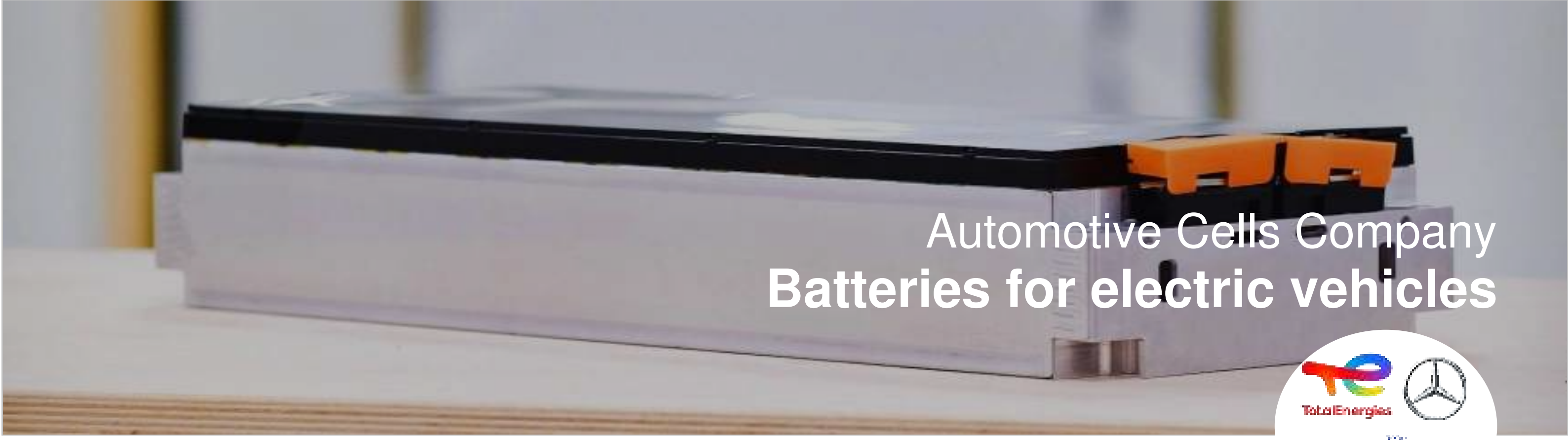

Automotive Cells Company
Batteries for electric vehicles

The project consists in building three gigafactories for the production of battery cells and modules for electric vehicles (EV).

Starting date of the project

Mid-2020 (creation date of the joint venture, ACC).

Project localization

These factories will be located in France, Germany, and Italy.

Project objectives

ACC designs, manufactures, and markets battery cells and modules for EV. The objective is to contribute to the energy transition, one of the main challenges of which is the decarbonization of transport, by facilitating access to environmentally friendly, sustainable electric mobility.
To achieve this, ACC wants to become a European champion for EV batteries, with a presence on all the segments of the value chain, and to make EV more affordable – the battery effectively represents around 40% of the total cost of an EV.
ACC intends to work toward a more virtuous mobility owing to its procurement policy, the eco-design and recycling of its products, and the sustainable management of its factories as part of a long-term perspective.
The price drop will be achieved thanks to the efforts of the ACC center's R&D teams in Nersac and by reducing the additional logistics costs of current batteries, essentially produced in Asia.

Detailed project description

The fundamental and inevitable transition toward an all-electric vehicle fleet is a huge challenge for France and Europe alike. The battery value chain is almost entirely controlled by Asia (China, Korea, Japan): extraction and refining of the minerals, manufacturing of the components, and so on. Based on this observation, TotalEnergies and Stellantis launched the joint venture ACC with the support of the European Union as part of the IPCEI (Important Projects of Common European Interest). They have since been joined by Mercedes-Benz. The partners have planned to build three gigafactories:

- At Billy-Berclau / Douvrin in the Hauts-de-France region – start of production in late 2023.
- At Kaiserslautern in Germany – start of production in 2025.
- At Termoli in Italy – start of production in mid-2026.

Each factory comprises three production units that will be gradually brought into service (roughly one block every 18 months). The objective is to attain a production capacity of 120 GWh of EV batteries per year between end 2023 and 2030, i.e. 40 GWh per year per factory, making it possible to equip around 850,000 EV each year.

Main project's drivers for reducing the greenhouse gas emissions

Reduction levers	Details on the aspects of the project
☒ Energy and resource efficiency (including behavior)	Optimization of the value chain, particularly procurement, recycling, etc.
☒ Energy decarbonization	Heat engine vehicles replaced by electric vehicles
☐ Energy efficiency improvements	
☐ Improving efficiency in non-energy resources	
☐ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, etc.)	
☐ Financing low-carbon producers or disinvestment from carbon assets	
☐ Reduction of other greenhouse gases emission	

Emission scope(s) on which the project has a significant impact and quantification

	Aspects of the project contributing to the reduction of emissions by emission category	Quantification of associated GHG emissions by emission category

of GHG emission reductions per emission scope

		Please follow the quantification methodology used in the Afep guidelines.
Reduction of the company's carbon dependency		
Scope 1 *Direct emissions generated by the company's activity.*	-	
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*	-	
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.*	-	
Increase of carbon sinks		
Emissions Absorption *Carbon sinks creation, (BECCS, CCU/S, etc.)*	-	
GHG emissions avoided by the company at third parties		
Avoided emissions *Emissions avoided by the activities, products and/or services in charge of the project or by the financing of emission reduction projects.*	Heat engine vehicles replaced by electric vehicles fitted with electric batteries made in Europe.	Gradual growth between end 2023 and 2030 from 3-4 MtCO$_2$eq/yr to 30-40 MtCO$_2$eq/yr.

