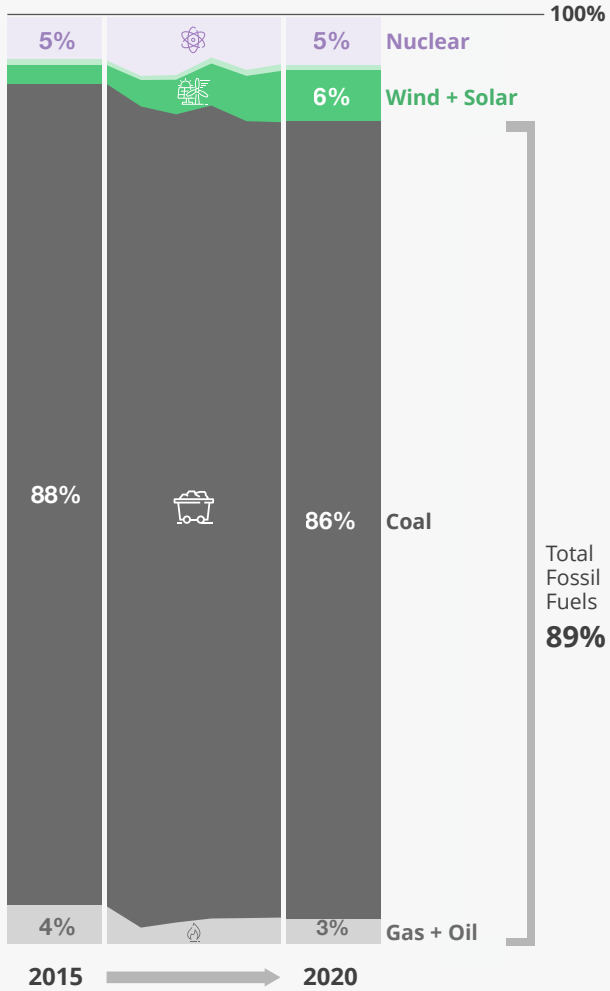
Percentage of total generation



South Africa's electricity is still dominated by coal

Electricity mix

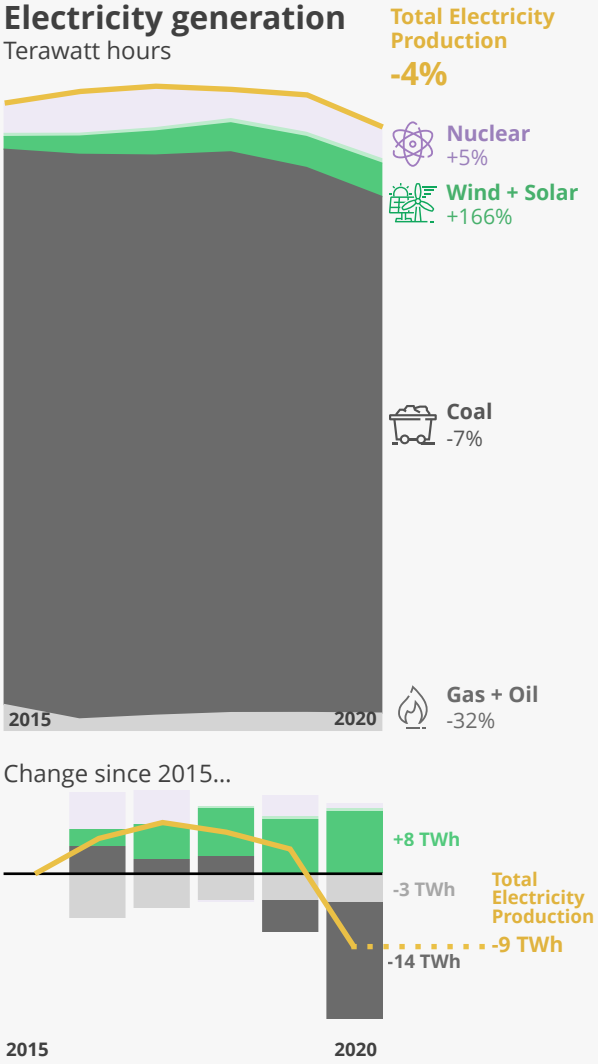
Percentage of total generation



Coal falling because of lower electricity production

Electricity generation

Terawatt hours

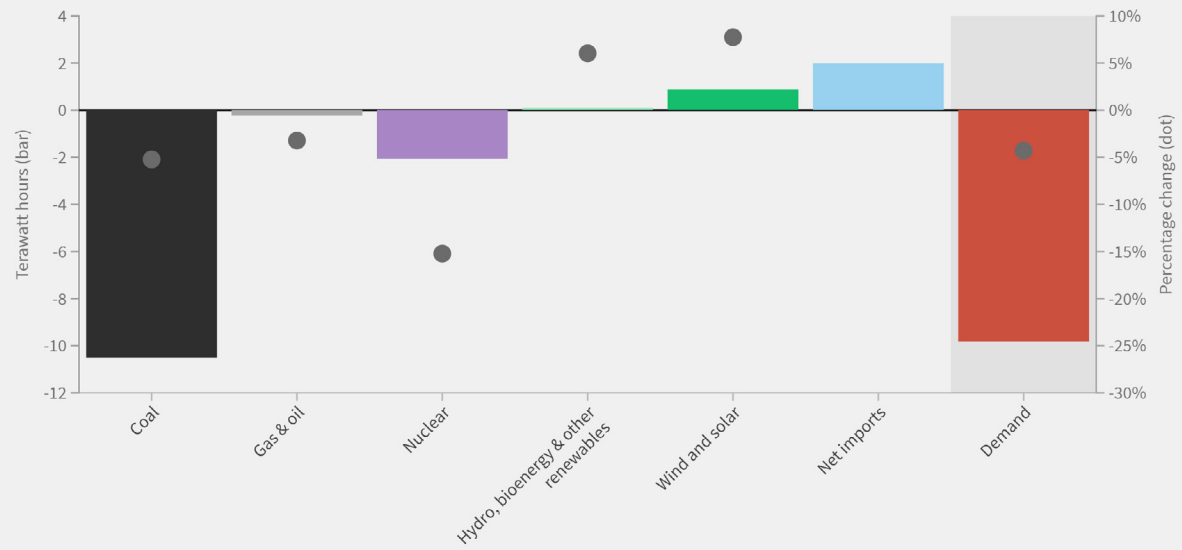


Renewables' share of electricity production in South Africa is growing, but the scale of the challenge is huge. Fossil fuels provide 89% of electricity, and 86% alone comes from coal power. In the last five years, renewables have grown by almost four percentage points—from 2.5% to 6.2% of the electricity mix—as coal generation has fallen. A major driver for this falling fossil generation in recent years has been the unreliability of coal plants; unplanned outages at coal power stations have resulted in rolling blackouts in recent years.

Renewable electricity in South Africa is almost all generated by wind and solar, so the growth of these technologies has driven the increases in renewables over the last five years. Wind and solar have increased their market share from 2% (5 TWh) in 2015 to 5.5% (12 TWh) in 2020, but this is still lower than the global average of 9.4%. This growth had been slowing as capacity additions, particularly for wind, slowed down in 2018 and 2019. Promisingly, however, additions picked back up in 2020. A combined total of 1.04 GW new wind and solar capacity was installed; the first time since 2016 that installations topped the gigawatt mark.

Fossil fuels provided 89% of South Africa's electricity, down from 93% in 2015. This reduction has mainly come from coal generation, which has fallen by three percentage points and now makes up 86% of the electricity mix. These dynamics are closely linked to the operations of Eskom, the state-owned utility company. A great deal of investment has been funnelled into the building of new coal capacity in the last decade, which has suffered major cost increases and delays in being built. The knock-on effects of this have been a drastic increase in electricity tariffs for consumers, driving a collapse in demand for electricity. With coal being the dominant fuel, this drop-off in demand has mostly come off coal. On top of this, a lack of investment in the maintenance of older coal plants has led to major problems with unplanned outages, resulting in rolling blackouts and further declines in coal generation. The final piece of South Africa's electricity mix is nuclear power: the country has one nuclear power station, which is due to operate for another 20 years following the installation of new steam generators.

