



Sustainable mobility

Electrified Mobility

Batteries

All-electric vehicles operate with a battery and an electric motor. The large-capacity battery has to be recharged with the vehicle stationary at a charging station.

- Environmental benefits
- Challenges to overcome
- Progress in terms of range and costs



ENVIRONMENTAL BENEFITS

Electric vehicles represent an alternative solution of interest for reducing local pollution and, potentially, GHG emissions (it all depends on the source of the electricity). And the benefits increase the more they are used, as is the case with buses and service offers, for example, since the impact of manufacturing the batteries is mitigated through usage.

Reduction in air pollution: no pollutant emissions (HC, NOx and particles).

Potentially very low CO₂ emissions if the electricity is produced from renewable or nuclear energy. Average CO₂ emission reductions of 50% are possible in some European countries. In France, electric vehicles potentially have a good carbon footprint since most electricity is produced from nuclear energy. But in China, for example, most electricity is produced from coal and electric vehicles may therefore actually have a worse carbon footprint than that of traditional solutions.

It is thus **important to consider the entire life cycle, incorporating energy production and the vehicle's manufacture, to measure the real impact of electric vehicles.**

CHALLENGES TO OVERCOME

A number of challenges remain to be overcome before electric vehicles become a long-term and large-scale alternative to IC vehicles in the global car fleet:

- **reduction in the sales price,**
 - the need to establish **government incentive policies** to increase market shares,
 - **rapid recharging times,**
 - access to **recharging infrastructure** (good network of charging stations),
 - reinforced **battery autonomy.**
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PROGRESS IN TERMS OF RANGE AND COSTS

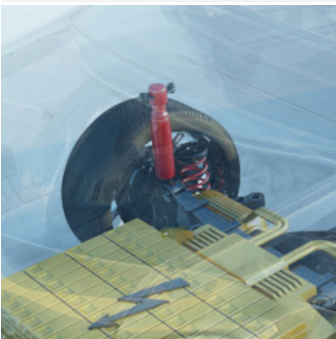
In the majority of cases, **the range of the electric vehicles** currently available on the market is **adequate to cover everyday journeys**, between home and work for example. Taking the most widely sold models in Europe, the average range (over harmonized test cycles) is 250 km, while a vehicle only actually travels an average of 50 km per day. However, range is still perceived as a factor hampering the decision to buy on the part of consumers, as is the relatively high sales price (even taking into account the purchase incentive rebate).

Substantial progress has been made in terms of battery energy density and it could increase significantly thanks to the emergence of new battery technologies using the lithium-air pairing, for example. This parameter is essential in order to evolve towards batteries that are more compact and lighter.

Did you know?

The operation of the lithium-ion battery, the current market standard, is based on the reversible exchange of the lithium ion between a positive electrode and a negative electrode. Such batteries are already fitted in several million rechargeable electric and hybrid vehicles.

Recharging infrastructures are multiplying in a number of countries. As of May 2023, France officially has 100,000 electric charging stations and 14,500 high-power stations, including 7,000 ultra-high-power stations (>150 kW) enabling charging in less than 20 minutes. The government's ambition is to reach 400,000 charging points open to the public by 2030.



Our expertise > Electrified mobility

Electric vehicles

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