UK Government

ELECTRIC MOBILITY IN INDIA
(MARKET REPORT)

Prepared for
British High Commission,
New Delhi

January, 2021

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1. Background

The global demand for energy has increased in recent times due to increasing population and economic growth, especially in the emerging economies. The monetary and economic value of gains from this growth has been offset by the negative implications on the eco-system and climate as a rapid increase in the global temperature has been observed. Continuing these unsustainable practices could impact the ability to meet the needs of a growing population and the emissions anticipated. The unprecedented economic development has also led to urbanization as the rural population migrates to cities for better opportunities. This puts further stress on two critical infrastructural pillars: energy and transport. According to a report published by IQAir AirVisual, India is home to 21 out of 30 most polluted cities in the world.[1] Significant reduction in local air pollution due to reduced consumption of fossil fuels could be achieved by adoption of electric vehicles (EVs) even though the highest fuel efficiency standards are being put in place for internal combustion engine (ICE) vehicles. A transition to electric mobility possesses the ability to improve public health and reducing ecological damage through fewer greenhouse gas (GHG) emissions in comparison to conventional vehicles. This also holds the potential to reduce dependency on oil imports and help India fulfill its climate commitments. In addition, an EV-driven mobility transition is also expected to encourage the growth of new industries.

India recognizes that the shift to electric mobility carries both environmental and socio-economic benefits and provides a unique opportunity to create new jobs while responding to the challenges of air pollution and energy security. The relative abundance of exploitable energy resources and availability of skilled manpower along with technology to manufacture EVs will allow India to pursue an EV programme that ensures that it keeps pace with the global economies and contributes to effectively curbing GHG emissions. However, a primary barrier to mass adoption of EVs is the lack of reliable and affordable charging infrastructure. Also, an unplanned transition towards electric mobility could pose a challenge for the existing automotive industry; thus, a sustainable approach is required involving all stakeholders, including the citizens.

[1] https://www.livemint.com/news/india/21-of-the-world-s-30-most-polluted-cities-in-india-says-new-report-11582637143751.html

Before the COVID-19 pandemic disrupted the global economy, India had steadily driven towards a 'shared, connected, and electric' mobility system and the country has been adopting innovative ways to increase the share of low carbon vehicles in its transportation fleet. The intention has been to phase-in the transition in a gradual manner with an aspiration to achieve zero emission in the transportation sector by 2047. Due to the COVID-19-imposed lockdown, one of the most visible impacts has been on the mobility sector, which has been witnessing limited demand, supply chain constraints, and market and liquidity shocks. The pandemic has had a dramatic impact on the transport-related emissions which globally account for a quarter of energy-related GHG emissions. According to the IEA, global average road transport activity fell to 50% of the 2019 levels by the end of March 2020. The case for environment-friendly mobility is therefore strong given the phenomenal improvement in the air quality in cities. The post-crisis period is expected to trigger behavioural changes with policies and awareness campaigns kicking in. The automotive sector in India is expecting a rise in demand of electric two-wheelers and electric four-wheelers.

A recent study by CEEW[2] shows that India's annual battery demand will rise up to 158 GWh by FY30 in which new battery demand will contribute about 89% of total battery demand. The study also highlighted that the battery demand for EVs is expected to be driven by commercial cars and two-wheelers. According to the report, 102 million EVs by FY30 would need deployment of 2.9 million public chargers. Slow chargers are expected to account for 71% of the total public charger deployment by FY30. In terms of investment opportunities, EV sales present an investment opportunity of ₹ 1,239,800 crore ($ 177 billion) for OEMs in vehicle production, ₹ 20,600 crore ($ 2.9 billion) for deployment of charging infrastructure and INR 85,900 crore ($ 12.3 billion) in battery manufacturing. ₹ 1,442, 400 crore ($ 206 billion) worth of revenue opportunity from end-consumers was also estimated.

[2] https://cef.ceew.in/solutions-factory/publications/financing-india-transition-to-electric-vehicles

2. India's EV Potential, Market Size, and Revenue Generation

India has acquired a dominant position across several vehicle segments and has emerged as one of the key automotive markets globally. The auto industry plays a very crucial role in the Indian economy by creating millions of direct and indirect jobs. However, the country is actively exploring ways to reduce dependence on oil imports while looking at sustainable energy sources.

Electric mobility has gained reasonable attention in the recent times as the domestic EV ecosystem has started to flourish. The market holds great potential to grow significantly in the next few years due to the push provided by the Government of India by putting in place various national-and state-level policies. However, the EV industry is in the nascent stage and is currently dominated by two-wheelers (2W) and electric rickshaws (3Ws) as more than 80% of the vehicles sold in India belong to these categories. These smaller vehicles are expected to lead the EV adoption in India as it is easier to electrify them and the requirement of smaller battery size brings down the cost differences when compared to ICE-based vehicles.

The total number of EVs sold in 2018 was 365,920 units and this number is expected to grow at a CAGR of 36% till 2026. The EV battery market in India is estimated to be worth $ 520 million in 2018 with a forecast to grow at a CAGR of 30% till 2026.The market for passenger vehicles in India will evolve due to various trends observed globally as well as those specific to India including urbanization and falling prices of batteries.

2.1 EV Sales Trends

The total number of EVs sold in India in November 2020 was 12,488 units. The total sales grew by 15% compared to October 2020. The cumulative sale of registered EVs from January to November 2020 was 104,270 units as seen in Figure 1. There also exists a significant deviation in the actual and forecast values of EVs which is majorly due to the economic slowdown and changing consumer behaviour. However, the current COVID-19 environment is unlikely to affect the medium-term EV adoption and it is expected that this could accelerate some beneficial trends. A report by Avendus Capital highlighted that considering the COVID-19 scenario, EVs in India hold an ₹ 50,000 crore

opportunity by 2025. Electrification is expected to increase in select segments such as 2Ws, 3Ws, and shared mobility due to the growth in last-mile delivery and rental start-ups.[3]

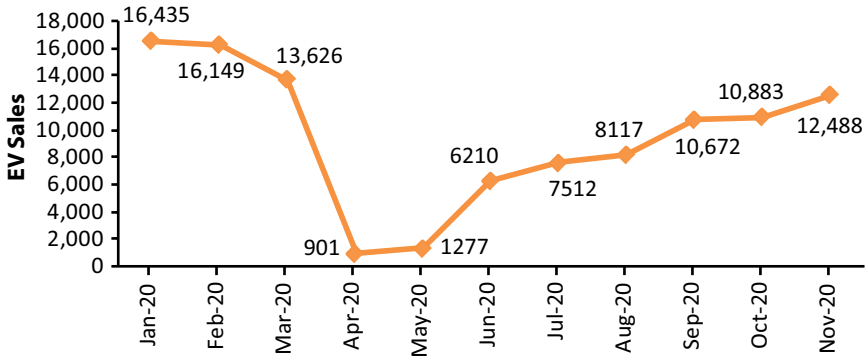
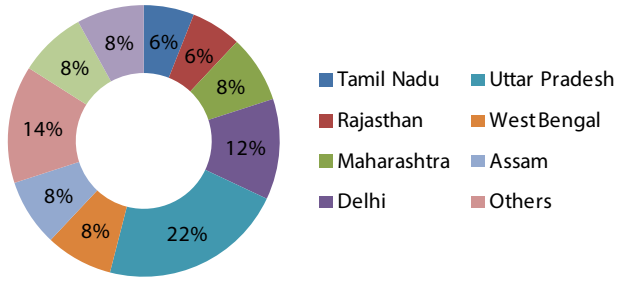


Figure 1: Registered EV sales in India from January to November 2020
Source: *Vahan Dashboard, JMK Research*

Uttar Pradesh registered the highest number of EV sales in November 2020 followed by Delhi and Karnataka, respectively as can be seen in Figure 2.



Source: Vahan Dashboard, JMK Research
Figure 2: Region-wise registered EV sales till November 2020 (State/UT)

2.2 India's Unique Transport Mix (Priorities on supply chain and demand creation)

India's transport sector is large and unique, catering to more than 135 crore people. There has been rapid growth in vehicles as the ownership per 1000 people has increased from 53 in 2001 to 167 in 2015.[4] However, the type of vehicles used in India is different from other countries as the Indian transport mix is characterized by variety of motorized road transport. The number of vehicles on Indian roads, according to the data of last 6 years is illustrated in Figure 3.

As per the National Highway Authority of India, 65% of freight movement and 86% of passenger movement in India is driven through roads (NHAI 2014). Moreover, the country's road network amounts to 5.23 million kilometres and a rail network of 65,808 route kilometres provide last mile connectivity to 199 ports and 92 airports (TERI 2017). Increased

[3] https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-of-mobility-in-indias-passenger-vehicle-market

[4] https://niti.gov.in/writereaddata/files/document_publication/EV_report.pdf

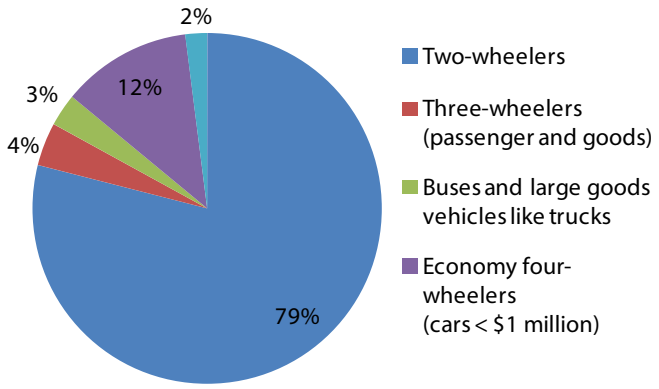


Figure 3: Current transport mix of India

air pollution, GHG emissions, and dependence on oil imports has driven the need for transitioning towards EVs. Particularly, the automobile and transport sector contributes to 7.5% of the country's total emissions (MoSPI 2015).

