

Energy storage solutions pose an opportunity to grow the local battery storage industry

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As many nations transition towards greener sources of energy in order to achieve their carbon emissions targets, energy storage is anticipated to be central in many of these decarbonisation efforts. After generation, energy requires storage as part of demand management to ensure its availability during peak hours or for transmission to energy deficient areas through wheeling of energy between geographical locations.

Many South African industries have experienced loss of output induced by relentless load shedding over the years therefore alternative ways to guarantee sustainable energy for industrial development are becoming increasingly urgent.

The President recently announced an energy plan, which has a raft of programmes and policy options aimed at mitigating the energy crisis. Chief amongst these measures is the removal of the licensing threshold of 100MW for embedded generation by both households and industries. As many of the planned projects come on stream, there will be a greater need to store energy in order to meet energy demand during peak demand times and during load shedding.

There are already encouraging developments in the local industry in terms of demand for storage solutions. Eskom is now searching for solutions for demand management and it has started procuring battery energy-storage systems (BESS). It has awarded contracts to two suppliers (a South Korean company called Hyosung Heavy Industries and a Chinese company named Pinggao Group). Both companies will design, supply, install and operate the two projects over a five-year period.

The project will be implemented in two phases. According to Eskom, *“The first – which is due to come online from June 2023 – will allow for 833 MWh of storage capacity across eight of Eskom's distribution substation sites, along with 2MW of solar PV capacity. The second phase – to be commissioned from December 2024 – will allow for 616 MWh of battery storage at four of Eskom's distribution sites and a transmission site”*

In addition, the Independent Power Producer (IPP) office intends to request proposals to procure 513 MW of battery storage. The IPP office states, *“The expected rise in renewable energy production in the country means that battery storage will become key to managing the electricity grid. The large-scale battery storage capacity will be located at Eskom substations, with the utility buying the stored electricity from the successful bidders”*

Furthermore, other IPPs such as Scatec SA have projects in the pipeline that are designed to use the solar-to-battery technologies. Industrial and household embedded energy generators and end-users further boost demand for battery storage as they try to mitigate the impact of the energy-supply crisis that has beset the country.

These developments are expected to increase the demand for energy storage applications especially for technologies such as the Lithium-ion (Li-ion) batteries. The developments also create an opportunity for industrialisation and job creation aided by advances in Li-ion battery technology. Li-ion batteries have been scaled-up to grid-scale size as a source of back-up energy to the grid in many advanced countries.

South Africa has an emerging Li-ion battery industry, which if adequately supported, can become a key role player in supplying storage solutions to energy producers such as Eskom and other industrial embedded generators. Engagements with the industry indicated that a few firms have ventured into this space, and are involved in a number of activities across the value-chain such as battery systems assembly. Estimates from the industry also indicate that as at 2021, the country imported

approximately R8-billion worth of Li-ion batteries. Local producers can potentially replace this value of imported batteries.

The local industry is poised to benefit from economies of scale generated by the new projects that are in the pipeline and increased demand by industrial and household end-users. So far, foreign-based companies dominate the supply of battery storage for the projects that are in the pipeline. The country risks losing the opportunity produce energy storage batteries locally and to advance the industry.

A number of challenges beset the local battery storage industry and active actions are required to unblock them. Firstly, the local industry depends on imported battery cells as South Africa has limited local technology and does not have large-scale manufacturing capabilities (these cells constitute 60% to 70% of production costs). Supporting the research and innovation activities in battery cells will yield long-term benefits for this industry.

Secondly, the industry faces competition from imported low quality and fully assembled batteries, which exert pricing pressure on local products.

Thirdly, there is limited policy support and related regulatory enforcement in the industry. At present, there are no South African Bureau of Standards (SABS) specifications and standards for the Li-ion battery industry. If these standards and specifications are developed and implemented, they would significantly improve the fortunes of the industry.

Lastly, a significant threat to the local industry comes from over-reliance on lithium ferro-phosphates (LFPs) from China. This leaves local firms vulnerable to policy changes emanating from China, particularly changes in pricing and possible market restrictions with respect to trading in LFPs.

What would enable the local industry to scale-up production?

Resource endowments in the local mining sector are favorable as most of the raw materials required for many Li-ion battery chemistries are available locally, especially manganese. The Li-ion battery industry provides an opportunity for beneficiation of these minerals through scaling-up of local production of storage batteries.

In addition, favourable energy wheeling frameworks and tariffs are required in order to boost the potential for significant private sector investment in renewable energy generation by removing some of the geographical location-based restrictions. Investment in energy storage becomes viable if surplus energy can be transferred at favourable wheeling tariffs to locations where there is energy deficit.

Moreover, red tape especially at local government level where most projects are situated needs to be reduced. It is paramount for the country to have a supportive framework for feed-in-tariffs, which is a cost-based tariff, paid to embedded energy generators for supplying surplus energy to the grid. This would promote investment in renewable energy generation, including storage infrastructure. Currently, South Africa does not have mandated feed-in tariffs as these are determined at municipal level.

Lastly, investment in the expansion of the existing Li-ion technology research and development (R&D) and innovation footprint in the country (in cell technology development, battery testing and certification) is urgent. Investment in R&D and innovation in materials and large-scale cell manufacturing capabilities is needed to ensure performance improvements. Failure to invest the necessary resources will prolong South Africa's deficiencies in competitive cell manufacturing capabilities.

More importantly for **the dtic**, the following actions are critical for the development of the battery storage industry. Firstly, the International Trade Administration Commission of South Africa (ITAC) should reconsider the decision on tariffs for fully assembled Li-ion batteries. This needs to be accompanied by anti-dumping measures, which ought to be instituted for bad lithium technology and products such as B-grade and second life cells.

Secondly, the SABS and National Regulator for Compulsory Specifications (NRCS) need to develop and introduce relevant regulatory standards and specifications, and enforcement mechanisms thereof, since few batteries available in the market meet the CE requirements.

Thirdly, given the current deficiencies in technology, consideration should be made for direct investment in the sector through support for the establishment of technology partnerships with foreign firms. Some companies have already taken steps to approach the Industrial Development Corporation (IDC) for funding. Financial support can also take the form of financing of joint ventures between IPPs and priority industries, which can jointly develop and implement embedded energy generation projects for industrial sustainability.

Lastly, direct incentives for the Li-ion industries can be advocated for as this is deemed a critical industry for the green economy priority sector.

In conclusion, South Africa will miss an opportunity for industrial development and job creation if no active steps are taken in time to grow this critical industry. So far, initial indications are that the few large-scale projects that are in the pipeline are already dominated by foreign firms and without active efforts to develop this industry, local firms will continue to be by-standers.