

Technology, energy efficiency and sovereignty: the multiple challenges of GigaFabs in Europe



As the COP 27 meeting held in Sharm el-Sheikh (Egypt) underlines the urgency of climate change, the mobility sector represents a major contribution to meeting this challenge. Energy transition is a vital aspect. This prompted the French President to recently reaffirm his ambition of producing 2 million electric vehicles in France each year. To achieve this goal, the production of batteries is essential. Christian Perrier, GigaFab Project Director at Equans France, explains the technological challenges and the key energy and climate-related requirements.

Why are electric batteries such a major issue?

The market is booming and this trend will continue to gather pace, generating ever-increasing requirements. Firstly, because of European legislation, which states that only electric vehicles may be sold from 2035 onwards. This acceleration and the resulting transformation of the automotive industry has consequences for the value chain. Indeed, the battery accounts for 40% of the value of an electric vehicle. The technical and technological challenge is therefore becoming geostrategic, since Asia alone accounts for 95% of production for the European market. The risk is all the greater as the Chinese domestic market is booming, with increasing demand.

However, the European Union has joined the fray and is currently supporting some fifteen serious GigaFab projects, each of which requires investments of between 1.5 and 2 billion euros.

What are the technological challenges involved?

The rejection rate, i.e. the number of substandard products, is still too high in the first battery production plants in Europe, at around 8 to 10%. Equans Digital, a dedicated brand of Equans, the world leader in multi-technical services, is able to leverage its expertise in the development of hypervision systems to allow for the real-time monitoring of production. These 4.0 factories rely on BIM (Building Information Modelling) technologies to control the entire production chain. Derived from the pharmaceutical and microelectronics industries, skills and solutions in the management of fluids and gas processes on Seveso sites, with ultra pure or ultra-hazardous products, are essential. A number of Equans' solutions have been patented.

Because batteries and their components are particularly sensitive to the presence of water in the air, in GigaFabs it is essential to protect the products being processed in anhydrous rooms. The

aim is to reduce any water in the air as much as possible by using HVAC (heating, ventilation, air conditioning, air treatment) techniques.

As Europe is in the process of playing catch-up, GigaFabs projects have very tight deadlines. The whole engineering side therefore needs to be reorganised, with engineering processes managed in parallel rather than sequentially. Just like performance and quality, time savings are non-negotiable.

How can the energy bills of gigafabs be reduced?

With installed electrical capacities of 100 to 150 MW, industrial battery production sites are particularly energy intensive. Energy optimisation is therefore a major issue, with tens of millions of euros at stake each year.

The energy performance solutions are designed from the preliminary stages to ensure perfect integration into these plants. The preferred approach is a comprehensive method, starting from each consumer, process and utility, in order to build an integral vision tailored to the strictest requirements. This implies perfect knowledge of the technical needs and processes, in order to identify the best factors for optimisation.

The choice of the best facilities is the other key aspect of energy performance. It is possible to use energy systems that greatly reduce energy consumption. These solutions contribute directly to energy efficiency with consequences for the production costs and therefore for the price of the batteries. In a global market where industrial sovereignty is a permanent challenge, it is essential to combine energy, economy and environment. This is also the goal of Equans, which supports the threefold energy, industrial and digital transition.

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About Equans

Equans is a world leader in energy services with nearly 100,000 employees, working in more than 50 countries and an annual turnover of over 17 billion euros.

Equans designs, installs and provides customized solutions to improve the technical equipment, systems, and processes of its clients and to optimize their use through their energy, industrial, and digital transitions. Thanks to a strong territorial footprint through historical local brands and excellent technical know-how in their clients' business fields, Equans' highly-qualified experts are able to support regions, cities, industries and buildings in areas such as HVAC (heating, ventilation and air conditioning), Cooling and Fire protection, Facility Management, Digital & ICT, Electrical, Mechanical, & Robotics.

Equans is the number one company in the main European markets (France, Switzerland, Belgium, the Netherlands, and the UK) and is also well ranked in the US and in Latin America. Equans is a Bouygues group company.