

ADEME



Agence de l'Environnement
et de la Maîtrise de l'Energie

Club ADEME
International



Bretin Energie Environnement



South Africa



Duration
9 months



Amount euros
380 K€



Staff mobilized
10 people internally,
including 1 person
seconded to the site

Thematic



Benefits performed

Studies

Search for energy supply solutions for the giant SKA telescope

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.

Financial support / subsidy

Trésor
DIRECTION GÉNÉRALE

Subsidy within the framework
of the FASEP Etudes system (DG Trésor)

French partners

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 project's objectives

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 objective of the comparative study is to define a selection of technologies that are best suited for the South African context, safe, environmentally friendly and with a long-term perspective.

Milestones

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**.

Environmental impact

The work carried out leads to a preference for solar energy, coupled with a storage solution yet to be defined, rather than the electricity grid, which has the characteristic in South Africa of being powered mainly by coal-fired power plants and experiencing frequent outages.

Local customers and beneficiaries

The company will offer SKAO (SKA Valorisation) 150 mots Organization) and SARAO (South African Radio Astronomy Observatory) scenarios for an economical, reliable and environmentally friendly energy supply.

Post-project results

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.

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Ils l'ont dit...

This study leads us to design an energy supply solution based on renewable energies and meeting the technical challenges of the project, which is very particular as it is a telescope: desert area, interference to avoid with the telescope's instruments, high availability requirements.

This work leads us to present solutions such as hydrogen production and storage, flow batteries, etc. to a country that is still unfamiliar with these technologies. We hope to enable French companies to win contracts for the construction of this major scientific instrument with global reach.



With more than 130 members, the Club ADEME International assists the SMEs in its network in the development of innovative projects and international partnerships. The objective is to participate in the dissemination of French knowledge, by supporting the private and public sector in the ecological and energy transition sector in order to meet global environmental and climate challenges.

For more information : www.clubinternational.ademe.fr

