

HYBRID VEHICLES: BENEDICTION TO REDUCE AIR POLLUTION

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ABSTRACT

Vehicular emissions are of particular concern since these are ground level sources and along these lines have the most extreme effect on the living of general population. Likewise, vehicles contribute fundamentally to the aggregate air pollution load. Air pollution is one of the greatest threats on the planet at the present time, and in a nation like India with a population of very nearly 1.282 billion (17% of world's population), it is as of now getting hard to breathe in the majority of the metropolitan urban areas. India is confronting some serious air pollution issues since most recent 10 years and it is expanding at a disturbing rate. Researchers say that if the pollution level continues expanding at the present rate, the future would drop no less than 10 years in a few areas of the nation by 2022. This paper proposes Hybrid Electric Vehicles and ought to be advanced as a potential innovation to reduce emissions of ozone harming substances and other pollutants by utilizing electricity rather than petroleum, and by enhancing electric system effectiveness. Hybrid vehicles can really diminish CO₂, SO₂, and NO_x emissions and are environment friendly.

Future research directions depend upon priorities to use low carbon energy in transportation. Today, the transportation area faces a test and obligation to radically decrease ozone depleting substance discharges.

Keywords: Hybrid Electric Vehicle(HEV), Transportation, Air Pollution

BACKGROUND

The main cause of the exponential increase in the pollution levels is the fuel-thirsty vehicles. Cars are the essential wellspring of air pollution in India's real urban communities. In India, transportation sector transmits an expected 261 tons of CO₂, of which 94.5% is contributed by road transport. The vehicle division in India devours around 17% of aggregate vitality and in charge of a 60% production of the greenhouse gases from different exercises. The contamination from vehicles is because of release like CO, Pb, unburnt HC, NO₂ and SO₂ and SPM for the most part from tailpipes (Dayal, 2011). Vehicles in significant metropolitan urban areas are assessed to represent 70% of CO, half of HC, 30% of SPM and 30-40% of NO_x, 10% of SO₂ of the aggregate pollution heap of these urban areas, of which two-third is contributed by two-wheelers alone. These high levels of pollutants are mainly responsible for respiratory and other air pollution-related ailments including lung cancer, asthma, etc., which is significantly higher

than the national average the automobile industry in India is reaching new heights with the combined effort of Indian companies and foreign companies stepping in India. The figures are surprising.

Table : 1

Type of Vehicle	Count in 2001-2002	Count in 2012-2013	Avg. annual growth rate
Passenger Vehicles	669719	3233561	34.8%
Commercial Vehicles	162508	831744	37.4%
2-Wheelers	4271327	15721180	24.0%
3-Wheelers	212748	839742	27.0%

