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VISION

To contribute to the nation, by delivering quality education and creating globally competent professionals to serve the industry and society.

MISSION

To create intellectually stimulating environment for learning, research and promotion of professional and ethical values, to develop a sense of responsibility, discipline and interest amongst students in various activities leading to the welfare of the industry and society at large and to empower the students through lifelong learning for self up-gradation and societal upliftment.

Program Educational Objectives (PEOs)

- PEO-1** To impart sound foundation in Applied Science and Engineering to the graduates, which enables them to formulate, solve, analyze and modify the problems in Electrical Engineering leading to societal benefit .
- PEO-2** To develop analyzing skill amongst graduates for technical interpretation, designing and implementation of innovative ideas
- PEO-3** To motivate and promote students for taking up new responsibilities and challenges in multidisciplinary projects
- PEO-4** To equip graduates with integrity, self-upgradation and ethical values so that their skill can be accepted globally .

Editorial

“ Intelligence plus Character is the goal of True education ”

With these words and season’s greetings a very warm a welcome to new edition of “Current Times”. This edition of Current times is dedicated to the new Technologies breakthrough in the area of Electrical Power for Electric Vehicle for the coming years. Everybody knows that what is the significance of month of January ,February and March for the person in the field of commerce but very seldom knows that for the engineering graduates also these months are of great importance . The most important in the GATE Result , which these days have become an important performance indicator of the Student as well as Institute. The students performance in the GATE Examination seeks an attention of the people of the nearby areas. The BITIANS are best GATE performers of the Central region.

Best wishes and regards

Dr. N.Tripathi
Editor

INSIDE STORY

Electric Car : An Opportunity
And
Challenges
Amazing facts



Student Solar Workshop organized in association with IIT Bombay to commemorate 150th Birth anniversary of

Two week FDP sponsored by AICTE on 4-16 November ,2019 “ Advancement in Electric Drives and Control and their

Electric Car : An Opportunity And Challenges

First Crude **Electric Vehicle** Is Developed around 1832, Robert Anderson develops the first crude **electric vehicle**, but it isn't until the 1870s or later that **electric cars** become practical. Pictured here is an **electric vehicle** built by an English inventor in 1884.

Electric cars are becoming more mainstream, and every car passionate person are wondering whether an electric car is right choice or not ?. As the technology supporting electric cars (EVs) and batteries continue to improve, drawbacks such as high cost, limited range, performance issues, long charge time, and a dearth of charging stations are fading away.



Advantages of Electric car

Electric cars cost less compared to conventional gas vehicles each year. As the cost of electric cars becomes the same as or less than existing vehicles the choice to 'go electric' will be obvious. In almost every way that counts, an electric car costs significantly less to run and maintain than a gas-powered car as there is no gas to buy, no oil changes, no smog tests, and fewer moving parts to break or wear out. In fact, many electric car owners will go years without any repair or service bills at all.

No pollution .

Since electric cars have zero tailpipe emissions, Cleaner air means less disease in the world, which means less stress on public health systems, hospitals, and so on. In addition, fewer greenhouse gas emissions will save the ozone layer and reduce our carbon footprint.

Low fuel cost

With no gas to buy, or oil to change. To refuel, simply plug in at home, at work or opportunity charge on the road. Non-renewable electricity charging your electric car is generated domestically. Installing a solar array at home or work your commute could pay for itself.

Better Safety features

EVs have to pass the same safety tests as gas-powered vehicles. A widely-circulating concern about EV safety revolves around the potential for fire, but in reality, EVs are far less likely to catch fire than gas cars. On average, gas cars will catch fire at the approximate rate of 1 fire every 20 million miles driven. For EVs, the rate is 1 fire per 120 million miles driven. That's 80% less if you're taking notes.

Low maintenance requirements.

With fewer moving parts, there are not many things to break or that need fixing on an electric car. This will save you a lot of time and money over the years: no more having to rent a car while yours is being serviced, no more oil changes, no more failed transmissions.

Quiet from both inside and outside.

One of the first things you'll notice about driving an electric car is the lack of noise. It's slightly offsetting the first time you press the accelerator and it whirs to life from a dead-silent stop to a slightly less silent zip down the road.

Better performance

Since electric cars have extremely high torque power, their pickup is very quick and smooth, leaving gas-powered vehicles eating dust. Most people are quite surprised at how much more comfortable the ride is too, and some might say that it makes gas-powered cars seem clunky and clumsy.

Major Challenges

Battery, charging issues

The energy density of the lithium-ion battery has nearly quadrupled in its 28 years of existence on the market through evolutionary improvements in materials and design

The energy density of Li-ion batteries currently can provide a limited driving range of 400 to 500 km ,whereas the consumer wants a driving range of 700 km or more. Also, the high cost of Li-ion batteries makes the EV expensive.

