Lithium-ion batteries offer an electrifying opportunity for South Africa

The global move to low-carbon transportation options, such as electrical vehicles (EVs), brings battery technologies to the fore. This provides unique opportunities for policy makers and local producers to explore South Africa's competitive advantage in the lithium-ion batteries (LIBs) value chain.

This emerged as a key theme from a study on opportunities to develop the lithium-ion battery value chain in South Africa, initiated by the United Nations Industrial Development Organisation (UNIDO) and the Department of Trade, Industry and Competition (dtic) as one of the deliverables of the Low Carbon Transport project in South Africa. A report on the study, which was conducted by Trade and Investment Policies (TIPS) on behalf of the project, was launched today during a side event of the Africa Energy Indaba.

According to Gerhard Fourie, the dtic's Chief Director of Green Industries, the report is intended to "feed into the broader debate around low-carbon transport, green industrial development and policy shifts in terms of the development of the EV value chain. The increased prominence of EVs entering the market is mentioned in the report, highlighting battery technologies as an important component of sustainable development. In view of the commitment of government and industry to ensure the country retains the position of the local automotive manufacturing value chain as a key player in the mobility of the future, the study investigated the potential for a South African lithium-ion battery (LIB) value chain."

Fourie adds that "every stage of the LIB value chain was therefore investigated with the aim of identifying the country's existing and potential competitive advantage. In addition, the TIPS research team sought to answer a number of questions, such as: can the country develop new capabilities relevant to the battery value chain? Should the country focus on specific segments of the value chain or work to build a complete value chain domestically? And finally, acknowledging that the country has the minerals required for the production of batteries, does South Africa and other African countries have the potential to build on their natural resources to support mining and beneficiation?"

What emerged is that there is a "vibrant value chain", but not all stages are at the same level of development. The report points out that "mining of multiple LIB-relevant minerals, such as manganese, iron ore, nickel and titanium, is already underway in the country and the region. Mineral beneficiation for battery production, while limited, is also present in the country, with existing pockets of excellence in manganese and aluminium and interesting developments in lithium, nickel and titanium. Importantly, battery manufacturing (off imported cells) and battery refurbishing (second-life batteries) is a booming opportunity with many firms operating in this space, leveraging unique expertise and intellectual property, notably in the development of battery management systems. By contrast, cell manufacturing, while explored at the R&D level, is yet to be proven commercially viable in the country. Similarly, the development of recycling is still early days in the country."

Identifying where in the value chain South Africa is competitive is critical, so as to channel support and resources into the most sustainable activities. Based on the research, four possible technical pathways are proposed to support the development of the LIB value chain: 1) battery manufacturing 2) mineral refining; 3) cell manufacturing; and 4) battery recycling.

The study noted that developing battery manufacturing and mineral refining are ready for scale-up whilst cell manufacturing and recycling could be explored in the medium to long term, provided they prove to be economically sustainable. The report notes that where there are "key pockets of excellence" (battery manufacturing, mineral beneficiation and mining), efforts and resources should be focused on these activities. TIPS research leader Gaylor Montmasson-Clair stresses that "indeed, the development of the LIB value chain is a fantastic opportunity for South Africa, provided the country invests in its strengths and competitive advantages, rather than unsubstantiated aspirations."

The study pointed out that "an established LIB industry is instrumental to the local development of both the (renewable) energy and (electric) transport industries." Hence, ensuring high levels of local content in renewable energy and automotive manufacturing will be dependent on localising the battery value chain as much as possible. In turn, strong partnerships and collaboration between public and private institutions as well as between local and international players is critical in growing the LIB value chain.

According to Dr Blanche Ting, Energy and Low Carbon Coordinator for UNIDO, it was noteworthy that the study also mentions the minerals beyond South Africa, particularly on the African continent. Among SADC are graphite (Mozambique and Tanzania), nickel (Botswana, and Zimbabwe), titanium (Mozambique, Madagascar) amongst others. Potential for regional industrial integration of these minerals notably though the implementation of the Southern African Development Community Industrialization Strategy and Roadmap 2015-2063, and the recent implementation of the African Continental Free Trade Agreement (AfCFTA) should be explored.

In moving forward, the report highlights that aside from identifying where in the entire LIB value chain South African industries are (or could be) competitive, a number of key components, such local testing and certification as well as access to funding for commercialisation of innovations, are required to establish an enabling policy framework for the development of the LIB value chain. In addition, facilitating access to markets, both domestically and globally, and shaping R&D and skills development in line with South Africa's competitive advantage would play a large part in South Africa succeeding in developing the value chain.

Issued by: the United Nations Industrial Development Organization (UNIDO), the Department of Trade, Industry and Competition (the dtic), and Trade and Investment Policies (TIPS). The link to the report: https://www.tips.org.za/projects/current-projects/item/4014-lithium-ion-battery-value-chain

Media enquiries: Dr Blanche Ting**,** UNIDO South Africa**,** Cell: +27 (0)60 796 4615 **or** Email: m.ting@unido.org. On behalf of TIPs, Gaylor Montmasson-Clair on 071-3199504 or Email: gaylor@tips.org.za