ELECTRIC CAR

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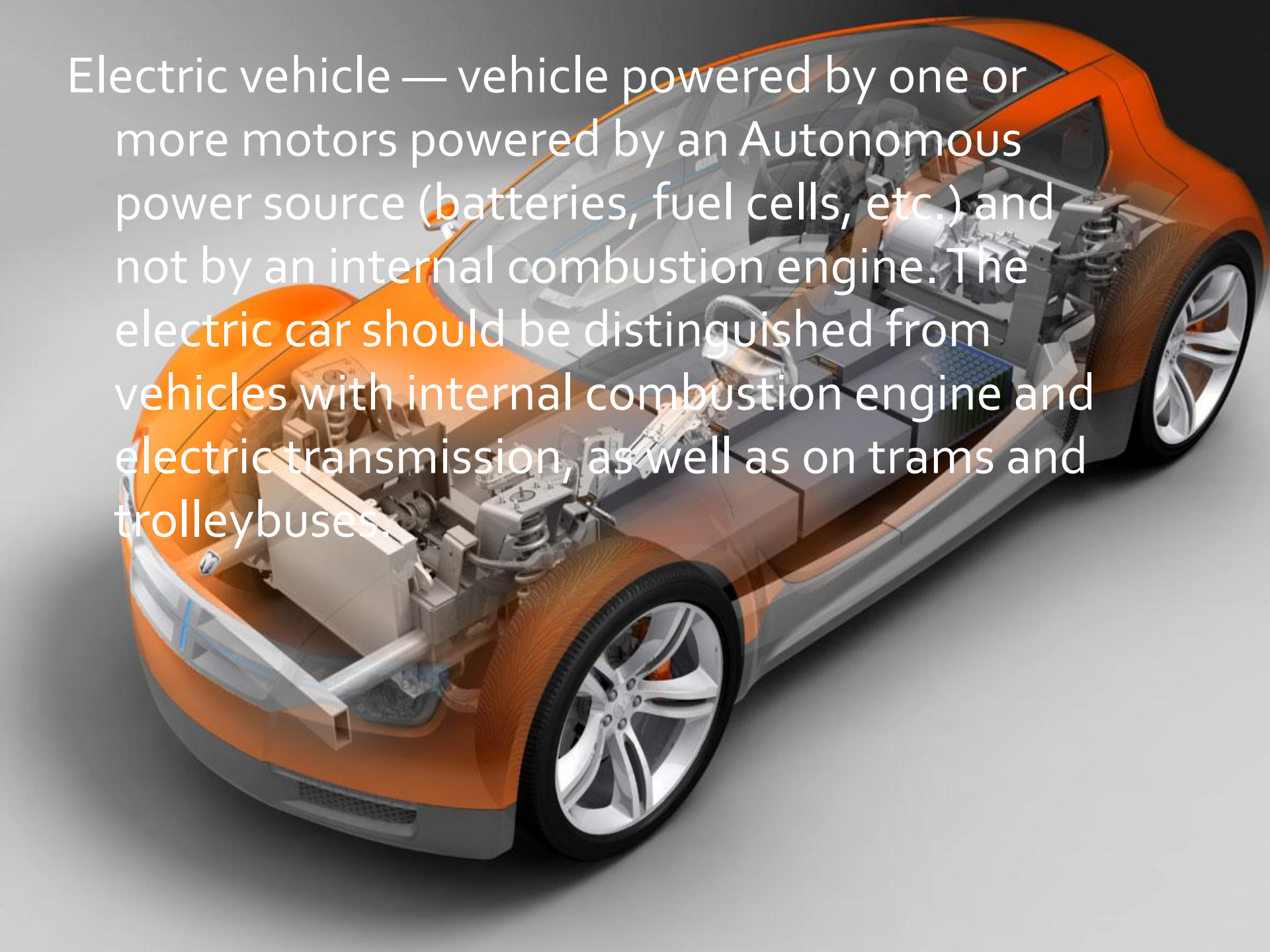
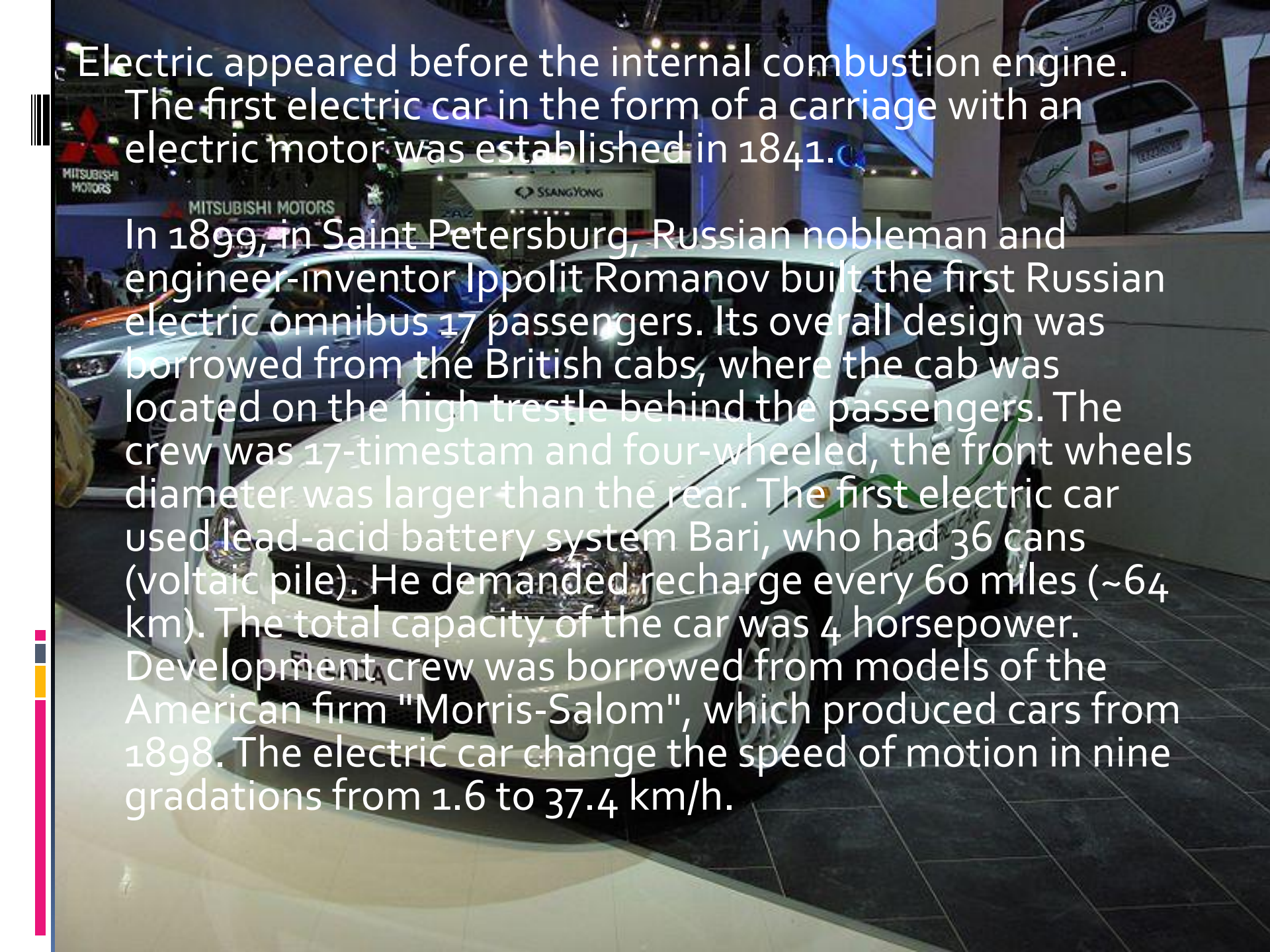


