

Auto Sector Review: How Policy Shifts, Emission Rules & EV Push Will Reshape India's Pre-Owned Car Market In 2026

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Abstract

As the electric vehicle (EV) market continues to expand, the importance of the used EV market has grown significantly, particularly in the context of environmental sustainability and green transportation. This study employs data-driven methods to develop a comprehensive understanding of consumer preferences for pre-owned EVs. The findings indicate that full-time employed, highly educated, and higher-income individuals—especially those living in detached houses or townhouses with access to personal parking facilities—are more likely to purchase pre-owned EVs.

Using a latent class choice model, the study examines the influence of latent psychological factors and vehicle attributes across two distinct user segments: *Experienced EV Drivers* and *New EV Drivers*. The results show that *New EV Drivers* demonstrate a preference for sedans and home charging facilities when considering pre-owned EVs. However, individuals who express concerns about charging infrastructure and vehicle pricing, as well as those with a positive attitude toward automated vehicles, exhibit lower willingness to purchase pre-owned EVs.

Overall, the study offers targeted, population-specific policy insights aimed at encouraging the adoption and sustainable use of electric vehicles, thereby supporting broader environmental and transportation sustainability goals.

Keywords: Electric Vehicles (EV), ICE (Internal Combustion Engine), HEV (Hybrid Electric Vehicle), PHEV (Plug in Hybrid Electric Vehicle), Battery Electric Vehicle (BEV).

INTRODUCTION:

India's luxury pre-owned car market is being reshaped by tightening emission norms, policy signals against large ICE vehicles and a gradual but uneven push toward electric mobility. As buyers, dealers and OEMs reassess value, will 2026 mark the moment when the used luxury segment becomes the clearest indicator of India's transition to cleaner propulsion?

India's luxury pre-owned car market is entering a period where regulatory intent, environmental expectations and product realignment are converging with unusual force. The Supreme Court's proposal to phase out new petrol and diesel luxury cars has unsettled the traditional hierarchy of the premium segment, signalling that combustion-led growth no longer enjoys policy neutrality. Added to this is the tightening of CAFE requirements, which places structural pressure on manufacturers whose portfolios rely on heavy, high-displacement SUVs. These conditions are beginning to influence how both customers and the industry evaluate value, longevity and long-term compliance.

Do Bans Accelerate EV Adoption or Expose Market Readiness Gaps

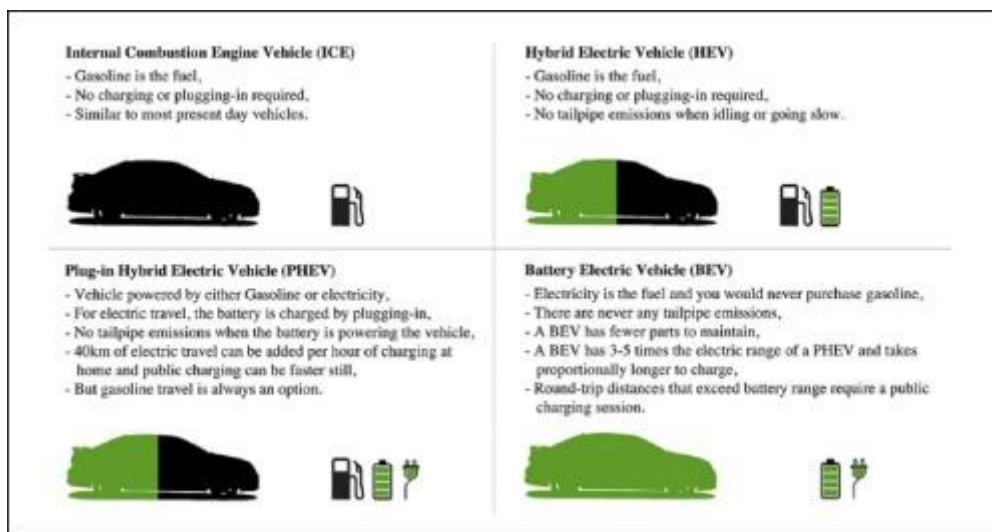
The debate around the proposed restriction raises a broader question about whether bans are the most efficient mechanism to accelerate EV adoption. India’s charging network is still patchy, the resale value of luxury EVs isn’t fully understood yet and many buyers remain more comfortable with the familiarity of fuel-driven cars. Policy can certainly nudge the market ahead, but it can also widen the gap between what the regulations expect and what consumers are actually ready for. And in the luxury segment, where people take longer to decide and expect more from their ownership experience, that gap becomes even more visible.

