

# VEHICLES FOR THE FUTURE – DILLEMAS AND PERSPECTIVES

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**Abstract:** *The homeland of the first modern electrical car is Greece. Legendary Enfield 8000 is one of the first electrical cars in the world, and that small two-seater was also extremely economical. It originated from the Greek island of Syros, where it is exhibited today at the Industrial Museum in Hermoupolis. It is believed that electrical cars are the real small revolution, because we replaced one type of engine with the other, while the autonomous vehicles resistant to human errors will represent the first real big transport revolution of the 21st century. Experts believe that new models of cars will have the best test in Norway<sup>1</sup>, where during the last year drivers mostly (52%) voted for electric cars and hybrids. Electrified icons: Ford Mustang and Ford F-150 hybrids are coming by 2020. Porsche plans to sell 20,000 cars E mission per year. Also the French are planning to present 8 new electric cars (record holder is the model "zoe"<sup>2</sup>, and soon the EV version of the "Quid", a small SUV that is sold on developing markets should join) before year 2022. In Serbia there is a plan to set up more charging stations for electrical vehicles. It will be initially only 3 stations within the project "Green Balkanica", while it is cited that in China there are even 5 million of these stations.*

**Keywords:** ELECTRICAL CAR, FUTURE, ECOLOGY, SERBIA, WORLD.

## 1. Introductory considerations

Would you be in a car that is driving instead of you? Many car manufacturers and other companies that are not part of the auto industry, have been working on the development of autonomous vehicles for years. So far they have mainly been focused on solving the problems that may occur when these cars find themselves in real traffic conditions and did not think too much about the future customers and their attitudes towards self-driving vehicles.

Real struggle is led in the world for new technologies between China and the United States, i.e. the race to develop the first "egzaskeji"<sup>1</sup> computer, as previously Russia and the United States fought for the development of space technology. The biggest problem in its development will be to ensure sufficient electricity, because its work requires the capacity of a small nuclear power plant. We should mention the supercomputer "Sunway TaihuLight" and computer "The Summit". Building the "Summit" America could for the first time after year 2013 again take over the primacy in the development of supercomputers. China then launched the computer "Tianhe-2" and took over the primacy in the development of the fastest computers in the world. In this race participate also Japan and the European Union (EU) and promote the development of various scientific disciplines, industrial technology, defense.

According to the data of "France Press" the European Automobile Manufacturers Association (ACEA) announced that in March 2007 in EU the number of registered passenger cars increased by a significant 11.2%. Today, the European car market is growing<sup>2</sup> and returns to the level before the economic crisis of 2008.

The question is "if your vehicle is fully autonomous (there is no steering wheel or steering commands) do you need auto insurance? Do you need a driver's license? Are you responsible in the event of a collision, or the manufacturer? Should a car manufacturer or its owner have insurance in the case of an accident? Should the liability coverage be included in the purchase price of the car? These are important legal issues that need to be answered.<sup>3</sup>

Greece is the home of the first modern electric car. Enfield 8000 was one of the first electric cars in the world, and a small two-seater was also extremely economical. It is interesting that it just originated at the Greek island of Syros (Syra island archipelago), where it is exhibited today at the Museum of Industry in Hermoupolis. The owner of the British company Enfield Automotive, Mr. Janis Goulandris in early seventies, contacted Mr. Jorgos Mikhail who was dealing with the construction of space shuttles for NASA. Specifically, he wanted that the first electric car is produced just in Greece, but its further production will take the company Enfield in the UK. For the Greeks themselves was of the great importance to continue the relationship with the company of Goulandris in Britain since it is precisely the one that produced vehicles used for the struggle against the Germans in the Second World War.

A small car was great and the most convenient discovery for the time when it was manufactured as evidenced by the interest in it from the whole world. A small two-seater battery was more popular beyond the borders of Greece, especially in London, where its 123 copies were sold, a few hundred were also sold in Sweden, where it was used as the primary mean of transport in the mines. Automobile worked on eight batteries and after seven hours of charging it was able to hold out the next 24 hours. It reached speed of 80 kilometers per hour and it was perfect car for the city in which it ran about 70 kilometers daily.

## 2. Serbia and World Experience

"Superchargers" connections that fill in "Tesla" vehicles in six countries of South-Eastern Europe by the end of 2017 have been set in our country at three locations: - near Belgrade, - Požega and - the city of Niš. The founder of the "Tesla" expects that fully autonomous "Tesla" will be ready in 2018, but it is clear that legal approval will take another one to three years more. Meanwhile the first electrocharger started to work on Corridor 10, and in Serbia the first device for charging electric cars began to work at the toll station of Preševo, on the border with Macedonia. Testing has shown that it works excellent and that it is possible to simultaneously charge three cars.

The production of the new "Fiat 500 L" has started on 25th of May 2017 year, and it is the best-selling model in its category in Europe. About 40% of built in parts are new. On one chassis can be made at least four models, and Italian partners are trying to keep the Serbian car factory from Kragujevac under its auspices mostly because of cheap labor. Unfortunately, the wages of workers in

<sup>1</sup> China has announced that this computer will be completed by 2020.