System integration, shared infrastructure development, and scaled manufacturing are the main elements for driving India's mobility transformation as these factors are likely to assist in both demand creation and making available the desired infrastructure for meeting the supply. Realizing the importance of electrification of vehicles, the Government of India has taken various measures for demand creation including setting up an ambitious target for the adoption of EVs and rolling out the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME India) scheme, which is a national-level programme. With the existence of small vehicles in the Indian market, there lies an opportunity for India to create a strong supply chain and take the leadership role in the global market. Market creation through policies is expected to play a significant role by enabling the manufacturing of EVs and necessary components in successive segments based on their market readiness. However, the path towards electric mobility will be based on economic viability, experimentation, and learning; however, there exist several strategies that are likely to have an impact on each segment's market readiness.

These strategies can be enumerated as:

- Manufacturing strategy: Private 4-wheelers and commercial buses are assessed to be the low-hanging fruits due to falling battery prices.
- Technology strategy: Swappable, smart, and standardized batteries can bring down the capital cost of 2Ws and 3Ws.
- Service strategy: High mileage can lead to lesser operational costs.

3. National EV Policy Initiatives in India

3.1 Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME)

The FAME scheme was launched in April 2015 with an agenda to ramp-up and meet the goals of the National Electric Mobility Mission 2020 which was launched in 2013. The phase II of FAME[5] was initiated on April 1, 2019 based on the outcomes and experience gained during the phase I from stakeholders for implementation along with appropriate allocation of funds. The scheme proposed to implement interventions such as demand incentives, establishment of charging stations, and creating awareness on EVs. The allocation of funds, component wise and category wise from 2019 to 2022 is shown below in Figure 4.

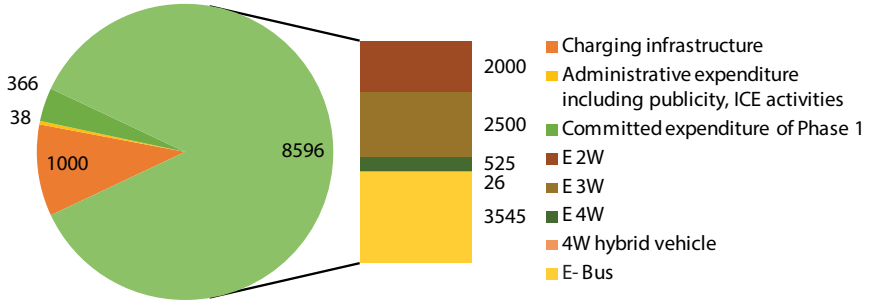


Figure 4: The total fund allocation under FAME-II scheme (₹ Crore)

3.2 Business Models Adopted by Energy Efficiency Service Limited (EESL)

The various business models adopted by EESL are explained as an illustration in Figure 5.

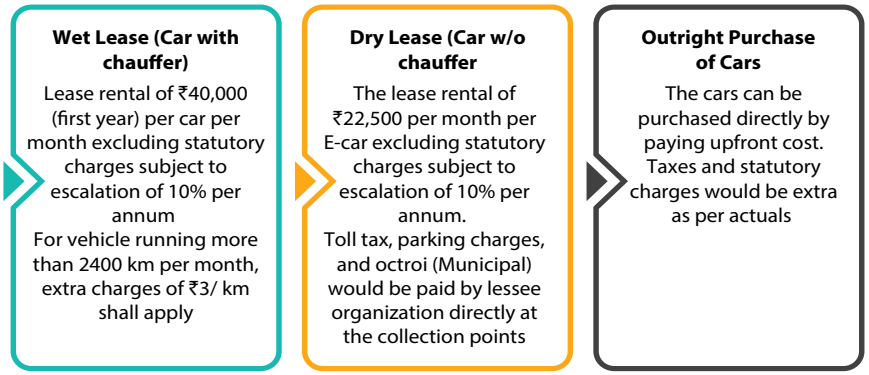


Figure 5: EESL's business models for electric vehicles[6]

[5] https://dhi.nic.in/writereaddata/UploadFile/publicationNotificationFAME%20II%208March2019.pdf

[6] Source: https://www.eeslindia.org/content/raj/eesl/en/MEDIA-CORNER/Newsletter_2019.html

3.3 EV Charging Infrastructure: Guidelines and Standards by Ministry of Power, Government of India

According to the guidelines and standards introduced by the Ministry of Power (MoP) on December 14, 2018[7] and revised on October 1, 2019[8], setting up EV charging stations does not require any license, as per the relevant provision of the Electricity Act, 2003. The key objective behind this move is to enable faster adoption of EVs, promote affordable tariff structure, generate employment, and encourage preparedness of electric distribution system by ensuring safety and reliability of charging infrastructure. The guidelines also proposed combinations of EV chargers based on different charging standards which has been one of the additive features. Also, to facilitate the implementation of charging infrastructure in various states, the MoP designated 26 state nodal agencies (SNA), as on date, under the Bureau of Energy Efficiency (BEE), which is the central nodal agency for the implementation of the FAME programme. In a recent amendment[9] to the guidelines and standards of charging infrastructure dated June 8, 2020, the MoP stated that as under the Electricity Act, 2003 Section 3, the tariff for EV public charging station shall be determined by the appropriate commission and not exceed 15% over and above the average cost of supply. Also, battery swapping stations were recognized as a type of EV charging infrastructure.

3.4 Safety and Connectivity Standards for EV Charging Stations by Central Electricity Authority of India

The Central Electricity Authority (CEA) introduced two provisions related to standards for EV charging stations seeking connectivity to the grid on February 6, 2019 and safety provisions for EV charging stations on June 28, 2019[10]. These amended regulations included definitions for 'charging points' and 'charging stations' as applicable to EVs based on voltage levels and nature of usage, respectively. Certain standards for charging stations were also added mentioning connectivity rules and prescribing compliance to certain international standards relating to power quality. These amendments further added safety provisions for EV charging station (EVCS) including general safety[11] requirements, Earth-protection system, and fire-protection requirements for EVCS. The amended regulations also mandated testing, inspection, and periodic assessment of charging stations apart from maintenance of records.

3.5 'Model Building Bye-Laws' for EV Charging Infrastructure, MoH&UA

According to the February 2019 amendments[12] to the Model Building Bye-Laws for electric vehicle charging infrastructure released by the Ministry of Housing & Urban Affairs (MoH&UA), 20% of all vehicle holding capacity or 'parking capacity' at the premises of buildings should be provided only for EVs. For residential buildings (plotted houses), minimum one AC slow charger is to be installed compulsorily

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[7] https://powermin.nic.in/sites/default/files/webform/notices/Clarification_on_charging_infrastructure_for_Electric_Vehicles_with_reference_to_the_provisions_of_the_Electrcity_Act_2003.pdf

[8] https://powermin.nic.in/sites/default/files/webform/notices/Charging_Infrastructure_for_Electric_Vehicles %20_Revised_Guidelines_Standards.pdf

[9] https://powermin.nic.in/sites/default/files/webform/notices/Amendment%20in%20Revised%20 Guidelines.pdf

[10] http://cea.nic.in/reports/others/god/gm/notified_regulations.pdf

[11] http://www.cea.nic.in/reports/regulation/measures_safety_2019.pdf

[12] https://pib.gov.in/newsite/PrintRelease.aspx?relid=188638

on the premises with a domestic meter connection. As per the minimum requirement specified by MoP for all other buildings (including housing groups), For four wheelers (1 SC- each 3 EVs and 1FC- each 10EVs), three wheelers (1SC- each 2 EVs), two wheeler (1SC- each 2 EVs) with commercial metered connection needs to be installed in every premises (FC and SC refer to fast charger and slow charger, respectively). The fuel filling stations (including COCO outlets) shall also confirm to specifications and safety norms as per the amendment in the PESO Act and obtain clearances from the 'Competent Authority ', for adding Public Charging Stations (PCS) to fuel filling stations.

3.6 Guidelines by Ministry of Road Transport and Highway (MoRTH) for Promotion of Electric Vehicles in India

In the Central Motor Vehicles (10th Amendment) Rules, 2018 for battery-operated vehicles, the vehicle registration mark is to be exhibited in yellow color on green background for transport vehicles and for all other cases, in white color on green background.[13] The amendment also proposes to exempt battery-operated vehicles from renewal of registration certificate and assignment of new registration mark. This means that EVs would be exempted from such registration charges.

3.7 Allocation of EV charging infrastructure under FAME II, Department of Heavy Industry

The Department of Heavy Industry (DHI) has sanctioned 2636 charging stations in 62 cities across 24 states/UTs after the acceptance of Expression of Interest (EoI) under FAME-II.[14] Out of these, 2636 charging stations were approved by DHI of which 1633 will be fast charging stations and 1003 will be slow charging stations. The sanction letters to the selected entities will be issued in phases after ensuring the availability of land for charging stations and signing of necessary agreements/MoU with concerned partner organizations like city municipal corporations, DISCOMs, and oil companies.

