

Preface

Electric cars have been around since 1873. In fact, the internal combustion engine (ICE) came into being only after 1885. The ICE quickly dominated the world automobile scene due to the high energy content, ease of handling and easy availability of petroleum fuel as compared to the bulky batteries of the electric vehicles (EVs). Now, more than a century after the EV was forced into obscurity, it seems that EVs may actually hold the key to the mobility of the future. Decrease in availability of fossil fuel, rise in the number of automobiles and deteriorating environmental conditions in the cities due to the harmful emissions from the ICEs will eventually see that the ICE ultimately loses out to EV. However, the transition from the ICE to the EV will not be instantaneous mainly due to the low volumetric efficiency and lack of infrastructure with regard to the energy source i.e. battery. The transition from the ICE to the EV will be gradual with many intermediate low-pollution vehicle solutions. In this direction, the ICE and electric hybrids are being considerably researched.

In India, the fossil fuel source for the ICE vehicles is in a state of flux. However, there are indications that the ICE engines will use more and more alternative and less-polluting fossil fuels like the CNG and LPG. Further, the Euro II and III standards have resulted in the petrol ICE to be more efficient and less polluting by the use of modern multipoint fuel injection (MPFI) systems and catalytic converters to control emissions. Therefore, the ICE engines used today in automobiles are more efficient, have higher power to weight ratio and higher power to cost ratio as compared to the ICE-genset systems that are available for nonmobile home application. This would have significant implications on the use of off-the-shelf ICE gensets for series hybrid vehicles. The cost, size and emissions would not be acceptable by the automobile industry. In this respect, one could think of a parallel hybrid system. The electric propulsion system can be connected either to the present nondriven axle or to the driven axle itself by designing an appropriate transmission. It is important to note that the change over from the petrol fuel to LPG fuel in most cities of India has been rather seamless. This has happened due to one important reason—retrofitting. Therefore, it would not be inappropriate to consider retrofitting electric propulsion to existing automobiles. This would lead to a seamless shift from the petrol vehicles to electric vehicles. If electric vehicles have to make a difference, then we have to think and work more and more along these lines.

This special issue on electric vehicle brings out few papers on the current research activities going on at various universities and industry. The paper entitled “Fuelling future cars” by A. K. Shukla gives an assessment of the power and energy requirements of electric cars as compared to the ICE vehicles. It also discusses the commercial viability aspects of the future electric cars.

Morphologies for designing the bodies of the vehicles based on user requirements plays an important role in the acceptability of the vehicles. An article titled “Usability heuristics and their role in designing vehicles—A case study of an electric hybrid vehicle body design” by Pradeep Yammiyavar addresses this crucial issue.

The Reva Electric Car Company at Bangalore has shared its rich experience in manufacturing and marketing a high-quality electric car in the article titled “Development of a globally competitive electric vehicle in India” by Chetan Kumar Maini.

The experiences of developing and implementing a fuel cell-based city bus is illustrated in the article “Experimental study of drivetrain configurations in fuel cell city bus” by Chen Yong *et al.* This paper gives experimental results on different drive trains.

The experience gained during the development, implementation and testing of a series hybrid three wheeler is shared in the paper “Low-pollution three-wheeler autorickshaw with power-assist series hybrid and novel variable DC-link voltage system” by Andrea Vezzini *et al.*

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