Electric vehicle — vehicle powered by one or more motors powered by an Autonomous power source (batteries, fuel cells, etc.) and not by an internal combustion engine. The electric car should be distinguished from vehicles with internal combustion engine and electric transmission, as well as on trams and trolleybuses.



Electric appeared before the internal combustion engine. The first electric car in the form of a carriage with an electric motor was established in 1841.

In 1899, in Saint Petersburg, Russian nobleman and engineer-inventor Ippolit Romanov built the first Russian electric omnibus 17 passengers. Its overall design was borrowed from the British cabs, where the cab was located on the high trestle behind the passengers. The crew was 17-timestam and four-wheeled, the front wheels diameter was larger than the rear. The first electric car used lead-acid battery system Bari, who had 36 cans (voltaic pile). He demanded recharge every 60 miles (~64 km). The total capacity of the car was 4 horsepower. Development crew was borrowed from models of the American firm "Morris-Salom", which produced cars from 1898. The electric car change the speed of motion in nine gradations from 1.6 to 37.4 km/h.

Different implementations of electric vehicle

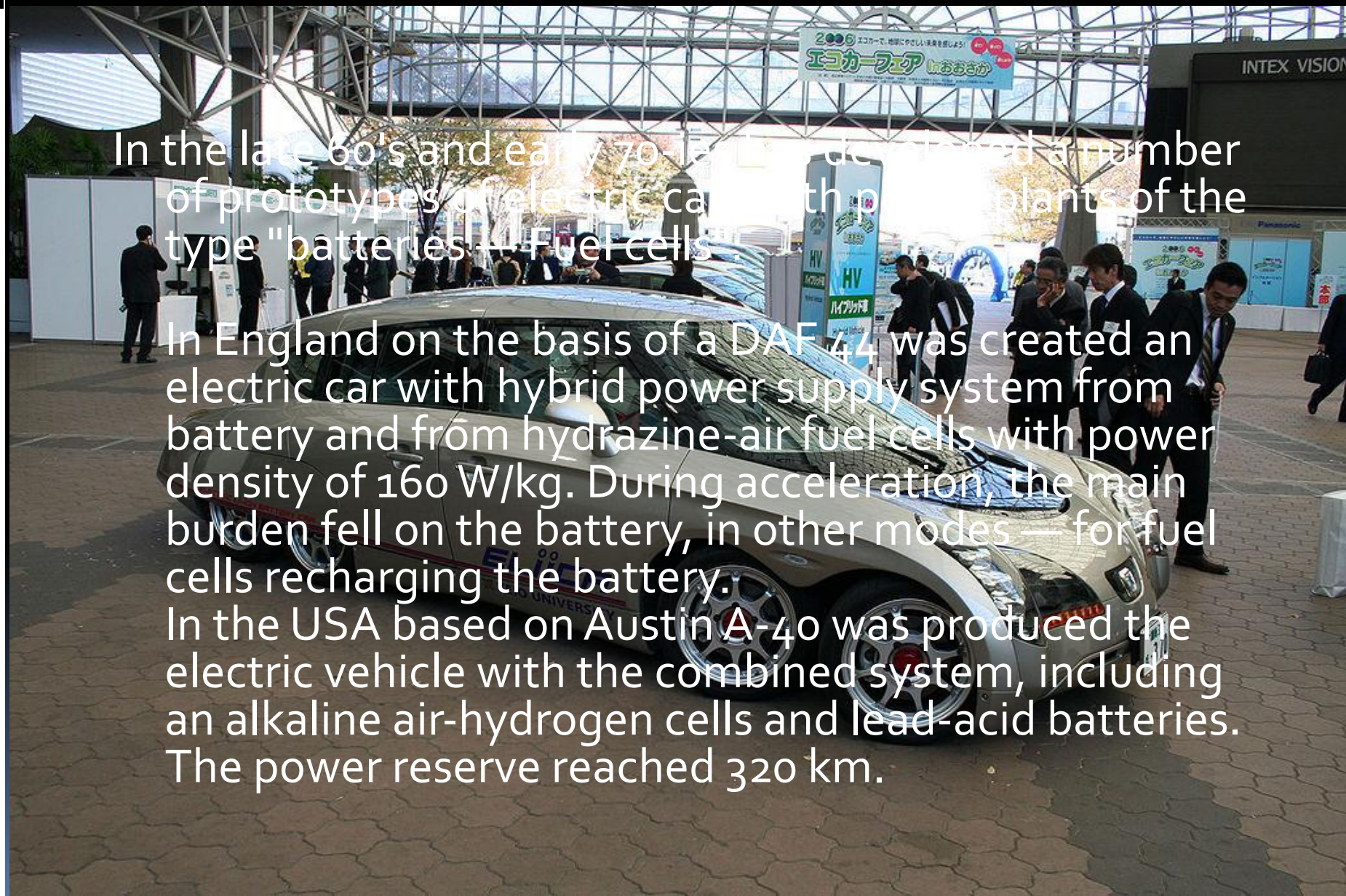
- Electric vehicles equipped with batteries
- Battery electric vehicles are the oldest and simplest form of electric vehicles. The first workable model was built in the late XIX century.
- Schematic diagram of the battery electric vehicle in the General case is as follows: battery through the power wiring and the control system (control) traction motor connected to the TED, which, in turn, through the drive shaft transmits the main transmission torque
- The batteries are located on the chassis of the electric vehicle often so that you were able to perform the rapid replacement of batteries batteries, easy access to pins and pin holes for pouring of the electrolyte. To do this, most often the batteries come in two boxes on the sides of the electric car

