

Kamenets E., Slesaryonok E.
Problems Refueling Electric Cars

Belarusian National Technical University
Minsk, Republic of Belarus

As of 2022, the number of electric cars in the world is just over 1% of the total number of cars. However, vehicles powered by electricity are increasingly penetrating private and public transportation systems. For 15 years the number of electric cars in the world grew by 7 thousand and in 10 years it will make 30% of all cars. The related business serving it is also growing. There are about 540 thousand charging stations in the world. The largest markets are the USA, China and Europe; the other regions account for about 10% of the total number of charging stations. In Europe, Germany and France have the largest number of charging stations; the top markets also include Norway, Austria and Finland [1].

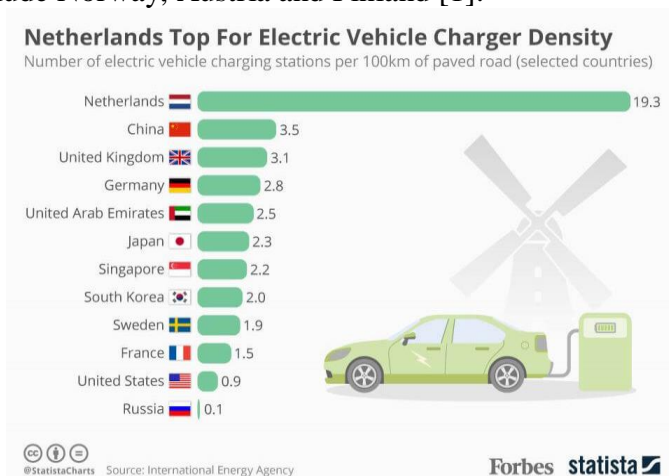


Fig.1 – Number of Electric Vehicle Charging Stations

To be sure, the number of public charging points has grown a lot in the past five years, but more is needed, Bloomberg analysts write. They predict that even those countries that are now leaders in promoting electric cars (China, the U.S., parts of Europe) may face a lack of charging infrastructure in the early 2030s, causing the growth of electric car sales to slow significantly. The main problems hindering the mass spread of electric cars are short travel times and limited routes due to the insufficient number of recharging stations, as well as the duration of the charging cycle itself. There are two types of charging: at home or in the garage, over a 220-volt. Charging in this case takes place overnight, in about 8-12 hours, it is convenient for daily use of the car and stable predicted daily mileage; in special places through special chargers with a mains voltage of 500 volts. Fast charging in 30 minutes or less (the time will vary depending on factors that include the specific charger and the capacity of the batteries of a particular vehicle). At this stage of charger development, high-powered fast chargers should only be placed under a roof, in a dry area, to minimize the possibility of electrocution in a humid environment. It is likely that consumers will not be able to handle electric chargers on their own. The lack of possibility to connect personal cars to any socket is seen as the main obstacle for the spread of electric cars in Europe, where with the high urbanization of the society the population lives in apartment buildings and has no personal electrified garages [2].

References:

1. Electrocar charge business [Electronic resource]. – Mode of access: <https://rb.ru/longread/electrocar-charge-business/>. – Date of access: 16.04.2022.
2. Atomic Expert [Electronic resource]. – Mode of access: <https://atomicexpert.com/page1930439.html>. – Date of access: 16.04.2022.