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Khatyniuk A., Ladutska N.

## **Development of Environmentally Friendly Transport in Belarus**

Belarusian National Technical University  
Minsk, Belarus

Currently, all stages of vehicle production, operation and utilization cause a significant damage to the environment and society, that is emissions of pollutants into the air, transport noise and vibration, soil and water pollution, waste production, and the removal of land and forest resources during the construction of transport infrastructure. Unfavourable trends in the use of the transport complex encourage the search for new ways to minimize the negative impact of transport [1].

Mass production of electric vehicles has not yet been established in Belarus, so they are bought abroad or from official dealers in the country. This option is convenient for individuals, but many organizations are interested in mass switching to ecological transport. Sergey Zhiltsov, a resident of the Technopark of Kupala University, has an interesting and profitable offer for both. His business focuses on universal installation kits for electromobility and the conversion of existing vehicles into electric cars.

The company operates in two areas. The first one is the development and production of removable battery type systems for small vehicles, such as scooters and tricycles, mainly for delivery services. The second one is the conversion of diesel and petrol vehicles into electric ones by replacing the internal combustion engine with an electric motor and associated units including the battery. The company's focus is on commercial vehicles used by organisations. For example, OJSC "Molochny

Mir" uses more than 80 GAZ vehicles, at least a third of them can be converted into electric vehicles. It is cost-effective and pays for itself within two years.

The company uses universal solutions which are suitable for 80% vehicles on the automotive market. This is possible thanks to 3D scanning of the engine; some parts are printed on a 3D printer, while others are produced on machine tools.

The company is ready to supply the domestic market with the necessary number of converted vehicles. The company's export plans are also great. Moscow transport companies are already interested in the company's products, and there is demand in Europe. By the way, cars with internal combustion engines older than 5 years are already banned from entering some European cities. Extensive exports will make the domestic economy profitable.

As Sergei Zhiltsov says, the converted vehicles are beneficial not only for organisations, but also for citizens, as the kilometre travelled by electric vehicles is much cheaper than by fuel, and maintenance costs are also several times lower. As for the environmental component, the difference with cars running on fossil fuel is one hundred per cent, all harmful emissions are taken out of the city to places where electricity is generated.

The company has also thought about recycling the batteries. All kits are leased and the owner must return them to the company at the end of their service life. The average service life of a battery is about 8 years. But after that time, the battery can still be used, for example for storage equipment. In this mode, the unit can operate for another 6-8 years, and after that it can serve in private households, providing storage and return from solar panels and wind turbines. In this mode, the battery can operate for another 6-8 years. In Grodno, batteries can be recycled free of charge at the electronic and electrical waste collection points of BelVTI [2].

Nowadays, Belarus is developing a comprehensive programme to switch all public transport in major cities to electric one. Today electric passenger transport is actively being developed, they are electric buses, trolleybuses, trams and electric trains. For example, there are eighty-three electric buses operated by Belkommunmash. The company is also developing a new type of electric bus that will meet EU requirements and will start exporting to these countries in the future.

Belarus aims to become a low-carbon country by 2050 [3]. Possible measures to achieve this goal include greater use of renewable energy sources, development of electric transport, and introduction of low- and no-carbon technologies into the economy.

#### References:

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