Clarification on the calculation or other remarks:
The avoided emissions calculation is based on the factors – throughout the lifecycle – taken from the study "*Quelle contribution du véhicule électrique à la transition écologique en France*" (The contribution of electric vehicles to the ecological transition in France) carried out by the *Fondation pour la Nature et l'Homme* (Foundation for Nature and Humankind) and the European Climate Foundation in December 2017.

At the end of 2023, with the start-up of the first unit of the first gigafactory, ACC will have the production capacity to equip around 280,000 EV/year.
In 2030, when the three gigafactories are working at full capacity (3 x 3 units), 2.5 million EV per year will be able to be fitted out. Between these two dates, the different units will be gradually brought into service and each one will help avoid 3 to 4 MtCO$_2$eq/year.

The calculation for 2030 is as follows:

Situation before the project	Situation after the project
2.5 million heat engine vehicles sold each year. Emissions (lifecycle) of a heat engine vehicle in 2030 (taking into account recycling credits): 19.6 (city car) to 30.9 (sedan) tCO$_2$eq.	2.5 million electric vehicles sold each year. Emissions (lifecycle) of an electric vehicle in 2030 (taking into account recycling credits): 8.1 (city car) to 13.9 (sedan) tCO$_2$eq.
Emissions (lifecycle) of the 2.5 million heat engine vehicles sold each year in 2030: 49 to 77 million tCO$_2$eq per year.	Emissions (lifecycle) of the 2.5 million electric vehicles sold each year in 2030: 20 to 35 million tCO$_2$eq per year.

Modality of verification of the quantification

Calculation standard used (ADEME base, GHG protocol, etc.) The study which served as the source of these calculations underwent a critical review. Overall, it meets the requirements and recommendations of ISO standards 14040 and 14044.
Verification of the calculation (internal or external): internal

Other environmental and social benefits of the project

This project contributes to the following SDG:

SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
By helping to create a new industry in Europe, and particularly initial and continuous training courses for working in the battery sector, the ACC project contributes to target 4.4 among others. Skills and access to employment, where the aim is to substantially increase the number of young people and adults who have relevant competencies, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

SDG 5 - Achieve gender equality and empower all women and girls
ACC wants to make it easier for girls and women to access its professions and have an employment rate for women higher than the average of the industry.

SDG 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
The ACC project contributes in particular to targets 9.2. Inclusive and sustainable industrialization, 9.4. Upgrade infrastructure and retrofit industries, and 9.5. Innovation, research and development. The ACC relies on substantial R&D efforts undertaken in

	two facilities: a center of expertise near Bordeaux and a pilot factory near Angoulême, where our engineers and researchers are working on the next four generations of batteries. ACC has also signed research agreements with various institutes, laboratories, and higher education institutions as part of the IPCEI. The company has committed to funding five PhDs each year, attending at least 50 conferences between 2020 and 2025, and publishing articles to share the results of our R&D not protected by intellectual property. Lastly, ACC contributes to reindustrialization by building new factories in France, Germany, and Italy. These factories are located on former industrial sites, which are finding new value in the conversion to an industry of the future while being part of the energy transition. **SDG 12 - Ensure sustainable consumption and production patterns** The ACC project contributes to developing electric mobility and to creating a European battery industry governed by extremely high environmental, social, and ethical criteria as regards procuring raw materials and manufacturing batteries in Europe. **SDG 13 - Take urgent action to combat climate change and its impacts** ACC was created as part of a European ambition to decarbonize the transport sector by developing an electric vehicle battery industry in Europe. The aim of the ACC project is to have the smallest possible carbon footprint and to constantly optimize it – in terms of both the products and the manufacturing processes – by continuing to perform R&D work for the next generations of batteries.
Project maturity level	☐ Prototype laboratory test (TRL 7) ☐ Real life testing (TRL 7-8) ☐ Pre-commercial prototype (TRL 9) ☐ Small-scale implementation ☒ Medium to large scale implementation **Remarks:** Click here to enter the level of maturity of the project
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	Three gigafactories are planned as part of this project. Electric vehicles will be increasingly used worldwide, even if the rate of deployment varies from one region to the next. In all areas where this sector is booming, it will be possible to develop local production centers for electric vehicles.
Amount of investment made (in €)	> €7 B
Economic profitability of the project (ROI)	☐ ST (0-3 years) ☐ MT (4-10 years) ☐ LT (> 10 years) **Observations:** Not disclosed
Engaged partnerships	A partnership was signed with Umicore for recycling the batteries of the ACC research site in Nersac.
Open comments from the project owner	In addition to the products that will contribute to decarbonizing the transport sector, ACC is working toward decarbonizing its processes and procurement chain. The main focuses of action in this respect are: - The eco-design of manufacturing processes and products to reduce their environmental footprints, with a particular emphasis on constantly reducing the carbon footprint. The products are designed such that they can be reused second-hand; they are repairable and recyclable. The R&D teams are also working on extending their life expectancies. In the case of processes, the focus is on reducing energy needs at the source and doing away with the energy-intensive stages, particularly by switching to "dry processes" without solvents for the next generations of batteries. - A small percentage of recycled materials will be integrated into the very first products made. This percentage is set to increase thanks to partnerships with ACC suppliers, car manufacturing clients and recyclers in order to promote a closed recycling loop as far as possible. - The choice of suppliers to reduce greenhouse gas emissions related to procurement chain logistics among others, with an ambitious objective of 70% of its supplier base in Europe by 2025. - 100% decarbonized electricity in its factories and no more gas in its future units. An energy management system is also planned with ISO 50001 certification on each site.
More about the project	
Contact the company carrying the project	matthieu.hubert@acc-emotion.com
Project URL links	Automotive Cells Company (acc-emotion.com)

Illustrations of the project