

Electric cars: history and perspectives

Dr. Georgios Ayeridis

*Mechanical Engineer
President of HEL.I.E.V.*

1. Introduction

Electric cars today are considered either as a new automotive technology, or as a mobility alternative mode, or as the future of transportation. What is truth and what is their supporters' overstatement? The answer is that everything is real laying to truth. The picture is completed thinking that the contemporary cars' beginning was electrified, before internal combustion engine predominance.

The first electric car was manufactured in 1835, whilst the first land speed records, in 1889 and 1900, were achieved by electric cars. However, battery and electric grid weaknesses of that period and the oil era rise following by internal combustion engine rapid evolution, left autonomous electric mobility aside.

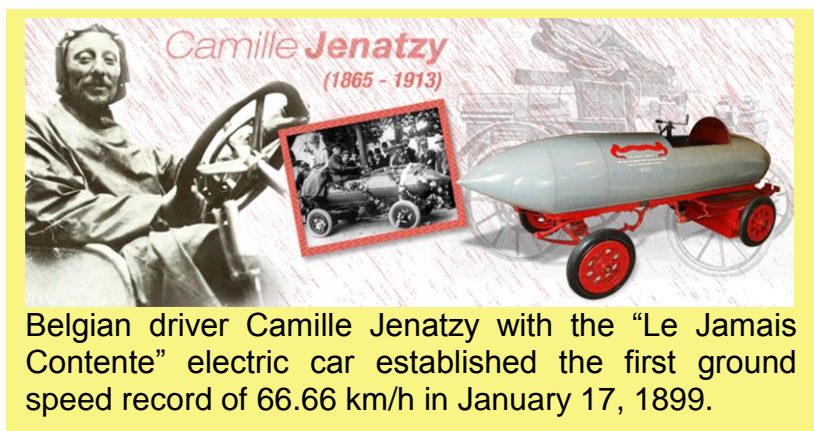
Meanwhile, the globe faced a series of new problems in the beginning of '70, which gradually are being more serious and their settlement

imperative. Issues of oil availability, sufficiency and security were emerged, and then it was realized that the end of the cheap oil era was arriving. In '80 the global air pollution implications, with a possible climate change, were obvious. These findings have affected the transportation sector, as vehicles are using in great extend oil products and as a result they are main contributors to air pollution. The alternative fuel and technology pursuit has brought electromobility again in spotlight.

2. The contemporary era of electromobility

The significant technological development in the 20th century does also affect the electric energy sector.

Actually, goods production and consumption and standard of living rise in a great part of global population is due to oil and electricity. Electric energy is the cleaner form of energy available, while it can be produced from any combustible material, as well as from renewable energy sources. Moreover, it can be



easily transmitted and easily transformed to any convenient form of energy, there is no problem to its management and there are no necessary expensive and bulky control systems.

Concerning the electric motor, it is the most energy efficient device for mechanical work production. It is small, light, without turpis, in egestas special maintenance needs and it can be placed and operates in any location and under severe environmental conditions. In addition, it is of low cost and can be manufactured easily, it does not need peripheral components, can be tele-controlled easily and credibly through low cost monitoring and protection systems.

Back to global problems of '70 and '80, they have pushed stakeholders and decision makers to change their way of thinking and to pay more attention to more efficient exploitation of natural resources and to minimize environmental implications of this exploitation. In energy sector this way of thinking has addressed to increased power generation from renewable energy sources and to seek means and methods to minimize energy losses to power transmission systems and distribution networks, as well as distribution networks operation optimization. At this point, the electricity crucial problem has emerged again, that is the very low storage potential and the weakness to differentiate generation and consumption time.

The broad electric cars use is known that could resolve or alleviate most of these environment and energy problems:

- Car electrification could significantly minimize transportation contribution to air pollution, due to less fossil fuel use. The advert argument that in this way power plants air pollution would be increased is not true as:
 - Electric energy can be generated from renewable sources without emissions, and
 - Pollution control is more technically and costly effective in big power plants than in millions of internal combustion engine vehicles with very low control of operation and maintenance.
- Electric car batteries in aggregate form an enormous electric energy storage device, charging and discharging in an extend time period.
- Electric car charging procedure can be a crucial parameter for stabilization of transmission system and distribution grid, allowing increased renewable systems penetration.
- Finally, car electrification can contribute significantly to decentralized – distributed power generation, exploiting local energy sources adjacent to consumption needs.

All the above were known from the end of 19th and the beginning of 20th century, but climate change and resources depletion were not important to ring the awareness bell, and

more crucial, the relative technology was unknown. However, scientific and technological evolution during the last two to three decades and the overwhelming development in microelectronics, information technology, material technology and nanotechnology has changed the scenery and thrust ahead vehicle electrification.

3. Electromobility in Greece

An ambitious effort related to electric car era started in Greece in the beginning of '70 at the island of Syros. "ENFIELD AUTOMOTIVE Ltd" Company established at London, was specialized in designing and manufacturing electric cars. In 1972 the company was taken over by Greek ownership Goulandris brothers, renamed to "ENFIELD NEORION Ltd" and its production line was moved to Neorion Shipyard at Syros Island. Three electric mini cars were produced based on the E465 English car. They were the "E8000", a two seater car of 65 km/h maximum speed and 100 km range of fully charged batteries, the "Bicini", a four seater jeep style car and the "Miner", a closed van type car. All the production was exported to Britain and Sweden and the production line closed in 1975 as it was not possible the cars issued the necessary type-approval in Greece.

After the year 2000 a small electric car imported in Greece, but with extremely low sales. The modern electric era in Greece started after 2010, as new and efficient cars were delivered in the market. However, selling figures remain very low, mainly due to the Greek State tax policy, as well as due to charging infrastructure lack.

The Hellenic Institute of Electric Vehicles – HEL.I.E.V.

It is founded in 1991 and it is an internationally recognized scientific and nonprofit entity, who promotes the broad dissemination of environmental



The "E8000" car



The "Bicini" car



The "Miner" car

friendly and energy efficient mobility. HEL.I.E.V. is a member of:

- The European Association for Battery, Hybrid and Fuel Cell Electric Vehicles – AVERE, and
- The World Electric Vehicle Association – W.E.V.A.

It is worth mentioned that the International Federation of Automobiles (Federation Internationale de l'Automobile – F.I.A.) recognizes the Institute as the National Authority for the development and control of the motorsport activity with electric, hybrid and alternative energies vehicles.

HEL.I.E.V. consistent to its founding objective:

- Promotes electromobility and clean transportation in general,
- Promotes legislative, institutional and procedural issues settlement,
- Organizes and implements events relevant to electromobility and clean mobility, and
- Gives and disseminates technical and scientific information in relative issues.

4. Conclusion

Electromobility is entered a new promising era. Automakers, as well as other innovative companies are claiming new entries in the market. Anybody who is interested in clean and effective mobility should assist society to choose the right alternatives. For Greece it is a new chance to create added value and new jobs.

FIA Alternative Energies Cup 2015
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Eco Mobility Rally 2013