Electric vehicles equipped with fuel cells

a characteristic feature of electric cars equipped with fuel cells (fuel cells), is that the mass energy-power installation does not change when you change its intensity, and the increase in the reserve can be achieved by increasing the mass of fuel in the fuel tanks (as in vehicles with internal combustion engines).

Thus, on the one hand, TE can significantly increase the car's range, but on the other hand, the fuel for them is expensive, and can also be toxic, and during processing in the fuel cells to allocate in the atmosphere of harmful substances.

Combined power plants



In the late 60's and early 70-[illegible] developed a number of prototypes of electric ca[illegible]th p[illegible] plants of the type "batteries — Fuel cells".

In England on the basis of a DAF 44 was created an electric car with hybrid power supply system from battery and from hydrazine-air fuel cells with power density of 160 W/kg. During acceleration, the main burden fell on the battery, in other modes — for fuel cells recharging the battery.

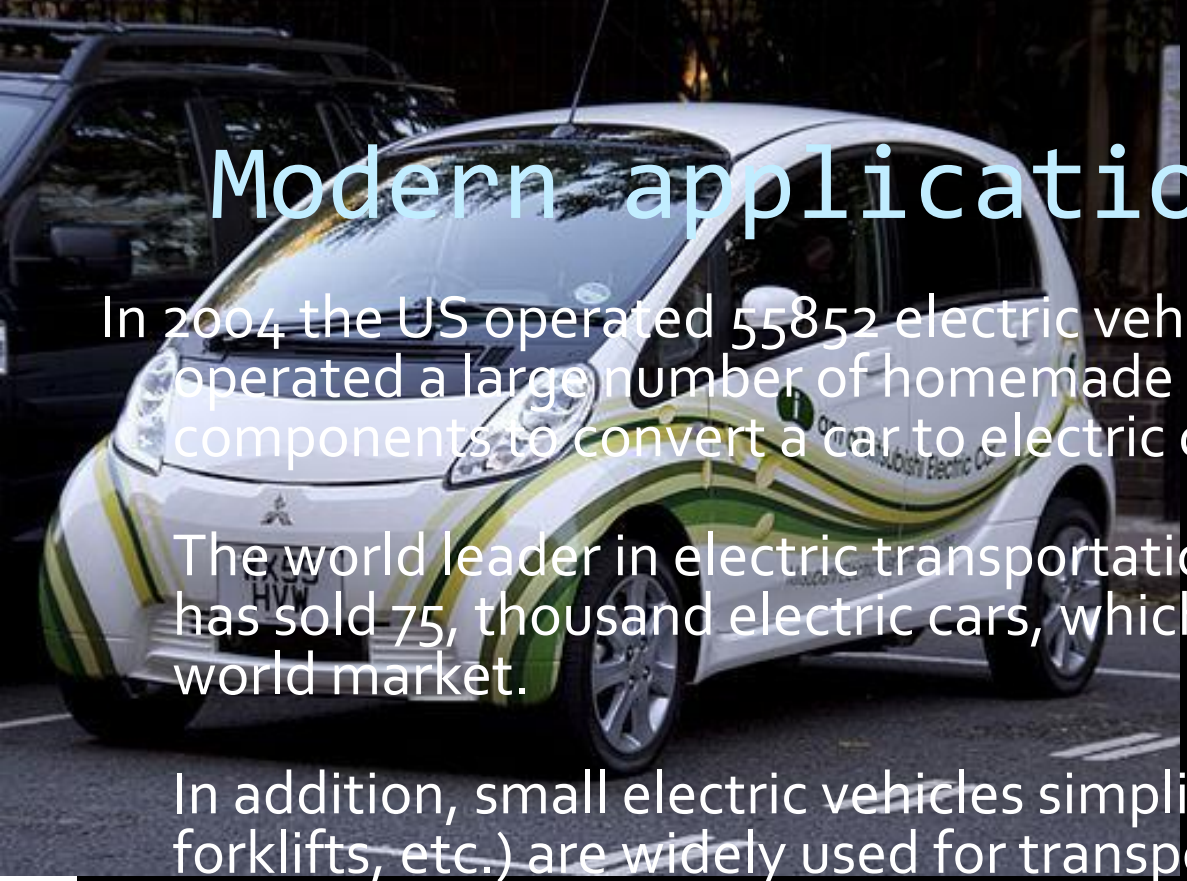
In the USA based on Austin A-40 was produced the electric vehicle with the combined system, including an alkaline air-hydrogen cells and lead-acid batteries. The power reserve reached 320 km.