CAFE Norms Force a Rethink of Large Luxury SUVs

At the manufacturer level, the tightening of CAFE norms has become a decisive factor in product planning. Large SUVs, the cornerstone of India’s premium market, now carry a compliance burden that is significantly heavier than in previous cycles. Meeting the upcoming targets requires new architectures, cleaner powertrains and a rethinking of weight, aerodynamics and thermal efficiency. These challenges feed directly into the pre-owned space, because any recalibration in new-vehicle output determines the flow of inventory into the used market two to four years later. A contraction in the number of large combustion models entering the new-car pipeline today could translate into a visible supply squeeze in the pre-owned luxury segment by the middle of the decade.

Why Buyers Are Rushing Toward High-Performance ICE SUVs

Many dealers have already reported a rise in enquiries for high-performance combustion SUVs as customers anticipate that policy and emission frameworks may tighten faster than expected. The pattern suggests a dual motivation. Some buyers are choosing these models now because they worry, they might be harder to get in the future, while others see them as assets that could hold their value if new restrictions start limiting fresh supply. If this trend continues into 2025, we could see a brief surge in pre-owned options before supply tightens again, especially as OEMs begin winding down production of their biggest ICE platforms.



At the same time, luxury EVs are subtly wiring the pre-owned market. New EVs still come with a premium that many buyers feel isn’t fully justified by today’s infrastructure or incentive levels. Pre-owned EVs, on the other hand, offer a way in that keeps the aspiration intact but at a price that feels more practical. Interest is growing especially among buyers who want to experience electric mobility without taking on the heavy early depreciation that comes with buying new. And if the proposed bans take effect and CAFE norms

tighten further, this segment could grow much faster than today's forecasts anticipate.

What Will Decide Whether 2026 Becomes a True Inflection Point

Whether 2026 becomes a genuine inflection point depends on several interconnected factors. Clearer regulations will ultimately decide how quickly customers and dealers lean into new powertrain choices. Improvements in battery chemistry, faster charging and better thermal management will also play a big role in how people judge long-term performance and durability. But more than anything else, it's the growth of dependable, high-speed charging corridors in major cities that will set the tone for luxury buyers. This audience doesn't compromise on convenience or predictability, and their willingness to embrace EVs will reflect how secure they feel on those fronts.

Dealers and OEMs Prepare for a Market in Transition

Dealers are gearing up for a market that's shifting, not simply moving forward as usual. Buyers are rethinking how much they value traditional combustion performance against the backdrop of changing regulations. OEMs, meanwhile, are trying to balance compliance demands with brand identity and financial priorities. All of this is giving the pre-owned luxury segment a more strategic place in the market, echoing the wider changes shaping India's automotive landscape.

Pre-Owned Luxury Cars as a Barometer of India's Clean Mobility Shift

If the current signals stay on course, 2026 could be the point when the pre-owned segment becomes the most visible marker of India's move toward cleaner propulsion. The brands and dealer networks that read this shift early and respond with precision and agility will be the ones that gain the most. Their choices will influence not just how resale values evolve but also how customer preferences take shape in the years ahead.

How the battery production brings low price for EV:

Battery production lowers EV prices through massive economies of scale, cheaper materials (like LFP batteries & falling lithium costs), increased manufacturing efficiency via automation & new tech (dry coating, digital twins), supply chain diversification, standardization, recycling, and government support, shifting the industry from regional to global, bringing costs below \$100/kWh and making EVs competitive with gas cars.

1. Economies of Scale & Capacity:

- **Massive Investment:** Years of investment have led to huge global production capacity (3 TWh in 2024), creating downward price pressure.
- **Overcapacity:** Surging production, especially in China, means supply often outstrips demand, forcing prices down.

2. Cheaper Materials & New Chemistries:

- **Mineral Price Drops:** Lithium prices fell drastically from peaks, and stable supplies of cobalt and nickel also help.
- **LFP Batteries:** Adoption of Lithium Iron Phosphate (LFP) batteries, which use cheaper materials, lowers costs.
- **Sodium-Ion:** Development of sodium-ion batteries can further reduce reliance on costly minerals.

3. Manufacturing Innovation:

- **Automation & Efficiency:** Advanced techniques like low-solvent/dry coating, digital twins, and optimized cell formation cut energy, space, and capital costs.

