

Integrated Resource Plan 2019 – Where to from here?

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South Africa's Integrated Resources Plan 2019 ("IRP") continues to espouse the need to balance supply and demand on a least-cost basis, and gives limited guidance in relation to the "Where from here?"

Noteworthy policy statements from the IRP however include the following:

- **Emergency Procurement and Reliance on Peaking Plants:** the expected lead times of new generation capacity (across all technologies) will not address the immediate shortages in power demand (the short-term gap is estimated to be between 2000 and 3000 MW) and it is therefore anticipated that Eskom Holdings SOC Limited ("Eskom") will run diesel-fired peaking plants at load factors averaging around 30 percent for the period 2019 to 2021 unless "*short-term supply and demand side interventions*" can be deployed.
 - **Further Power Purchase Programmes:** the IRP identifies the need for a further power purchase programme to assist with the acquisition of capacity needed to supplement Eskom's declining plant performance and reduce the extensive utilisation of diesel peaking generators.
 - **Embedded Generation:** the development of generation for own use will be encouraged through the enactment of policies and regulations that eliminate red tape (unfortunately the IRP doesn't elaborate on this and it remains to be seen just what effect this statement will have on small-scale embedded generation going forward).

The IRP provides for an aggregate limit of 2000 MW for distributed/embedded generation, CoGen, Biomass and Landfill (listed together under the heading 'Other') for the period 2019 to 2022 without separately identifying any specific sub-limits for the component parts of the category (the draft 2018 IRP had indicated a limit of 200 MW per annum for embedded generation from 2019 through to 2030). For the years 2023 to 2030, the IRP provides for an additional limit of 500 MW per annum (but again
 - without specifying any break down of the sub-limits in respect of the component parts).
 - **Just transition:** the IRP prioritises the need to develop a single, consolidated policy on socially just transition following the decommissioning and retirement of coal power plants which mitigates the adverse impacts thereof on people and local economies.
 - **Build Limits on Renewables:** the IRP imposes annual build limits on onshore wind ("Wind") and photovoltaic ("PV") with the stated aim of "*smoothing out*" capacity allocation and creating a constant pipe line for investments (whilst also acknowledging the need to address investor confidence). Notably, the IRP also acknowledges that these annual build limits will have to be reviewed in line with demand and supply requirements.
 - **Gas to Power:** the IRP contemplates additional capacity of 1000 MW in 2023 and 2000 MW in 2027. However, with the anticipated relatively low levels of gas utilisation (down from the 8100 MW set out in the draft 2018 IRP), the IRP suggests converting existing diesel-powered peaker assets as opposed to the development of new gas infrastructure and power plants. Whilst the combined 3000 MW of gas-to-power would appear on first glance to tie-in with the projects contemplated under the Information Memorandum released by the Department of Energy for the LNG-to-Power IPP Programme (October 2016), the statements in the IRP regarding the conversion of existing peakers suggests otherwise.
- The implementation of any of the stated policies will need to go hand in hand with the implementation of the commitments made in the "Roadmap for Eskom in a Reformed Electricity Supply Industry".

Coal

- Due to its abundance in South Africa, coal will continue to form an integral part of the energy mix, however:
 - all new coal projects (including the exploration of coal resources) for purposes of electricity generation must be based on high efficiency, low emission (HELE) technology or other clean coal technologies such as Carbon Capture, Utilisation and Storage (CCUS) and Underground Coal Gasification (UCG);
 - rather than the current fleet approach, coal-fired power plants in South Africa should be undertaken on a modular and/or smaller scale in order to manage investments; and
 - an oblique reference to the Coal IPP Programme appears to underline the South African government's aspirations to continue with or revisit the stalled Round 1 projects (Thabametsi and Khanyisa), subject to addressing the environmental/clean coal technology and funding challenges.
- Additional capacity of 1500 MW of electricity generated from coal is planned until 2030 (750 MW in 2023 and in 2027).

Storage

- The IRP contemplates that storage will play a significant role in the energy mix in both the short-term and long-term, and makes provision in years 2022 and 2029 for the introduction of additional energy storage capacity of 513 MW and 1575 MW respectively.
- The IRP identifies Eskom's planned battery-storage pilot project as a test case for the assessment and development of the technical applications, benefits and regulatory matters associated with a utility-scale energy storage technology.

Solar

- The electricity grid will be boosted with committed contracted capacity of 814 MW for PV (on a staggered basis from 2019 to 2022) and 300 MW for concentrated solar power ("CSP") (2019).
- An aggregate of 6000 MW of new additional capacity for PV is planned between 2022 and 2030. This will be implemented by way of 1000 MW allocations in each of 2022, 2023, 2025 and 2028 to 2030. No further additional capacity is planned for CSP prior to 2030.

Hydro

- The local contribution of hydro technology is primarily based on the potential of run-off river hydro projects, with a current aggregate installed capacity of 2100 MW.
- The IRP contemplates the import of 2500 MW from the Grand Inga Hydropower Project by 2030—however this will be subject to the finalization of a technical solution for the evacuation of power from the Grand Inga to South Africa across the transit countries (DRC, Zambia, Zimbabwe and Botswana) (whilst also acknowledging the inherent regional political instability issues which may arise in any cross-border project).
- It had been previously indicated that there would be support for small-scale local hydropower projects, however no such provision has been included in the IRP's capacity table.

Nuclear

- The Koeberg Power Plant ("Koeberg"), presently contributing 1860 MW to the current energy mix, is expected to reach the end of its design life by 2024.
- Subject to required regulatory approvals, Eskom plans to extend the design life and nuclear safety licence of Koeberg for a further 20 years (to 2044) with its original design capacity of 1926 MW being utilised.
- The IRP motivates that small nuclear stations may be a more manageable investment for the economy.
- Whilst the IRP states that no new capacity from nuclear will be implemented before 2030 (other than the extension of Koeberg), the IRP does contemplate a nuclear build programme of 2500 MW, subject to affordability constraints, post 2030.

Wind

- An aggregate of 14400 MW of new additional capacity for Wind is planned between 2022 and 2030, with annual build limits of 1600 MW in each year from 2022 – 2030.
- Given the continuous droughts experienced by most parts of South Africa, the IRP suggests the use of renewable energy technologies such as Wind and PV for the purposes of desalination projects (subject to affordability constraints).

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