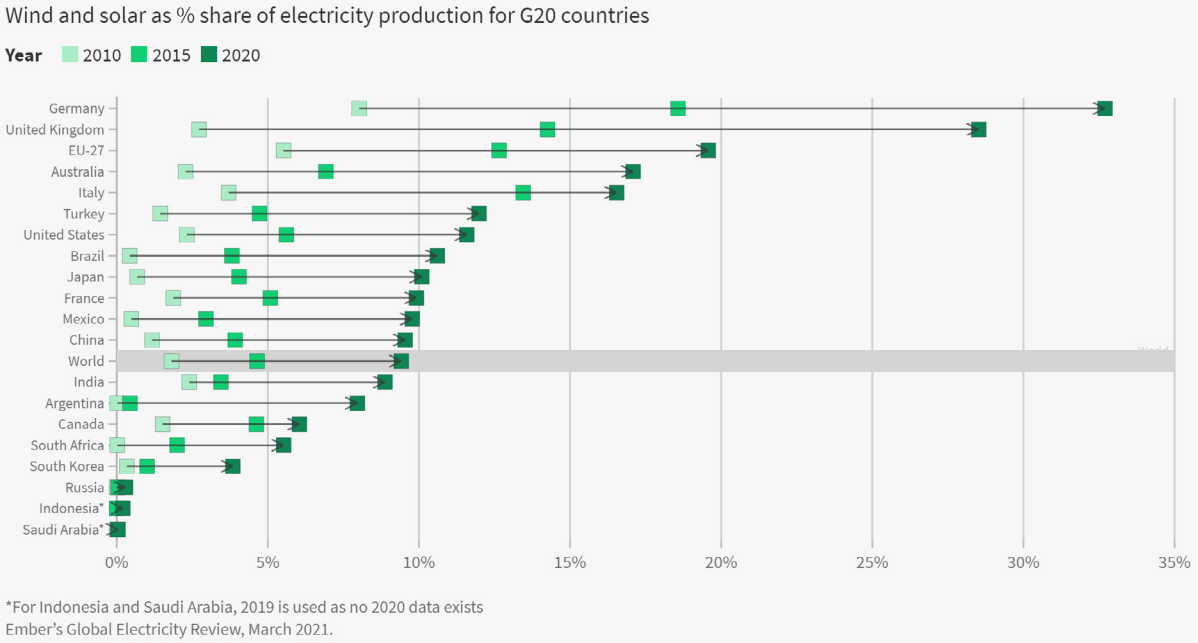
What happened in 2020?



Electricity demand fell by 4.3% (-10 TWh) driven by two main factors: the impacts of Covid-19, and continuing effects of rolling blackouts due to unplanned outages at coal power stations. The pandemic had a large impact on electricity demand, with data from Eskom suggesting demand was 5 TWh less than predicted in April alone during the most severe restrictions. Coal generation fell the most in response to this, falling 5.2% (-11 TWh). Solar saw a promising increase, following a welcome pick up in solar capacity additions. Nuclear fell 15.2% (-2 TWh) due to scheduled maintenance at Koeberg, South Africa's only nuclear power station.