PERCENTAGE OF PETROLEUM USED IN DIFFERENT VEHICLES

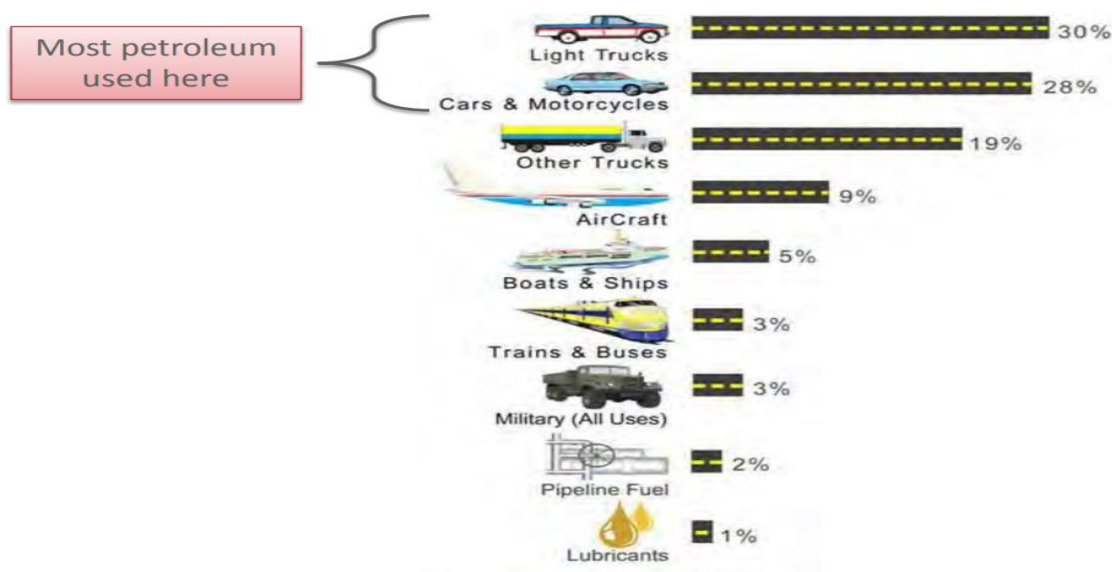


Figure 1: Usage of Petroleum

This percentage could be reduced by promoting hybrid technologies.

Trains are using Diesel and Electronic Hybrid

Cars & SUVs are using Gasoline-Electric Hybrid

Submarines can be promoted on Nuclear-Electric and Diesel-Electric Hybrid

INTERVENTIONS

This study gives suggestions based on case studies and interviews with an extensive variety of pioneers and specialists from energy and mobility industries, civil society, the scholarly world, city gatherings and National governments. The government is fighting furiously against air pollution. According to the most

recent information, very nearly 3% of the nation's GDP is spent in fighting against air pollution. So it has not just proven bad for the wellbeing, it is absolutely leading the nation down. Stringent and drastic measures are required promptly like:

- Use of perfect and good quality fuels, as CNG.
- Use of Hybrid Vehicles
- Phasing out old, fuel-thirsty vehicles
- Ban on old and inferior technologies used to make motors
- Use of renewable sources of energy
- Considering Energy Security
- Focus on electrifying public and commercial fleets, including mobility-as-a service.

PRIORITY OF LOW CARBON ENERGY IN TRANSPORTATION

Future research coordinates towards the utilization of eco-friendly fuels. To accomplish the goal of the agreement of keeping worldwide temperature rises well beneath 2 degrees Celsius, worldwide net emissions of carbon dioxide (CO₂) and other greenhouse gases (GHG) must be ceased in the second 50% of this century. Along these lines, hybrid vehicles are becoming more prominent and more typical. Fundamentally, a hybrid vehicles is one that utilizes at least two motors i.e. an electric motor and a conventional engine (either petroleum or diesel). The electric engine powers the car at bring down rates and gas engine power it at higher paces. A hybrid car like Toyota Prius and Civic Hybrid monitors fuel as well as produce less CO₂ discharges. Despite the fact that hybrid vehicles are currently developing in notoriety yet at the same time few individuals are really utilizing it for the most part because of act of knowledge of hybrid technology and whether they're in the same class as other gasoline powered vehicles.

There are vehicles that utilization hybrid technologies with propane and natural gas also. A hybrid car is best characterized as a vehicle that has a engine that can switch between a fossil fuel and an alternate fuel source. There are additionally greater government motivation programs that utilization credits and special rebates to help the buy and utilization of hybrid vehicles. Many urban areas are exchanging the public transportation and administration vehicles over to hybrid cars and buses as a piece of the program to wind up more environmentally responsible.

THE PROS OF HYBRID VEHICLES

Hybrids vehicles have made some amazing progress over the previous decade. A considerable lot of the common shortcomings of these vehicles have been replaced by attractive features. Aside from environmental benefits, electric vehicles offer a few different points of interest that have contributed to their developing popularity. They are quite safe to operate. Most electric vehicles accessible today are outfitted with intelligent safety features that can anticipate fatal injuries and accidents. Fuel economy is another key

favorable position of electric vehicles. Dissimilar to gasoline-powered vehicles, electric vehicles are very reasonable to operate. Moreover, they require very little maintenance.

