Amrit Mahotsav
Sanrachna: Idea Generation Challenge 2021-22

Challenge Opted: Challenge 1: Roadmap for nation-wide faster adoption of e-vehicles (EVs)
College/University: Yeshwantrao Chavan College of Engineering, Nagpur.

Team Details:

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1. Background of the Challenge as understood

In the Roadmap, the EV Culture should be designed in a way so that people will adopt it faster, and recommend it to their connections as well. Moreover, the required infrastructure should be done at a reasonable price and specifically should be compatible with the available resources. EV should be beneficial to both Buyers and Industries. EV Industry should run in such a way that at lower power consumption more range coverage. EVs should be made a popular choice due to their eco-friendly nature, less cost of repairing using less non-renewable resources.

2. Idea Proposed with proposed design and recommendations

Electric vehicles are very popular in India and throughout the world. They are very good substitutes for traditional petrol and diesel vehicles and are also more environment-friendly.

Solutions:

- Making people aware of the benefits of switching to EVs.
- At present only Tata motors in the automobile is the automobile company that took the initiative to bring electric vehicles on Indian roads so there is a need for more automobile companies should start their research and development along with production focusing mainly on electric vehicles.

At present the features in electric vehicles has some flaws and there is a lot of scope for improvement with this booming technological arena.

- Electric vehicles can have a longer range if there is a self-charging mechanism in the vehicle that can recharge itself while out on the road besides conventional charging.

- The basic idea is to design a type of **Universal Standardized Port** that will be in every new Electric Vehicle so that drivers can locate a charging station easily.

- One other thing is **battery swapping** but there is an issue in this process is that there is no standardisation of size and type of battery. So, to fix this we have to set at least 3-4 types of batteries for every type of vehicle used. So that these batteries can be inserted in any vehicle of any brand depending upon size and weight. By this, we will also achieve less wastage of resources and maximise the output.

- The electric vehicle manufacturing companies should collaborate with the electricity distribution board of India and infrastructural giants to build infrastructure and charging stations throughout the particular city & country.

- It is possible for manufacturing companies to use **Graphite Graphene Batteries** that take very little amount of time to charge and can last for a long time in the future.

- The Government should provide Electricity for charging Electric Vehicles at **Subsidised Rates**. Moreover, encourage people to switch to Electric Vehicles.

- We must not forget the load which will be shifted from Petroleum industry to power industry, as there will be a hike in power usage of the country,
  The government will have to manage with the same electricity rates as of now. Moreover, the electricity production must be increased in order to meet the demands of power Consumption by the country. This can be managed by implanting more Solar & Wind Power Plants.

So, these are "**The solutions for the faster adoption of electric vehicles in India and the idea"** proposed by us.

3. Cost/ benefit Analysis of the proposed solution

The long-awaited change for electric vehicles in India is eventually on track. The increased focus on electric vehicles is substantially due to two factors diving into the growing trouble of air pollution and reducing India's over-reliance on crude canvas significances. In addition, support for domestic R&D, duty cuts, subventions on the significance of raw accoutrements and other impulses also serve as catalysts for this change. Electric vehicles offer us numerous benefits in numerous ways, one of which is reducing pollution. Electric vehicles have zero tailpipe emigrations-that is, they no way emit exhaust feasts or patches from the onboard power source. Also, plug-in mongrel electric vehicles have veritably low emigrations because their power comes from the energy stored in the battery. Since electric vehicles are slower than diesel and petrol-powered vehicles, they can reduce the threat of accidents caused by high-speed or high-speed driving in the teens. The good news is that electric vehicles are more precious than petrol vehicles, but petrol is more precious than electric vehicles, and electric vehicles are cheaper to repair than petrol/ diesel vehicles because of the heart-only battery. In utmost cases, repairs to the battery will need to be made.

4. Support required to take this idea forward

As we know in today's date the EVs running in our surroundings are not efficient in terms of range i.e., on a single charge we get a range of 300-450 Kms only.

So firstly, we need technology to improve the battery backup of the vehicles

In addition to that Charging infrastructure is a MUST.

Like Charging stations for the vehicles is mostly at home or in some dedicated areas in the metropolitan cities only. So, on the respective fuel stations (i.e., petrol and diesel stations), Charging points should be installed.

For this to happen, the help of the **"Ministry of Road Transport and Highways"** is needed

Then comes the production of batteries

Secondly, in EVs Lithium-ion (Li-ion) batteries are used, which are rarely made in India. Most of the batteries are imported from China i.e., we are being dependent on other countries. And as we have started the campaign of **"Aatmanirbhar Bharat"** so we need to start making batteries in our Country.

So, for that our power generation companies like Tata Power, Adani Green, Ather energy, etc. need to increase their production of batteries used in the EVs.