South Africa's transition in comparison with G20 countries

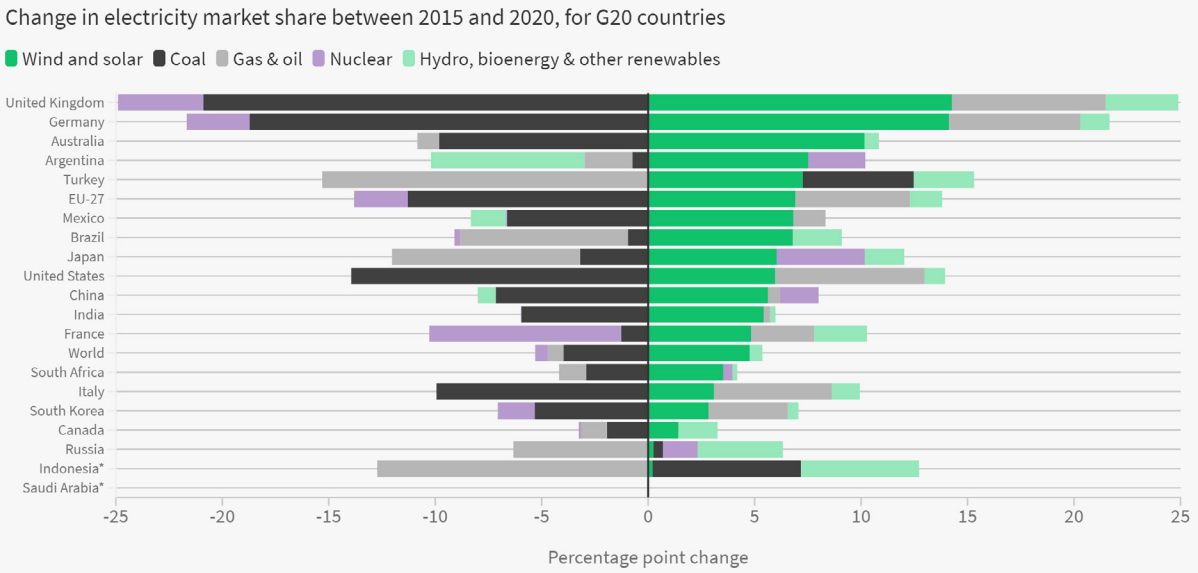
Wind and solar are increasing in South Africa, but still below global average



*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists
Ember's Global Electricity Review, March 2021.

South Africa has increased its share of electricity from wind and solar significantly in recent years, almost tripling from 2% in 2015 to 5.5% in 2020. This is below the world average of 9.4%, but could soon overtake Canada, where progress in building new wind and solar has slowed in the last five years.

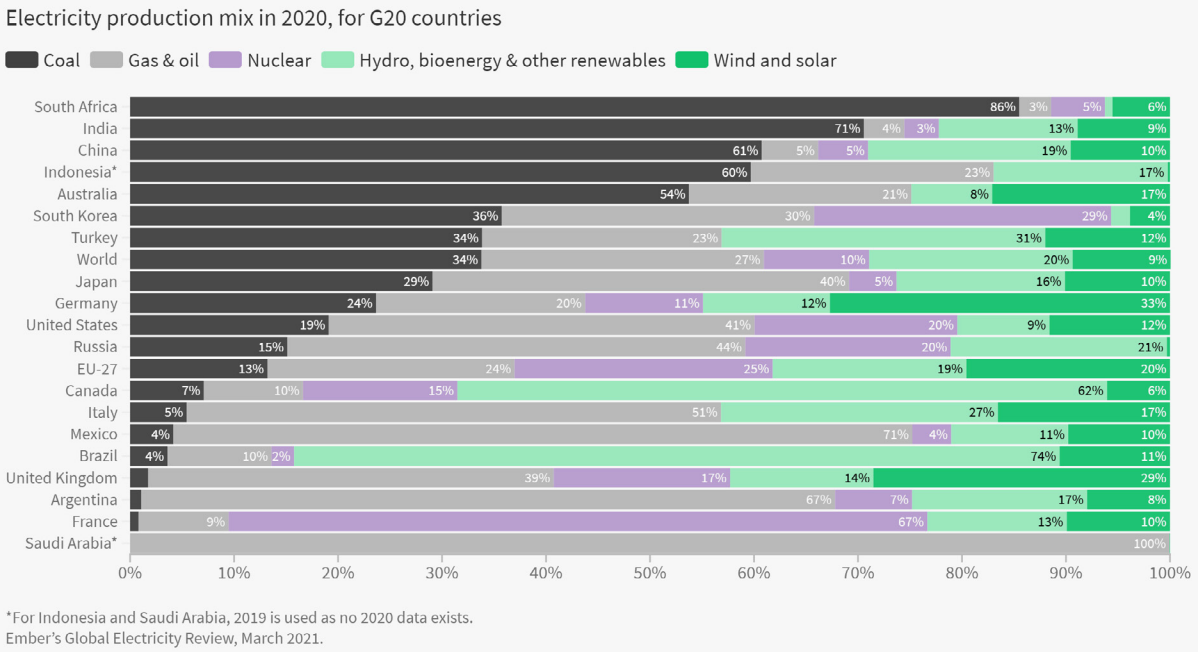
Coal's share of electricity has fallen in South Africa



*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

Increases in wind and solar power have partly driven falls in coal's market share in South Africa. But unlike other G20 members like the United States where reductions in coal generation have been driven by plant closures, a large factor surrounding the fall in coal in South Africa is the ongoing electricity crisis. This means that these gains in market share mask the potential for coal generation to pick up in future unless wind and solar deployment is prioritised.