Here are some of the pros of owning a hybrid.

1. Fuel Efficient

Fuel efficiency is the most clear advantage. Toyota, for instance, claims its hybrids run 80 percent cleaner than standard gasoline-powered vehicles. So in the event that you wish to decrease your negative effect on nature, a hybrid vehicle is a solid choice.

2. Teaches More Efficient Driving Habits

Not only are hybrids fuel-efficient as well as they encourage drivers to be more effective in their task of the vehicle. A sports car tends to influence drivers to need to press the gas pedal and whip around bends, however a hybrid encourages them to consider how they drive, when they drive, and how much effect they're having on the environment.

3. No Emissions Testing

"When I asked about registering my car I was informed that a hybrid does not require a emissions test to be enrolled," auto lover Jason Steele clarifies. "Since your state's laws may vary from those here in Denver, Colorado, check with your neighborhood DMV to check whether a emissions or other test is required for enrollment."

No required emissions testing is only one of many advantages. A hybrid vehicle may likewise enable you to drive in special HOV lanes in certain cities and states.

4. Less Maintenance

"A slick aspect concerning a hybrid is that the gas engine isn't running when you are stopped or driving slowly. It is astounding how frequently that occurs in city driving. The outcome is that you are putting less wear on your engine," Steele brings up.

"Hence, Toyota just prescribes oil changes each 5,000 miles, not at all like my Subaru which determines oil changes each 3,000 miles."

Less maintenance is clearly less expensive, however it additionally decreases your pressure. You can basically bounce in the car and drive, as opposed to stress over whether it'll begin when you require it.

ECONOMIC BENEFITS OF PROMOTING HEVS

Cities with a high concentration of automobile manufacturing will see job gains well beyond this. A few jobs will be lost in conventional gas industries, (for example, gas station attendants), yet the employment increment more than compensates for any shortfall. There are a few employment creation studies that have

been produced for specific urban communities and states. The Northwest Economic Research Center (NERC) of Portland State University banded partnered with Drive Oregon and Portland Development Commission to recognize Oregon's HEV cluster and assess its economic impacts.

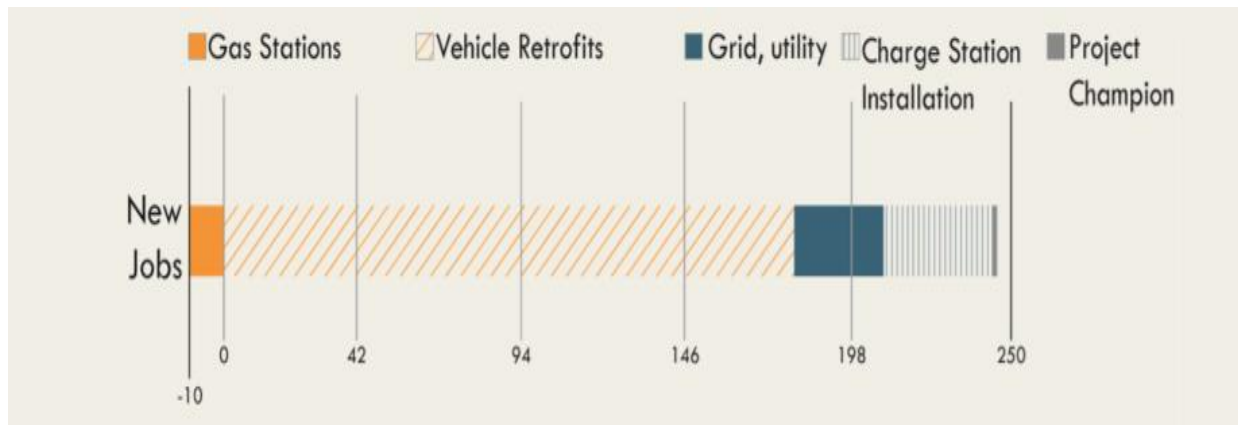


Figure2 : Job Creation

Increasing demand for clean vehicle innovations, including HEVs, gives job development along the HEV supply chain. It is creating investment funds from diminished fuel utilize, which is cash that is regularly spent locally.