- **Supply Chain Integration:** Better supply chain partnerships and more efficient logistics reduce overall costs.
 - **Standardization:** Moving from diverse tech to standardized processes boosts efficiency.
4. **Supply Chain & Policy:**
- **Diversification:** Efforts to diversify supply chains reduce risks and potentially costs.
 - **Incentives:** Government support for local cell production and recycling lowers barriers.
 - **Recycling:** Recovering valuable materials through recycling creates a circular, cheaper supply.
5. **New Business Models:**
- **Battery-as-a-Service (BaaS):** Separating battery cost from the car purchase lowers upfront EV prices.
- These factors combine to bring battery pack costs below the \$100/kWh threshold, making EVs cost-competitive with gasoline cars.

EV Battery Replacement Cost

One concern for Indian EV owners is the cost of replacing their batteries. In India, this cost depends on the car's make and model and the battery's size. On average, replacing an EV battery in India can cost between ₹3,00,000 and ₹8,00,000, which amounts to about 50% of the vehicle cost. Moreover, most EVs come with 6-month to 3-year warranties (in some cases, they are extendable to 5 years), which usually does not cover the entire life of the battery.

As the local battery manufacturing ecosystem develops, these replacement costs are expected to decline, reducing the financial burden on EV owners.

Strategies to Reduce EV Battery Costs

Reducing EV battery costs is crucial for making electric vehicles more affordable. Here are some strategies that the industry is exploring:

Advanced Materials:

Researchers are working on cheaper and more efficient alternative chemistries. For example, lithium-iron-phosphate (LFP) and nickel-manganese-cobalt (NMC) batteries are currently widely used, but lithium-manganese-iron-phosphate (LMFP) batteries are gaining popularity due to their lower cost and safety.

Improved Manufacturing Processes:

Automation and innovative production techniques can reduce manufacturing costs. Gigafactories, which produce batteries at scale, are key to achieving this.

Battery Recycling and Second-Life Application:

Establishing an efficient battery recycling ecosystem in India is key to reducing raw material costs. Moreover, second-life applications, such as using retired EV batteries for energy storage, can further reduce costs by extending battery life beyond its automotive use.

Government Incentives:

Government schemes like FAME and state-specific EV policies provide incentives for both consumers and manufacturers. These incentives can help reduce the upfront cost of EVs and encourage local manufacturing, driving down the overall cost of batteries in India.

Digital Twin Technology:

Digital twin technology allows manufacturers to create virtual models of batteries, enabling them to optimize designs, predict failures, and improve efficiency. These Digital twins can help reduce costs, enhance battery performance, and increase battery life, thereby reducing lifetime costs by simulating real-world conditions.

Shared Charging Infrastructure:

The Indian government and private companies are investing in shared charging infrastructure across cities and highways. This reduces the need for expensive home charging setups, lowering the overall cost of owning an EV.

Using EV we can make Environment Clean in India:

Everyone talks about how cleanliness would be the first and most essential step to our nation's success and growth. Yet, apart from cleaning public spaces, we must also focus on cleaning our environment by opting for a greener lifestyle and life's choices. Here is where electric vehicles can contribute a lot. Despite electric vehicles being in the nascent phase in India, many individuals have shown keen interest in replacing their regular bikes and cars with electric vehicles. At Revolt Motors, we take pride in being one of the pioneers of this revolution. More details about how electric vehicles can contribute to a cleaner India are discussed in the below sections!

Electric vehicles Are Emission-Free Vehicles:

Unlike traditional vehicles, electric vehicles do not release any poisonous emissions such as carbon dioxide, carbon monoxide, nitrogen oxide, etc. in the surroundings. This emission-free capability of electric vehicles makes them the best option for a cleaner and safer environment.

At Revolt Motors, we have single-handedly defined how electric vehicles can bring a change. We have sold over 40,000 motorbikes to date in India which is a remarkable contribution. Also, our bikes maintain zero tail emissions at all times. The table below shows a comparative analysis of fuel bikes and electric bikes in this regard:

Basis of Comparison	Petrol Bike	Revolt Electric Two-Wheeler
Co2 Emissions	75 to 100 grams per kilometre	0 gram per kilometre
Air Pollution	NOx, PM, and CO emissions	Zero Emissions
Dependency on Fuel	Petrol or Diesel	Zero dependency as charged with renewable energy

No Noise Pollution

Contribute to a noise-free environment by choosing an electric bike or car. Electric bikes are not only noiseless but also decipher speed into silence and help keep busy streets less noisy.

