The electrochemical energy storage (EES) market is booming. While lead batteries remain the major technology in terms of volume with 70% of the market in GWh, Li-ion batteries are growing strongly (annual growth rate of about 15%) and now represent more than 50% of annual sales. This growth is driven by the electrified vehicle market (battery electric vehicle and plug-in hybrid electric vehicles) that is rapidly emerging around the world to limit greenhouse gas emissions and contribute to the energy transition.

The uses and needs related to electrochemical storage push the development of solutions that present higher energy and power densities, containing less critical or strategic materials and improve service life and safety. Unlike accumulators dedicated to consumer electronics applications, EES are based on serial and parallel combinations of many accumulators. These solutions must be sustainable and economically viable to have a positive impact on the climate. Complementary uses are also being given major attention at CEA Tech to cope with the strong emergence of intermittent electricity production (photovoltaic and wind power) that require massive energy storage. Two solutions are highly advanced to complement stationary batteries: the V2G (Vehicle to Grid) and the V2H (Vehicle to Home) whose main interests are to use the battery integrated in a vehicle as a temporary support to the grid.

CEA Tech, a major French research player in the energy transition, offers skills in the fields of electrochemistry, electronics, electrotechnic, thermal, mechanics together with safety management and ecodesign.

Around 200 researchers and technicians combines experimental work, carried out on dedicated platforms, with multi-scale and multi-physics modelling in order to understand in-depth controlling mechanisms and develop tomorrow’s systems, such as solid Li-ion batteries, Na-ion or K-ion batteries, or high-energy supercapacitors. CEA Tech is partner or coordinator of numerous National, European and International projects involving industrial partners on electrochemical energy storage systems.

Completing a thesis at CEA Tech is a unique opportunity to contribute to the energy transition and to acquire skills on a current societal hot topic.

**CEA-Liten Institute in Grenoble Alpes**

**40 ongoing PhD projects**