

Drive Forward: Careers in India's Electric Vehicle Ecosystem

Dr. Prateek Singh

India is racing into an Electric Vehicle (EV) boom — and for engineers, it's the start of an exciting, opportunity-packed era. In 2024, over 50% of three-wheelers, 5% of two-wheelers, and 2% of cars sold in India were electric, with the country targeting 80 million EVs on the road by 2030. Despite global market slowdowns, India's EV sales surged by 20%, driven by policy support, robust consumer demand, and a firm commitment to local manufacturing. The EV battery market alone is projected to grow from US\$ 16.77 billion in 2023 to US\$ 27.70 billion by 2028, unlocking significant opportunities in energy systems, materials engineering, and battery innovation. With only around 12,000 public charging stations nationwide today, India needs to build 1.32 million by 2030 — a monumental infrastructure challenge requiring the expertise of electrical, civil, and software engineers alike. Backing this growth are powerful government schemes like FAME II and PM E-DRIVE, together injecting over Rs. 20,000 crore into EV manufacturing and infrastructure. Investments from major private sector players are flowing into R&D, production, and ecosystem development, while auto component makers ramp up spending, with Rs. 30,000 crore earmarked for FY26. Add to this India's advantage as a cost-competitive manufacturing hub and the drive for 100% domestic production, and the message is clear: a wave of fresh demand is sweeping across multiple engineering fields. For aspiring and working engineers, this is a moment to seize.

Electrical and Electronics Engineering is at the heart of the EV movement. From motor design to battery management systems, power converters to wiring harnesses, the shift to electric drives demands deep expertise in circuits, control systems, and high-voltage safety. Every EV



needs a brain and a nervous system — and that's exactly what electrical engineers build.

Mechanical Engineering is evolving fast. No longer limited to internal combustion engines, mechanical roles now focus on lightweight chassis design, thermal systems, aerodynamics, and integration of electric powertrains. The goal to make EVs lighter, more efficient, and safer, without compromising performance.

Battery Technology and Chemical Engineering are seeing explosive growth. Batteries are the beating heart of an EV, and engineers in this space are working on everything from lithium-ion cell chemistry to solid-state innovations, thermal regulation, and recycling solutions. As India ramps up domestic battery manufacturing, these roles are set to skyrocket.

Software Engineering and Embedded Systems are now core to vehicle design. From smart dashboards to autonomous features and over-the-air updates, EVs are as much code as they are hardware. Engineers with skills in embedded C, IoT, machine learning, and cybersecurity are in high demand to power the EVs' digital backbone.

Civil and Power Systems Engineering is critical behind the scenes. Charging infrastructure needs to be everywhere — in cities, towns, highways, and even rural areas. Engineers are needed to plan, build, and maintain a national network of fast, reliable, and grid-friendly EV chargers. Power systems experts are also leading efforts to ensure the grid can handle this new load.

Industrial and Manufacturing Engineering is also entering a new phase. As companies scale up EV production, there's a huge need for engineers who can design efficient, automated, and sustainable manufacturing lines— especially under the "Make in India" push for self-reliant supply chains.

Automotive Design and Human Factors Engineering are gaining traction too. EVs offer new design freedoms, and engineers are rethinking everything — from

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2.2 Those who had applied against the Recruitment Notice published in Employment News dated 25th Nov, 2023 to 1st Dec, 2023 and are still eligible and willing, may also apply afresh.

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interior layouts to user interfaces and driver experience— to suit electric platforms.

Skills That Drive the EV Industry

The EV sector blends mechanical, electrical, digital, and chemical domains into one high-performance engine, and to thrive here, engineers must rethink their learning pathways.

Core design tools like SolidWorks, CATIA, and Ansys are now essential for mechanical and thermal engineers tasked with creating lightweight, energy-efficient components. In electrical and electronics engineering, mastering MATLAB/Simulink, power electronics, Battery Management Systems (BMS), and high-voltage safety protocols is no longer optional — it's expected. For those eyeing roles in embedded systems, fluency in embedded C, Python, IoT frameworks, and CAN communication protocols is vital, particularly as vehicles become increasingly software-defined.