Electric cars that use other sources of energy

- Electric cars solar

There are many designs of electric vehicles is solar-powered, so-called "santamobile", but their common problem is the low efficiency of batteries (usually of the order of 10-15 %, the advanced design can achieve 30%), which does not allow to store a significant amount of energy during the day, reducing daily mileage; moreover, solar cells are useless at night and in cloudy weather. The second problem is the high cost of solar panels.

Among the examples of santamobile can be called the prototypes manufactured by astrolab Venturi, Venturi Eclectic (additionally equipped with wind installation), the concept car ItalDesign-Giugiaro Quaranta (however, the energy that accumulate of solar panels, enough in it except for the power on-Board electronics), Italian Phylla, and SolarWorld GT, which in 2012 made it round the marathon. The latter is equipped with two motorized wheels Loebbemotor nominal power of 1.4 kW each (peak power of 4.2 kW each, or in total — 11,42 horsepower). Due to the low weight (carbon body achieved weight 260 kg, the body itself weighs 85 kg) and aerodynamically perfect shape of the body (CX = 0,137), achieved a maximum speed of 120 km/h Cruising speed — 50 km/h (when operating motors with rated power), it is SolarWorld GT can go 275 km — more than many modern electric vehicles. This run provides a 21-pound lithium-ion battery with a capacity of 4.9 kWh