This incorporates:

- Vehicle production jobs,
- Battery production jobs,
- Construction jobs,
- Vehicle segment generation employments
- Infrastructure supplier jobs,
- R&D jobs.

Electric Power Research Institute's aggregate of 86,000 new occupations is a long ways in front of the 250 jobs Project Get Ready appraisals for the normal city without a quality in auto manufacturing. In spite of the fact that it is hard to join the two investigations since they utilize distinctive systems, it is instinctive that urban areas solid in automotive manufacturing are probably going to see more employment gains from HEV supply than the normal city.

CUSTOMERS' CONCERNS ABOUT HEVS

As the cost of batteries goes down, HEVs will turn out to be more moderate than internal combustion engines(ICEs). Combined with the lower expenses of HEV support and repair, and expecting the cost of electricity remains competitive compared to the fossil fuel equivalent, clients will profit by a critical decrease in the operating cost per mile from driving HEVs. Overall, by 2020, the aggregate cost of an individual utilize HEV could be about the same as a customary vehicle, beside any motivators, in a few markets. As cost turns into a less applicable concern, numerous clients are as yet stressed over draining their

battery's charge before achieving their goal or waiting for their HEVs to charge, as appeared in an ongoing study among drivers. The accessibility of chargers and the distance that can be travelled on charge become the main barriers to HEV adoption.

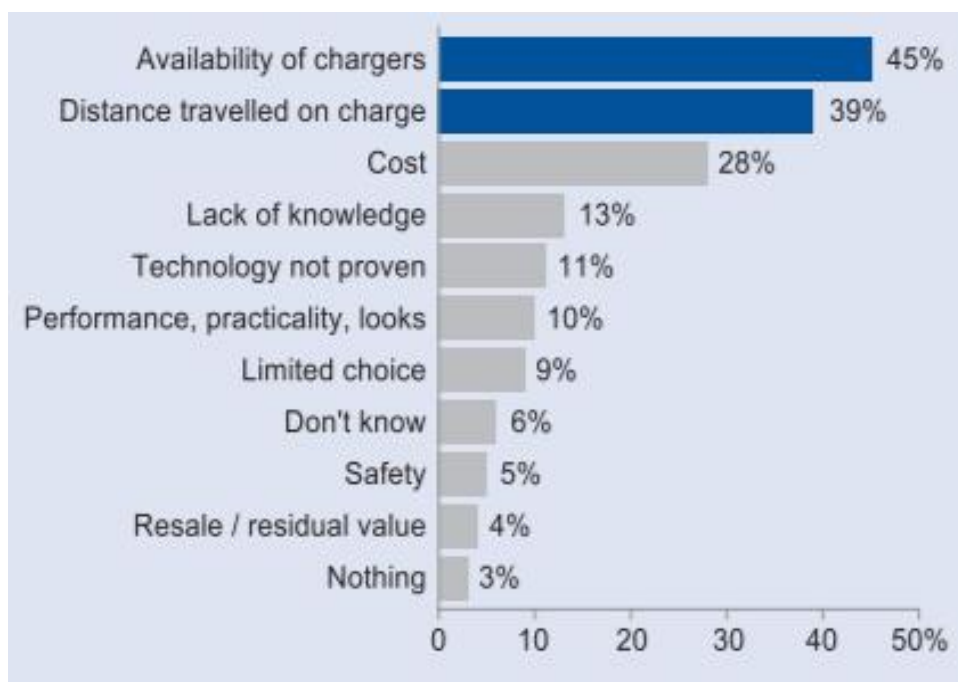


Figure 3 : Reasons For Not Purchasing HEVs

CONCLUSION

This study concluded that the utilization of Hybrid Electric Vehicles will make esteem in three measurements:

Environment: As the offer of miles driven by Hybrid Electric Vehicles increments, urban mobility emission will diminish logically; electrification combined with a perfect vitality blend and streamlined charging patterns will additionally reduce emissions, enhancing air quality and profiting human health, with a much-diminished environmental impression.

