MARKET RESEARCH

Fitment Indexation for Value Chain Players and Opportunity Breakup Analysis of Setting EV Charging Stations on Major Highways & Expressways in India

Examining state wise location feasibility indexation for setting the EV charging infra and opportunity assessment for power DISCOMs, GENCOs , TRANSCOs, RE power developers, Oil marketing companies , EPC players and OEMs. Cost breakup analysis of the charging stations w.r.t the type of chargers to be installed

Feb 2021

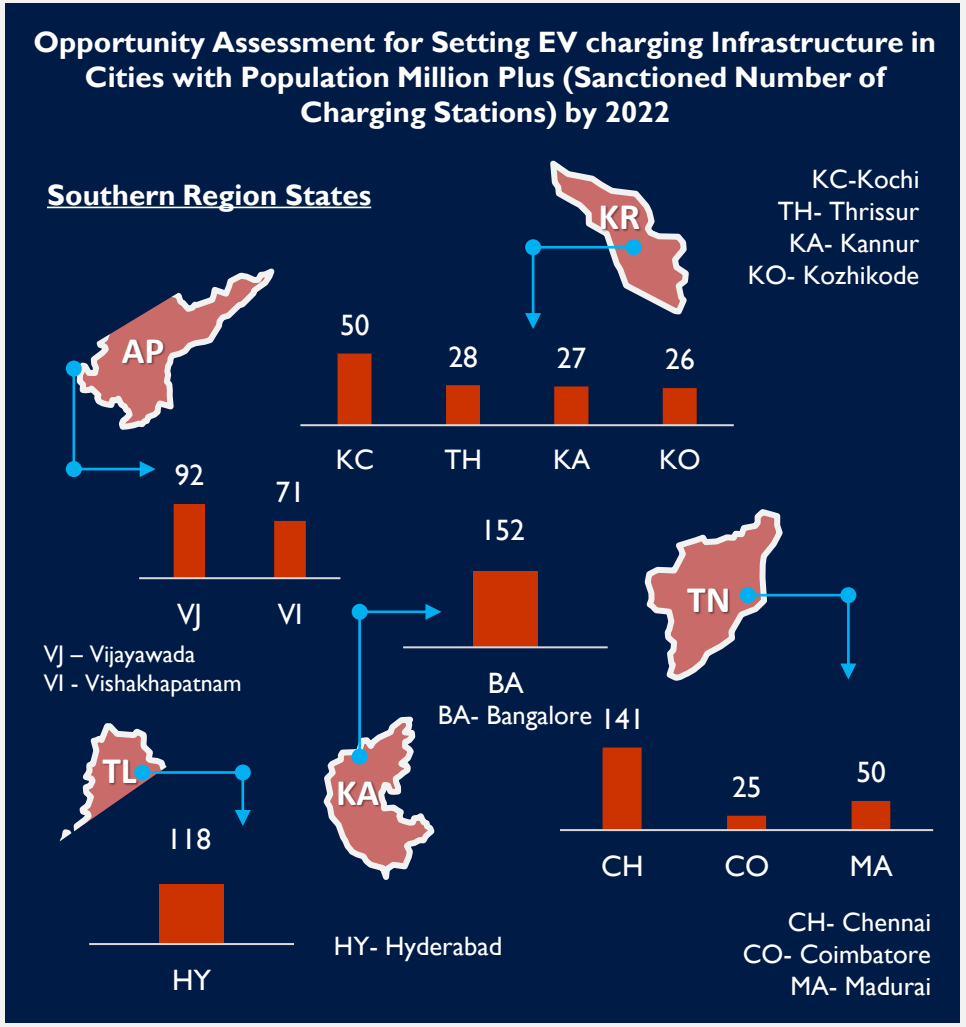
Market Research Flash Report

Why eninrac's market research on assessing market opportunity for electric vehicle charging infrastructure?

