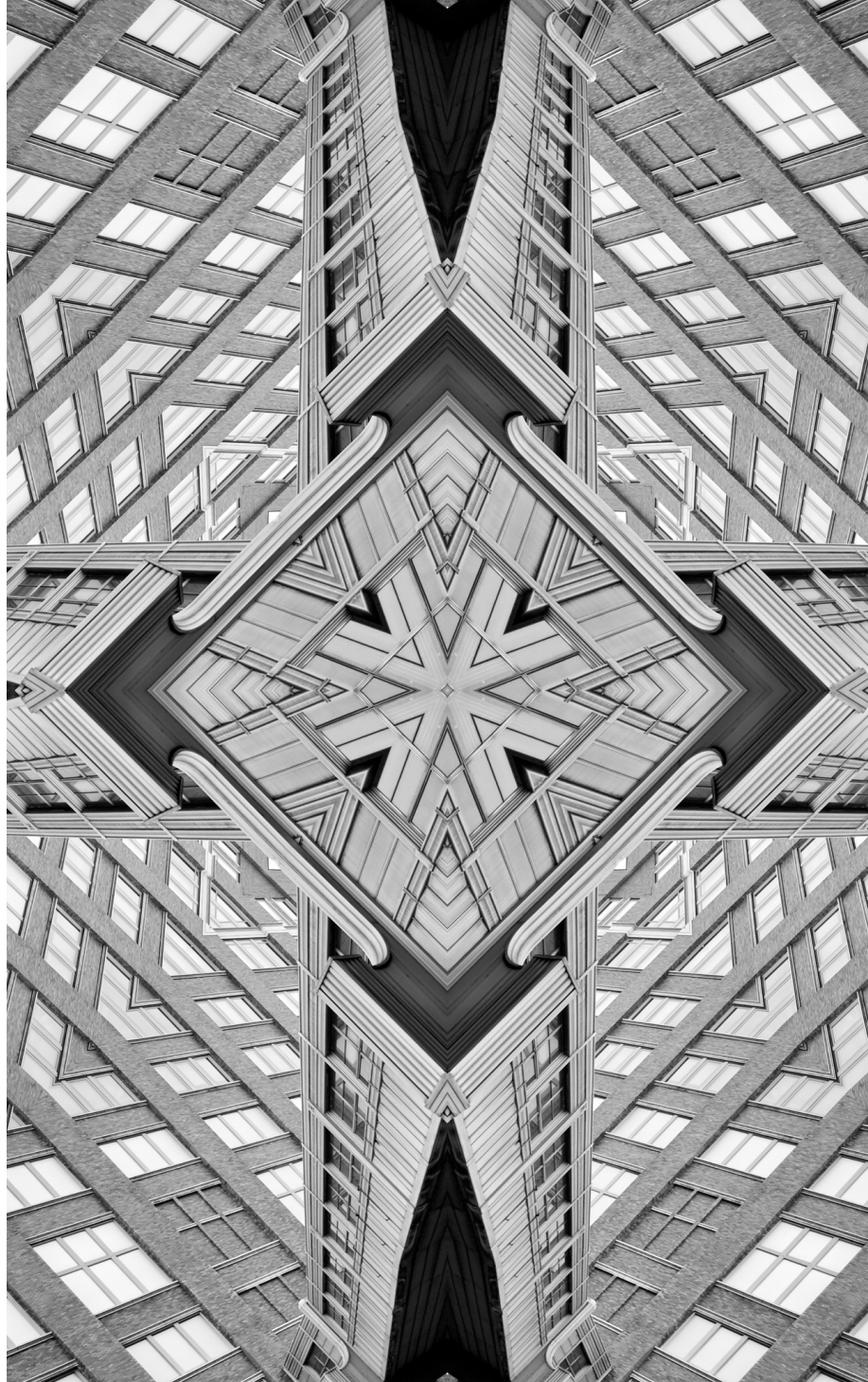


Issue

Brief

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Reaching Full Charge: The Need for a Policy Reset for India's Electric Two-Wheeler Industry

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Abstract

The electric two-wheeler segment represents a unique opportunity for India to become a global leader in the green technology space. The growth of this segment in the country is being driven by strong policy support, combined with homegrown engineering and innovation. However, the industry has yet to fully harness the global electric vehicle (EV) opportunity, and policy uncertainties are impeding innovation and investment. This brief makes a case for a policy reset for the India's electric two-wheeler industry and proposes a roadmap of action. Three broad ideas are highlighted: rapid and fair resolution to existing disputes associated with the FAME scheme; development of a deliberative growth strategy for the segment; and the need to centre innovation as a pillar of indigenisation efforts.

