

AN FTI CONSULTING REPORT - PUBLISHED DECEMBER 2020

Energy Transition in South Africa

The Power Sector in 2020



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1. DISRUPTION IN 2020

FTI Consulting published a report on the Energy Transition in South Africa in February 2020, which covered the shape and pace of South Africa's energy transition across the power, liquid fuels and mining sectors. A few weeks later, a somewhat distant health and economic shock in China and Europe rapidly became front and centre in South Africa. In this follow up article, we focus on the power sector and explore the developments during 2020. We review how events this year have impacted the energy transition of decarbonisation and supply diversification in the power sector.

A bleak start but cautious optimism in early 2020

South Africa entered 2020 recuperating from power supply shocks in December 2019. Eskom had implemented record setting rounds of load-shedding and Stage 6 was implemented for the first time in the country. The higher frequency of nationwide blackouts was a further setback to the economy and confidence in the power sector and the state-owned entity, Eskom. South Africa was already going into recession at the start of this year, with negative GDP growth in Q4 2019 and Q1 2020. Power supply problems constrained our economic growth.

>90%

The power sector continued to rely on coal as the primary source of energy supply for power generation. Eskom continued as the monopoly power provider generating over 90% of all electricity consumed.

Discussions on energy transition continued and South Africa appeared to be on a path of an incremental and gradualist energy transition path.

Discussions on the issue of security and monopoly of power supply became louder. Many solutions were proposed such as:

- Consumers reducing their reliance on Eskom through the adoption of behind-the-meter solar photovoltaics (PV) and battery storage technologies at a time when solar grid parity economics improve further.

- The emergence of companies with "virtual utility" business models that enable and control the proliferation of distributed generation and participation of prosumers in the energy system, with greater convenience and lower cost for customers.
- A move towards decentralised supply, with smaller, lower carbon installations replacing large fossil fuel power plants.
- More self-supply via Small Scale Embedded Generation (SSEGs) – typically solar systems - for commercial and residential use.
- More banking and wheeling agreements between private sector power producers and municipal grids to distribute energy across cities and provinces to high demand users.

In February, a policy shift was met with cautious optimism when the Minister of Mineral Resources and Energy announced that companies - such as those in the mining industry - could now generate their own electricity rather than rely on Eskom.

We have started to see a move towards more power supply self-sufficiency - with companies such as Sasol releasing tenders to purchase renewable power from Independent Power Producers (IPPs) – but unclear registration requirements and protracted licensing processes have remained a hurdle to rapid and large-scale adoption of off-grid power so far.

COVID-19 and lockdowns take centre stage

In March, the country implemented one of the world’s strictest COVID-19 lockdowns, severely limiting economic activity as a consequence of trying to prepare for, control and mitigate the health impacts of COVID-19. As the pandemic hit and economic activity dropped, the country focused on lockdown levels instead of load-shedding levels, with load-shedding ceasing during the initial phases of lockdown.

The economic impact of lockdown included a GDP drop of over 16% from Q1 2020 to Q2 (see Figure 1). This translates into an annualised growth rate of -51%, the steepest on record and graver than the global financial crisis in 2009. The impact has continued into the rest of the year and is still ongoing, despite almost all sectors of the economy now being reopened.

Figure 1 : Trends in South African GDP and electricity consumption in 2020



Source : StatsSA, Q3 data not published at the time of writing

Demand for power dropped by as much 9,000 MW from usual peak daily demand of ~30,000 MW to as low as ~21,000 MW during the first 5 weeks of the national lockdown, before returning to close-to normal levels by September as economic activity resumed. Yet despite the Q2 drop in demand, 2020 has already beaten 2019’s record for load-shedding hours, with South Africans experiencing rolling outages in September as economic activity resumed.

Approximately 1,500 GWh of power outages had occurred by the end of September, emphasising that Eskom’s performance remains a risk to the South African economy and our recovery from COVID-19.

Other disruptions related to the power sector included oil price falls and investment appetite. Due to South Africa’s reliance on domestic coal for power generation, the oil price drop in March-April did not enable a corresponding drop in South African power prices or operating costs.