Total of 1544 electric vehicle charging stations has been sanctioned by the GoI to get installed across highways & expressways network length of 15546 kms in India

To give push to clean mobility in India, Department of Heavy Industries (DHI) has sanctioned 2636 charging stations to get installed in 62 cities across 24 states under phase II of FAME scheme

The Indian automotive industry has been slowing since the last quarter of calender year 2018. Some of the key reasons responsible for this downturn were -crunch in liquidity, increasing acquisition costs and weakening consumer sentiments. The outbreak of COVID19 in 2020 has further led to fall in the sales of automobiles in India. It is pertinent to note that the sales of passenger vehicles and two wheelers fall by 18% in 2020 as compare to last year, while sales of commercial vehicles declined by 29%. Amidst this economic fallout of automobile industry in India, a ray a hope lies with the Indian government pushing clean mobility in public transportation and taking significant initiatives for promoting electric vehicles and establishing efficient charging infra for the same. The GoI intends to develop such a robust EV charging network that have atleast one charging station will be available in most of the selected cities in a grid of 4 Km X 4 km which shall boost the confidence of EV users and will also lift the business sentiments of OEMs and other value chain players. During October 2020 Department of Heavy Industries (DHI) invited EoI for setting and availing incentives for deployment of EV charging infrastructure within the Indian cities. Of the received proposal, 2636 charging stations were sanctioned by the GoI. Of the approved charging stations, 1633 stations will be fast charging and 1003 shall be the slow charging stations.



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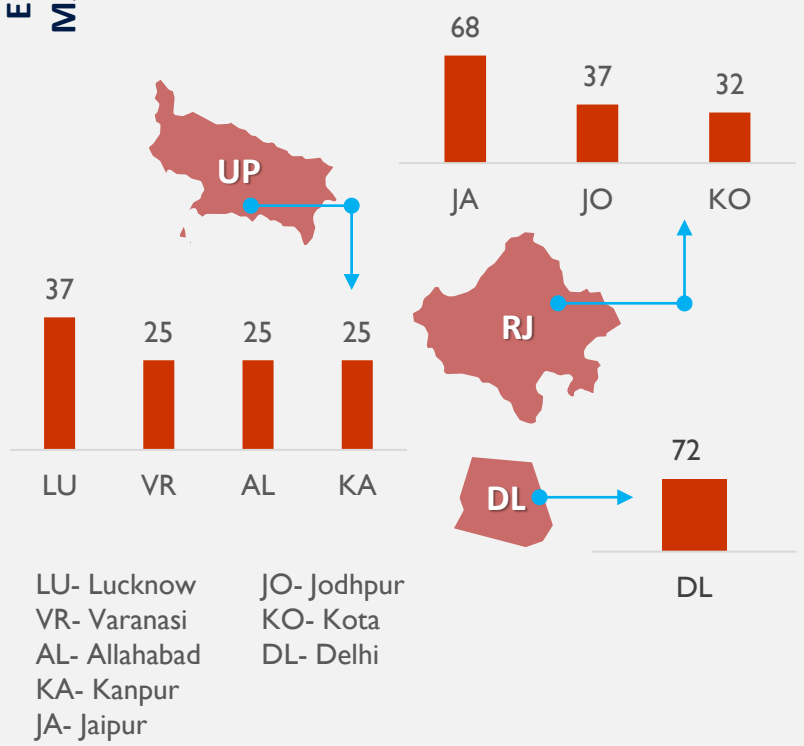
Opportunity Assessment for Setting EV charging Infrastructure in Cities with Population Million Plus (Sanctioned Number of Charging Stations) by 2022, Contd.