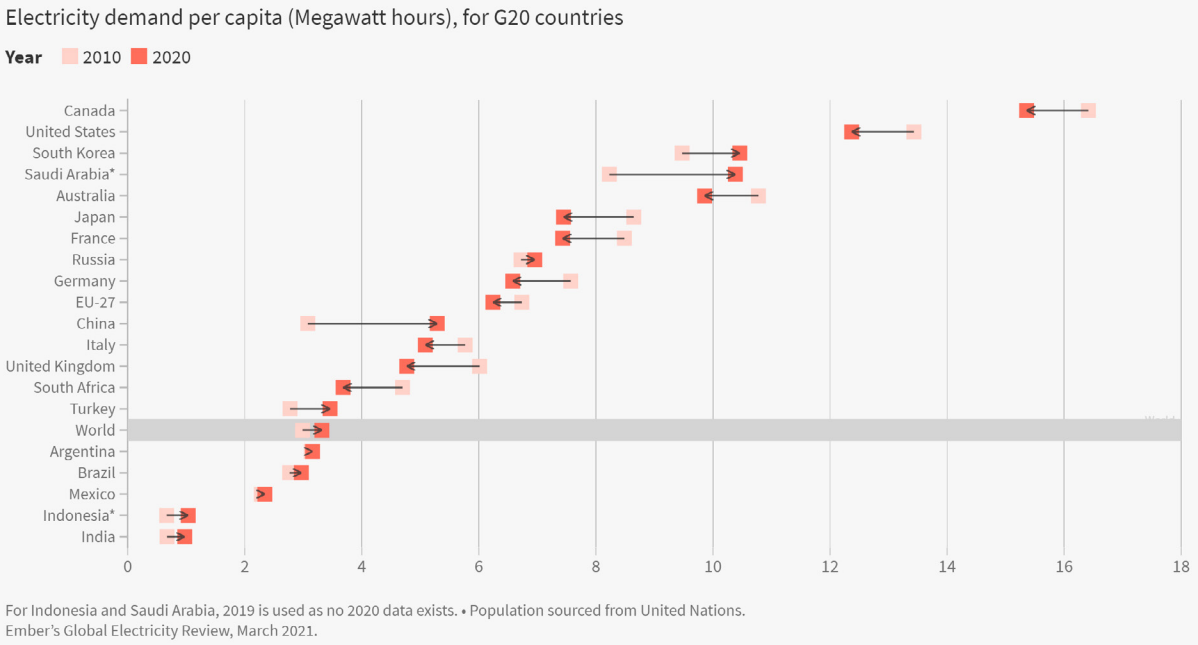
South Africa has the largest share of electricity from coal in the G20