BEVs consist of a battery pack with lithium-ion cells. To extend the driving ranges, OEMs are increasing the energy levels of the battery packs. For example, Tesla's Model S has a 100 kilowatt-hour (kWh) battery pack, compared to 60 to 70kWh at one time. Battery cell costs have fallen from \$1,000/kWh in 2010 to \$200/kWh in 2018.

Reliability and efficiency

Batteries and charging issues aren't the only challenges. Improving the efficiency, reliability and the cost of the sub-systems and devices are also critical. One of the biggest challenges for EVs and hybrids is how the microcontroller can optimize the power efficiency for all of the different components inside the EV, from high- to low-end designs to ensure long-term design flexibility.

The dominant power semiconductor types are based on silicon, namely the power MOSFET and the insulated-gate bipolar transistor (IGBT). Power MOSFETs are used in applications up to 900 volts. IGBTs, the leading midrange power semiconductor, are used for 400-volt to 10-kilovolt applications.

Both types have some limitations. For voltage range 600 to 900 volts, silicon MOSFETs are good but they start losing some steam. IGBTs are good heavy lifters, but they are not quick or fast .

That's why the industry is interested in two wide band-gap technologies—silicon carbide (SiC) and gallium-nitride (GaN). Compared to silicon-based devices, GaN- and SiC-base power chips are faster and help eliminate the power losses in systems. GaN- and SiC-based devices are more expensive, however.

Future technology : Self-driving cars

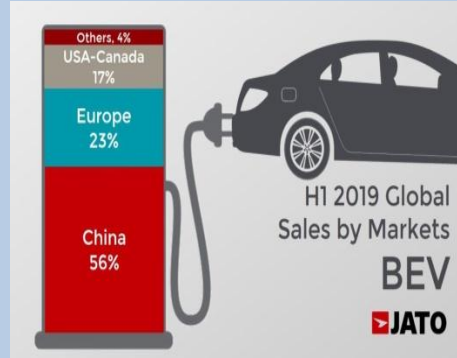
The next big things are self-driving cars and advanced driver-assistance system (ADAS) technologies. Self-driving cars are still in R&D, but ADAS is already here. ADAS involves various safety features in a car, such as automatic emergency braking, lane detection and rear object warning.

In the ADAS world, "Level 1" involves the automation of one or more control functions in a car, while "Level 2" is the automation of two or more functions. Level 3 and 4 involve more self-driving capabilities. "Level 5" is fully autonomous, steering-wheel optional.

Electric cars available in India

- Hyundai Kona Electric. (452 Km)
- Mahindra e-Verito.(181km)
- Mahindra e2o.(110 Km)
- Tata Tigor EV 2019.(213 Km)
- Tata Nexon EV 2020 (300Km)

Facts and figure about Electric Vehicle



Top 10 BEV Markets by Volume H1 2019		
	Sales (k)	Δ 18 vs 19
1 China	430.7	+111%
2 USA	116.2	+87%
3 Norway	36.3	+74%
4 Germany	33.0	+72%
5 France	24.3	+38%
6 Netherlands	17.8	+118%
7 Korea	17.7	+63%
8 Canada	13.1	+37%
9 UK	12.7	+62%
10 Japan	11.0	-27%

Increasing Sales tend of EV in last decade

Global frontiers in EV usage

Top 10 countries using EV

Electric Vehicle global Stats

US has over 1,68,000 retail locations in the U.S. that sell fuel to the public.

US now has over 20,000 electric car charging stations with more than 68,800 connectors.

China has 1,10,000 retail location for fuel filling in country .

China has 77,000 EV charging stations as on 2019

India has 55,685 petrol pump in country as on 2019

India has only 5,000 Electric vehicle charging stations including both Public and Private station.

US has 276 million vehicles operating on roads.

China has 340 million motor vehicles operating on roads

India has 210 millions vehicles operating on roads

China has 1.28 million electric cars on the road (2019)

US has 0.76 million electric cars on the road. (2019)

India has 0.4 million electric vehicles on the road (2019)

Amazing Facts

- ❖ The Hyundai Kona **electric** has the highest range of 452 km in a single charge among the **electric cars** available in **India**.
- ❖ The average **human**, at rest, produces around 100 watts of **power** in a year.
- ❖ **BYD Auto** Co., Ltd. is the automotive subsidiary of the Chinese multinational **BYD** Co Ltd, which is based in Xi'an, Shaanxi Province.
- ❖ The leading Lithium ion Battery Manufacturers in India
 1. ISRO.
 2. Amar Raja Batteries Ltd.
 - 3.HBL Power Systems.
 - 4.EON Electric Ltd.

5. EXIDE Industries.

❖ The leading Lithium ion Battery Manufacturers in World

1. LG Chem

2. Contemporary Amperex Technology Co. Ltd. (CATL)

3. BYD Co.

4. Panasonic

5. Tesla

Electric Power consumed by 1 google search is sufficient to lit 11 watt CFL bulb for 1 hour.