Consumers in India and in other parts of the world are showing growing demand for electric two-wheelers, including bicycles, mopeds, scooters and motorcycles. In Europe, by 2030, the electric scooter market is expected to cross US\$60 billion, more than doubling from 2022.¹ Sale of e-bikes outpaced that of four-wheeler EVs in the United States (US) in 2022, and the industry is expected to surpass the 1-million mark for annual e-bike sales next year.² In Asia, Indonesia saw 5 million conventional two-wheelers sold in 2022;³ indeed, Asia is the hotspot, accounting for over 90 percent of global sales of these vehicles.⁴ The potential for growth of this market is immense—in the African subcontinent alone, there are more than 80 million conventional motorcycle users who could make the jump to battery-powered ones in the coming decade.⁵ The biggest beneficiary of the two-wheeler EV revolution has been China, the world's largest manufacturer and exporter, which exported 23 million units in 2021.⁶

In India, between 2021 and 2023, the two-wheeler electric vehicle (EV) segment expanded three-fold to around 670,000 registrations in FY2022-2023;⁷ today the country boasts 1.4 million registered electric two-wheelers.⁸ This remarkable growth can be attributed to a combination of homegrown innovation, engineering and manufacturing, combined with strong government support in both the demand and supply sides. However, India's electric two-wheeler industry has yet to capitalise fully on the EV growth story. The last few years have also seen a number of warning signs for the industry. Investigations into alleged violations of subsidy norms have jolted business and investor sentiments. There is urgent need for course correction to develop a long-term collaborative roadmap, and make India a global leader in this segment.

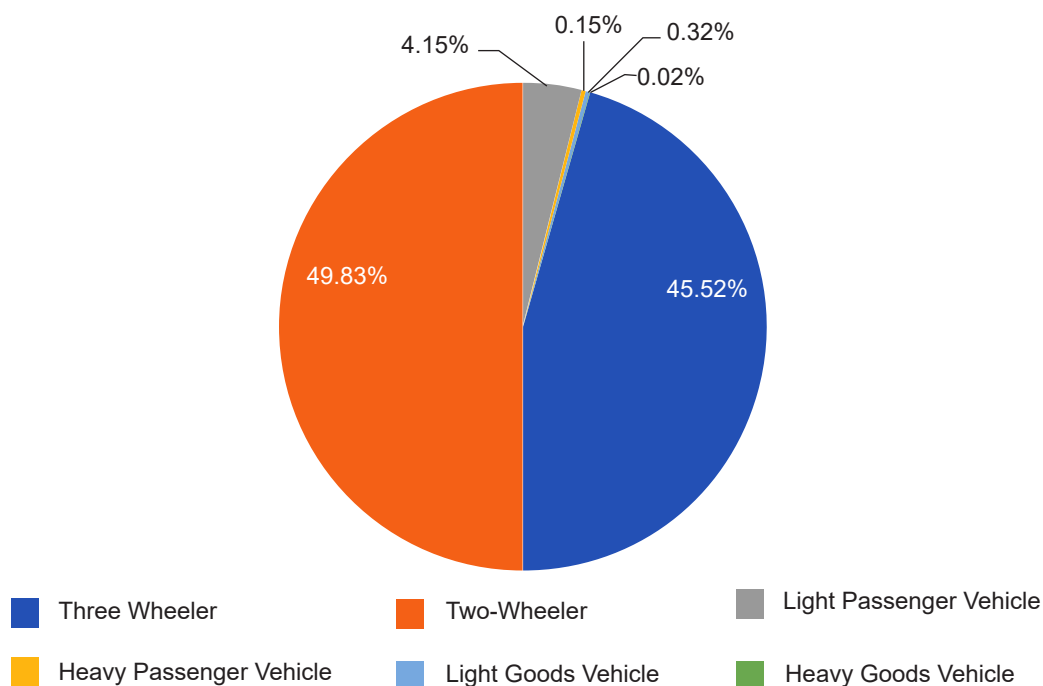
This brief delves into the immense potential of India's two-wheeler EV industry, while also addressing the impediments to growth. It analyses the existing growth trajectories and untapped possibilities of this segment and highlights the policy catalysts that have helped propel its expansion. It examines recent developments that have introduced a sense of uncertainty in the landscape, and outlines policy recommendations to counter the evolving risks and provide the necessary framework for continued growth.

The Electric Two-Wheeler Opportunity

In FY2023, India's automobile industry achieved a milestone as annual sales of EVs surpassed the one-million-unit mark for the first time. As elsewhere, EV growth in India has been propelled by rapid reduction in the costs of lithium-ion batteries, paired with robust policy support.