As per the recent EoI released by DHI on October 12, 2020, minimum number of charging stations sectioned for 9 expressways and 25 highways are 174 and 1370, respectively. These stations include one fast charger (50 kW) based on CCS/CHAdeMO and one DC 001 (15 kW) charger at every 25 km including one heavy duty charger of 100 kW at every 100 km range.

3.8 Union Budget Envisions India as a Global Hub for Manufacturing Electric Vehicles

The Union Budget 2019/20[15] had outlined various proposals for giving a boost to manufacturing EVs and developing India as a global hub for the same. The government has lowered the GST on EVs from 12% to 5%. The Union Budget also provided an additional income tax deduction of ₹ 1.5 lakh for an individual on interest paid on loans taken to purchase EVs. This amounts to a benefit of around ₹ 2.5 lakh over the loan period to the taxpayers who take loans to purchase these vehicles. As a further incentive to e-mobility, customs duty was exempted on certain parts of EVs.

[13] https://pib.gov.in/newsite/PrintRelease.aspx?relid=181837
[14] https://dhi.nic.in/writereaddata/UploadFile/Revised-%20Expression%20of%20Interest.pdf
[15] https://pib.gov.in/newsite/PrintRelease.aspx?relid=191292

Under the Union Budget 2020/2021,[16] the government has allocated ₹ 6.93 billion (~$96.8 million) for the FAME-India scheme. In addition to that, the government has increased the number of EVs to be supported in the fiscal year 2020/21 through increasing demand incentives. In various vehicle categories, the government has increased the number of EVs to be supported for 2020/21 through demand incentives, for electric buses to 5000 as compared to 1650 announced in the last budget. The demand incentives for electric four-wheelers has been increased to 3000 as compared to 1650 in the previous budget. Demand incentives on electric three-wheelers has been decreased to 15,000 from 16,500, and demand incentives on electric two-wheelers has been increased to 40,000 from 33,000. Also, 2,600 charging stations will be put up on different highways as per the budget announcements.

3.9 Guidelines of New Retail Fuel Policy by Ministry of Petroleum & Natural Gas

According to the 'New Retail Fuel Policy Guidelines,[17]' oil marketing companies have to install at least one new generation alternative fuels such as compressed natural gas (CNG), biofuels, liquefied natural gas (LNG), EV charging points, etc., at their retail outlets within three years of operationalization, complying with other statutory guidelines.

3.10 National Mission on Transformative Mobility and Battery Storage

The Government of India launched the National Mission on Transformative Mobility and Battery Storage[18] to promote clean, connected, shared, and holistic mobility initiatives on March 7, 2019 which is being steered by NITI Aayog. The mission aims for creation of a Phased Manufacturing Programme (PMP) to support setting up of large-scale industries for battery and cell manufacturing, and localize the production of EV value chain in India. The steering committee comprises of secretaries from Ministry of Road Transport and Highway, Ministry of Power, Ministry of New and Renewable Energy, Department of Science and Technology, Department of Heavy Industry, Department for Promotion of Industry and Internal Trade, and Director General, Bureau of Industrial Standards. The mission has also proposed the National Programme on Advance Chemistry Cell (ACC) Battery Storage[19] (the 'Programme'), which is pending for approval from the Union Cabinet to support 50 giga watt hours (GWh) of domestic ACC manufacturing. This umbrella-level initiative proposes various fiscal incentives through a single-window mechanism, to make domestic ACC manufacturing industry globally competitive. In addition, the programme also proposes a composite framework for imposition of suitable basic custom duty with the intent to promote phased manufacturing of ACCs and its components in India and provides recommendations for promoting the overall market demand for ACCs in India.

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[16] https://mercomindia.com/not-lot-ev-sector-in-the-budget/#:~:text=The%20government%20has%20allocated%20%E2%82%B9,the%20financial%20year%202020%2D21

[17] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1601706

[18] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1567807

[19] https://niti.gov.in/sites/default/files/2020-11/Model-Bid-Documents-ACC.pdf

4. State-level EV Policy Initiatives in India

Electric vehicles promise zero tail-pipe emissions and a reduction in air pollution in cities. The Government of India has created enough momentum through its FAME schemes which encourage, and in some segments, mandate adoption of EVs, with a stated goal of reaching

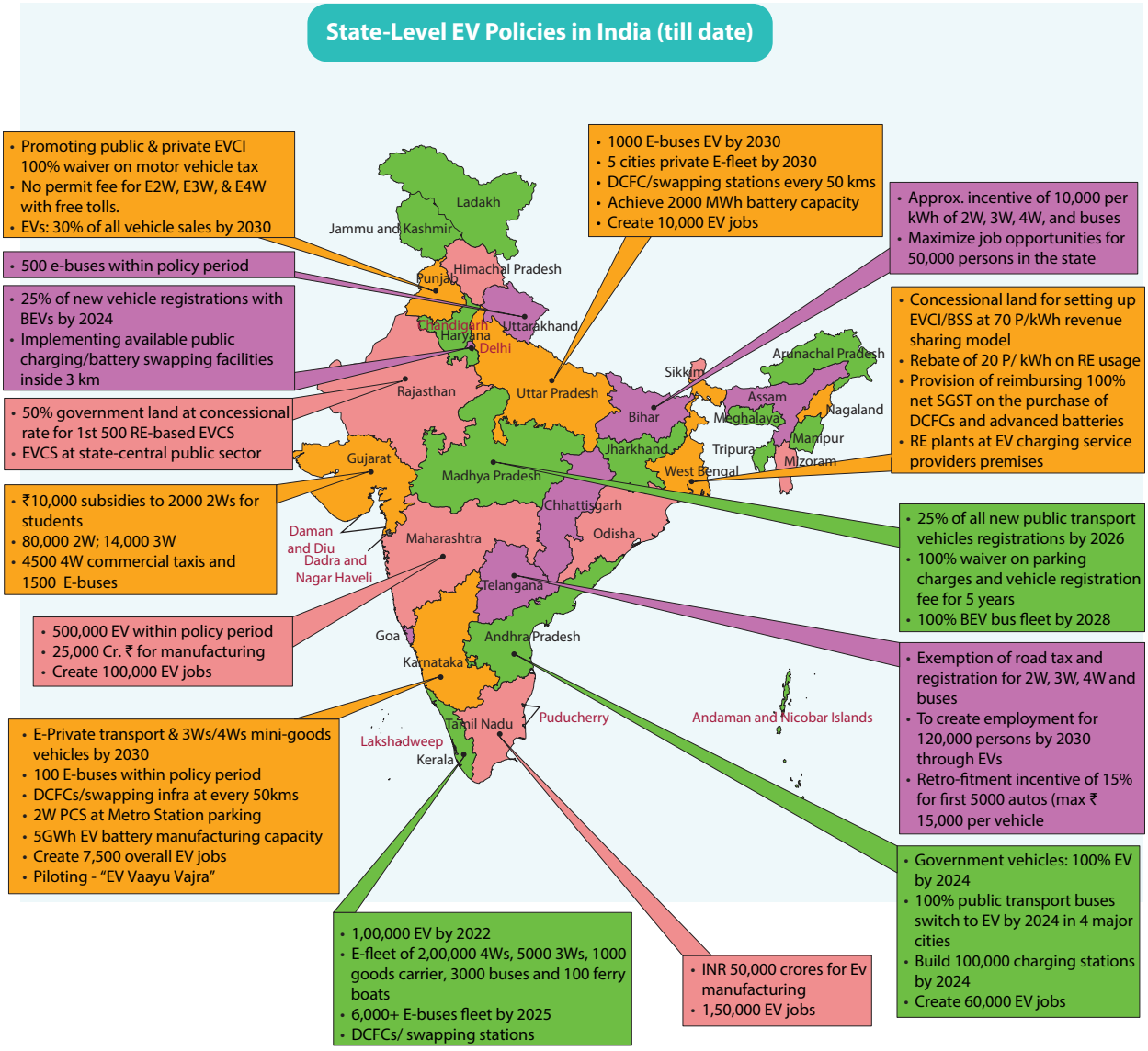

Figure 6: EV policies at a glance (state level in India): 15 states-UTs

30% EV penetration by 2030. To scale the deployment of EVs, state government and local transport bodies collaborated with each other. As on August 2020, 15 states/UTs have published draft or final EV policies which are shown in Figure 6. The timeline of major developments in EV-related policies at the state level is illustrated in Figure 7(a) and 7(b).