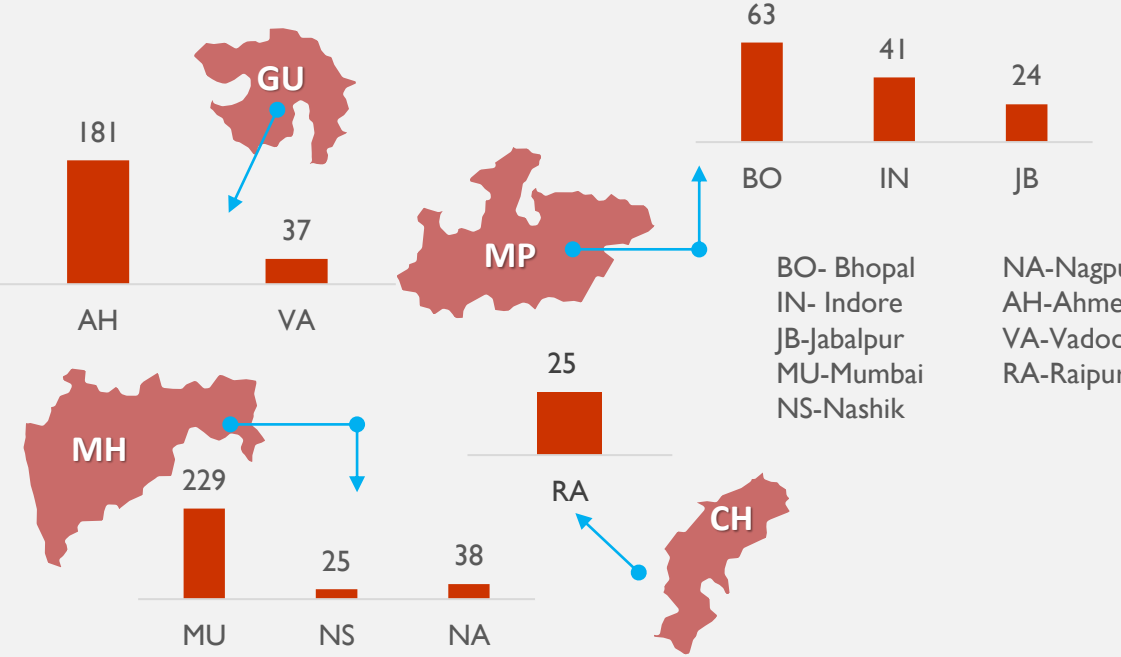
Northern Region States



LU- Lucknow
VR- Varanasi
AL- Allahabad
KA- Kanpur
JA- Jaipur

JO- Jodhpur
KO- Kota
DL- Delhi

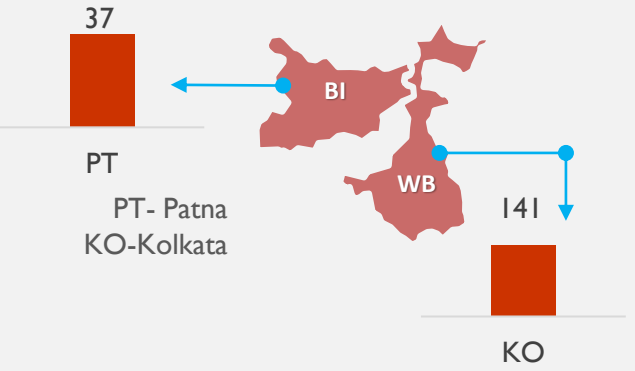
Western Region States



BO- Bhopal
IN- Indore
JB-Jabalpur
MU-Mumbai
NS-Nashik

NA-Nagpur
AH-Ahmedabad
VA-Vadodara
RA-Raipur

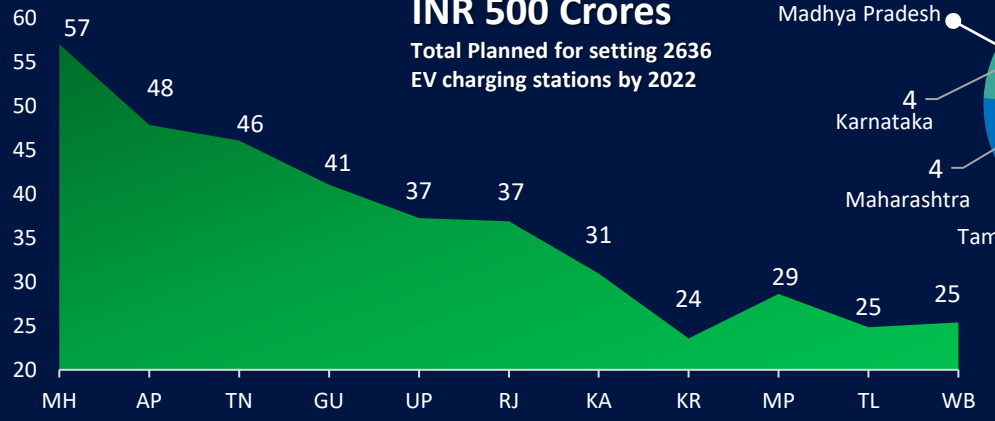
Eastern Region States



PT- Patna
KO-Kolkata

Opportunity Assessment for Approved EV Charging Stations Under FAME II in India to be Installed by 2022