However, the Indian story is unique in one critical way. As shown in Figure 1, 95 percent of the 2.85 million EVs currently registered in India belong to two segments: two-wheelers and three-wheelers.⁹ This is in contrast to the developed world, where EV growth has been driven largely by passenger car sales. For example, in the US, the stock of electric cars had grown to 3 million by 2022,¹⁰ while that of electric two-wheelers comprised mostly high-end motorcycles. The story is similar for most countries in Europe.

Figure 1: Registered EVs in India, by Segment



Source: Vahaan Dashboard¹¹

The Electric Two- Wheeler Opportunity

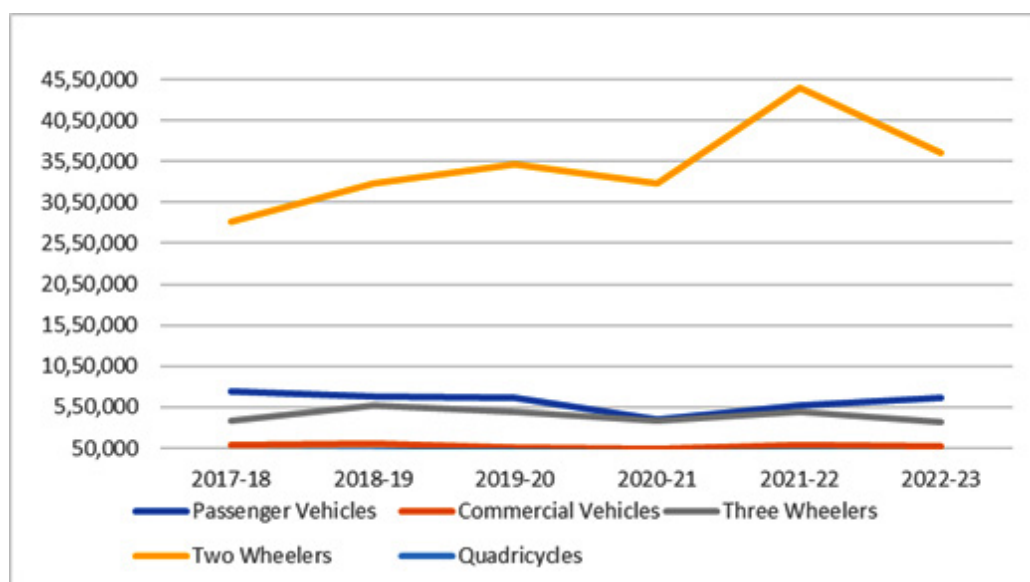
In India, however, it is two-wheelers which are meeting the mobility requirements of a significant population of people in the low- and middle-income brackets. The National Family Health Survey-5 (2019-21) shows that 54 percent of Indian households own a motorised two-wheeler, whereas only 8 percent own a car.¹² The predominant factor influencing purchase of two-wheelers is their affordability, coupled with lack of adequate public transportation alternatives. That many of these two-wheelers are electric suggests an increased acceptance of these as a cost-effective solution to daily commuting needs.

A transition to electric two-wheelers also leads to greater reduction of greenhouse gas (GHG) emissions, especially if the complete lifecycle of emissions, including those from vehicle manufacturing and battery production, are taken into account. Estimates by the International Transport Forum (ITF) suggest that electrification of two-wheelers in India could reduce lifecycle emissions by 28-57 percent compared to their internal combustion engine (ICE) variants, which is higher than in many other vehicle segments where vehicle and battery sizes are larger.¹³

The two-wheeler segment has also been a notable driver of manufacturing growth in India in the last two decades. Before the COVID-19 pandemic, India had the largest two-wheeler industry in the world, producing on average around 20 million units annually between FY15 and FY20. Post- pandemic, production has taken a hit on the back of reduced domestic demand and supply chain issues, falling to a low of 17 million units in FY22.¹⁴ While the automobile industry as a whole accounts for 49 percent of India's manufacturing gross domestic product (GDP) and over 19 million jobs,¹⁵ the central role of two-wheelers is evident from the fact that around 70 percent of its vehicles are either scooters or motorcycles.¹⁶

Though two-wheelers produced in India primarily cater to the domestic market, exports are also considerable. Automobile exports stood at nearly US\$ 23 billion in FY22, accounting for 5 percent of overall merchandise exports from India.¹⁷ Two- wheelers are a significant contributor to automobile exports, accounting for around 80 percent of the 5 million units exported annually. Already, Indian two-wheelers account for 7.4 percent of total two-wheeler exports globally.¹⁸

Figure 2: Vehicle Exports from India, by Segment



Source: Society of Indian Automobile Manufacturers¹⁹

Latin America, Africa, and South Asia have emerged as key markets for India’s two-wheelers. Demand in these geographies is expected to increase rapidly since penetration levels are currently low, and usage of two and three-wheeler EVs as a commercial fleet is bound to escalate as a response to rising crude prices.

