

PROOF OF CONCEPT ENERGY TRANSITION AT CSG

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Abstract: The European Space Agency and CNES have been building for the last three years an ambitious, innovative and realistic large scale decarbonization project in the Guiana Space Centre.

The energy footprint of the CSG must be reduced. The 'greening' project covers all energy issues and solutions related to production, economics and management. Its detailed implementation began back in 2021 and, even though full deployment will take a total of four years, the first results of this project will see the light as early as 2023.

The operating conditions of the energy supply configuration at CSG will change. The evolutions of the supply by the EDF SEI network is aimed to change because of the integration of new power sources (photovoltaic and biomass). On top of that, the increases of costs and the new carbon taxes will have also an impact on the energy management at CSG. Consequently, many factors need to be mastered to ensure decarbonisation and cost reduction: control, acquisition and data processing are essential means of proactive energy management including the creation of the future smart-grid.

Since 1991, GTD has provided continuous support to CSG operations with its engineering skills as well as technical aid to various contractors. In these new challenges initiated by ESA and CNES, two of the identified main areas in energy consumption at CSG are the cold and heat necessary for industrial processes and the climate management of CSG infrastructures. To provide an effective answer to this situation, GTD has identified existing solutions actually applicable to CSG.

Before embarking on a massification phase of these solutions, technological demonstrators will be deployed on the UPG site (Regulus) and on the Europropulsion site (BIP). Technologies for storing heat and cold are now available, thus making it possible to produce these energies when cheaper and carbon-free -night production, photovoltaic and biomass power plants-.

These processes are complex, the principle of action is to model the heating or cooling existing networks together with the addition of storage solutions, as the objective is to have a reality-accurate model in order to test all guidance and performance possibilities. During the massification of solutions, a dynamic dimensioning will be used in order to consider the particularities of each installation.

These demonstrators, and the resulting massification, are based on three fundamental pillars: the technology itself, dynamic modelling, and the command and control of such installations. The massification of facilities offers possibilities for setting up primary and secondary reserves. Indeed, it is a factor of financial gain and decarbonization, as peaks in demand are carbon-intensive.

In conclusion, all these solutions regarding production, storage and savings will have a direct impact on the cost of energy for each CSG stakeholder.