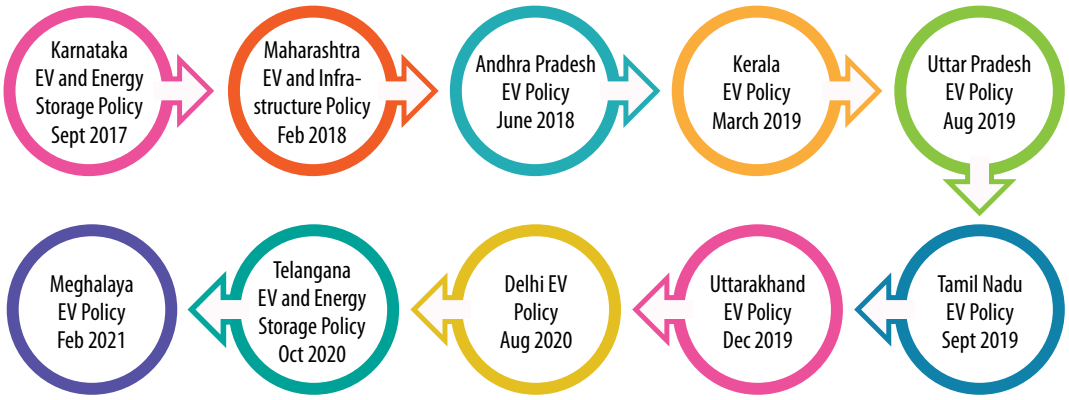

Figure 7(a): Year-wise release of final states EV policies in India

Figure 7(b): Year-wise release of draft states EV policies in India

Some state policies also talk about phasing out of ICE vehicle in a given duration of time. For example, in the recent Delhi EV policy of 2020, the state government sets up a target that 25% of all new vehicle registrations by 2024 will be electric. Similarly, Karnataka aims to achieve 100% electric mobility by 2030 in the following categories: auto rickshaws, cab aggregators, corporate fleets, and school buses/vans. Madhya Pradesh also seeks rapid EV adoption and contribution to 25% of all new public transport vehicle registrations by 2026.

4.1 Analysis of Electricity Tariff Orders for EV Charging

Almost 20 states/UTs so far have issued tariff orders[20] for EV charging (refer to Figures 8 and 9). The energy charges in some states such as Himachal Pradesh are based upon the contracted demand, i.e., contract demand ≤ 20 kVA: ₹ 5.00/kWh; contract demand >20 kVA: ₹ 4.70 kWh. Also, in states including Delhi, Maharashtra, Telangana, Uttar Pradesh, and Rajasthan, time of day (ToD) tariff is applied on energy charges for High Tension category. The energy charge and demand charge varies from state to state which is also shown in Figures 8 and 9.

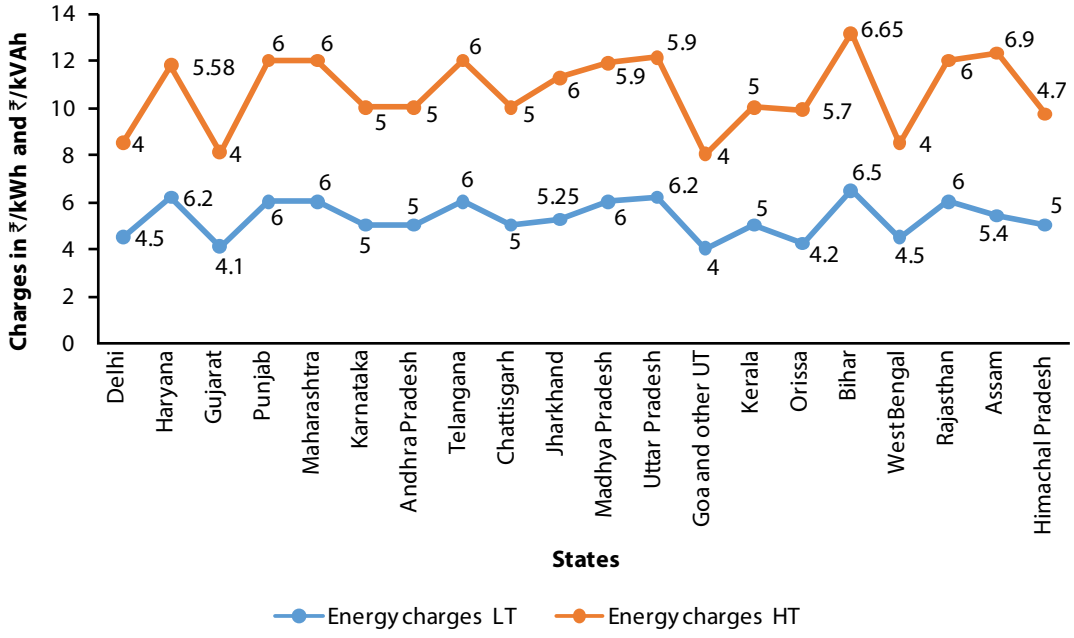

Figure 8: Energy charges in various for EV charging

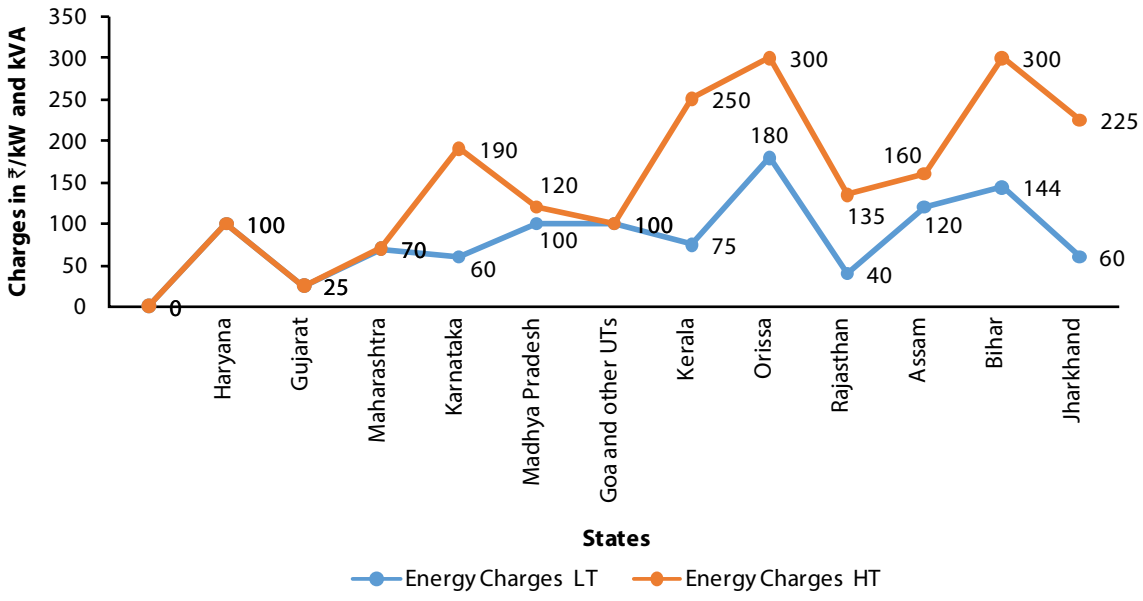

Figure 9: Demand charges in various states for EV charging

[20] https://www.teriin.org/sites/default/files/2020-09/DUF_EV_Report.pdf

5. Analysis of E-buses under FAME-II

The Phase-I of the FAME programme focused on the induction of 5595 buses, however, the target could not be met. This was due to the higher cost of e-buses compared to the conventional ICE-based fleets. Higher costs have been quoted in FAME-II bids than in FAME-I bids, due to the lower per-bus subsidy offered by DHI and increased awareness on the actual cost of operations. The bids could be reduced by harmonizing request for proposals (RfP) and model concession agreements (MCAs) to improve bankability and encourage competition. Also, it has been observed that there exists significant variation in prices quoted in different cities, even for tenders with the same vehicle specifications and hence the risk associated with the current Phase-II OPEX contracts should be reduced. In order to build investor confidence, it is important to ensure return on investment for operators by guaranteeing a mechanism for payment. In order to improve readiness of states and cities for e-bus deployment, it is important to extend tendering and contracting timelines as the short timelines allowed by DHI are one of the key constraints faced by cities in e-bus planning and procurement.[21] The OEMs submitted bids to supply e-buses under FAME-II segregated in 9m and 12m buses as illustrated in Figure 10. However, the selection

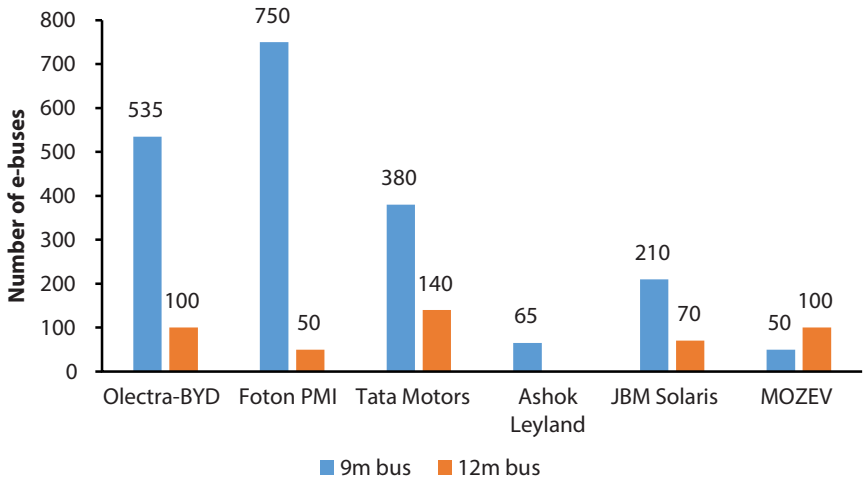

Figure 10: Suppliers of e-buses sanctioned for FAME-II subsidy charging

[21] https://shaktifoundation.in/report/electric-bus-procurement-under-fame-ii-lessons-learnt-and-recommendations-for-phase-ii/

criteria for the winning bidder was based on gross cost contract (GCC) with least cost (L1) quote per kilometer of operations as the deciding parameter for the winning bidder. Figure 11 presents the price range of the bids finalized under FAME-II.