The subsequent diesel shortages as the re-opening of the economy coincided with unplanned refinery outages also risked the planned start-up of power plant units coming back online, but overall no major impacts on power supply or pricing were seen as a result of oil supply and price disruptions.

In terms of investment, many projects were understandably halted or delayed as a result of the lockdown, but recent government announcements and the prioritisation of infrastructure projects seem to be re-invigorating investment in the sector.

“While these statistics paint a grim picture and illustrate the need for decisive action on economic recovery, the pandemic is also viewed as a reset opportunity by many in the energy sector.”

While Environmental, Social and Governance (ESG) issues have typically attracted less attention than economic ones, there is greater recognition that these are becoming mainstream.

Whether led by an investor-driven ESG perspective or policy maker’s focus on sustainable development, these are now mainstream and strategic issues for both public and private sector organisations.

In line with this, the renewable energy opportunity is being viewed as an enabler for investment and infrastructure development.

Renewables are now being seen as a catalyst for kick-starting a greener economy which creates jobs at the same time as supporting climate change targets.

To support economic recovery, the Presidency has announced an infrastructure-led strategy, including investments in the energy sector which focus on energy security, local industrialisation and green economy interventions.

This includes prioritising and accelerating the procurement and installation of new electricity generation capacity from IPPs across multiple technologies, supporting Eskom’s generation capacity and creating competition in the sector.

The longer-term economic impacts of COVID-19 are still emerging.

“However, it is clear that the energy sector can play a vital role in enabling an economic recovery that also supports South Africa’s just energy transition.”

This can be done by investing in power generation projects that

- (1) increase energy security,
- (2) lower the country’s emissions and
- (3) provide jobs in areas impacted by decommissioned coal plants.

So far this year, a number of announcements have been made which have started to move South Africa along this pathway. The implementation of these projects and enabling policy actions is the next step to make real progress in the sector.

Global developments in 2020



Total energy demand forecast to drop by 5% compared to 2019, with an 8% drop in oil demand but only 2% drop in electricity demand.



Energy-related CO2 emissions forecast to drop by 7%, 2,4 Gt less than in 2019.



More than 1 million people attended climate change protests at over 2,900 events in 125 countries.



An eight-fold increase in net-zero commitments made by cities, with 823 in 2020 compared to only 100 recorded in 2019.

2. POLICY & MARKET DEVELOPMENTS IN 2020

The power sector is now viewed as an enabler – rather than constraint – of economic recovery.

There have been a number of government announcements regarding the development of power sector. This accelerated in the second half of the year as focus turned from the immediate healthcare crisis to economic recovery.

In a letter from the Presidency at the end of September, President Cyril Ramaphosa stated that the government's vision is:

“...to lead South Africa through a just transition which ensures that as many people as possible benefit from the investment, growth and job-creation that we can achieve through expanding our electricity generation capacity.”

This encompasses power sector developments covering capacity additions, climate change goals and sector employment.

Significant developments so far in 2020 include:

- Releasing an RFP for 2,000 MW of emergency dispatchable power through the Risk Mitigation Procurement Programme to rapidly meet the current generation shortfall, to be connected to the grid by June 2022.
- Government gazette of ministerial determinations to enable the development of 11,813 MW of additional power generation (over half of which is wind and solar), with competitive and transparent procurement processes to follow shortly.
- Prioritising the opening of Bid Window 5 of the Renewable Energy Independent Power Producer Programme (REIPPP) by January 2021 (first RFPs planned to be issued in December 2020).
- The Department of Mineral Resources and Energy issuing an RFI to assess nuclear technologies for a national programme to build 2,500 MW of new nuclear capacity, the first step of a nuclear new build programme.
- Removing the licensing requirement for self-generation projects under 1 MW. So far, 156 self-generation facilities under 1 MW have been registered, with a total installed capacity of 72 MW.

