

THE FUTURE OF ELECTRIC VEHICLES

Kabakov V.P.

Belarusian State University of Informatics and Radioelectronics, Minsk, Republic of Belarus

Lazarenko A.M. – senior lecturer

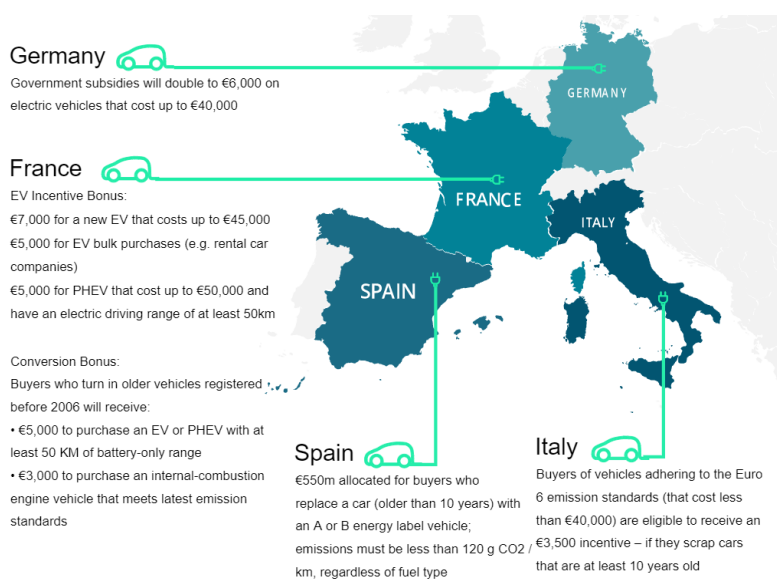
Annotation. Since the beginning of the 20th century, the internal combustion engine has occupied a leading position in the automotive industry. Even then, humanity found an alternative in the form of electric motors, but this technology has become in demand only nowadays. In our age, this issue is particularly relevant, in connection with the growing problems in the environment, which, in part, were caused by the use of internal combustion engines.

Keywords. Electric vehicles, internal combustion engines, future, gas stations, hydrogen.

Back in the 2010s, many leading countries of the world prioritized the development of electric vehicles. They promised to reduce the number of cars produced with internal combustion engines, and restricted their movement on certain streets. In Europe, drivers were offered incentives to buy and charge them. However, most of the commitments will be fully implemented closer to 2025. In the meantime, the automotive industry, although going to the goal, but not as fast as Elon Musk said, - director of the leading Tesla electric car company.

Why, if more than 100 years have passed, does humanity still use internal combustion engines? The point is the relative low cost and easy availability of raw materials for the production of fuel. The world industry has been sharpening and adapting for decades to the use of gasoline, and not to the state of the electric motor. Fuel filling stations everywhere are located within walking distance from each other for the convenience of car users. With electric cars the situation is reversed: if there are more than 200 electric stations in Minsk, and this is quite enough to put an electric car on charge and go to work (according to statistics, the average daily mileage of the average motorist is about 50 km.), then the number of them is not enough between cities and it will not be possible to travel around our country without fear of being left without electricity.

Based on the above, we can conclude that there is practically no infrastructure for electric vehicles in Belarus. There is an alternative in the form of a hybrid car: fuel consumption per 100 km is 3-4 liters, which is twice less than that of an internal combustion engine, but its cost is higher, so not everyone can afford it and prefers to buy a regular car and switch it to gas fuel in the future.



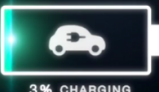
*This represents a summary of government programs, rather than a comprehensive view.

Whatever the current situation in our country may seem, this does not cancel the plans for the development of this industry. Over the past few years, the transformation of the automotive industry, as well as the fight against CO₂ emissions, has accelerated worldwide. Never before states have given discounts on the purchase of electric vehicles and refueling them with energy. England, Germany, Spain and China and other world leaders in the development of the electric industry offer car owners to exchange their gasoline

car for an electric one, paying only 10% of the price difference.

What Are Hydrogen Fuel Cells?