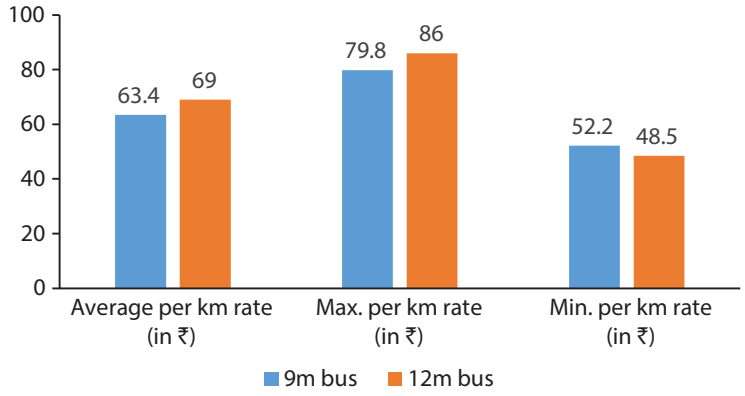

Figure 11: Range of L1 bids approved for 9m and 12m buses

6. Technology-Related Collaboration between Companies

EESL partners with BHEL for EV charging network, January 30, 2020

Energy Efficiency Services Limited (EESL) signed a Memorandum of Understanding (MoU) with Bharat Heavy Electricals Limited (BHEL) to set up a network of public charging infrastructure for electric vehicles at various highways across the country. The MoU covers collaboration for identifying, planning, development, and installation of charging stations at suitable locations.

Source: *Economic Times Auto*

Omega Seiki Mobility and FITT, an industry interface organization established by IIT Delhi, partnered to jointly work on electric vehicle technologies and advanced research, October 12, 2020

Omega Seiki Mobility and FITT have signed an MoU for a collaboration that will be primarily aimed at innovating alternate energy-powered vehicles and other emerging technologies in the EV space, including efficiency and performance improvement of Omega Seiki Mobility's existing vehicles. The collaboration will leverage on OSM in terms of design, simulation, product development, prototyping, and production of automotive components and full vehicle development of two, three, and four-wheeler EVs.

Source: *Business Standard*

Tata Tech, GKN Automotive set up e-mobility software centre in Bengaluru, October 8, 2020

Tata Technologies in collaboration with GKN Automotive have set up a global e-mobility software engineering centre in Bengaluru. The new centre will leverage Tata Technologies' expertise in electric and embedded systems as well as its ability to attract India's software engineering talent to work on GKN Automotive's e-drive technologies.

Source: *Business Standard*

BattRE partners with REVOS for low-cost charging solutions in India

BattRE, a tech-driven EV startup, has launched innovative low-cost RE:charge stations powered by RevOS which will disrupt the entire EV charging ecosystem.

Source: *Automotive Lead*[22]

[22] https://automotiveleadnews.com/2020/11/25/battre-partners-with-revos-for-low-cost-charging-solutions-in-india/

7. Investments and Import Taxes

Ola Electric to invest ₹ 2400 crore for e-scooter factory plant in Tamil Nadu[23]

Ola Electric rolled out an investment plan of ₹ 2400 crore ($320 million) for setting up an electric scooter manufacturing in Houser, Tamil Nadu. The company has signed an MoU with the Tamil Nadu government for this facility. The factory will create almost 10,000 jobs with an annual holding capacity of 2 million units. Also, Ola has acquired Amsterdam-based e-scooter equipment manufacturer company, Etergo BV.

SmartE electric last-mile connectivity provider raised $15-million from Mitsui & Co[24]

SmartE, an electric mobility startup that helps commuters ferry across a city in a modernized, electronic avatar of India's iconic three-wheeler autorickshaws, has raised $15 million (~₹ 100 crore) from Japanese trading major Mitsui & Co. The capital is a part of the company's Series B round.

Bajaj Auto invests $8 million in e-bicycle sharing platform Yulu[25]

Bajaj Auto Ltd will be investing $8 million in an e-bicycle sharing platform, Yulu. The platform will source from Bajaj electric two-wheelers which have been co-designed and manufactured exclusively for shared micro-mobility. Bajaj will also consider facilitating the vehicle finance needs of Yulu for a large-scale deployment of its micro-mobility electric vehicles.

[23] https://www.business-standard.com/article/companies/ola-to-set-up-world-s-largest-scooter-factory-to-invest-rs-2-400-cr-120121400436_1.html

[24] https://thetechportal.com/2019/07/22/smarte-electric-vehicle-india-funding-seriesb/

[25] https://www.livemint.com/auto-news/bajaj-auto-to-invest-in-ev-cycle-sharing-platform-yulu-11574749789225.html

Ather Energy raises $51Mn led by Sachin Bansal, plans 1-million-unit factory[26]

Ather Energy, a Bengaluru-based electric scooter maker, closed an investment of $51 million in its latest round of funding, led by Sachin Bansal's investment of $32 million. Hero MotoCorp has converted its Convertible Debt of $19 million as a part of this round. Ather Energy will be utilizing this fund for expansion of capacity to 25,000 units per annum and add three to four cities to expand the business.

Taxes

In order to facilitate the development of domestic manufacturing of EVs, its assemblies/sub-assemblies, and parts/sub-parts, the following Phased Manufacturing Programme (PMP) was notified (refer Table 1). The programme is expected to have a positive impact on increasing domestic value addition and generating employment opportunities. It will also assist the manufacturers to plan their investment for establishment of a manufacturing base in India.

The custom duty applicable for electric cars is given in Table 2.

Table1: Custom duty applicable for vehicles

Items Description		Current BCD w.e.f. 30/01/2019	Phased Manufacturing Proposal	
			Proposed BCD	Proposed Date of PMP
CBU (Completely Built Up)	Bus (HS 8702)	25%	50%	April 2020 onwards
	Trucks (HS 8704)			
SKD (Semi Knocked Down)	PV (HS 8703) & 3W (HS 8703/8704)	15%	30%	
	2W (HS 8711)		25%	
	Bus (HS 8702)		25%	
	Trucks (HS 8704)		25%	
CKD (Completely Knocked Down)	Bus (HS 8702)	10%	15%	
	PV (HS 8703)		15%	
	2W (HS 8711)			
	3W (HS 8703/8704)			
	Trucks (HS 8704)			

Table 2: Custom duty applicable for cars

Criteria	Current Import Duty (in%)
Used car import	125
Cars CBUs whose CIF value is more than $ 40,000 or petrol engine > 3000 CC or or diesel engine > 2500 CC	100
Cars CBUs whose CIF(Cost, Insurance and Freight) value is less than $ 40,000 and petrol engine < 3000 CC and diesel engine < 2500 CC	60

[26] https://auto.economictimes.indiatimes.com/news/two-wheelers/scooters-mopeds/ather-energy-raises-51mn-led-by-sachin-bansal-plans-1-million-unit-factory/69539189

8. New Announcements

Tesla drives into India through Bengaluru

January 13, 2021 | ***Source:*** Autocar India

American electric vehicle maker Tesla has made its first move in the Indian market by registering its office in Bengaluru, Karnataka. The company, registered as Tesla Motors India & Energy Pvt Ltd,[27] has named three directors as part of its team in the country – Vaibhav Taneja, Venkatrangam Sreeram, and David Jon Feinstein.

Target of 20% e-vehicle mobility by 2030: Prakash Javadekar

November 27, 2020 | ***Source:*** Twitter

Shri Prakash Javadekar, Minister of Environment, Forest and Climate Change highlighted that India aims to have 20% e-mobility by 2030 during the global meet on COP26 ministerial dialogue of zero-emission vehicle transition.[28] To achieve this target, more than 2300 battery charging stations have been established. He also stated that the cost of EVs have to be reduced for more people to adopt it and for that technology needs to be affordable.

Focusing on solid state batteries such as sodium ion and silicon batteries

September 22, 2020 | ***Source:*** Autocarpro[29]

While addressing the MS students (by research) in e-mobility programme at IIT Guwahati on Saturday, September 19, 2020, NITI Aayog CEO Mr Amitabh Kant mentioned that new battery technologies are what one should focus on since lithium, cobalt, and nickel are not available in India. He said that we should look at solid state lithium-ion batteries (using materials from recycled batteries), sodium-ion batteries, and silicon-based batteries as alternatives. These technologies are all under development.

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[27] https://www.autocarindia.com/car-news/tesla-registers-india-office-in-bengaluru-419654

[28] https://twitter.com/PrakashJavdekar/status/1332349143893700608

[29] https://www.autocarpro.in/news-national/niti-aayog-charts-out-four-paths-to-build-clean--sustainable-mobility-in-india-67243

IIT Kanpur establishes 'Department of Sustainable Energy Engineering' for education and cutting-edge research in energy sustainability

The Indian Institute of Technology (IIT) Kanpur has established a new department of sustainable energy engineering.[30] The new department at the institute has been introduced with the aim of becoming a vital contributor to the nation's growing clean and renewable energy sector by generating high-quality scientific and technological know-how and human resources. This department will engage in cutting-edge research in frontier and futuristic areas related to energy sustainability with a clear focus on new, renewable, and alternate energy technologies.