At Revolt Motors, we have gone a step ahead by redefining the algorithm of sound in our electric motorbikes. With a mobile app, you can keep your bikes noiseless or prefer an artificial sound that suits your biking adrenaline! So, you can now be silent in the crowded streets and get your adrenaline pumping

with your favourite bike sounds while cruising through the mountain trails!

Zero Dependence on Fossil Fuels

Fuels such as petrol and diesel are non-renewable and depleting rapidly. These fuels also play a crucial role in power plants, industries, and other sectors. Electric vehicles do not require fuel as they generate power via rechargeable batteries. By choosing electric bikes and cars, you can reduce fossil fuel consumption by that much!

Sustainable Plus Money-Saving Option

Electric vehicles not only save non-renewable energy sources but also reduce your travelling expenses. Their operating costs are fewer than traditional fuel bikes. Moreover, they also incur less maintenance costs than your regular bikes and cars.

Also, by choosing an electric vehicle, you can avail of the government-offered subsidies and incentives on EV purchases. For example, if you purchase an electric bike from RV Motor, you can save up to Rs. 43,000 every year.

With most of our models equipped with fast charging ability, the energy consumption gets significantly reduced. So, purchasing our electric vehicles can be a money-saving option for you!

Securing Vehicles for A Cleaner World

Electric vehicles, especially electric motorcycles are being integrated with the latest innovative and safety-related features. They not only offer sustainable means of transportation but also come with GPS, geofencing, smart alarms and notifications. So, you can also safeguard the safety of your vehicles by choosing the right electric bike.

Stolen vehicles are disassembled and then their spare parts are sold separately. This process often leads to leaking fluids and hazardous chemicals in the environment. Also, abandoned and stolen vehicles can contribute to pollution through discarded batteries, tyres, and other harmful substances.

Moreover, they might attract vermin that further pollute our environment. By introducing smart safety features in electric motorcycles, brands like Revolt Motors contribute to a cleaner environment and safer world!

Smog-Free Vehicles

Traditional cars and bikes run on either diesel or petrol. They release Nitrogen Oxides and other poisonous gases that pollute our environment. These gases often mix with moisture or fog to create smog which is hazardous for both human and environmental health.

In most Indian cities including Delhi, smog is a major issue that affects visibility for riders. Electric vehicles don't release such emissions to increase the smog problems further which not only affects our health and the environment but also reduces the general visibility while driving. This not only improves air quality but also helps us breathe cleaner and safer air. Indirectly, it helps us to build a cleaner and safer nation!

How Emission rules help in EV market Spread:

Emission rules help in the spread of the Electric Vehicle (EV) market by creating a regulatory and economic environment that **incentivizes manufacturers to produce EVs** and encourages consumers to purchase them.

Key Mechanisms:

- **Forces Manufacturer Innovation and Supply:** Strict emissions standards for internal combustion engine (ICE) vehicles make it difficult and costly for manufacturers to meet compliance targets with

traditional models alone. To avoid penalties, companies are compelled to invest heavily in zero-emission vehicle (ZEV) technology, develop new EV models, and scale up their production capabilities. This increases the variety and availability of EVs in the market.

- **Provides Market Certainty for Investment:** Long-term, committed emission standards (like those in California or the EU) provide a predictable policy environment that gives manufacturers and investors confidence in the future of the EV market. This certainty encourages large-scale, long-term investments in:
 - **Manufacturing facilities**
 - **Battery production and supply chains**
 - **Charging infrastructure networks**
- **Shifts the Total Cost of Ownership:** Emission regulations often work in tandem with other policies that make ICE vehicles more expensive and EVs more attractive economically. This can include:
 - **Feebate programs** (taxing high-emission vehicles to subsidize low-emission ones).
 - **Increased taxes or fees** on polluting vehicles.
 - **Direct financial incentives** for EV purchasers, such as tax credits or rebates, which are more effective when paired with stringent emissions rules.
- **Drives Down Costs through Scale:** By forcing manufacturers to produce more EVs, emission regulations help achieve economies of scale. This leads to a reduction in the cost of batteries and other components over time, eventually allowing EVs to reach price parity with conventional vehicles.
- **Increases Consumer Awareness and Demand:** The public conversation and policy changes around emissions raise consumer awareness about environmental issues and the benefits of zero-tailpipe-emission vehicles. This can increase consumer preference and demand for cleaner transportation options.