On the battery front — one of India's fastest-growing verticals — knowledge in electrochemistry, cell design, thermal regulation, and battery lifecycle management is opening doors to high-value roles in both R&D and manufacturing. Platforms like Skill-Lync, NPTEL, and ISIE India offer tailored courses aligned with industry demand, while institutes such as IIT Madras, and IISc Bengaluru are pioneering specialised EV certifications and research programmes.

Importantly, India's EV transition is being shaped by initiatives like FAME II, PLI schemes, and the Make in India mission — all of which are nudging the industry towards local innovation. This means engineers who can work across disciplines, prototype rapidly, and understand both tech and policy frameworks are highly sought-after.

Aspiring candidates should also focus on building project portfolios — whether it's a DIY electric drivetrain, a simulation of regenerative braking, or an EV charger prototype. These hands-on projects demonstrate real-world readiness and often matter more than a traditional résumé.

In this new mobility era, the ability to learn fast, adapt across domains, and apply knowledge practically will separate the leaders from the laggards. For Indian engineers, the message is clear: your skills are your launchpad— and now is the time to upgrade.

Choosing Your Launchpad in the EV Industry

When it comes to starting a career in India's booming Electric Vehicle (EV) industry, one of the biggest choices young professionals face is where to begin: a nimble startup or a powerhouse corporate brand? Both offer rich ground — but the journey feels very different.

EV startups are fast, flexible, and fearless. They are rewriting the rules of urban mobility and building bold, futuristic products. Working at a startup means getting your hands dirty — prototyping new battery systems, testing code in real-time, designing compact hardware that fits into scooters or city chargers. Here you're not one cog in a big machine. You're in the core team. You might be building in the morning and presenting to the CEO by afternoon. If you want speed, impact, and a steep learning curve, startups will stretch and shape you.

But the pace comes with pressure. Roles blur. Resources are tight. And structure? Often still in the making. For self-driven engineers, designers, or marketers, that's the thrill. For others, it can feel chaotic.

On the other hand, corporate giants offer scale, stability, and structure. You'll work on national-level EV rollouts, mass-market platforms, and robust R&D ecosystems. You'll learn how to test for safety and comply with global regulations. There's mentorship, cross-functional collaboration, and clear ladders to climb. The exposure here is vast — from advanced materials labs to international supplier chains.

Yet, things move slower. Ideas can take months to get approvals. And your role might be more specialised. But if you value rigour, long-term growth, and deep domain mastery — this is where you build a strong foundation.

The truth is, there's no wrong path — just different kinds of momentum. Some youngmen start in startups to gain versatility, then move to corporates for depth. Others build a base in large firms and leap into the startup world when they're ready to lead. What matters is knowing your strengths, your appetite for risk, and the kind of work culture that brings out your best.

(The author is a NEET/JEE coach and career counsellor. Views expressed are personal).



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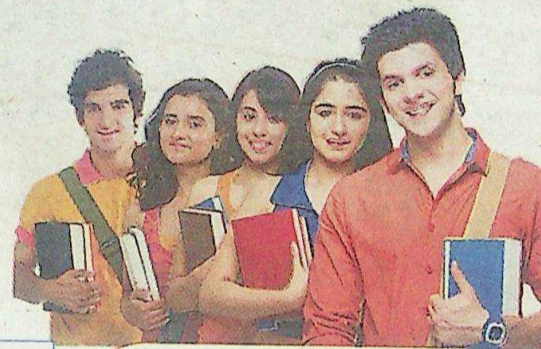
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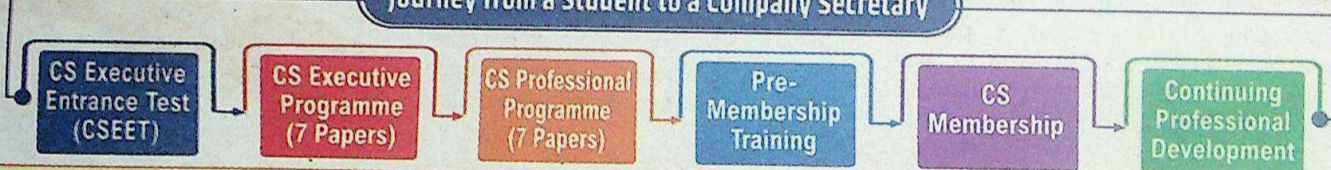


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