Indian Institute of Technology (IIT) Guwahati introduces MS Research in e-mobility

IIT Guwahati has introduced a new programme, MS (Research) in e-mobility.[31] The institute claims to be the only IIT to have this course. The programme is jointly offered by the Departments of Electronics and Electrical Engineering and Mechanical Engineering from the coming academic year. The two-year MS (Research) programme will cover topics including smart mobility, EV drivetrain design and control, EV testing standards and protocols, charging infrastructure and V2G, among others.

Indian EV segment likely to continue drawing investments

Dilip Dusija, Partner, Deloitte mentioned that as far as the scenario for funding in EV space is concerned[32], it is definitely going to get impacted due to COVID 19 but that will be a short term phenomenon because there is so much of focus on EVs in India by the government and a lot of policies going forward will be more conducive to promote EVs. He added that the recent Make in India/vocal for local focus is also going to push investments in the EV space.

Motovolt Mobility launches e-cycles in Kolkata

December 12, 2020 | ***Source:*** Autocar Pro

Kolkata-based EV startup Motovolt Mobility has launched its fleet of smart e-cycles.[33] Motovolt offers different range of smart e-cycles that have been designed taking into consideration users' comfort, riding conditions, and the riding behaviour. The price range of the products along with accessories would be within ₹ 25,000–₹ 40,000.

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[30] https://www.iitk.ac.in/new/department-of-sustainable-energy-engineering

[31] https://indianexpress.com/article/education/iit-guwahati-introduces-ms-research-in-e-mobility-a-course-on-electric-vehicles-6455514/

[32] https://auto.economictimes.indiatimes.com/news/industry/indian-electric-vehicle-segment-might-continue-to-draw-investments-report/76508697#:~:text=x-,Indian%20EV%20segment%20likely%20to%20continue%20drawing%20investments%3A%20Report,pre%2Dset%20goals%20and%20targets

[33] https://www.autocarpro.in/news-national/motovolt-mobility-launches-ecycles-in-kolkata-77951

OKAYA bags World Bank-funded contract for setting up EV charging stations across India

November 26, 2020 | ***Source:*** OutlookIndia[34]

OKAYA has achieved a notable distinction by securing a significant World Bank-funded contract from Energy Efficiency Services Limited (EESL) for the deployment of 1020 EV charging stations across India. EESL has given this contract to OKAYA for supply, installation, and commissioning of 1020 multi-standard EV charging stations with CCS, CHAdeMO & Bharat specification protocol across India.

Delhi government to cover e-cycles under EV policy, announces 25% subsidy

November 30, 2020 | ***Source:*** Inc42[35]

The Delhi government's EV policy will now include the promotion of e-cycles. The decision is being taken as part of the government's draft proposal under the Delhi Electric Vehicle Policy 2020, which was notified in August 2020. Besides offering subsidies of up to ₹ 30K on two-wheelers and up to ₹ 1.5 lakh for cars, the government plans to subsidize 25% of the cost of the cycle. This is an amount of ₹ 5.5K alongside a fixed additional incentive of ₹ 2000 that will be offered for the first 10K e-cycles sold.

India plans to energise electric car segment with charging kiosks across 69,000 petrol pumps

November 23, 2020 | ***Source:*** Times Now[36]

Addressing the virtual conference–9th Edition of Auto Serve 2020: Electric Mobility Conference 2020-Seizing Opportunities in New Normal, Shri Nitin Gadkari, Minister of Road Transport and Highways & MSME, said that the government is planning to set up at least one EV charging kiosk at around 69,000 petrol pumps across the country. Considering the huge potential of the automobile sector, the government has earmarked over ₹ 51,000 crore for this sector under the Production Linked Incentive (PLI) Scheme, the highest among the ten champion sectors.

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[34] https://www.outlookindia.com/newsscroll/okaya-bags-world-bankfunded-contract-from-eesl-for-ev-charging-stations/1981345

[35] https://inc42.com/buzz/delhi-govt-to-cover-ecycles-under-ev-policy-announces-25-subsidy/#:~:text=Delhi%20Govt%20To%20Cover%20Ecycles%20Under%20EV%20Policy%2C%20Announces%2025%25%20Subsidy,-Shubham%20Singh&text=Delhi%20government's%20ambitious%20Electric%20Vehicles,include%20the%20promotion%20of%20ecycles.&text=Besides%20offering%20subsidies%20of%20up,the%20cost%20of%20the%20cycle

[36] https://economictimes.indiatimes.com/industry/auto/auto-news/govt-plans-to-set-up-charging-infrastructure-across-69000-petrol-pumps/articleshow/79373302.cms?from=mdr

IOC to set up solar power-based charging stations for e-vehicles

November 21, 2020 | ***Source:*** The Financial Express[37]

The EV charging system has been designed by Hygge Energy, a start-up incubated by Tech Mahindra, and has three main features — EVs charged with solar power, no upgrades required in grid infrastructure, and improved grid resilience, especially in remote areas. The technology enables intelligent EV charging using hybrid microgrids, created by integrating existing grid infrastructure with solar PV batteries.

Tata Motors delivers state-of-the-art e-buses to BEST; helps environmentally friendly mass mobility solution for the city of Mumbai

December 4, 2020 | ***Source:*** Tata Motors[38]

Tata Motors initiates deployment of 26 Tata ultra urban e-buses. Under the Government of India's FAME-II initiative, the buses are being delivered as a part of the larger order of 340 electric buses for Brihanmumbai Electricity Supply and Transport (BEST).

Hitachi ABB Power Grids teams up with Ashok Leyland in e-bus pilot at IIT Madras campus

December 27, 2020 | ***Source:*** Hitachiabb[39]

An electric bus (e-bus) pilot is initiated to support sustainable in-campus commuting by IITM's students and staff. Hitachi ABB Power Grids' innovative flash-charging technology will be provided by Ashok Leyland while the infrastructure to host the same will be provided by IITM.

Flipkart to move to 100% EV usage by 2030, joins Climate Group's EV100 initiative

August 25, 2020 | ***Source:*** Live Mint[40]

Walmart-owned Flipkart said it will transition completely to the usage of EVs by 2030 as part of its sustainability efforts, and has joined the Climate Group's global electric mobility initiative, EV100.

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[37] https://www.financialexpress.com/auto/electric-vehicles/ioc-to-set-up-solar-power-based-charging-stations-for-e-vehicles-hygge-energy-evs-infrastructure/2133288/#:~:text=Indian%20Oil%20will%20set%20up,to%20charge%20using%20solar%20power

[38] https://www.tatamotors.com/press/tata-motors-delivers-state-of-the-art-e-buses-to-best-helps-environmentally-friendly-mass-mobility-solution-for-the-city-of-mumbai/

[39] https://www.hitachiabb-powergrids.com/in/en/news/local-news/press-releases/hitachi-abb-power-grids-teams-up-with-ashok-leyland-in-e-bus-pilot-at-iit-madras-campus

[40] https://www.livemint.com/industry/retail/flipkart-to-move-to-100-ev-usage-by-2030-joins-climate-group-s-ev100-initiative-11598347822118.html

9. Tenders, Expression of Interest, etc.

EV charging station operators to be hired via centralized tenders in Delhi, October 26th 2020

A centralized tendering system will be adopted to hire an operator to install, run, maintain, and upgrade charging stations for EVs in Delhi. Land-owning agencies will be required to provide land for the installation of public EV charging stations. Delhi has currently about 70 charging stations. The city government is working to expand infrastructure as per its EV policy to increase EV numbers, which is to be 25% of all new vehicle registrations, by 2024.

Source: *Business Standard*

IGL to foray into electric vehicle charging in tie-up with Mahindra Powerol, October 29th, 2020

Indraprastha Gas Ltd (IGL), the country's leading city gas distributor, collaborated with Mahindra Powerol to offer EV charging facility at its retail outlets in the National Capital Region. It is also in discussion with some other companies for swapping of batteries for EVs.

Source: *Business Standard*

Central, Delhi govt agencies to identify locations for EV charging station,September 17th, 2020

All concerned agencies of the Centre and Delhi government need to identify the locations under their jurisdictions for setting up charging stations for EVs. Delhi government will aggregate these locations and work out a unified model for setting up 200 charging spots in the city in next one year.

Source: *The Hindu*

Proposals invited for installing EV charging infrastructure on highways and expressways, October 13th 2020

The Department of Heavy Industries showed interest in installing, building, and operating charging infrastructure along the highways by inviting proposals. The installation is expected to be complete within 9 months of approval. These projects are eligible for incentives under Phase-II of the central government's FAME programme. One charging station out of every hour is expected to have a minimum of one 50-KWCCS II or CHAdeMO chargers alongside one 15-KW DC001-charger.[41]

[41] https://dhi.nic.in/writereaddata/UploadFile/EoI%20EV%20Charging.pdf

10. The United Kingdom EV Market Updates

10.1 Policy Announcements

The phasing out of ICE vehicles is a key part of the UK meeting its goal of net zero emissions by 2050.

The UK government has announced that it is bringing forward its ban on the sale of new petrol and diesel engine cars and vans from 2030 until 2040. However, some plug-in hybrid vehicles will be allowed to remain on sale until 2035, specifically those that can drive a significant distance with zero emissions. The definition of 'significant distance' is to be consulted on. Government Ministers are keen to stress that motorists will still be able to drive conventional cars after 2030. It is only the sale of new ones that will be banned.