- Improving the NERSA licensing processes and turnaround time for facilities that can generate above 1 MW, including being able to process licence applications for facilities of above 1 MW even if they are not in compliance with the IRP (Integrated Resource Plan) 2019, removing the need for Ministerial approval for deviation for such facilities.
- Government gazette of a new directive which provides a framework around electricity generation for municipalities, giving effect to Ramaphosa's commitment that municipalities in good standing will be able to procure their own power from independent power producers, increasing competition in the generation sector.

These developments were re-iterated in the President's address on 15th October. This demonstrates the importance that government is placing on the energy sector's contribution to South Africa's infrastructure-led economic recovery, and its transition to a lower carbon energy mix.

Change of leadership and direction at Eskom

Eskom is named as a central risk to the economy by multiple international credit ratings agencies. As with other state-owned entities, Eskom was severely impacted by COVID-19 and the associated lockdowns in Q2 of this year.



For example, while the sudden drop off in economic activity at the end of March enabled some units to be taken offline for maintenance, it also resulted in Eskom issuing force majeure notices to 22 wind IPPs.

Eskom advised that the power they produced would at times not be paid for by the utility until demand returned to normal levels, instead offering to extend the terms of their power purchase agreements.

“Since Eskom’s new CEO, André de Ruyter took office in January 2020, there have been several developments indicating that change is being implemented at the utility, even if it will take some time for the operational and financial impact to be seen.”

These changes are in three main areas:



1. Power plant performance



2. Generation capacity



3. Organisational restructuring

In terms of power plant performance, 2020 has already been the worst year on record for load-shedding - a result of unplanned breakdowns exceeding forecast levels - but an enhanced maintenance programme is now underway.

The objective of this programme is to return to the original manufacturers guidelines for maintenance cycles, instead of maintenance being deferred to meet short term operational targets.

It is acknowledged that while this programme will result in an increased likelihood of load-shedding for the next 12-18 months, it is urgently required to prevent further deterioration of the system and improve long term performance.

In order to support this maintenance programme, De Ruyter has publicly stated his support for increasing the number of IPPs contributing to the national grid.

This would take some of the pressure off Eskom’s generation requirements during the enhanced maintenance programme, will attract valuable foreign investment at a time when Eskom’s balance sheet is severely constrained and introduce more competition into the generation sector.

While Eskom had previously opposed the introduction of more IPPs on the grounds of cost (particularly for the initial rounds of the REIPPP), the rapidly reducing price of wind and solar power and their ability to improve energy security has made these IPPs increasingly attractive to the utility.

In terms of restructuring Eskom into three separate entities, the current plan sees functional separation complete for Generation, Transmission and Distribution by March 2021.

Following functional separation, Transmission will be the first part of the value chain to be legally separated, planned to be completed by December 2021.

This will enable the new subsidiary to procure power from IPPs as well as from Eskom’s generation business, increasing competition and energy security.

R3,8 Bn

In the meantime, increasing efforts are also being made to bring corruption and poor performance to account within the organisation, as demonstrated by a civil suit launched in August 2020 to recoup R3.8 billion from Gupta-linked contracts and the suspension of two power station managers following high levels of load-shedding in September.

Examples of private sector developments in 2020



Three-fold global increase in companies making net-zero commitments. For example, oil majors such as BP, Total and Shell have all committed to significant portfolio pivots to achieve net-zero by 2050, while technology firm Microsoft has committed to achieve net-zero by 2030, plus off-setting all historic emissions since it began operations in 1975.



Amazon Web Services launched its first Africa region site in Cape Town in April 2020, with renewable energy plans already in place and a commitment to be entirely powered by renewables by 2030. Other companies are expected to follow suit.



In the mining sector, Anglo American has committed to improving its energy efficiency by 30% and reducing GHG emissions by 30% by 2030 (vs. 2016 baselines), plus a target of carbon neutrality across all global operations by 2040, with similar commitments made by other firms in the sector.



