



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 4, April 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423



9940 572 462



6381 907 438



ijirset@gmail.com



www.ijirset.com

Impact of Hybrid Vehicle on environment and society

Mr. Rahul Samre¹, Pradeep Singh Hada², Kapil Patodi³, Manoj Raut⁴, Rizwan Sheikh⁵, Jayant Khede⁶, Rahul Chadhokar⁷

IPS Academy, Institute of Engineering & Science, Indore (M.P.), India¹⁻⁷

ABSTRACT: In a current scenario the global warming and pollution is major issues now a days the weather is unpredictable and there is lots of cyclone is coming now a days. There are many factors affect the environment one of them is pollution by automotive vehicle. Despite of many norms given by government the situation is becoming worst to minimize the impact new technology is immerging one of them is Hybrid Vehicle. A combination of these renewable energy sources can be used for hybrid electric vehicles (HEV) in the next generation of transportation. With the significant progress of automobile technology, the hybrid electric vehicle has already become the main achievement of transportation electrification due to its excellent fuel-saving performance and reduction of pollution. This paper is an overview of trend emerging in automobile, types of hybrid vehicle are present, role that this technology plays in the current automotive market and what are the impact of Hybrid Vehicle on environment and society.

I. INTRODUCTION

Human kind has done many discovery one of the biggest one is Crude oil and other is the invention of IC engine and its applications in many areas one of the biggest applications was in many areas like in lathe ships earth movers and Automobile. Automobile is the quickest way for transport of goods and peoples. Earlier it was not much concern with pollution and scarcity of crude oil but as the decades are past the pollution is the biggest thing and new innovation is started like two stroke engine is stopped and four stroke engine is started to manufacturing so that pollution will be in control but the situation is not stabiles hence the automobile sector is now seeking to new technology like Hybrid vehicle, Electric vehicle, fuel cell vehicles A hybrid electric vehicle can perform at least one or more of the following functions.[6]

- └ Engine Idle Stop/Start
- └ Electric Torque Assistance (Fill And Boost)
- └ Energy Recuperation (Regenerative Braking)
- └ Electric Driving
- └ Battery Charging (During Driving)
- └ Battery Charging (From The Grid)

II. WORKING METHODOLOGY

Vehicle which runs with the combination of at least two sources of energy is termed as hybrid vehicle. The two sources can be gasoline or diesel fuel with the combination of battery. Vehicles use the fuel for generator to charge the battery, which then propels the motor. This is not fully hybrid as it technically has only one energy source for the end propulsion. However, if the fuel and batteries – separately or together – can propel the vehicle, then it's a true hybrid vehicle (HV).

Series Hybrid

In Series Hybrid vehicle use two source of energy, petrols with electrical, Diesel with electrical and CNG with electrical energy. The traction is provided merely by electric motors rest other source of energy that is petrol, CNG or Diesel is use to run engine which runs the generator which provides electricity to energize the battery or to give directly power to traction motor. [3]

Parallel Hybrid

In Parallel Hybrid vehicle use two source of energy, petrols with electrical, Diesel with electrical and CNG with electrical energy. The traction is provided both electric motors as well as the I.C engine it depend whether IC engine is

running by which sources of energy. Here the maximum part of traction provided by I.C engine and remaining is provided by traction motor.[3]

Based on Degree of Hybridization

Degree of Hybrid is depends upon the ratio of the traction given by IC engine and Electric motor or traction motors. Some vehicle need torque while acceleration some need regular supply of both the sources but it also have specific ratio.

Degree of hybridization = $\text{Motor power} / (\text{Motor power} + \text{Engine power}) * 100$

Type Of hybrid Degree of hybridization

Micro <5%

Mild Up to 10%

Full Hybrid:

Parallel 10% to 50%

Series 50% to 75%

Electric vehicle 100%

1) Micro Hybrid: Electric motor functions to start or stop the system to automatically shut off the engine while idling. This motor does not provide additional torque to the vehicle [3]. Electric Motor supplies power 2.5kW at 12 volts [3]. Energy saving 5 to 10%. Example: BMW 1 series, For two Mercedes, etc

2) Mild Hybrid: Electric motor generator is integrated to provide 10% of maximum engine power. These hybrids improve drawbacks of fossil fuel vehicles. Here motor or generator is in parallel with IC engine [3]. Electric Motor supplies power 10 to 20 kW at 100-200 volts [3]. Energy saving 20 to 30% Examples: Chevrolet Malibu, Chevrolet Silverado is a full-size pickup truck, Honda Escape, etc.