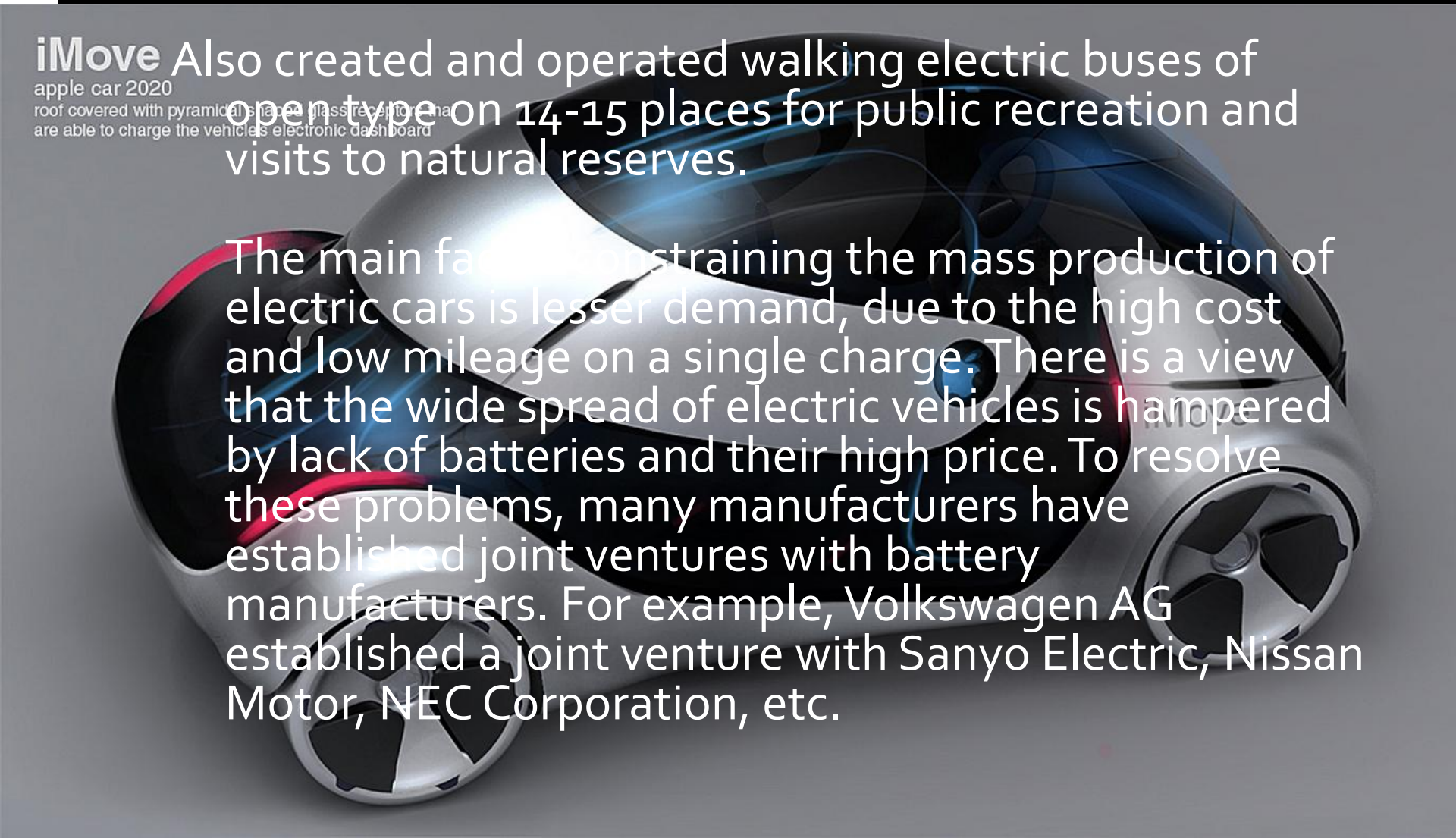


Modern application

In 2004 the US operated 55852 electric vehicle. In addition, the U.S. operated a large number of homemade electric vehicles. Kits of components to convert a car to electric car sold in shops.

The world leader in electric transportation — China. In 2014, China has sold 75, thousand electric cars, which accounted for 25 % of the world market.

In addition, small electric vehicles simplified design (electric cars, forklifts, etc.) are widely used for transportation of goods in railway stations, in shops and large stores, as well as attraction. In this case, all the drawbacks in the form of a small power reserve and speed, high private cost of batteries and the weight, overlap advantages: absence of harmful emissions and noise, which is fundamentally important for work in confined crowded areas. Technically, the electric cars these cars are not made due to specificity of their application.



Also created and operated walking electric buses of open type on 14-15 places for public recreation and visits to natural reserves.

The main factor constraining the mass production of electric cars is lesser demand, due to the high cost and low mileage on a single charge. There is a view that the wide spread of electric vehicles is hampered by lack of batteries and their high price. To resolve these problems, many manufacturers have established joint ventures with battery manufacturers. For example, Volkswagen AG established a joint venture with Sanyo Electric, Nissan Motor, NEC Corporation, etc.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