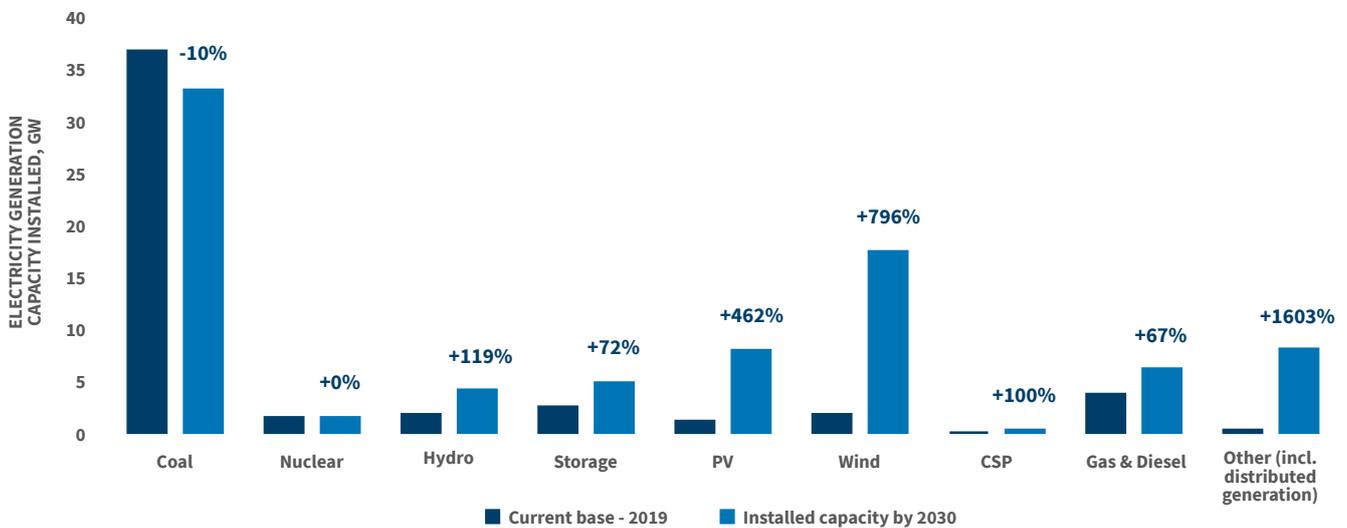
At least 275 MW of utility-scale wind and 132 MW of utility-scale solar power generation projects have commenced commercial operations so far in 2020, despite lockdown halting construction for 50 days. These projects will feed into Eskom's grid and are part of REIPPP Bid Window 4. In total they will add over 400 MW of supply, compared to only 100 MW added by utility scale renewables in 2019.



Sasol has tendered for 600 MW of renewable energy via IPPs for its Secunda operations and is aiming to reduce GHG emissions by 10% by 2030. However, the company also rejected a climate-related resolution tabled for its 20th November annual general meeting, showing that there is still progress to be made in this area.

These developments are all in line with the release of the latest IRP in 2019 (see Figure 2), which outlined the energy mix and key policy supply and demand decisions to support electricity infrastructure development for the next decade.

Figure 2 : Changes in South African energy supply capacity planned by the IRP 2019