In essence, emission rules act as a powerful regulatory push that, when combined with market-based incentives and infrastructure support, accelerates the entire EV ecosystem's development and market penetration.

Benefits of Electric Vehicles:

Transport is a fundamental requirement of modern life, but the traditional combustion engine is quickly becoming outdated. Petrol or diesel vehicles are highly polluting and are being quickly replaced by fully electric vehicles. Fully electric vehicles (EV) have zero tailpipe emissions and are much better for the environment. The electric vehicle revolution is here, and you can be part of it. Will your next vehicle be an electric one?

Lower running costs

The running cost of an electric vehicle is much lower than an equivalent petrol or diesel vehicle. Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel. Electric vehicles are more efficient, and that combined with the electricity cost means that charging an electric vehicle is cheaper than filling petrol or diesel for your travel requirements. Using renewable energy sources can make the use of electric vehicles more eco-friendly. The electricity cost can be reduced further if charging is done with the help of renewable energy sources installed at home, such as solar panels.

Low maintenance cost

Electric vehicles have very low maintenance costs because they don't have as many moving parts as an internal combustion vehicle. The servicing requirements for electric vehicles are lesser than the

conventional petrol or diesel vehicles. Therefore, the yearly cost of running an electric vehicle is significantly low.

Zero Tailpipe Emissions

Driving an electric vehicle can help you reduce your carbon footprint because there will be zero tailpipe emissions. You can reduce the environmental impact of charging your vehicle further by choosing renewable energy options for home electricity.

Tax and financial benefits

Registration fees and road tax on purchasing electric vehicles are lesser than petrol or diesel vehicles. There are multiple policies and incentives offered by the government depending on which state you are in. To find out more about electric vehicle incentives, click below .

Petrol and diesel use is destroying our planet

The availability of fossil fuels is limited, and their use is destroying our planet. Toxic emissions from petrol and diesel vehicles lead to long-term, adverse effects on public health. The emissions impact of electric vehicles is much lower than petrol or diesel vehicles. From an efficiency perspective, electric vehicles can convert around 60% of the electrical energy from the grid to power the wheels, but petrol or diesel cars can only convert 17%-21% of the energy stored in the fuel to the wheels. That is a waste of around 80%. Fully electric vehicles have zero tailpipe emissions, but even when electricity production is taken into account, petrol or diesel vehicles emit almost 3 times more carbon dioxide than the average EV. To reduce the impact of charging electric vehicles, India is ambitious to achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by the year 2030. Therefore, electric vehicles are the way forward for Indian transport, and we must switch to them now.

Electric Vehicles are easy to drive and quiet

Electric vehicles don't have gears and are very convenient to drive. There are no complicated controls, just accelerate, brake, and steer. When you want to charge your vehicle, just plug it in to a home or public charger. Electric vehicles are also quiet, so they reduce noise pollution that traditional vehicles contribute to.

Other Country policy regarding EV market:

Countries worldwide employ a mix of **financial incentives, regulatory mandates, and infrastructure investments** to promote electric vehicle (EV) adoption, with leading markets showing varied approaches. Policies are generally evolving from consumer subsidies to a focus on charging infrastructure and local manufacturing.

Here is a summary of EV market policies in key countries/regions:

Norway

Norway is the global leader in EV adoption, with 9 out of 10 new cars sold in 2024 being fully electric.

- **Financial Incentives:** The primary driver has been significant tax exemptions, including an exemption from the 25% Value Added Tax (VAT) and from vehicle registration tax.
- **Perks:** Historically included free parking, reduced road tolls, and access to bus lanes (some perks are being phased out as the market matures).
- **Goals:** Set an ambitious target to phase out sales of new internal combustion engine (ICE) vehicles by 2025.

China

China is the world's largest EV market, accounting for almost two-thirds of global EV sales in 2024, driven by a strong industrial strategy and market competition.

- **Manufacturing & Affordability:** Policies have encouraged the development of affordable domestic models, with many EVs now cheaper than their conventional counterparts.
- **Infrastructure:** Invested heavily in public charging, possessing more public fast charging points than the rest of the world combined.
- **Non-monetary Benefits:** In some cities, EV buyers can bypass license plate rationing and long wait times.
- **Goals:** Targets for "new energy vehicles" (NEVs, including hybrids) sales share have been set at national and local levels, with a national action plan aiming for around 40% NEV sales by 2030.