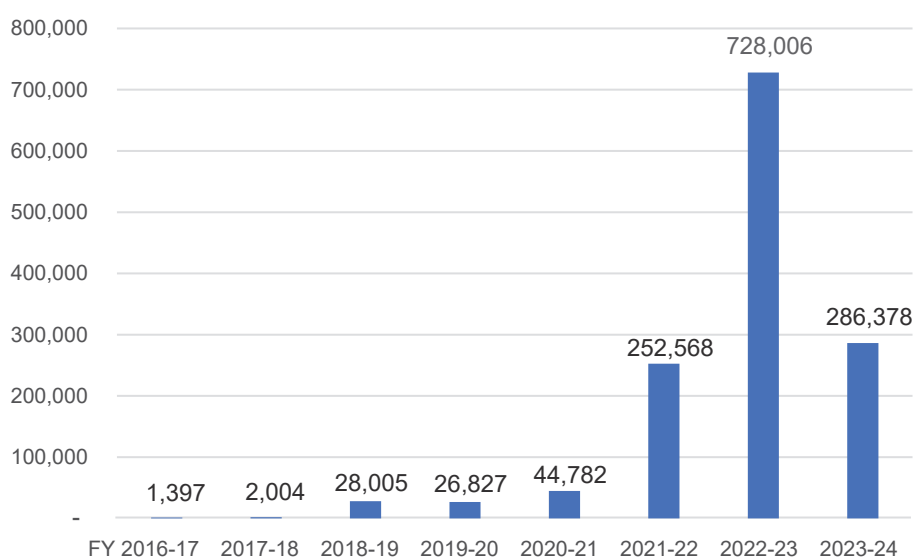
India is in a good position to meet the demand for several reasons. First, its electric two-wheeler industry is a unique mix of legacy two-wheeler manufacturers pivoting to electric vehicles and new original equipment manufacturers (OEMs) looking to take advantage of the electrification opportunity. This has created fertile ground for innovation driven by competition, due to which Indian manufacturers offer an extensive range of two-wheelers, mostly electric scooters, with varied technical specifications serving a wide range of uses. Second, production capabilities are expected to expand rapidly with cumulative capacity for electric two-wheeler production potentially reaching over 30 million units by 2026, almost 50 percent more than the peak capacity of 21.2 million two-wheelers in FY19.²⁰ Altogether, India will be in a favourable position to meet the projected demand from global markets.

The Policy Environment's Pivotal Role

Government support for electric mobility in India began early. The National Electric Mobility Mission Plan (2013) underscored a commitment to EV adoption at a time when the technology was still in its fledgling state. To operationalise this mission, the Faster Adoption of Manufacturing of (Hybrid and) Electric Vehicles (FAME-I) was launched in April 2015, encompassing three key objectives: demand subsidy, infrastructure development, and research and development (R&D) support.

India's EV policymaking was further boosted by the MOVE Summit it organised in September 2018, which led to more targeted policy and ecosystem development for the growth of EVs in India. FAME-II was launched on 1 April 2019. For two-wheelers, the biggest driver of adoption has been the demand subsidies provided under FAME-II. Initially, it was INR 10,000 per kWh of battery capacity, increased to INR 15,000 in June 2021. The increased subsidy has been pivotal in bringing down the high upfront costs of electric two-wheelers, which were a key barrier to EV adoption, especially in India's price-sensitive automobile market. As shown in Figure 3, sales of electric two-wheelers have accelerated rapidly after the subsidy increase.

Figure 3: Electric Two-Wheeler Registration, by Year*



Source: CEEW²¹

*Sales data updated till August 2023

The Policy Environment's Pivotal Role

FAME-II also established a phased manufacturing programme (PMP) to promote increased local content in the EV manufacturing process. First, it established a roadmap for phased increases in custom duties on imports of already assembled vehicles and lithium-ion batteries and EV components. Next, it laid down an effective date of indigenisation of different EV parts and a minimum local value addition criterion to avail incentives. Models which failed to meet the localisation criteria would miss out on the subsidy.