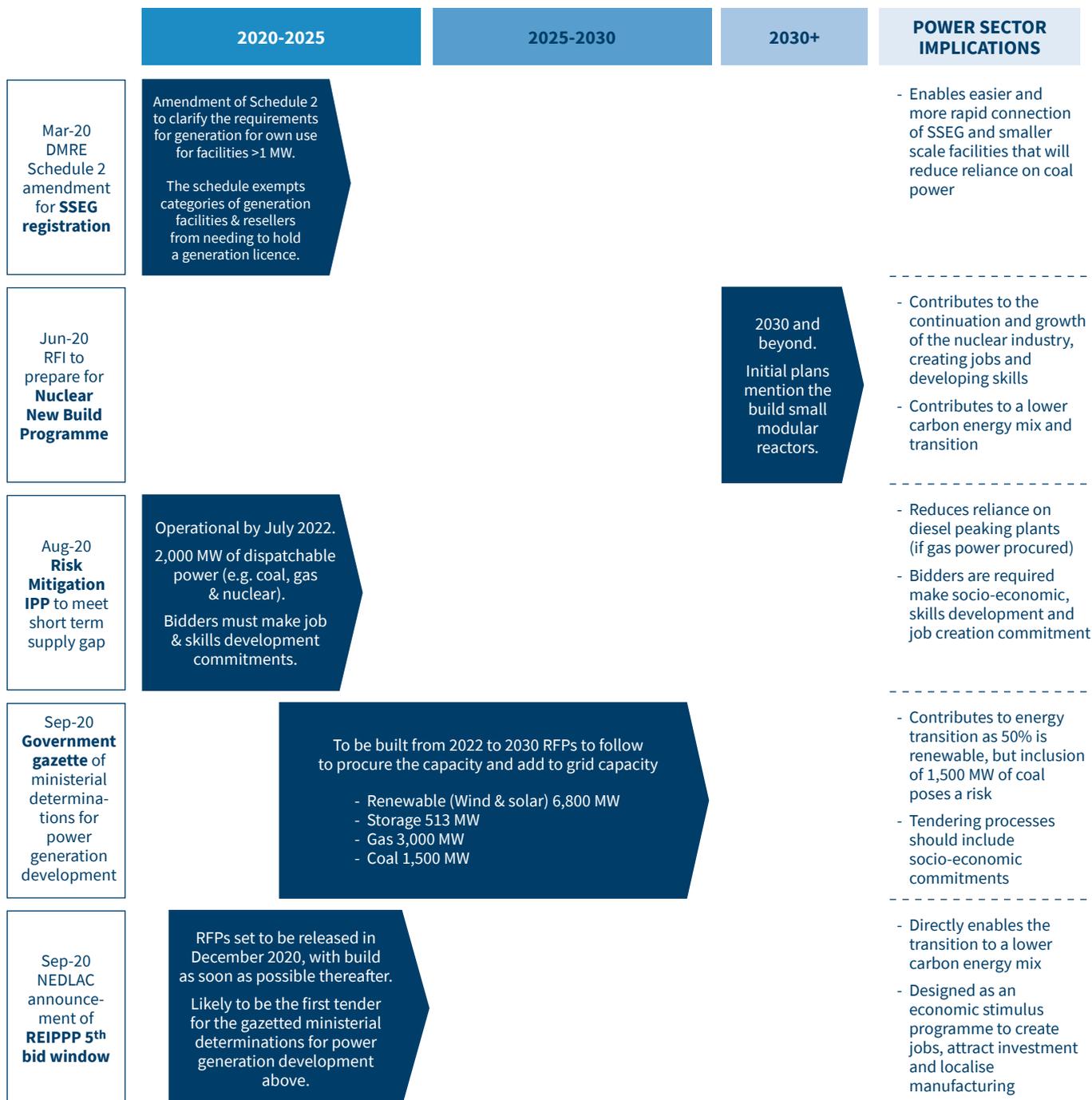
Source: IRP 2019, DMRE

The combination of these government announcements, Eskom changes and private sector developments signal:

1. Increasing activity within the South African power sector in response to the need for urgent energy security and economic recovery from the COVID-19 pandemic.
2. Policy reform picking up pace to enable increased agility in the sector, in particular to streamline the licensing processes for smaller, decentralised facilities and SSEG that will increase generation capacity and contribute to a lower carbon energy mix.
3. Increasing awareness in the private sector of local and global energy transition urgency and the need to make and follow through on climate change commitments.

