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Question 3.2.1 What are international experiences on matching between increasingly top-down energy targets and private driven generation/storage investments? And how do grid operators organise their grid planning in this increased complexity?

South African Energy procurement background

The procurement of energy in South Africa is guided by the Integrated Resource Plan (IRP), which is an electricity infrastructure development plan based on the least-cost electricity supply and demand balance, considering security of supply and the environment through the minimisation of negative emission and water use. The latest IRP was published in 2019. Further to that the procurement is facilitated in accordance with section 34 of the Electricity Regulation Act (ERA), which states that the Minister of Mineral Resources and Energy (DMRE) may, in consultation with the National Energy Regulator of South Africa determine the new generation capacity needed to ensure the continued uninterrupted supply of electricity, as well as the related types of energy sources. In recent past, the energy procurement process has been facilitated through a competitive tender process that was designed to enable private sector investment into grid connected generation. To date, the following procurement programmes have been concluded:

Programme	RE BW 1	RE BW 2	RE BW 3	RE BW 3.5	RE BW 4	RMIPP (Hybrid)*	RE BW5*	Total
Projects (MEC) MW	1425,34	1040,42	1433,1	200	2205,41	2000	2583	10887,27

*Awaiting financial closure

Recent developments in the Energy procurement process

There has been major development in the Energy procurement regulations and processes, which gives rise to a number of opportunities and challenges. These are mainly driven by energy insecurity due to the deteriorating performance of the aging Eskom power stations, with the recent Coal Power stations EAF below 60. The average age of these power stations is about 35 years. The recent significant developments are as follows:

February 2020: Ministerial determination issued under section 34 of the ERA by the South African Government for short-term risk mitigation determination of around 2000MW, to be procured from a range of energy source technologies.

September 2020: Ministerial determination issued under section 34 of the ERA by the South African Government for the procurement of around 12,000MW of new generation capacity from Independent Power Producers (IPPs) in line with the IRP 2019. In terms of this determination, DMRE would procure, and Eskom would by the energy produced from these successful IPP bidders. It set aside 6,800MW to be generated from solar and wind renewable energy sources between 2022 and 2024; 513MW to be generated from storage in 2022; 3,000MW to be generated from gas between 2024 and 2027; and 1,500MW to be generated from coal between 2023 and 2027.

October 2020: The South African Government gazetted amendments to the Energy procurement regulations. These proposed that municipalities can apply to the minister for approval to establish new generation capacity through either an internal mechanism, subject to compliance with stipulated conditions.

August 2021: Schedule 2 of the ERA provides for exemptions from the obligation in the Act to apply for (and hold) a licence from NERSA. The Government gazetted the Amended Schedule 2 of the ERA on 12 August 2021. Under the newly gazetted Amended Schedule 2 of the ERA, applicants for 1 – 100MW embedded electricity generation projects will be exempt from the obligation to apply for a Licence but, will be required to Register with the National Energy Regulator of South Africa (NERSA).

July 2022: There's also an imminent Schedule 2 amendment of the ERA following the announcement that the licensing threshold for embedded generation will be removed completely to enable greater participation by private investment in electricity generation.

Main challenges

These developments together with carbon neutrality ambitions by various industrial customers have invigorated the private sector participation in the development of renewable generation project in recent times. These private sector renewable projects integration is largely facilitated through the individual company's competitive bidding process, while some are in form of embedded behind customer meter self-generation. The main challenge for speedy integration of substantial new renewable generation projects in the areas of the country with excellent renewable energy sources is the capacity constrained transmission network and the low pace of new infrastructure roll-out due to land acquisition and capacity challenges (budget and construction resources). Furthermore, the private sector participation has introduced significant competition for the limited connection capacity between the privately procured and the DMRE competitive bidding programme. To date, more than 40 renewable energy projects with a total capacity of over 6 GW are in the budget quotation phase, with more applications received daily. There's also a significant growth in rooftop solar PV installations that are not registered with the utility, which has an impact on the demand forecast integrity.

Notwithstanding the above, the main challenge is that policy changes have largely outpaced the development of the enabling processes and procedures, resulting in some execution challenges. This are having an impact of the quotation and construction timelines.

Management Considerations

1. Develop an industry accepted network assessment and queuing rules for Independent Power Producers to circumvent any potential disputes, as well as to enable a transparent and non-discriminatory grid access.
2. Encourage timeous registration and information sharing by the IPP projects to ensure alignment with the long-term transmission planning process.
3. Appropriate resourcing and pre-planning of the IPP connection enabling transmission network to facilitate speedy and agile quotation process.
4. Forge a much closer collaboration between transmission and distribution planning to improve efficiency and future network security