Separately, the government has also recently introduced two production-linked incentive (PLI) schemes. The first, for automobiles and auto components with a budgetary outlay of INR 25,938 crore, provides sales-linked incentives up to 18 percent of the sale value for manufacturing Advanced Automotive Technology (AAT). While EV components such as motors, wires, and converters are included in AAT, the incentives can also be availed for advanced ICE vehicle components where Indian component manufacturing still lags behind. It remains to be seen how much of the PLI incentives will actually end up directed towards EV components. The second PLI scheme, more explicitly focused on Advanced Chemistry Cell Battery Storage technology, has an outlay of INR 18,100 crore and seeks to create an indigenous supply chain for battery manufacturing.

Both PLI schemes have received substantial interest from the larger manufacturers who are able to meet the steep revenue and asset ownership eligibility criteria for availing these schemes.^{22,23} However, results will only be visible in the coming years.

Although policy support remains a crucial enabler for electric two-wheeler adoption, there have been uncertainties in the subsidy schemes and the PMP as detailed in the following paragraphs.

- While the PMP's vision was laudable, its rollout was problematic in certain ways. First, FAME-II's norms initially lacked specificity about domestic value-addition thresholds. The norms did not specify the 50 percent localisation target; this was only set later. Second, the initial set of norms did not clearly define and differentiate between indirect import and assembly. Third, the procedure to assess products and certify vehicles as compliant with FAME-II norms also shifted over time, with continuing ambiguity about the timing of indigenisation of different EV components.

It is reasonable and even desirable for norms to evolve over time as policymakers monitor standards and their implementation and refine them. However, if norms are refined, industry should be given sufficient time to shift its practices and comply. Additionally, updated norms should not be retrospectively applied on a subset of OEMs.

- FAME-II norms required OEMs to sell vehicles under strict price ceilings to qualify for subsidies. The price ceiling for two-wheelers was set at INR 1.5 lakh. However, the norms left some ambiguity about whether certain parts of the electric vehicles could be separately charged. Four OEMs took advantage of this ambiguity and billed customers separately for chargers and software updates while keeping the EV itself below the price ceiling. Alerted about this in April 2022, the Ministry of Heavy Industries launched a probe, while also freezing INR 500 crore of subsidies that were yet to be disbursed to these OEMs. Eventually, the OEMs agreed to reimburse customers for the cost of chargers and the ministry released their frozen subsidies. Tensions, however, remain with the government unhappy with the OEMs' progress on reimbursements. It recently set a deadline for the OEMs to ensure the return of INR 278 crore to customers by November 2023.²⁴
- In mid-2022, the ministry revealed that some OEMs had falsely claimed FAME-II subsidies despite being in violation of localisation requirements. Once more, subsidies reportedly up to INR 1,500 crore were held back with the OEMs required to reimburse subsidies worth INR 500 crore.

The recovery of subsidies has become a major issue and the penalties being contemplated for the offending OEMs could drive them into insolvency. Some OEMs under investigation are also being asked to pay their fines before the government releases even the non-disputed portions of their subsidies. This has exacerbated their working capital pressures.

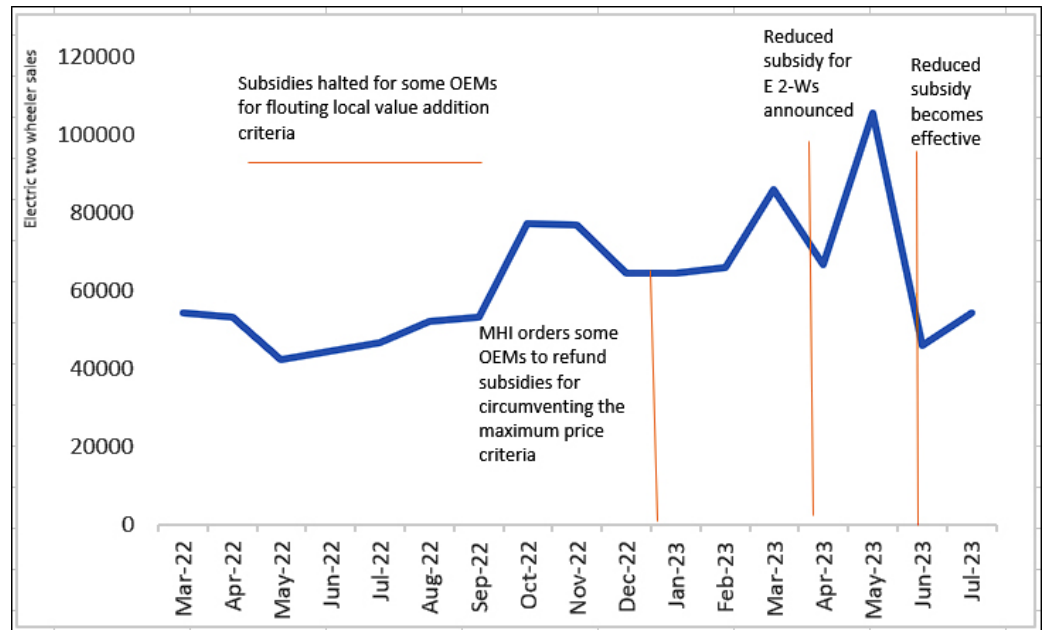
These pressures are forcing the OEMs to prioritise their available finances towards ongoing operations, adversely impacting investments in R&D and other efforts to increase global competitiveness. This could set back India's drive for global leadership in the electric two-wheeler EV space.

