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E-Highway for Heavy Vehicles

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ABSTRACT

Highways are one of the significant parts of the modernized world. They play an important role for the development of country's economy. The transport sector heavily depends upon non-renewable sources. The transportation sector not only contributes for the nation's development but also for the greenhouse gases emission that accounts for nearly 1/5th of the global total energy consumption. Constant release of harmful gases into the atmosphere by the vehicles must be restricted and replaced with a more sustainable transportation alternative.

Keywords : Dynamic pantographs, Electrical road systems, Highways, Electrical vehicles, Greenhouse gases, Power grid, Smart power supply, Vehicle recharging

I. INTRODUCTION

Transportation is a necessity and facilitator for people to meet their needs in today's society. At the same time, side effects of the current, fossil-based transport system, suchas emissions of carbon dioxide, particulate matters, nitrogen and sulfur oxides, undermine human health as well as eco-system quality . In the EU, the transportation sector accounts for one third of the total energy use and one fifth of all greenhouse gas (GHG) emissions . At the same time, living up to the Paris Agreement requires drastic emission reductions and Europe wants to be the leading region in the transition towards a sustainable society. Electrification ofvehicles has been pointed out as a key factor for success, due to zero exhaust emissions in the use phase . However, there are still sustainability constraints in other life-cycle phases . So far, most attention has focused on electric vehicles (EVs) for passenger transport. Still, trucks account for 25% of GHG-emissions of EU's transport sector and the number of heavy trucks,especially, is increasing more and more . Battery electric vehicles are often regarded as the mainsolution and several fully electric, battery-powered trucks have been presented to the public, for example the Tesla Semi and the Nikola One. Enabling a heavy truck to drive 800 km on one charge, however, requires large batteries. Batteries have a substantial. Sustainability impact during their life-cycle, at least with current designs .

II. OBJECTIVE

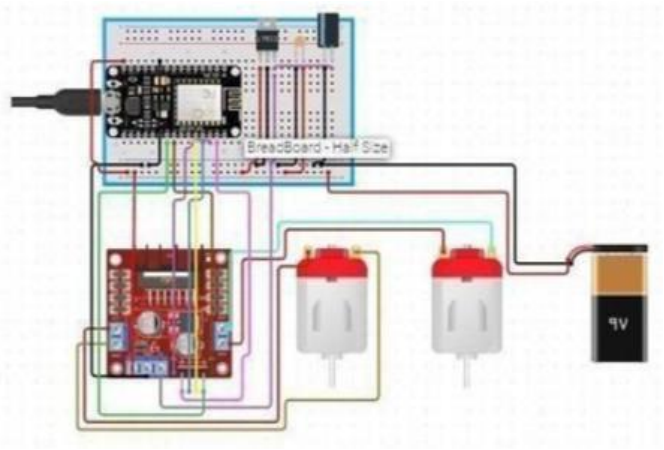
The main objective of present work is to carry out a research if there is a probability to substitute the major part of the transportation area's enslavement on fossil fuels by presenting a new system as Electrical Road Systems-ERS.

III. PARTS OF PROJECT

1. **ARDUINO IDE:** The Arduino Integrated Development Environment (IDE) is a cross platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

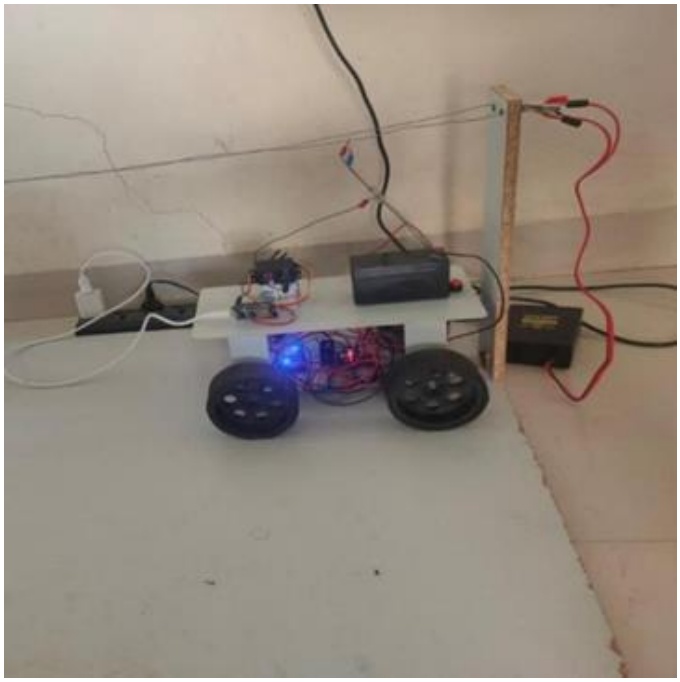
2. **ESP8266**: ESP8266 is a computer on a chip. It is an integrated chip that is usually a part of an embedded system. It is a self contained, independent and yet function as a tiny, dedicated computer. It also supports IOT Applications due to built-in Wi-fi The cost of this Controller is 500/-

3. **ROVER CONTROLLER:** Rover control is used to move robot in forward or reverse direction or in left or right direction for moving to robot in desired direction rover is used.



4. **SERVO MOTOR:** This Tower Pro MG996R Digital Metal Gear High Torque Servo Motor (180 Degree Rotation)features metal gearing resulting in extra high 10kg stalling torque in a tiny package. The MG996R is essentially an upgraded version of the famous MG995 servo, and features upgraded shock- roofing and a redesigned PCB and IC control system that make it much more accurate than its predecessor. The gearing and motor have also been upgraded to improve dead bandwidth and centering. The unit comes complete with 30cm wire and 3 pin 'S'type female header connector that fits most receivers, including Futaba, JR, GWS, Cirrus, Bluebird, Blue Arrow, Corona, Berg, Spektrum and Hitec.

FINAL DEMO OF MODULE



IV. ADVANTAGE

1. It is a highly energy efficient system.
2. It minimizes the operating costs.
3. An instant and prompt integration into existing infrastructure is possible.
4. It is a safe, reliable and open technology.

V. CONCLUSION

It is hereby to conclude that the E- Highway system not only enhances the benefit of reducing the harmful CO2 emissions into the atmosphere but also improves the nation‟s economy by its reliable system. The electrification of roads/highways will enable evident decrement in CO2 emissions and ensures a sustainable supply of energy. The significant advantage in this system is that Electricity can be produced in several ways i.e. through conventional power plants and also from renewable sources. This modern electrifying highway is twice as efficient as internal combustion engines. Besides this, this is a noiseless system whichturns out as an eco-friendly technique in transportation sector. The power consumption is less i.e. running cost is less when compared to that of conventional petroleum based transportation.

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