European Union

The EU market share for EVs was around 20% in 2024, with significant variation among member states.

- **Regulations:** EU-wide CO2 emission performance standards for new cars and vans require a 100% reduction in emissions by 2035, effectively mandating zero-emission new vehicle sales by that date.
- **Infrastructure:** The Alternative Fuels Infrastructure Regulation (AFIR) mandates the installation of fast chargers every 60 km along the trans-European transport network.
- **Subsidies:** Purchase incentives vary by country and many, such as in Germany and France, have been reduced or removed, impacting short-term sales growth.
- **Trade Policy:** The EU has imposed additional tariffs on Chinese EV imports to counteract alleged subsidies.

United States

EVs accounted for over 10% of U.S. car sales in 2024.

- **Financial Incentives:** The federal Clean Vehicle Tax Credit provides up to \$7,500 for eligible new EVs, with strict requirements for domestic battery and component sourcing to encourage local supply chains.
- **Infrastructure:** The Bipartisan Infrastructure Law provides substantial funding for a national charging network along major highways.
- **State-level Mandates:** Several states, led by California, have adopted Advanced Clean Cars II regulations, which require an increasing percentage of new car sales to be zero-emission vehicles, reaching 100% by 2035.

Emerging Markets (e.g., India, Indonesia, Thailand)

These markets are experiencing rapid growth, often with policies aimed at attracting domestic manufacturing.

- **Manufacturing Incentives:** Countries like India and Indonesia offer reduced import tariffs and tax breaks for automakers that commit to local production and meeting specific local content requirements.
- **Vehicle Focus:** Policies often target two/three-wheelers and public transport (buses) for electrification due to their significant urban use and air pollution impact.
- **Goals:** India's national FAME II scheme and PM E-DRIVE scheme focus on accelerating adoption of electric two/three-wheelers, buses, and trucks.

Measures of Government taken for Vehicle Emissions:

The government has implemented a comprehensive strategy to combat vehicle emissions, focusing on **stricter emission standards**, the promotion of **electric mobility and alternative fuels**, and **traffic**

management policies.

Regulatory and Standards-Based Measures

- **Bharat Stage (BS) Emission Standards:** India has progressively tightened its national emission standards, leapfrogging directly from BS-IV to BS-VI norms for all vehicles nationwide from April 1, 2020. This change significantly reduced limits for pollutants like sulfur (from 50 ppm to 10 ppm), nitrogen oxides (NOX), and particulate matter (PM).
- **Real Driving Emissions (RDE):** To ensure vehicles maintain low emissions outside of laboratory settings, Real Driving Emission tests and on-board diagnostics (OBD) systems have been mandated for all BS-VI compliant vehicles.
- **Vehicular Scrappage Policy:** A policy has been introduced to encourage the phasing out of older, more polluting vehicles (e.g., commercial vehicles over 15 years old, private diesel vehicles over 10 years old in some regions like Delhi-NCR) by providing incentives for voluntary scrapping.
- **Pollution Under Control (PUC) Certificates:** Stricter and mandatory PUC certification norms are in place for in-use vehicles, with some regions enforcing a "No PUC, No Fuel" rule to ensure compliance.

Promotion of Clean Mobility and Fuels

- **Electric Vehicles (EVs):** The Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME-II) scheme provides subsidies and financial support for the purchase of e-vehicles and the development of charging infrastructure.

Alternative Fuels:

- The **Ethanol Blended Petrol (EBP) Programme** promotes blending ethanol with gasoline to reduce emissions.
- The **Sustainable Alternative Towards Affordable Transportation (SATAT)** initiative supports the setting up of Compressed Bio-Gas (CBG) production plants for use as automotive fuel.
- The use of Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG) as auto fuels is also permitted and encouraged.

Urban Planning and Traffic Management

- **National Clean Air Programme (NCAP):** Launched in 2019, this program aims to improve air quality in 131 non-attainment cities through city-specific action plans that address various pollution sources, including vehicles.
- **Graded Response Action Plan (GRAP):** For regions like Delhi-NCR, a GRAP is enforced during air quality emergencies. Measures under GRAP can include restricting the entry of non-BS-VI vehicles, banning construction, and implementing odd-even traffic schemes.
- **Public Transport Improvement:** Governments are investing in expanding metro rail networks, promoting e-buses, and enhancing bus-based public transport systems to reduce dependence on private vehicles.
- **Low Emission Zones (LEZs):** Cities are exploring and implementing LEZs where highly polluting vehicles are restricted from entering, a measure that has shown success in other global cities.
- **Infrastructure for Non-Motorised Transport:** Efforts are being made to create comprehensive networks of footpaths and cycle tracks to encourage walking and cycling for short distances.