- In April 2023, the government announced that the subsidy on two-wheeler EVs was being scaled down from INR 15,000 to the original INR 10,000 per kWh of battery capacity. The decision was implemented beginning June 2023. Since then, there has been a sharp drop in monthly two-wheeler sales, from over 100,000 units in May to less than 50,000 units in June, recovering slightly to around 54,000 units in July.²⁵ It remains to be seen what the long-term impact of this subsidy reduction will be.

This decision has also led to increased uncertainty about how electric two-wheelers will fare in the upcoming version of the FAME policy, likely to be announced in 2024. Current signals suggest that the budgetary outlay for FAME-III will be thrice that of FAME-II, but that the greater part of the subsidies will be devoted to the commercial vehicle segment. This raises the question: will this shift come at the expense of reduced subsidies for the two-wheeler segment?

The uncertainty is already showing in the sale fluctuations of electric two-wheelers in the last few months (Figure 4). The impact of the subsidy reduction on sales is clearly visible. If localisation conditions continue to hamper production capabilities, the growth of this segment will continue to remain at risk. It is imperative to bring stability to this segment if India is to realise the full potential in electric two-wheelers.

Figure 4: Recent Policy Changes in the Electric Two-wheeler Industry



Source: Author's own, based on Vahaan Data

A number of policy course corrections are needed to put the segment back on a high-growth track. The following recommendations should be considered:

i. Resolve current investigations quickly and fairly.

The subsidy-related FAME-II investigations could drive some of India's most innovative OEMs to insolvency, severely setting back future investments and the growth of the industry. A quick, fair, and proportionate resolution will send a strong, yet constructive message to the market and investors. The resolution should include:

- *Fair and proportionate penalties on violating OEMs:* These could involve the OEMs replacing all components incorrectly claimed as compliant with the government's domestic value addition norms, with genuinely local ones. Alternatively, the penalties could be structured as fines and/or foregone subsidies of equivalent value for the components incorrectly labelled.
- *Permitting subsidies for non-disputed products:* Currently, if an OEM is under investigation for any of its products allegedly violating norms, the OEM as a whole is completely debarred from the FAME portal. For these OEMs, even products that have even been certified by the Automotive Research Association of India (ARAI) as FAME-compliant are ineligible for subsidies. This could be modified to enable the ARAI-certified products to receive subsidies while the OEM is investigated and penalised for other violations.

Case Study 1. Telecom Sector: Policy Reset that Set the Foundations for Dramatic Growth

Following the liberalisation of the 1990s, India opened up telecom to private sector participation. Under the 1994 National Telecom Policy, private companies (telecom service providers) were invited to participate in an auction of telecom spectrum. Companies' bids included a fixed annual fee they would pay the government, based on projected revenues. Following the auction, 34 licenses were issued for an initial period of 10 years, later extended to 15.²⁶

However, aggressive bidding during the auction had led to inflated and unsustainable annual fee commitments by many of the telecom service providers. By early 1997, six were in default, and by 1998 there were eight.²⁵

Initially, the government was opposed to changing its policy. The companies were themselves to blame for their plight. However, as it was being recognised that even a few insolvencies could set back investments and the growth of India's telecom industry, the government responded with bold reforms in the form of the New Telecom Policy of 1999. This allowed licensee companies to migrate from a fixed license fee regime to a revenue sharing scheme, wherein license fees were determined in proportion to the service provider's adjusted gross revenue.

