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PRESS RELEASE

Bertin Energy & Environment looking for green energy supply solutions for the giant SKA radio telescope

Bertin Energie Environnement is supported by the French private sector research and assistance fund (FASEP) to study possible energy supply solutions for the South African part of this large radio telescope. The company will thus offer SKAO (SKA Organization) and SARAQ (South African Radio Astronomy Observatory) scenarios for an economical, reliable and environmentally friendly energy supply.



Illustration of the central hub of the future South African parabolic network. Source: SKA

SKA (Square Kilometer Array) will soon be the **largest radio telescope in the world**, ultimately covering a **total collector area of one square kilometer** in the Karoo Desert in South Africa (SKA1-MID) and Murchison County in Australia (SKA1-LOW). Designed by an international scientific consortium, it aims to study fundamental questions such as the initial phases of formation of all objects in the Universe or the Cradle of Life.

With the **64 antennas already in existence through the MeerKAT South African radio telescope, of which 133 additional SKA1-MID dishes will be integrated by 2028**, the site's overall energy demand is estimated at **5 MW** approximately. Today, MeerKAT is connected to the local electricity grid, which is not adapted to support the required power, mainly supplied by fossil fuels. The objective of this comparative study is therefore **to define a selection of technologies that are best suited** for the South African context, **safe, environmentally friendly and with a long-term perspective.**

Bertin is studying the various resources available in the area into consideration: **photovoltaic and thermodynamic solar energy, wind energy, hydropower, hydrogen and biomass**. The **experts also study the impact of production and storage technologies on the environment** by integrating product life cycle analysis. They identified and sized several solutions to better meet the needs of the SKA project. These solutions highlight **technological innovations, some of which are French**, that make it possible to consider an **economically and technically credible alternative to fossil resources**.

Bertin is studying in particular the **integration of solar energy with trackers** to reduce grid energy demand in a centralized configuration, that is, with a distribution network providing all the buildings and antennas. The interest of daily storage for balancing photovoltaic production will be studied.

Bertin is also interested in the possibility of independently feeding the antennas furthest from the center, in order to avoid the costs and losses associated with the distribution network. It will then be necessary to size many **mini photovoltaic networks** with short (battery) and long-term storage (Redox Flow battery, hydrogen, mini-STEP...) for balancing and solar intermittency smoothing.

This initiative was made possible by the CNRS and the House of SKA France, which represent France's interests and contributions to the designers of the SKA project. In addition, energy companies, industries and technology SMEs have expressed an interest in taking part of the project, including Air Liquide, Atos, CVE (Cap Vert Energy), EDF INGEUM, Ergosup, Helioslite, Hysilabs, Kemiwatt, SAFT, Stepsol and Total Eren. The resulting monitoring club thus initiates a reflection on the most appropriate financing method for the project, between private or public investments, installation of demonstrators, etc. Travel is planned in the country and on site, in order to adapt the solution to the specific challenges of the project.

This study thus makes it possible to set up a **replicable analysis methodology** and to form a **group of French companies**, able to propose an industrial offer for the energy supply of isolated and export-sensitive sites.

ABOUT BERTIN TECHNOLOGIES

*Bertin Technologies, subsidiary of CNIM Group, relies on its long experience of innovation to offer innovative consulting and engineering services. Its **Bertin Energy Environment department** supports territories and industries towards energy autonomy and environmental exemplarity through a complementary set of expertise related to energy efficiency, process flexibility, renewable and decentralized energy production, smart grids, microgrids and energy management systems.*

In addition, the company develops, produces and markets innovative systems and instruments worldwide.

Among its 620 employees, there are 2/3 engineers and high-level managers. The company is active worldwide and its turnover amounts to nearly 100 million euros in 2018.

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A COMPANY OF THE CNIM GROUP

Founded in 1856, CNIM is a French equipment manufacturer and industrial contractor operating on a worldwide basis. The Group supplies products and services to major public and private sector organizations, local authorities and national governments in the Environment, Energy, Defense, and High Technology markets. Technological innovation is at the core of the equipment and services designed and manufactured by the Group. They contribute to the production of cleaner and more competitive energy, to limiting the environmental impacts of industrial activities, to making sensitive facilities and infrastructures safer and protecting individuals and nation states. CNIM is listed on the Euronext exchange in Paris. It relies on a stable family-based majority shareholding structure committed to its development. The Group employs 2,613 staff and reported revenues of €689.8 million in 2018, 62.1 % of which was from exports.

The SKA project is part of the Group's strategy to be present on major international projects addressing current scientific, technological and environmental challenges.

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