How to replace our Petrol Diesel Vehicles by EV's:

Option 1: Buy a New EV (Easiest & Recommended for Most)

1. **Assess Needs:** Determine your budget, daily commute, and required range.
2. **Research Models:** Look at available new EVs that fit your needs (e.g., Tata Nexon EV, MG ZS EV, Hyundai Kona).
3. **Consider Charging:** Check for home charging (install a smart charger) or public charging availability.
4. **Purchase:** Buy a new EV from a dealer, often with government subsidies available.

Option 2: Retrofit Your Existing Car (For Classics/Specific Needs)

Process for Retrofitting:

1. **Vehicle Suitability:** Confirm your car (especially older models) is good for conversion.
2. **Find a Retrofitter:** Locate a certified professional or company that specializes in EV conversions in your area.
3. **Inspection & Quote:** They inspect your car, check documents, and provide a quote based on desired range/speed.
4. **Conversion:** Engine removed, replaced with electric motor, battery pack (often in trunk/frunk), controller, and charging port.
5. **RTO Approval (India):** Apply for an endorsement on your RC (Registration Certificate) via VAHAN using forms like 22D/22F; this ensures legal compliance.
6. **Insurance:** Inform your insurer; conversion affects policy.

Key Components Replaced/Added:

- **Engine:** Removed, replaced by electric motor.
- **Fuel Tank:** Replaced by battery pack.
- **Transmission:** Sometimes retained (e.g., for torque) or replaced.
- **Accessories:** AC, power steering, brakes may need electrical upgrades.
- **Charging Port:** Installed (often where fuel cap was).

Considerations:

- **Cost:** Kits and professional installation can be expensive but may be cheaper than a new EV.
- **Range & Performance:** Depends on battery size and motor; often provides better torque and lower running costs.
- **Legalities:** Essential to get RTO approval to avoid issues.

How you can convert your Petrol or Diesel Car to Electric process, Legality, Benefits and Costs:

Converting an ICE car to an EV cost around Rs 4-6 lakh and can take several weeks, but there are quite a few steps involved while doing so. So, you've been thinking about switching to an electric car, whether to save the environment or to cut down on high fuel costs. But if you don't have the budget to pick up a new EV, you might want to consider converting your existing petrol or diesel car to an electric vehicle. On this World Environment Day, let us look at the complexities, costs, and considerations involved in converting an internal combustion car (ICE) vehicle to an EV.

What is an EV Conversion Kit?

Conversion kits are collections of components that transform petrol or diesel vehicles into electric vehicles. These kits usually include an electric motor, controller, battery pack, charging system, and other necessary components.

During the conversion, the internal combustion engine and associated components are replaced with electric drivetrain components. The basic principle is similar to that of an EV, so the electric motor propels the vehicle, the battery pack stores and supplies energy, and the controller regulates the flow of electricity to ensure optimal performance and efficiency.

Benefits

Lower operational costs

Electric vehicles (EVs) are less expensive to operate than petrol or diesel vehicles. This is because electricity is cheaper per kilometre than fuel, resulting in significant long-term savings.

New life to older cars

In New Delhi, the life of a petrol car is limited to 15 years, and a diesel car is limited to 10 years, after which it must be scrapped. However, conversion kits can breathe new life into old ICE cars, as the government has enacted rules that allow petrol and diesel cars to continue running even after their life cycle has expired by converting them to EVs.

Environmentally friendly

EVs produce zero tailpipe emissions, reducing air pollution and greenhouse gas emissions. Using renewable energy sources to charge EVs can further reduce the environmental impact, contributing to a cleaner and more sustainable energy ecosystem.

Lower maintenance costs

EVs have fewer moving parts compared to internal combustion engine vehicles, leading to less wear and tear and lower maintenance requirements. There is no need for oil changes, exhaust system repairs, or other engine-related maintenance, which translates to fewer visits to the mechanic and reduced maintenance expenses.