10.2 Vehicle Registration Growth

Pure-electric car sales went from 4652 in November 2019 to 10,345 in November 2020 (122.4% increase), while 86,291 pure electric cars have been sold in the UK so far in 2020, which is up from 32,911 that had been sold by the same point in 2019 (162.2% increase). The total share of the new car market so far in 2020 taken by pure electric cars is 5.8%, compared to 1.5% for last year.

A total of 7717 plug-in hybrid cars were registered in November 2020, which was a 76.9% increase on November 2019's figure. Year-to-date, the plug-in hybrid market is up by 89.4%, with 57,769 of them having been registered so far in 2020, against 30,503 at the same point in 2019.

10.3 EVSE news in the United Kingdom

10.3.1 Joint statement of the Zero Emission Vehicle Transition Council

A joint statement was published on November 27, 2020 from the Zero Emission Vehicle Transition Council[42] after their first meeting to accelerate the pace of the global transition to zero emission vehicles at COP-26. For the first time, ministers and representatives from some of the world's largest and most progressive car markets came together to form a new Zero Emission Vehicle Transition Council. The Council

[42] https://www.gov.uk/government/news/joint-statement-of-the-zero-emission-vehicle-transition-council

was made up of ministers and representatives from California, Canada, Denmark, European Commission, France, India, Italy, Japan, Mexico, Netherlands, Norway, Spain, South Korea, and Sweden, the UK.
The Council addressed some of the key challenges in the transition to ZEVs, enabling the transition to be faster, cheaper, and easier for all.

10.3.2 Funding headlines from UK government's 10-point plan for a green revolution

A total of £950 million to support the rollout of rapid EV charging hubs at every service station on England's motorways and major A-roads; £275 million to extend support for charge point installation at homes, workplaces, and on-street locations, while reforming these schemes so that they target difficult parts of the market such as leaseholders and small and medium-sized enterprises (SMEs). Also, £90 million to fund local EV charging infrastructure to support the roll out of larger on-street charging schemes and rapid hubs in England.

10.3.3 Nottinghamshire, UK to pilot EV charging point for buses

Cheescake energy and Nottinghamshire County Council have partnered to pilot EV charging for a fleet of their electric buses.

10.3.4 Instavolt to roll our 450 chargers across the UK in partnership with KFC

Instavolt is a rapid charging company and has partnered with many retailers to provide charging on their parking spaces.

10.3.5 Siemens installs 37 chargers for electric buses in London

A total of 34 AC and 4 DC charging units have been installed in the Westbourne Park bus depot on the Great Western Road.

Siemens says that when all 37 electric buses are in operation, the amount of energy charged will add up to 11 MWh/day.

10.3.6 Kaluza launches smart charging trial with Fiat

For the first time, an OEM is involved in a project to give the control of charging to the car rather than having smart capabilities only in the charger. Kaluza are a technology company in the EV charging space who creates smart systems for control.

Annexures

Annexure I: Analysis of state EV policy based on vehicle category

State	Targets	Incentives	Charging Infrastructure	Total Investment/ Manufacturing/Jobs
Delhi[43]	25% of all new vehicle registrations by 2024 will be electric Aims to have at least 50% e-buses for all new-stage carriage buses procured for the city fleet, starting with 1000 e-buses by 2020	Purchase incentive for thefollowing categories are: 2W: ₹ 5000/- per kWh (max. ₹ 30,000) 3W: 30,000/- per vehicle 4W: 10,000/- per kWh (max. ₹ 1.5 lakh) Scrapping incentive on the following categories are: 2W: ₹ 5000/- 3W: 7500/- No road tax on registration for BEV	100% subsidy of ₹ 6000 per charger for setting up first 30,000 private charger Capital subsidy for the cost of public charger installation	Policy using the 'feebate' concept Cess on the sale of diesel "25 paise per litre" Additional road tax on diesel and petrol vehicle
Karnataka[44]	Aims to achieve 100% electric mobility by 2030 in the following categories: auto-rickshaws, cab aggregators, corporate fleets, school buses/ vans Target of 1000 EV buses for public transportation	No taxes on BEV, e-rickshaws, e-carts No stamp duty on loan agreement, credit deeds	Capital subsidy: 25% on equipment and machinery for first 100 fast charging stations (max. ₹ 10 lakh per station) and 100 swapping stations (max. ₹ 3 lakh per station) 25% on equipment and machinery for 4W (max. ₹ 5 lakh per station) and buses (max. ₹ 10 lakh per station) swapping stations Set up 112 EV charging stations in Bengaluru	For micro enterprises: 25% of the value of fixed assets (max. ₹ 15 lakh) Small enterprises: 20% of the value of fixed assets (max. ₹ 40 lakh) Medium manufacturing enterprises: ₹ 50 lakh Interest-free loan on net SGST to large and above large-scale enterprises for certain number of years

[43] https://evreporter.com/wp-content/uploads/2020/08/Delhi-EV-Policy-07-08-2020.pdf
[44] https://evreporter.com/wp-content/uploads/2020/07/Karnataka-EV-Policy.pdf

State	Targets	Incentives	Charging Infrastructure	Total Investment/ Manufacturing/Jobs
Himachal Pradesh[45]	Aims for a 100% transition to EVs by 2030	Encourages the use of hybrid EVs by government entities during the transition	Promote creation of a dedicated EVCI, develop a model for private players, and include a provision for charging spots in commercial buildings	
Telangana[46]	To make Telangana a major base for EV and ESS sectors and to attract investments worth $ 4.0 billion Make Telangana a preferred destination for EVs, ESS, and component manufacturing	Exemption of road tax and registration 2W: For first 2 lakh vehicles 3W: For first 20,000 vehicles 4W: For first 5000 commercial and private vehicles For first 500 electric buses Retro-fitment incentive of 15% for first 5000 autos (max. ₹ 15,000 per vehicle)	Charging/swapping station for every 50 km within state boundaries Govt will develop night time community parking with charging facility TSERDCO will establish public charging stations	To create employment for 120,000 persons by 2030 through EVs EV and ESS sectors shall be incentivized based on Electronics Policy 2016
Gujarat[47]	Aims to have 100,000 EVs on road by 2022, which includes 80,000 2W or scooters,14,000 3W, 4500 cars Target of 1500 buses within policy period	Purchase subsidy on the following categories: 2W: ₹ 12,000 for school and college students with target of 80,000 3W: ₹ 48,000 for rickshaw driver and self-employed people with target of 14,000 4W: Target of 4,500 commercial and private 4-W	Charging points to be provided in parking space for government employees Municipal corporation will provide parking space for charging stations 100% exemption from electricity duty for EV charging stations	
Madhya Pradesh	Rapid EV adoption and contribution to 25% of all new public transport vehicle registrations by 2026	e-rickshaws and e-auto: incentives: free cost of permits, exempt/reimbursement from road tax/vehicle registration fees for 5 years	Ensure a safe, reliable, and affordable charging infrastructure, and promote renewable energy usage in the charging infrastructure	

[45] https://www.nrdc.org/experts/anjali-jaiswal/review-state-ev-plans-across-india-amidst-covid-19
[46] https://tsredco.telangana.gov.in/Updates_2020/Telangana_EVES_policy_2020_30.pdf
[47] https://evreporter.com/wp-content/uploads/2020/09/Gujarat-EV-policy.pdf

State	Targets	Incentives	Charging Infrastructure	Total Investment/ Manufacturing/Jobs
Uttarakhand[48]	To create a beneficial atmosphere to support manufacturing of EVs and reduce air pollution Initial target of 500 e-buses	Exemption from vehicle motor tax for first 100,000 customers 100% of electricity duty exemption for entrepreneurs		To create jobs in the state Government decided to give ₹ 20 million for manufacturing plants having more than 100 employees
Uttar Pradesh[49]	To improve air quality by bringing down carbon emission from the transport sector 1000 EV buses introduced by the state in order to promote EV in public transportation Roll out nearly 10 lakh (one million) EVs combined across all segment of vehicles by 2024.	100% road tax exemption for EV buyers 100% interest-free loans to state government employees for purchase of EVs	Service units setting up charging stations with capital investment of more than ₹ 25 lakh but less than ₹ 5 crore, will be provided Capital Interest Subsidy @5% per annum for 5 years	100 acres of land area in National Capital Region districts and Kanpur for private EV manufacturing and assembling unit
Tamil Nadu[50]	State Transport Undertaking (STU) will replace 5% of buses every as EV every year (1000 buses every year)	100% road tax and registration tax exemption will be provided till 2022 An Open Permit System for e-auto permits	EV-related and charging infrastructure manufacturing units will receive 100% exemption on electricity tax through 2025	To develop Tamil Nadu as a hub and attract investment of ₹ 50,000 crore in EV manufacturing
Kerala[51]	Attract investment and create employment in EV component manufacturing To reach 1 million EVs on road by 2022 and 6000 e-buses in public transport by 2025	Subsidizing charging rates and demand aggregation of home and workplace EV chargers Incentives of ₹ 30,000 or 25% of EV cost on 3W	Creation of e-mobility zones 20 e-bus charging stations in districts of Trivandrum, Ernakulam, and Kozhikode Swappable stations across three districts 2W/3W/4W and bus charging stations in depots	Create enabling ecosystem – skilled manpower, infra, R&D, regulations and initial volumes through govt programmes Create Centres of Excellence (CoE) in EV value chain