The subsequent rebound and dramatic growth of India's telecom sector is testament to the impact of this reform. The sector captured an average of 8.2 percent of total inward foreign domestic investment (FDI) flows between 2001 and 2011, with much of the FDI directed towards the cellular mobile segment.²⁷ As private operators introduced innovative pricing models and diverse service offerings, mobile connectivity became more accessible to a larger segment of the population. The total number of telephone subscribers in India increased from 28.53 million in March 2000 to 943.49 million in February 2012. In fact, India reached its Eleventh Five Year Plan (2007-2012) target of 600 million subscribers two years early, in 2010.²⁸

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Since then, however, the government has taken a hands-off approach to the telecom sector despite its continuing financial pressures. Heightened competition between service providers—which increased sharply with the entry of Jio in September 2016—hurt the commercial sustainability of many. Smaller entities were acquired, while major players Vodafone and Idea merged. The industry now consists of only three private players (Jio, Airtel, and Vodafone Idea). At least one of them (Vodafone Idea) continues to be under severe financial stress, and one public sector entity (BSNL) is heavily supported by the government. There are fears of market dominance by the large companies, which could reduce their incentive to continue investing in innovation and competitiveness going forward.

ii. Ensure policy stability through a targeted roadmap.

The government should develop a roadmap for the two-wheeler EV industry, to work towards India's leadership on the global stage. It would provide stability to policymakers, other implementing agencies such as ARAI, and the industry, ending uncertainties such as those regarding FAME-III.

The roadmap should include the following:

- *Ambitious yet realistic targets and timelines:* Both policymakers and OEMs need a clear reference point. Targets and timelines should be set in consultation with innovative OEMs which have invested in growing domestic value chains and sourcing. Specific domestic sales-based targets for electric two-wheelers should be set both in the short and long term. There should also be clear targets for expanding exports alongside specific export support policies.
- *Clear communication around incentive schemes:* The future structure of subsidies for the electric two-wheeler segment should be made clear in the FAME-III scheme. For a start, the subsidy could be increased back to INR 15,000 per kWh of battery capacity. In the longer run, the government should set a roadmap for future reduction in subsidies, clearly identifying dates by which subsidies will be scaled down. The roadmap should provide enough time for consumers and OEMs to adapt. Barring exceptional circumstances, there should be no backtracking on stated timelines. This will help OEMs build their long-term business plans to localise components and thereby cut costs when the subsidies are reduced.

- *Clear certification and compliance procedures for any phased manufacturing plans:* The government should specify detailed certification procedures at the outset. The localisation requirements for any schemes focused for two-wheeler EVs must be aligned with the expected outcomes of the PLI schemes for automobiles and auto components, advance chemistry cell batteries, and large-scale electronics, all of which are helping to grow domestic value chains for EV components.
- *An inclusive consultation process:* While the government did make some efforts to consult with EV manufacturers during the policy formulation stages, it can do more. The two-wheeler segment comprises more than 60 manufacturers. Many are newcomers and operate on a small scale. Their perspectives are often ignored in the proposals presented by industry associations. An open, inclusive, and dedicated consultation platform with electric two-wheeler manufacturers is imperative. It would allow both policymakers and the industry to work together, articulating their concerns and sharing ideas and potential solutions.

Case Study 2. Japan's Automotive Industry: Planning Combined with Flexibility

Japan's automotive industry has been among the world's top three for many decades now. Its annual production grew from modest beginnings in the early 1950s to over 5 million vehicles in 1970, to its peak of 13.5 million in 1993.²⁹ Its exports grew similarly, from a handful in the early 1950s to 10,000 vehicles in 1961 to over 1 million by 1970.³⁰

The industry's remarkable growth in domestic and export markets was accompanied by the rise of Japanese OEMs such as Toyota, Honda, Nissan, and Suzuki. In the process, the Japanese automotive industry also developed intricate and cutting-edge value chains comprising Tier 1, Tier 2, and Tier 3 suppliers, contributing substantially to job creation.

The rapid rise of Japan's automotives—as well as many other industries, including steel and electronics—to positions of world leadership owes to its powerful Ministry of International Trade and Industry (MITI). MITI's role

in developing long-term roadmaps for each industry and segment is well-known. However, less known is MITI's flexibility and adaptability over the years and its close engagement with industry to understand and address challenges.^{31,32}

MITI had initially envisioned, for instance, the creation of a small set of 'national champion' companies that could achieve high economies of scale, dominate the domestic market, and compete globally. However, looking at the changing context and organic evolution of the industry, MITI stopped pursuing this goal actively. The number of passenger car OEMs in Japan fell from 11 in the early 1960s to nine shortly thereafter, but only for market-related reasons.³³ Again, until the 1970s, MITI strictly limited and monitored FDI in the industry, but as circumstances changed, norms were relaxed.³²

Over the years, MITI has also modified, clarified, or relaxed a variety of its administrative oversights, approvals, and certification processes, all following consultations with automotive companies and experts. Its flexibility and responsiveness have been the cornerstone of the Japanese automotive industry's remarkable rise.³⁴

Case Study 3. China's EVs: Dramatic yet Sustainable Industrial Growth through Long-term Roadmap

China is one of the leading EV markets in the world, its EVs having achieved cost parity with their traditionally fuelled counterparts. Its success was built on a highly structured incentive plan for consumers and manufacturers, and investments in the ecosystem that fostered innovation. From 2009 to 2022, the government poured over US\$ 29 billion in subsidies and tax incentives into the industry.³⁵ Subsidies were reduced but only gradually over a period of 12 years, which helped the EV ecosystem to mature and develop organically.