3. IMPLICATIONS FOR SOUTH AFRICA’S ENERGY MIX

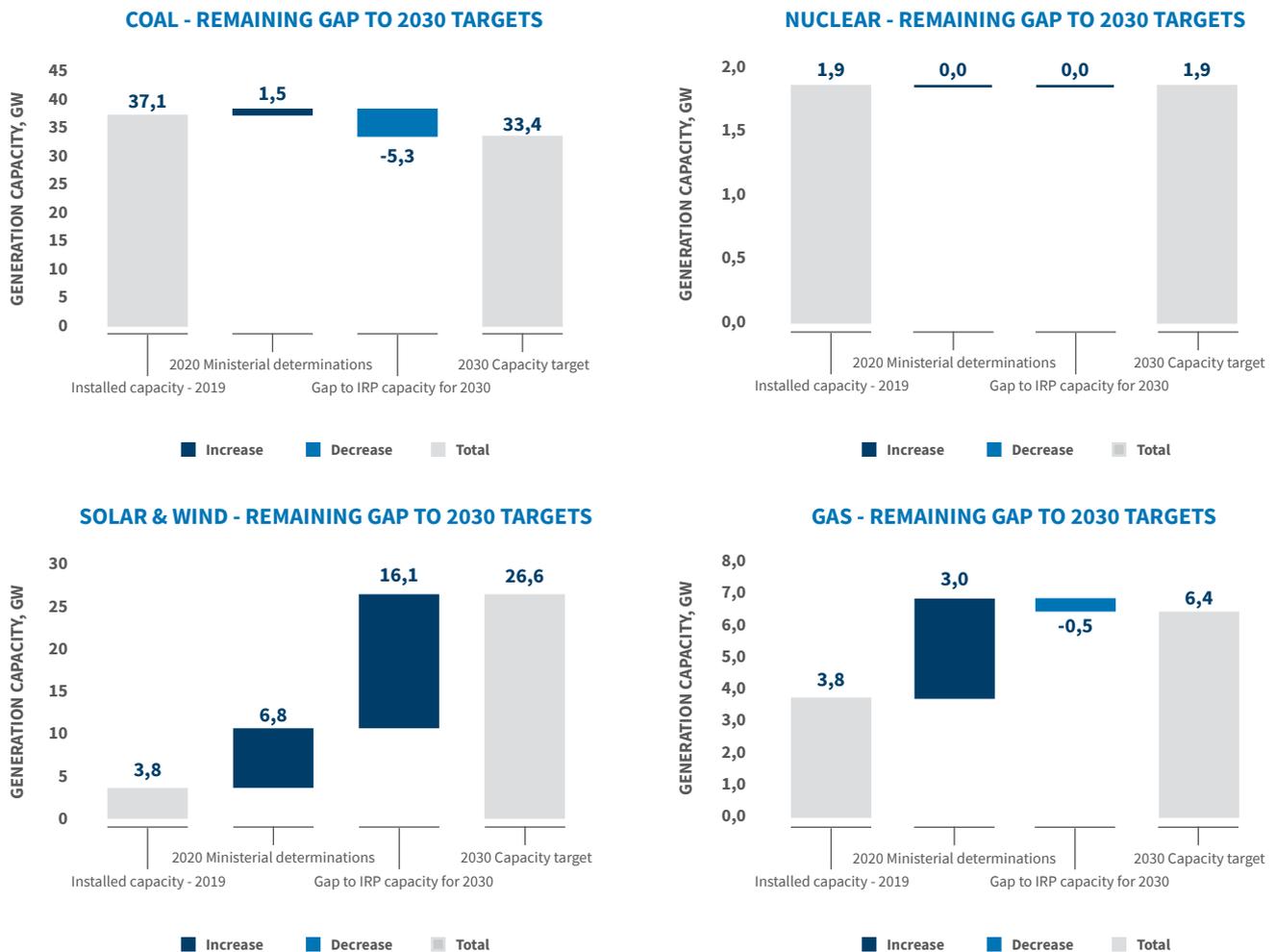
Figure 3 : 2020 Power sector announcements and capacity build timelines



Source : FTI analysis of government announcements

Figure 3 illustrates the relative timing for each of the major power sector announcements made so far in 2020, including the technologies involved and their contributions to the economy and climate change. Many of these announcements involve the addition of lower emissions power sources and the prioritisation of job creation and investment. This ensures that they support both economic recovery and the just transition to a lower carbon energy mix that meets South Africa’s National Development Plan goals and Paris Agreement targets.

Figure 4 : Remaining capacity required to fulfill the IRP 2019 plan



Source: FTI analysis of IRP 2019 and 2020 government announcements

However, as **Figure 4** shows for the four most prominent generation technologies, further ministerial determinations and investment in the power will be required to meet the 2030 capacity generation targets in the IRP 2019.