<sup>2</sup> Better results were observed in all 5 major markets, so that in March in Italy, the number of newly registered cars increased for 18.2%, in Spain for 12.6%, in Germany for 11.4%, in the UK for 8, 4% and in France for 7%. /Tanjung/

<sup>3</sup> Poiras Colin. The rise of self-driving cars, March 2017. <https://phys.org/news/2017-03-self-driving-cars.html>

factory based in Kragujevac and today are 3-4 times lower than than those of "Fiat"'s workers in Italy, Turkey and in Brasil. The term contract of Italian-American group "Fiat-Chrysler" with Serbia for 10 years expires at the end of year 2018. It is believed that the car factory in Kragujevac can not survive if we do not produce a totally new car soon.

For the first time in March 2015, the autonomous car drove from San Francisco to New York. Mining company "Rio Tinto" already operates a fleet of self-driving garbage trucks in the mine in Western Australia.

During the spring 2015, the Federal Department of Environment, Transport, Energy and Communications

in Switzerland has given permission to the company "Swisscom" to test "Volkswagen Passat" without a driver on the streets of Zurich. But still "Volkswagen" remained the largest European manufacturer with regard to the new registrations of its "BMW", "Audi", "Porsche", "Seat" and "Scoda," there is an increase of 6.5%, so that this manufacturer dominates on the market with a share of 21.3%.

Since the summer in 2015 the French Government allowed to "Peugeot Citroen" to perform testing under real conditions in the area of Paris. These experiments were extended to other French cities such as Bordeaux and Strasbourg in 2016, and the first demonstration of autonomous vehicles on the open road in France was performed in Bordeaux in October 2015. Also, the French are planning to present 8 new electric cars till 2022-year. (Record holder is model "Zoe" and very soon the EV version of "Quid", an small SUV, that is sold in developing markets should join.) In mid-October 2017, the French car company "Renault" published that half of its models will be hybrid or electric till 2022. These "robotic" vehicles will have an elevated degree of autonomy and "Renault" will offer 8 fully electric and 12 hybrid vehicles before year 2022 and strategic plans anticipate the doubling of vehicle sales in the markets of Russia and China.

At the end of October 2017 it was announced that it was a successful first testing of vehicles in Bavaria, i.e. smart bus without the driver was the first pickup truck without driver<sup>4</sup> presented by the German railway "Deutsche ban". And related to railroad, probably that is why once is said that where there are no trains - there is no life. The testing was conducted in the spa Bad Birnbach, in Bavaria on the south of Germany, and this electric mini bus can carry 12 passengers and represents a new era of public transport. So the first public transport line with autonomous vehicles was opened. Since 2018, "Deutsche ban" who founded the branch "Joki" dedicated to electric mobility and transport of the future, intends to test his pickup truck in several German cities, including Hamburg, Paris, Lyon, Las Vegas and Dubai already have such vehicles, but in smaller proportions. The new German law also contains a special provision that allows for self-driving cars in certain limited areas, such as parking areas in shopping malls.<sup>5</sup>

Company "NuTonomy" is planning to place commercially self-driving taxis in Singapore during 2018, with the intention to be operational with the fleet of self-driving taxis in 10 world cities till

<sup>4</sup> This pickup truck was projected by the French start-up company „Easy mail“.

<sup>5</sup> See: Hetzner C, "German industry welcomes self-driving vehicles law", *Automotive News Europe*, May 15, 2017, <http://europe.autonews.com/article/20170515/ANE/170519866/german-industry-welcomes-self-driving-vehicles-law>, 22.09.2017.

2020. Electrified icons: Ford Mustang and Ford F-150 Hybrids are coming by 2020 and Porsche plans to sell 20.000 mission E cars a year.

"BMW" has already announced that by 2025 it is planning to put on the market 12 electric models and 13 versions of hybrid cars. The first "BMW" electric car "mini" will come off the production line in year 2019, according to the report of the British public Service BBC. "General Motors" is testing 50 self-driving vehicles "Chevrolet Bolt Sedan" in several states including California and Michigan.

During January 2018 in town Jeddah (Saudi Arabia) was opened the first Car Show dedicated to women – customers. Also manufacturers have prepared many novelties for Geneva Motor Show, the most influential automotive event in Europe on the 8th of March 2018. Thus, in "Mercedes" A class now new trunk will be larger, of 370 liters and aerodynamics and performance have been improved. While the "Opel" will not show up at this event in 2018, "Škoda" has prepared redesigned "Fabia" which is improved and with a screen of 6.5 inches impresses at first glance. Sales of this model should begin in mid-March this year. It was expected that the "Hyundai" in Geneva exposes the fourth generation of the car "Santa Fe" with more modern design.<sup>6</sup>

Romanian brand "Dacia" continues to develop under the control of "Renault". This reliable and safe car, "Duster" got all it could from the "Renault" and "Nissan". But also the leaders in the "Maserati", who were planning that SUV "Levante" becomes a pillar of financial stability of this Italian brand, have failed, during the 2017 production has been stopped for several days due to the weaker demand. "Fiat-Chrysler cars" will reduce working hours until June 2018 and the factory "Mirafiori" will produce less "Levante". Yet the contracts of solidarity for workers were introduced, so workers will not receive temporary layoffs, but they will be earning less. Thus, a little more than 2000 jobs have been rescued.