[48] https://www.siidcul.com/industrial-policy/Electric%20Vehicle%20Policy%20of%20Uttarakhand-2018
[49] https://evreporter.com/wp-content/uploads/2020/07/UP_Electrical-vehicle-policy_english_Aug7_2019-1.pdf
[50] https://evreporter.com/wp-content/uploads/2019/09/TN-EV-Policy-2019.pdf
[51] https://evreporter.com/wp-content/uploads/2020/09/Kerala-EV-Policy-Doc.pdf

State	Targets	Incentives	Charging Infrastructure	Total Investment/ Manufacturing/Jobs
Maharashtra[52]	Increase number of EVs registered in Maharashtra to 500,000 during the policy period	Purchase subsidy of 15% on 2W (max. ₹ 5000) 3W (max. ₹ 12,000) 4W (max. ₹ l lakh) Buses: Purchase subsidy of 10% (max. ₹ 20 lakh) Exempts EVs from road tax and registration fees over 5-year policy period	EV charging charged at residential tariff rates Development Control Rules & planning authorities suitably allow for setting up of public charging facilities Enable fuel stations to set up charging points through governing regulations	To generate an investment of up to INR 25,000 cr. in EV To create newer employment opportunities Incentives for micro, small, and medium enterprises and large manufacturing units
Bihar[53]	Establish Bihar as the most preferred investment destination Prioritizes electrification of rickshaws and plans to convert all paddle rickshaws to e-rickshaws by 2022	Approx. incentive of @10,000 per kWh 2W: Max. ₹ 20,000 for first 24,000 vehicles 3W: Max. ₹ 50,000 for first 70,000 vehicles 4W: Max. ₹ 1.5 lakh for first 4000 vehicles Buses: Max. ₹ 25 lakh for first 1000 vehicles Additional special incentive of INR 10,000 will be provided for lithium-ion battery e-rickshaw	Set up fast charging stations at intervals of 50 km on state and national highways, and charging stations at commercial and residential locations	Maximize job opportunities for 50,000 persons in the state Attract around investment of ₹ 1500 crores
Punjab[54]	Aim to have 25% of annual vehicle registrations as EVs in the 5 year policy period Aims to increase the share of electric 2Ws to reach 25% of new sales over the policy period Replace 25% of the bus fleet of the transport department with e-buses (presently about 90% of bus fleet runs on diesel)	100% wavier on Motor Vehicle Tax and permits during policy period on 2W, 3W, 4W and buses Free registration of e-rickshaws	First 1000 charging points gets the capital subsidy of 25% (limited to ₹ 50,000 per charging point) Concessional lease rentals to be charged for installing public charging stations	To promote manufacturing EV in the state, 100%reimbursement of net SGST for 15 years Exemption on electricity duty for 15 years 100% employment generation subsidy

[52] https://evreporter.com/wp-content/uploads/2020/07/EV-policy_Maharashtra.pdf
[53] https://evreporter.com/wp-content/uploads/2020/07/EV-policy_Bihar.pdf
[54] https://www.transportpolicy.net/wp-content/uploads/2019/12/Punjab_Draft_EV_Policy_20191115.pdf

State	Targets	Incentives	Charging Infrastructure	Total Investment/ Manufacturing/Jobs
Andhra Pradesh[55]	Aims to have 1,000,000 EVs on road by 2024 Target of APSRTC bus fleet 11,000 into electric by 2029 Phase 1: 100% conversion of buses in top four cities by 2024	Exemption of registration charges and road tax sale of electric until 2024	Capital subsidy of 25% on chargers, charging stations and battery swapping stations, Establish 1 lakh (100,000) slow and fast charging stations by 2024	Attract EV manufacturers and promote EV innovation and R&D through grants and venture funds, industrial park development, skilled workforce Celebrate 'green days' to create awareness among public
West Bengal	It is a global hub of electric mobility development and manufacturing Target of 100% of bus fleet (over 1000 buses) by 2030	Registration on retrofitted 2Ws, 3Ws, and 4Ws will be allowed (certified by ARAI) Registrations of EVS will be done online No parking fees Rebate of 20 paisa/kWh if charging stations are powering through renewables	Aims to have 100,000 public and semi public charging stations by 2040 Concessional land across major cities will be allocated for private developer to set up charging/ swapping stations on revenue sharing mechanism of 70p/ kWh 25% of capital subsidy for 50 swapping stations (10 lakh max.) 100% SGST reimbursement on 50 kW chargers & on charging/swapping stations, hydrogen stations	100% net SGST will be reimbursed for a period of 5 years for micro & small, 7 years for medium, 10 year for large industry 100% of stamp duty on purchase or lease of land by the industry will be reimbursed only one time All resources (power supply, roads, water) to build an industry/ charging/battery swapping station will be provided on 50% of the cost of infrastructure (max. limit of 2 crore per project) Automobile manufacturing: Allowing 100% FDI in the sector Removal of min. capital clauses for fresh entrants

[55] https://evreporter.com/wp-content/uploads/2019/09/AP-Policy_final.pdf

Annexure II: State/Union Territories-specific EV Charging Tariff at a Glance

S.No.	State	Energy Charges	Fixed Charges/ Demand Charges	ToD
1.	Delhi	Supply at LT- ₹ 4.5/ kWh; supply at HT-₹ 4/kVAh	No demand charges	May-September – Peak hours: 14:00 hrs-17:00 hrs and 22:00 hrs-01:00 hrs (surcharge-20%), off peak hours: 04:00 hrs- 10:00 hrs (rebate-20%)
2.	Himachal Pradesh	Contract demand ≤ 20 kVA: ₹ 5.00/kWh; Contract demand >20 kVA: ₹ 4.70 kWh	Contract demand ≤ 20 kVA Fixed charges: ₹ 130/month Contract demand >20kVA : Demand charge: ₹ 140/kVA/ month	
3.	Punjab	₹ 6/kVAh	No fixed charges	
4.	Haryana	₹ 5.58/kVAh to ₹ 6.2/kWh	Fixed charges: ₹ 100/kW/month	
5.	Gujarat	Supply at LT-₹ 4.1/ kWh; HT-₹ 4/kWh	Demand charge: ₹ 25 per kVA	
6.	Maharashtra	₹ 6/kWh	Fixed charge: ₹ 70/kVA/Month	TOD/surcharge/rebate: 22:00 hrs to 06:00 hrs: ₹(-) 1.5/kWh; 18:00 hrs to 22:00 hrs: ₹ 1.5/kWh
7.	Karnataka	₹ 5/kWh	Fixed charge : LT- ₹ 60/kW/ month; HT- ₹ 190/kVA/month	
8.	Andhra Pradesh	₹ 5/kWh	No fixed Charges	No TOD applicable
9.	Telangana	LT ₹ 6/kWh, HT (11 kV and above)- ₹ 6/unit with TOD charges		06:00 AM to 10:00 AM and 06:00 PM to 10:00 PM (₹ 5/unit) 10:00 PM to 06:00AM (₹ 7/unit)
10.	Chhattisgarh	₹ 5/kWh	No demand charge	
11.	Jharkhand	Rural: ₹ 5.25/kWh Urban: ₹ 6.00/kWh	Fixed Charges: Rural-₹ 60/ Conn/month Urban–₹ 225/Conn/month	
12.	Madhya Pradesh	LT: ₹ 6.00/kWh; HT ₹ 5.90/kWh	Fixed charges: LT-₹ 100/kVA; HT: ₹ 120/kVA of billing demand	
13.	Uttar Pradesh	LMV: ₹ 6.20/kWh; HV: ₹ 5.90/kWh Public charging: LT- ₹ 7.7/ kWh; HT- ₹ 7.3/kWh	No demand charges	Summer months: 05:00 hrs to 11:00 hrs- (-) 15%; 17:00 hrs to 23:00 hrs- (+) 15% Winter Months: 17:00 hrs to 23:00 hrs (+) 15%; 23:00 hrs to 05:00 hrs- (-) 15%
14.	Goa and Other Union Territories	₹ 4/kWh	Fixed charge: ₹ 100/kW/ month	

S.No.	State	Energy Charges	Fixed Charges/ Demand Charges	ToD
15.	Kerala	LT: ₹ 5/kWh; HT: ₹ 5/kWh	Fixed charge LT: Rs.75/kW/ month; HT: ₹ 250/kVA/month	
16.	Orissa	₹ 4.2 to 5.7/ kWh	No demand charge	
17.	Bihar	LT: ₹ 6.5/kVAh; HT: Rs.6.5 to 6.65/ kVAh	Fixed charge: ₹ 144/kVA/ month (LT I) ₹ 180kVA/month (LT II) Fixed charge: ₹ 300/kVA/ month (HT)	
18.	West Bengal*	LT: ₹ 4.5/kWh HT: ₹ 4/kVAh	No fixed Charges	*yet to confirm
19.	Rajasthan	LT: ₹ 6.00/kWh HT: ₹ 6.00/kVAh	LT: ₹ 40/HP/month of sanctioned load HT: ₹ 135/kVA/Month	Off peak: 23:00 hrs to 06:00 hrs (-) 15%
20.	Assam	LT: ₹ 5.4/kWh HT: ₹ 6.9/kWh	LT: 120/kW/month HT: 160/kVA/month	

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1. Promoting efficient use of resources
2. Increasing access and uptake of sustainable inputs and practices
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