Energy: HEVs are an applicable decentralized energy resource, giving another controllable electricity demand, storage capacity and electricity supply when completely incorporated with grid edge technologies and smart grids. Smart charging will make greater adaptability in the energy system, enhancing steadiness and improving pinnacle limit ventures. This will likewise open the way to more extensive vitality effectiveness administrations.

Mobility: HEVs will turn out to be more moderate than vehicles controlled by internal combustion engines (ICEs) as the cost of batteries decreases. Smart charging administrations will decrease charging costs (for instance, by charging when energy costs are low, if dynamic valuing is executed), and new income streams for fleet administrators, will's identity ready to give auxiliary administrations to energy markets. Later on,

Autonomous Vehicles will likewise cost altogether less per mile than personal utilize ICEs, by as much as 40% and could also reduce congestion and traffic incidents.

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REFERENCES

1 Harvard Kennedy School, Belfer Center for Science and International Affairs. (2011, July). Will Electric Cars Transform the U.S. Car Market? Cambridge: Lee, H. & Lovellette, G. Retrieved from <http://belfercenter.ksg.harvard.edu/files/Lee%20Lovellette%20Electric%20Vehicles%20DP%202011%20web.pdf>

2 Harvard Kennedy School, Belfer Center for Science and International Affairs. (2011, July). Will Electric Cars Transform the U.S. Car Market? Cambridge: Lee, H. & Lovellette, G. Retrieved from <http://belfercenter.ksg.harvard.edu/files/Lee%20Lovellette%20Electric%20Vehicles%20DP%202011%20web.pdf>

3 BlueGreen Alliance/American Council for Energy-Efficient Economy. (June 2012). Gearing Up: Smart Standards Create Good Jobs Building Cleaner Cars. Washington, D.C. Retrieved from <http://www.drivinggrowth.org/wpcontent/uploads/2012/06/BGA-Auto-Report.pdf>

4 Electrification Coalition. (2010). Economic Impact of the Electrification Roadmap. Washington, D.C. Retrieved from http://www.electrificationcoalition.org/sites/default/files/SAF_1249_EC_ImpactReport_v06_proof.pdf

5 Center for Entrepreneurship & Technology, University of Berkeley. (2009, August 24). Electric Vehicles in the United States. Retrieved from http://cet.berkeley.edu/dl/CET_Technical%20Brief_EconomicModel2030_f.pdf

6 Baum, A. & Luria, D. (2010, March). Driving Growth: How Clean Cars and Climate Policy Can Create Jobs. National Resources Defense Council. Retrieved from <http://www.nrdc.org/energy/files/drivinggrowth.pdf>

7 Rocky Mountain Institute. (2009, February 24). Project Get Ready: The Menu. Retrieved from http://projectgetready.com/wp-content/uploads/2009/02/projectgetready_menu_feb24.pdf

8 Next 10. (2011, May). Driving California's Economy. San Francisco: Roland-Holst, D. Retrieved from http://www.calcleancars.org/docs/ExecSum_Driving_CAs_Economy.pdf

9 The Cleveland Foundation. (2009, May). Regional Economic Impacts of Electric Drive Vehicles and Technologies: Case Study of the Greater Cleveland Area. Cleveland: Stuebi, R. Retrieved from <http://www.clevelandfoundation.org/uploadedFiles/VitalIssues/AdvancedEnergy/EPRI%20PHEV%20Economic%20Impact.pdf>

10. Baum, A. & Luria, D. (2010, March). Driving Growth: How Clean Cars and Climate Policy Can Create Jobs. National Resources Defense Council. Retrieved from <http://www.nrdc.org/energy/files/drivinggrowth.pdf>