3) Full Hybrid: Electric motor provides at least 40% of engine power as additional torque. Bigger motor and battery reduces the required size of conventional engine [3]. It has improved fuel consumptions and reduced emissions. Circa Electric Motor supplies power 50 kW at 200-300 volts [3]. Energy saving 30 to 50% Example: -Toyota Prius, Camry Hybrid, Ford Escape Hybrid, Ford Fusion Hybrid/Lincoln MKZ Hybrid, Ford C-Max Hybrid, Kia Optima Hybrid, as well as the General Motors hybrid trucks with 2 –mode.

4 Parallel and combined hybrids can be categorized according to degree of hybridization. Degree of hybridization depends upon the power supplied by IC engine and electric motor. In some vehicles, IC engine is dominant; electric motor turns on only when boost is needed. In many vehicles, both IC engine and electric motor share equal loads. Others can run only with electric motor system operating. The ratio of power developed by an electric motor in a hybrid vehicle to the total power consumed by the vehicle is known as degree of hybridization.[8]

III. CONCLUSION

The present greenhouse effect and its arrays of limitations on energy sources have made Hybrid Electric Vehicles (HEV's) a current research focus due to its reduced amount of fuel usage. The ability to simultaneously deliver power to the wheels from the motor/engine made HEVs to have greater advantages (less fuel consumption and reduced internal combustion engine size without compromising the power output) over the traditional vehicles. Despite its low patronage in the market, there is still hope that its popularity in the global automotive market will rise due to the superior qualities associated with it. In view of the above, this paper presents a brief overview on the developmental trend of the HEV's, right from idea conception till date. It also outlined and discusses the various HEV's architectural configurations, energy source/storage and the motor control strategies.

REFERENCES

- [1] M. Viswanath, 1K. M. Arunraja, 2K. Lakshan Raaj A Literature Review on Hybrid Electric Vehicles International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Special Issue - 2018
- [2] Pankaj R. Patil, Shivani S. Johri, Design and Control of Series Parallel Hybrid Electric Vehicle, International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181
- [3] Jayavant R. Saindane, Alka Thakur Review of Series-Parallel Hybrid Electric Vehicle using PI/PD/PID Controller, July 2016 IJSDR | Volume 1, Issue 7, ISSN: 2455-2631



- [4] Jan Dornoff, John German, Ashok Deo (ICCT), Athanasios Dimaratos (DITENCO), MILD-HYBRID VEHICLES: A NEAR TERM TECHNOLOGY TREND FOR CO2 EMISSIONS REDUCTION
- [5] Shaiful Fadzil Zainal Abidin , Amir Khalid , Sophia Zanalli , Izzarief Zahari , Rifqi Irzuan Abdul Jalal , Mohd Azman Abas , Hasan Kotein , The effect of 48V mild hybrid technology on fuel consumption of a passenger car by using simulation cycle, Received 6 June 2021; Received in revised form 20 September 2021; Accepted 22 September 2021, 2214-157X/© 2021 Published by Elsevier Ltd
- [6] Daniel S. Cardoso, Paulo O. Fael, António Espírito-Santo, A review of micro and mild hybrid systems, 6th International Conference on Energy and Environment Research, ICEER 2019, 22–25 July, University of Aveiro, Portugal
- [7] Muhammad Yousaf Iqbal, Tie Wang, Guoxing Li, Dongdong Chen, Mohammad Al-Nehari, A Study of Advanced Efficient Hybrid Electric Vehicles, Electric Propulsion and Energy Source, Journal of Power and Energy Engineering, 2022, 10, 1-12, ISSN Online: 2327-5901
- [8] Karan C. Prajapati, Ravi Patel, and Rachit Sagar, Hybrid Vehicle: A Study on Technology, International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 3 Issue 12, December-2014



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details