*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

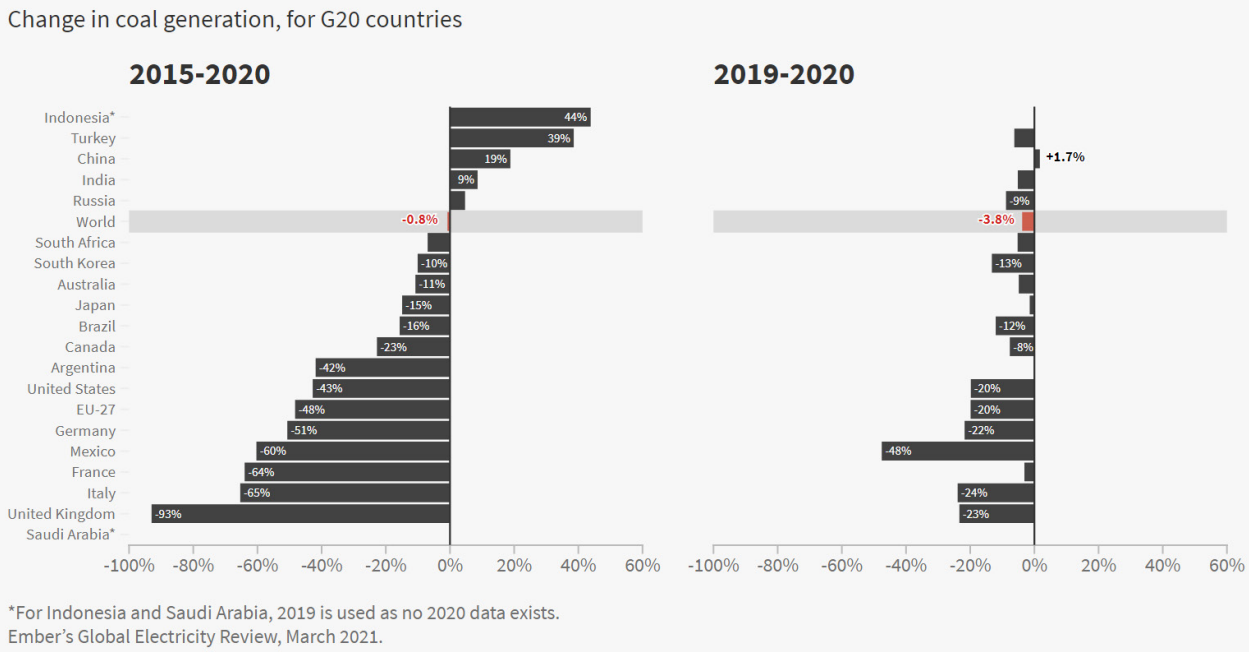
South Africa still has the highest share of coal in the G20, and only Saudi Arabia generates more electricity from fossil fuels. Even another coal-reliant economy such as Indonesia generates 60% of their electricity from coal, in comparison to South Africa's 86%. The scale of the challenge to decarbonise South Africa's electricity grid is very large, but so too are the risks that come with not diversifying the country's economy and electricity system away from coal.

Electricity demand falls in South Africa amid electricity crisis



South Africa stands out among G20 members as a developing economy showing a large fall in electricity demand over the last five years. Although part of this reduction is from the effects of the Covid-19 pandemic on demand, it also speaks to how the lack of resilience of South Africa's electricity grid has slowed growth and socio-economic development. With tariffs on electricity drastically increasing in recent years thanks to poor grid maintenance and the spiralling costs of new coal plants, electricity demand per capita has stagnated and begun to decrease. Further, In 2019, half of the government's budget deficit came from bailouts to Eskom, highlighting the severe financial implications of the country's worsening electricity crisis.

Coal generation has not been rising in South Africa



Unlike some other coal-reliant countries, coal's market share hasn't increased in South Africa in recent years, instead falling by 7%. This is still modest in comparison to some other G20 members where coal has been structurally falling.

Concluding remarks

The challenge of decarbonising such a coal-reliant system is made even larger by the reliability issues plaguing the grid, and the dire financial situation of the state-owned utility Eskom. But with new wind and solar capacity cheaper than new coal, and the closure of these unreliable coal plants inevitable, there is a clear path that South Africa must pursue to transform its electricity system.

However, with the economy fostering persistent inequality and highly intertwined with coal, it is absolutely imperative that any transition is just, and planned with socio-economic development at its core. Part of this is setting clear market signals as to the future trajectory, so it is welcome that Eskom have announced they are aiming for net-zero emissions by 2050.

More information about the Global Electricity Review 2021

Global Electricity Review 2021	www.ember-climate.org/global-electricity-review-2021		
Main Report	Global Trends	English	Español 中文
G20 Profiles	Argentina	English	Español
	Australia	English	
	Brazil	English	Português
	Canada	English	
	China	English	中文
	European Union	English	
	France	English	Français
	Germany	English	Deutsch
	India	English	
	Indonesia	English	Bahasa Indonesia
	Italy	English	Italiano
	Japan	English	にほんご
	Mexico	English	Español
	Russia	English	русский
	Saudi Arabia	English	عربي
	South Africa	English	
	South Korea	English	한국어
	Turkey	English	Türk
	United Kingdom	English	
	United States	English	

The information in this report is complete and correct to the best of our knowledge, but if you spot an error, please email info@ember-climate.org

EMBER COAL TO CLEAN ENERGY POLICY