The level of development required varies by generation technology:

1. **COAL** - Including the 1,500 MW gazetted in 2020, 5,285 MW of coal generation capacity needs to be decommissioned to meet 2030 targets.
2. **NUCLEAR** - No further development is required for 2030 beyond the design life extension of Koeberg, but preparations to expand the nuclear power programme need to be implemented to prepare for new capacity beyond 2030.
3. **SOLAR & WIND** - In addition to the 6,800 MW of wind and solar power gazetted in 2020, an additional 16,076 MW need to be developed by 2030, equivalent to adding 1,600 MW to the grid each year.
4. **GAS** - Development of the 3,000 MW gazetted in 2020 will be sufficient to meet 2030 targets, with space for 450 MW of diesel power to be decommissioned to support climate change targets.

Recent policy announcements have accelerated progress towards achieving 2030 targets, but action on procurement and implementation must now be seen before any real judgements can be made.

The need to gazette an additional 16,076 MW of wind and solar power shows that a sustained programme of renewable power infrastructure development is needed to fulfil the 2030 power generation mix set out in the IRP 2019.

This provides a long term opportunity for South Africa to benefit from renewable power developments in terms of attracting international investment, industrialising local economies and creating jobs.

The assigning of Renewable Energy Development Zones (REDZs) in areas where coal and gold mining are in decline will also help the potential redeployment of workers in these areas, supporting a just transition.

However, many of the most promising wind and solar sites are not located by existing power plants, so the spatial distribution of South Africa's generation capacity will shift during the energy transition.

R118 Bn

As a result, significant work and investment (at least R118 billion over the next 10 years) is needed to update South Africa's transmission network and link new renewables developments to areas with the most power demand, including developing new South-North transmission corridors.

Given the sustained need to build renewables infrastructure and update the transmission network in South Africa over at least a 5-10 year period.

There is also significant opportunity to build a manufacturing hub for renewable energy equipment and infrastructure manufacturing in the country, creating jobs across the value chain and driving future economic growth



4. THE PATH AHEAD

The COVID-19 pandemic has created an urgent need for economic stimulus and rebounding that the Presidency is primarily addressing through an ambitious infrastructure build programme. Therefore, there is currently more incentive than ever to progress the energy build programmes that will contribute to achievement of the IRP 2019 and South Africa's climate change targets.

So far, 2020 has seen action being taken to accelerate developments in the power sector, driven by the need to:

 <p>1. Improve energy security</p>	 <p>2. Create jobs</p>
 <p>3. Attract investment</p>	 <p>4. Transition to a lower carbon energy mix</p>

The focus now needs to turn from planning to implementation if new capacity is to begin being added to the grid in 2022. This includes starting competitive and transparent tender processes that get projects "shovel-ready" as soon as possible to support job creation and economic recovery.

In recent years procurement and build programmes (such as REIPPP Bid Window 5) have been pushed out by multiple delays. To achieve the IRP and support economic recovery the sector needs to embark on a sustained infrastructure programme for gas and renewable power, with renewables developed at pace over the next decade to meet capacity targets, build the industry in South Africa and support Paris Agreement goals.

"In conclusion, while there have been a number of announcements made in 2020 which will enable South Africa's energy transition, action must now be taken to implement these changes and accelerate generation capacity developments to support economic recovery and the achievement of climate change commitment."

LAURA MENZIES

Director
laura.menzies@fticonsulting.com
FTI Consulting South Africa

MICHELLE DEAVALL

Africa Marketing Manager
michelle.deavall@fticonsulting.com
FTI Consulting South Africa



FTI Consulting South Africa

Cape Town
8th Floor
125 Buitengracht Street
Cape Town
8001
South Africa
Tel: +27 21 487 9000
Fax: +27 21 426 0582
Website: www.fticonsulting.com

Johannesburg
WeWork Link
Reception Floor
173 Oxford Road
Rosebank
Johannesburg
2196
South Africa
Tel: +27 11 214 2400
Website: www.fticonsulting.com

Stellenbosch
76 Dorp Street
Stellenbosch
7600
South Africa
Tel: +27 21 887 5678
Website: www.fticonsulting.com