Outstanding environmental performance: zero on-road CO_2 emissions, minimal noise, and excellent energy efficiency

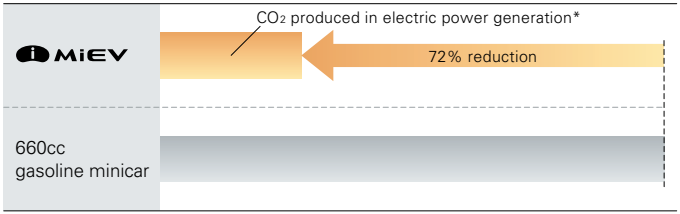
Know-how built up over years of electric vehicle development

Mitsubishi Motors' involvement in electric vehicle development began with the *Minicab EV* in 1971. Since then the company has continued its EV research and development, concentrating principally on motors and batteries. In 2006, the company developed the *i MiEV,* a new-generation EV, and is currently working with several power companies with a view to bringing it to market. A public road testing program has already produced a range of valuable and useful data.

Environmental performance unrivalled by other power sources

Electric vehicles return superior environmental performance compared to vehicles using other sources of power. For example, they generate zero on-road CO_2 emissions. Even in terms of well-to-wheel performance (efficiency of entire process, from fuel production and supply to operating the vehicle), which includes CO_2 emissions produced in electric power generation, the EV emits only about 30 percent of the CO_2 generated by a gasoline powered car of comparable size. With future improvement in the environmental performance of sources used for electric power generation, EV CO_2 emissions will drop still further.

Volume of CO_2 generated per 1 km (10-15 mode driving pattern)

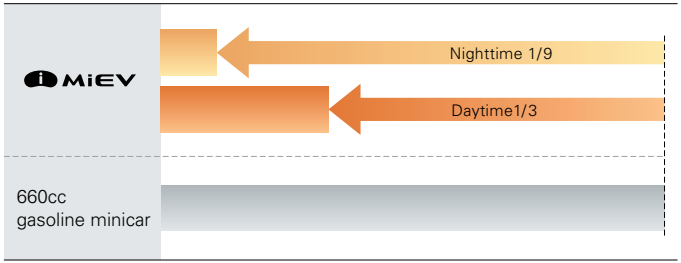


*Average for all electric power generation sources in Japan

EVs are cheaper to run

The cost of driving an EV 100 km is one-third that of a comparable 660cc gasoline minicar. If nighttime power is used to charge the batteries the cost is further reduced to around one-ninth or less, giving the EV a clear economic advantage. The EV can benefit from an energy regeneration system when driving downhill, decelerating or braking, employing the motor as a generator to achieve more effective energy utilization.

Driving costs over the same distance (10-15 mode driving pattern)



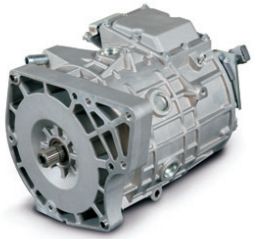
Gasoline price: 140 yen/ℓ (Tokyo Electric Power Company prices)

i MiEV—The pinnacle of Mitsubishi Motors' EV development technologies

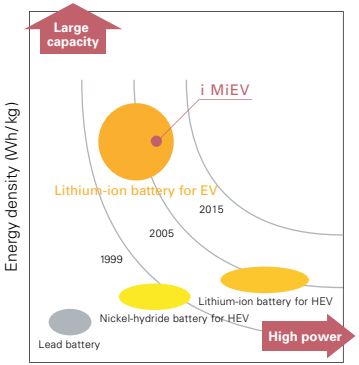
Development of core components — batteries and motors

Mitsubishi Motors turned to the lithium-ion battery at an early stage because of its high energy density and power density, and has continued its development of this type of battery to further improve performance. As a result, fleet monitor vehicles developed jointly with several electric power companies have achieved a cruising range of 160 km (10-15 mode driving pattern) on a single charge. The company has also developed a compact, lightweight, high-power, highly efficient permanent magnet synchronous motor.

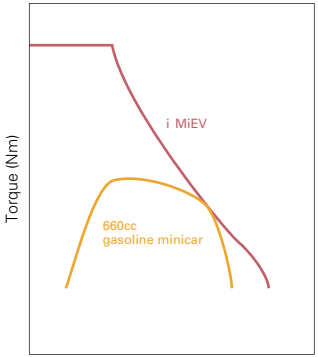
Lithium-ion battery



Permanent magnet synchronous motor



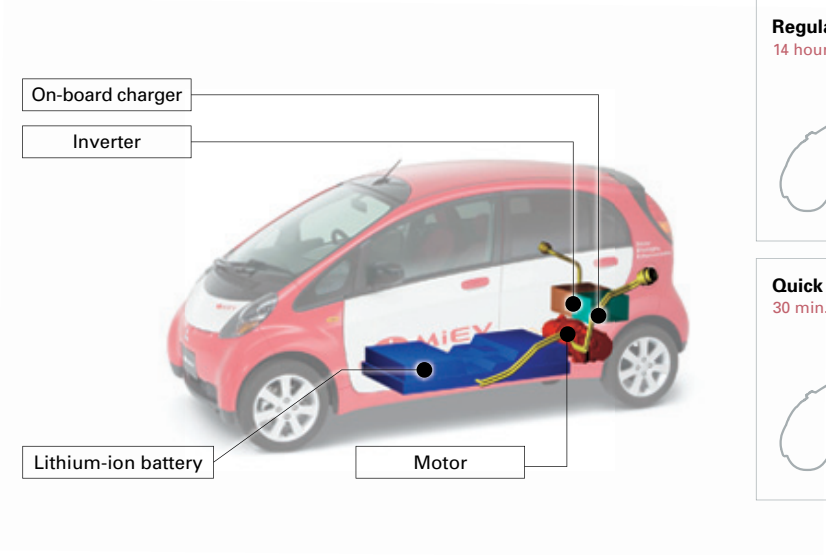
Lithium-ion battery performance graph



Permanent magnet synchronous motor torque graph

Optimum packaging with rear midship layout

The *i MiEV* uses the rear midship layout of the *"i"* base model. Capitalizing on the long wheelbase that is a feature of this platform, the high capacity lithium-ion batteries are located under the floor, and the motor, inverter, charger and other EV components are installed beneath the luggage compartment. Locating these heavy parts low down achieves a low center-of-gravity which translates into excellent vehicle stability while providing ample space for occupants and for luggage.



Compatibility with a range of charging systems

i MiEV's batteries can be charged using a regular 100V or 200V domestic outlet or can be quick-charged using a 3-phase, 200V supply when on the road. Charging with a 100V regular household supply takes 14 hours (7 hours with a 200V supply). Collaborative research and development with several power companies has led to the development of a quick charging system capable of recharging to 80% capacity in 30 minutes.