Energy is stored as hydrogen. A fuel cell converts it to electricity through a chemical reaction.



Quick Stats: General Motors' Ultium

Up to **200 kWh**

Up to **1,000 horsepower**

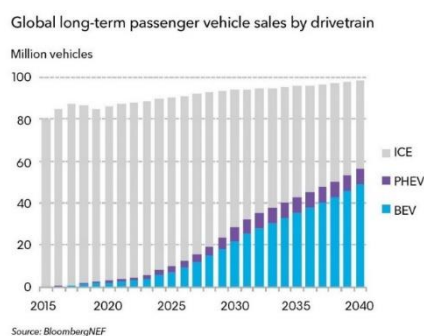
400+ miles of range

0-60 mph in as low as 3 seconds

Can recharge up to **100 miles** of range in just 10 minutes

The road to an all-electric future has been paved. Not only electric-powered engines are being developed, but also their competitors using an alternative type of fuel - hydrogen. For example, if electric-powered engines are still limited in horsepower, power reserve and battery charge time (on average 3 or more hours), then a hydrogen-powered engine, if not devoid of such shortcomings, is on a

par, having a power reserve of 600 km, charging time of 60 minutes and up to 1000 horsepower.



Like any new product, electric vehicles must be tested not only by the consumer, but also by time in general. It is not only about its main advantages: environmental friendliness, cost-effectiveness compared to the above-mentioned alternatives and road safety, if we are talking about artificial intelligence, which is not currently being tested, but is already used on the roads of America. For example, Tesla has introduced a separate subscription to drive a car without a driver, so that they, in turn, can test it before buying and decide whether they need it, and Audi is greatly decreasing the

development of new cars with internal combustion engines and plans to completely stop their production by 2030. If we talk about Belarus, we are not far behind the world in the implementation and optimization of electric vehicles. The example of this is the words of Energy Minister Viktor Karankevich during the Forum on the Development of Electric Mobility E-Mobility 2020: "The global market for electric vehicles will only grow in the near future. In 2019, the number of electric vehicles in the world increased by 2.3 million and exceeded 7 million. According to forecasts, by 2030, about 20% of the world's fleet will be electric. This is a completely different qualitative level of urban planning, a significant reduction in greenhouse gas emissions, and therefore an improvement in the environmental situation. In addition, it is a powerful impetus for the creation of new high-tech industries in the industry".

References

1. *Неизбежное будущее или почему электромобиль обречен на успех*: [Electronic resource]. – URL: <https://habr.com/ru/post/535874/>
2. *The Future is electric*: [Electronic resource]. – URL: <https://www.jpmorgan.com/insights/research/future-is-electric>
3. *Future electric cars: EVs launching in 2021*: [Electronic resource]. – URL: <https://www.carmagazine.co.uk/electric/future-electric-cars-upcoming-evs/>
4. *What you need to know about the future of motoring*: [Electronic resource]. – URL: <https://news.sky.com/story/electric-cars-all-you-need-to-know-about-the-future-of-motoring-11757459>
5. *All the things carmakers say they will accomplish with their future electric vehicles between now and 2030*: [Electronic resource]. – URL: <https://www.businessinsider.com/promises-carmakers-have-made-about-their-future-electric-vehicles-2020-1>
- 6.: *Electric cars, cool. But when?* [Electronic resource]. – URL: <https://www.nytimes.com/2021/02/12/technology/electric-cars-batteries.html>
7. *Electric car technology: what does the future hold?*: [Electronic resource]. – URL: <https://www.autoexpress.co.uk/features/352923/electric-car-technology-what-does-future-hold>
8. *Our Path to an All-Electric Future*: [Electronic resource]. – URL: <https://www.gm.com/electric-vehicles.html>
9. *The electric revolution: what will the cities of our future look like?*: [Electronic resource]. – URL: <https://www.eon.com/en/new-energy/electric-revolution.html>
10. *Introducing the all-new 2022 e-transit*: [Electronic resource]. – URL: <https://www.ford.com/powertrains/battery-electric-vehicles/>