In the early 2000s, China recognised the transformative potential of EVs in mitigating urban pollution and bolstering energy security. EV development was driven by government subsidies, tax incentives, and favourable

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regulations—which attracted automakers, start-ups, and investors. Notably, the government’s subsidies were not limited to local companies. Incentives for consumers were then introduced, encompassing a noteworthy 50-percent reduction in vehicle purchase tax. To bolster industry growth, China also implemented other measures such as sector-specific development strategies, setting of technical standards, and provision of tax credits.

However, funding these subsidies placed a substantial financial burden on the government given the price differential and the considerable number of buyers. China’s policymakers then formulated a plan to phase out subsidies by the end of 2020 through the introduction of a mandate on automobile manufacturers. This mandate required a designated percentage of every automaker’s annual vehicle sales to comprise battery-powered units. They also announced a ‘dual credits’ policy with strict guidelines for subsidies in 2017 to effectively alleviate subsidy pressure.³⁶ Automakers had to earn a stipulated number of points^a to avoid financial penalties. This helped avoid any sudden shock to the market and encouraged manufacturers to focus on innovation and cost efficiency.

The phased reduction of government subsidies allowed the sector to adjust and innovate to the needs of the market. Data suggests that with every reduction in subsidy, the number of units sold reduced initially, but the market self-adjusted as manufacturers innovated and consumer choice changed. Further, the effect of subsidy reduction dwindled with every rollback.³⁷ The calibrated approach allowed the sector to transition from being policy driven to market driven.

iii. Focus on innovation as a pillar of localisation.

India has relied exclusively on local content requirement and import substitution as means to build local capabilities for EV production. There has been little focus on research and development (R&D), if at all. While local content requirements do lead to some level of indigenisation as manufacturers reorient their supply chains, large-scale localisation is difficult unless products are designed within the country as well. An R&D strategy for localisation with a specific focus on the electric two-wheeler industry is essential.

^a The points were assigned using a complex algorithm that incorporates factors such as range, energy efficiency, and performance, among others.

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Some of the aspects that can be covered under such a strategy are listed below:

- *Incentivise private sector R&D efforts:* There should be specific incentives to encourage electric two-wheeler manufacturers, and green energy companies in general, to invest more in R&D. These could include bigger tax rebates on R&D spending. Tax exemption on R&D expenses used to be as high as 200 percent; there is a strong case for increasing it again, perhaps with specific focus on certain green sectors. The PLI scheme can also be amended to include additional incentives based on R&D spending, either as part of the sales-based incentives or as a separate component. A Design Linked Incentive (DLI) scheme, which has been implemented in some other sectors, can be created for critical EV components that incentivise the creation of intellectual property.
- *Set up a Green Technology Innovation Centre:* The government can consider setting up an innovation centre focused on scaling promising green technologies, such as electric two-wheelers, and helping bring them to market. The centre could have multiple focus areas. It could help incubate promising technologies which are still in their nascent stage; it could link some of the R&D work happening in universities and scientific institutions with industry; it could act as a bridge between investors and manufacturers, helping smaller manufacturers with proven technologies to access capital to scale up their operations.
- *Provide specific incentives for smaller manufacturers:* The minimum revenue and asset ownership conditions that must be met to qualify for the PLI schemes can be availed of only by large companies. Yet, much of the innovation in the electric two-wheeler segment in terms of vehicle design and specifications is being carried out by the smaller companies. A specific production- or design-linked incentive scheme to encourage smaller manufacturers is needed, which can complement the existing PLI schemes. Sectors such as telecom have dedicated allocations for the micro, small and medium enterprises (MSME) category; the automotive sector needs similar support.

Conclusion

India's two-wheeler EV policy has laid the groundwork for the country to become a global leader. However, as with any new industry, policy formulation is an evolving process—the policy needs to be continuously refined and adapted. At present, the segment finds itself in a state of flux, grappling with uncertainty brought on by multiple policy changes over a short period. Remedial measures are needed taking into account the interests of the diverse spectrum of stakeholders. [ORF](#)

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