

Section 02. Geotechnical Systems Stability

Oleksii Kalisty
D.S. Malashkevych, research supervisor
I.I. Zuyenok, language adviser
National Mining University, Ukraine

Independence from oil: is it possible?

Now the world is on the verge of change in the development of industrial economy, the level which is always associated with the extraction of gas, oil and coal. These non-renewable minerals are considered to form the basis of the strength of any state economy. However, more and more renewable sources are raised for power generation. Thus, by 2013 the volume of wind and solar energy is increased twice compared to 2000. The main consumer of oil is transport. The International Energy Agency research shows that transport burned 45.4% of all oil produced in 1980. In 2015 – 65.3%.

A good alternative for vehicles run on petroleum is electric cars that use electric power. Externally, gasoline and electric cars are very similar, but on the principle of their work they are significantly different. Under the hood of an electric car, instead of a gasoline engine, an electric motor is installed, which receives power from the batteries. "Batteries" work for the "fuel tank" and provide the electric motor with the energy required to move the vehicle. The electric car is also equipped with a controller - the motor control unit, which regulates the current between the batteries and the engine. All other components in the electric car are almost the same as in the gasoline: gearbox, brakes, airbags, etc.

According to IDTechEx research, the electric transport industry achieved sales in 2005 of \$ 31.1 billion worldwide (including hybrid transport). By 2020, the electric transport market will grow about 8 times and reach about \$ 250 billion. For example, the American company Tesla Inc. Presented in 2009 at the Frankfurt Motor Show a retrospective car Tesla Model S. This car was the first to prove that the electric motor has superiority over the gasoline.

According to the US Environmental Protection Agency (EPA), the cost of a lithium-ion battery with a capacity of 85 kWh is 426 km, which allows the Model S to cover the longest distance from electric cars available on the market.

According to the results of 2013, 4750 copies of Tesla Model S were sold in the USA. Thus, the model became the best-selling luxury sedan, ahead of, in particular, Mercedes-Benz S-class and BMW 7-series. There are many achievements of electrical machines: batteries as storage, reducing greenhouse gas emissions, and electricity as a fuel. Unlike oil and gasoline, the prices for which don't always depend on the producing country, there is an opportunity to protect yourself from sudden jumps and deficit.

To sum up, electric vehicles are the future of transport for the reason they don't pollute the environment. Moreover, they could provide independence from oil, especially in those countries where it is imported to.