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Created in 2018 under the leadership of IFP Energies nouvelles (IFPEN), alongside CEA-LITEN, EIGSI, Gustave Eiffel University, IMS and UTC, [the COMUTES<sup>2</sup> \(Consortium pour la Mutualisation de Tests Electriques sur Systèmes de Stockage\) consortium](#) aims to set up and carry out joint battery ageing test campaigns, that are open to external members. COMUTES<sup>2</sup> is now launching its very first test campaign dedicated to the cold cycling ageing of Li-ion batteries. Five industrial partners have signed up to COMUTES<sup>2</sup> for this campaign: DGA, EDF, Hutchinson, Siemens and Valeo.

Through the creation of the COMUTES<sup>2</sup> consortium, the Carnot IFPEN Transports Energie, CEA-LITEN, EIGSI, Gustave Eiffel University, IMS, and UTC make use of their shared experience of more than 10 years of collaborative projects (Ademe, ANR and FUI) in accelerated battery ageing campaigns.

## High-stakes test campaigns for electric mobility

Batteries account for more than 30% of the cost of electric vehicles, and so improved knowledge of their behavior and lifetime estimates are essential for the large scale roll-out of electrified transport.

The objective of COMUTES<sup>2</sup> accelerated ageing campaigns is to characterize the behavior of batteries under a large variety of loading conditions (temperature levels, current levels, states of charge, etc.) at different partner laboratory sites. The obtained databases would make it possible to comprehend the ageing mechanisms involved and to create models for determining the viability of batteries in a given application (transport, stationary storage), whether they are first or second life batteries.

As part of this first campaign, the partners will study the impact of cold temperatures on Li-ion battery response throughout the charge/discharge cycle over a 12-month period. Indeed, lithium metal deposition mechanisms can be considered, particularly during the charging phase, which can degrade the batteries; a problem which is all the more topical as the battery cells are increasingly energy dense and subjected to higher and higher charging currents.

## A novel approach to collaborative research

Coordinated by IFPEN with the help of all the partners, [COMUTES<sup>2</sup>](#) is now opening its ageing campaigns to external partners. They would take part in defining and selecting the type of tests and contribute to their funding. The databases generated during a testing campaign equally belong to all participants (investigators and members), who can use them for internal research purposes.

The study of battery ageing requires substantial testing facilities and a real know-how in setting up experimental stations and interpreting the results. Through pooling these resources and sharing costs, COMUTES<sup>2</sup> offers an innovative means of research that allows quick and efficient responses to these challenges, and also distribute the project outputs.

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Studying battery ageing: the COMUTES2 consortium launches its first-ever testing campaign  
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