EV effect on Pre-Owned Car market in India:

Electric vehicles (EVs) are reshaping the transportation system, offering a sustainable alternative to fossil-fuel-powered vehicles. In the past five years, the percentage of EVs sold in the light-duty vehicle market has increased exponentially, with an average annual growth rate of 65 %. This growth has resulted in EVs accounting for 10 % of all light-duty vehicle sales in 2022, up from just 1.6 % in 2018 (International Energy Agency (IEA), 2023). This shift is critical for reducing greenhouse gas (GHG) emissions and improving [air quality](#), aligning with global climate and United Nations sustainable development goals. Many key factors are playing pivotal roles in accelerating this transition, including but not limited to government policies, such as incentives and mandates for zero-emission vehicles improved [battery](#) technology and availability of fast-charging infrastructure to diminish range anxiety EV design, styling, and lower maintenance cost and increased public awareness. As EVs continue to gain market share, a growing market for used electric vehicles is emerging, further amplifying the importance of EVs in developing a sustainable transportation system. A recent report indicates that there are currently over 3 million EVs on US roads, with 70 % of them being model years from 2022 or earlier. This indicates a significant market potential for pre-owned EVs in the coming years. It is also anticipated that the volume of used EV sales in 2024 will grow approximately 100 % compared to 2022 and will increase by 40 % in contrast to 2023. As such, understanding user preferences towards pre-owned EVs is becoming increasingly important in the context of global environmental sustainability and the transition towards greener modes of transportation, which is currently missing.

The State of EV charging Infrastructure in India:

EV charging infrastructure: An overview

Electric vehicle charging infrastructure plays a crucial role in the widespread adoption of electric vehicles, contributing to a sustainable transportation system. Technical specification with respect to different EVs.

Status of EV charging infrastructure:

India's EV charging infrastructure is still in its early stages of development, but it is witnessing a steady growth trajectory. Here is what the current scenario looks like:

1 Growth and distribution

India's EV charging infrastructure, with 8,738 operational stations, demonstrates a promising growth trajectory. However, the uneven distribution, particularly favouring urban centres, can become a challenge to accessibility.

2 Charging station types: Captive stations and public charging stations

Diverse charging station types, from slow chargers in residential areas to fast chargers along highways, cater to varied user needs. Battery swapping stations offer a quick alternative, addressing the challenge of prolonged charging times.

Government initiatives to pump development of charging infrastructure

Government-led programs like FAME India and the EESL initiative aim to boost EV adoption and address charging infrastructure challenges. Union Ministry of Power is also playing a crucial role in developing and enabling standard charging policies to enabling development of public charging stations. Additionally, a focus on integrating renewable energy sources aligns with India's sustainability goals, ensuring a more resilient charging network.

EV charging infrastructure: Challenges

India's ambitious electric vehicle (EV) goals hinge on one crucial factor: a robust and evenly distributed charging infrastructure. Here's a closer look at some major hurdles for a fully charged future:

1 High costs, low returns

Setting up charging stations, especially fast-charging ones, requires significant investments. Land acquisition, equipment installation, and grid upgrades add to the costs. This can become a roadblock for private players to scale.

2 Grid gridlock

While India's power generation capacity is increasing, integrating surging EV demand into the existing grid poses a challenge. Upgrading grid infrastructure to handle peak charging hours without sacrificing stability requires proactive planning and significant financial resources.

3 Patchy distribution, range anxiety

Most charging stations are clustered in urban centres, leaving rural areas and highways bereft of charging options. This creates "range anxiety" for potential EV buyers, limiting their travel choices.

3 Lack of consistency in standards

The lack of consistent charging standards across manufacturers and regions adds to the confusion. Incompatible plugs and communication protocols can leave drivers stranded with depleted batteries. Clear, unified standards are essential to ensure seamless charging experiences.

4 Lack of awareness

Public awareness about EV charging options and their benefits remains limited. Addressing knowledge gaps through awareness campaigns and accessible information can encourage wider adoption, leading to a greater demand for charging infrastructure.

Conclusion:

The rise in EV adoption emphasises the growing significance of the pre-owned EV market for environmental sustainability and green transportation. Understanding the factors driving preferences for pre-owned EVs is crucial to support this shift. Thus, the study endeavours to provide a data-driven understanding of the factors influencing consumer preferences for purchasing pre-owned EVs compared to pre-owned non-EVs. It evaluated a variety of attributes, including demographic data, psychological aspects such as motivation and willingness, and contextual factors such as the characteristics of pre-owned EVs, reasons for purchasing, the charging experience, and policies related to EV incentives.

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