### 3. Importance of Safety Issues

Industry of self-driving cars has experienced that regulators prevented innovations that could improve public safety. In the USA, 30 000 people die every year on the roads, and over a million are injured. 94% of these accidents are caused by human factor.<sup>7</sup> Self-driving cars could eliminate human error as the cause of 90% of collisions and they could make people more mobile, may be reduce emissions and set in motion economy.

These days in Serbia new stricter regulations on traffic safety were adopted. Harsher penalties are provided for speeding and also the mandatory installation of video surveillance during the inspection, which will be associated with the Ministry of Internal Affairs by a special program, is predicted.

During July 2017 year more than 5.3 million vehicles passed along highways in Serbia. (statement of the Public Enterprise "Roads of Serbia"). Unfortunately, there are also thefts<sup>8</sup> of traffic

<sup>6</sup> Koreans have changed the interior and set a high central touchscreen.

<sup>7</sup> Draxler B, Who's Responsible When A Self-Driving Car Crashes ? June 2015, Bryant Walker Smith talks shop, <https://www.popsoci.com/whos-responsible-when-self-driving-car-crashes>

<sup>8</sup> About 120 million dinars or around one million euros.

signs and other traffic signalization and equipment along our roads, and that directly reduces security and directly endangers the lives of participants in traffic.

At the same time the authorities in France have decided to tighten laws on road safety, all in order to help reduction of the number of fatalities on the roads and improve safety. So in the future the drivers will not be able to stand on the side in order to check the phone<sup>9</sup>; even though the engine is shut down. If drivers are caught by the authorities with a mobile phone in their hands, for that they will pay a fine of 135 euros. The law now provides for an obligation for the driver to park the vehicle in the parking place, turn off the engine and then check the mobile device.

And in China at every more significant crossroads in Beijing, the teams of emergency services are stationed and ready to react in the case of traffic accidents. Traffic violations are charged for immediately after the execution, on-site, and police has devices in which data of the offender are entered and issues the proof of payment of such penalty.

Researchers from the Serbian Institute of Nuclear Energy "Vinča" in cooperation with colleagues from the Croatian Institute "Ruđer Bosković" and the Swiss Federal Institute EMPA already for two years are working on the project of hydrogen energetics with the title "New materials for saving energy." It is about development of methods for storing hydrogen that would be applied as fuel and energy source. The authors develop complex hybrids (which contain large quantities of hydrogen) capable of releasing or receiving hydrogen according to our need.

In the final version of the Climate Action Plan, the Government in Germany lowered the aims on reducing emissions of carbon-dioxide for industrial sector, however, the industrial sector calls for reducing carbon dioxide emissions for only 20% by year 2030, comparing to year 2014.

It is stated that "Audi" is buying the technology for cars using hydrogen. "Numbers are the language to confirm the truth." From the company "Folkswagen" we are notified that Germany should reduce subsidies for diesel cars and ban vehicles that are big polluters. It is also pointed out that the gradual tax relief should be directed towards the promotion of environmentally friendly technologies. The scandal that broke out in 2015 indicated that the diesel cars of this manufacturer are to blame for the problems of air pollution in Germany and abroad. Calls for a ban on diesel cars already have full support in some major German cities.

The wider European project Central European Green Corridors (CEGC) included Slovakia, Germany, Austria, Croatia and Slovenia where the dense network of 115 modern fast chargers for electric cars was placed.

## 4. Conclusion

The first modern electrical car was great and the most practical discovery for the time in which it was produced what testifies the interest in it from the whole world. It is believed that electric cars are the real small revolution, because we replaced one type of the engine with another, while the autonomous vehicles resistant to human errors will represent the first real big transport revolution of the 21st century. Be ready for any surprise - it is a sign of culture, wrote the Indian philosopher and poet Rabindranath Tagore.

Having in mind that electric cars have become our future, on this path Serbia is still lagging behind, but on the way of electrification the most advanced is Scandinavia, especially Norway. The primary objectives are of economic - environmental nature with regard to electrical vehicles which produce significantly less carbon dioxide and in Serbia the setting up charging stations for electric vehicles is planned. As it was mentioned the first electrical charger on the Corridor 10 started to work, i.e. in Serbia the first device for charging electrical cars began to work at the toll station of Presevo, on the border with Macedonia. It will be initially only 3 stations within the project "Green Balkanika", while the cited data show that China has even 5 millions of these stations.

Expecting news from the area of self-driving cars this paper represents my contribution to the vehicles for the future for the generations to come.

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<sup>9</sup> The only exception is in the case of a traffic accident or some similar situation when the use of a mobile phone is allowed, in order to realize an urgent call.