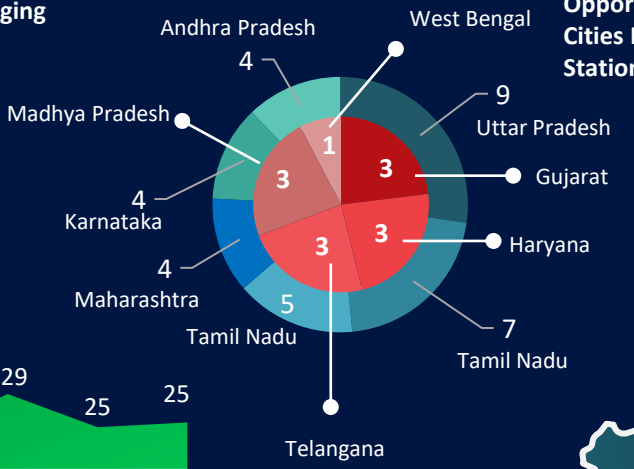
Anticipated Investment Split (INR Crores) for Setting 2636 EV Charging Stations in Key States

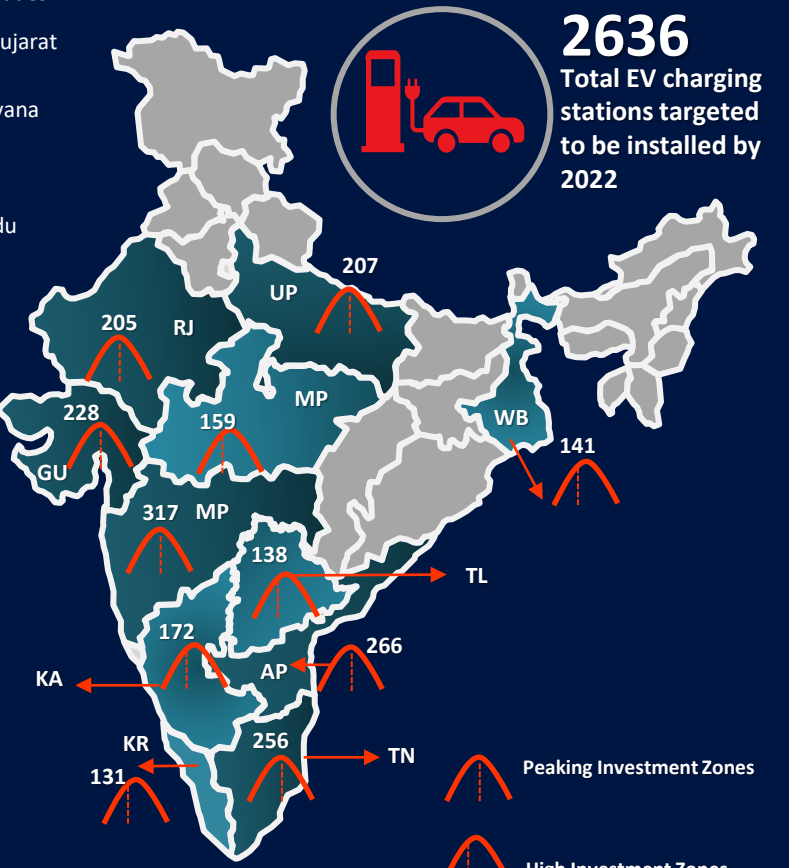


INR 500 Crores

Total Planned for setting 2636 EV charging stations by 2022

Opportunity in terms of Number of Cities Planned for Setting EV Charging Stations across key States by 2022

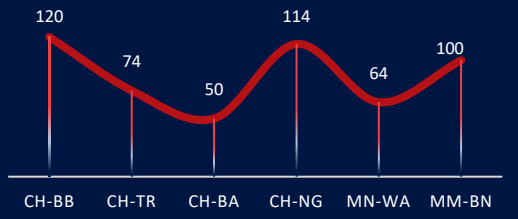


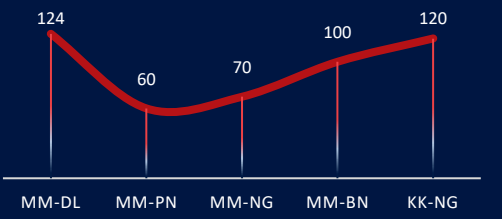


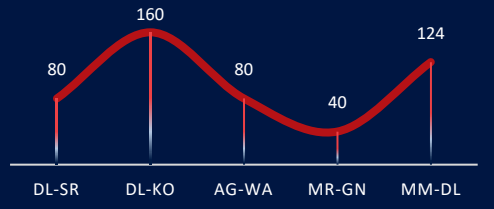
2636

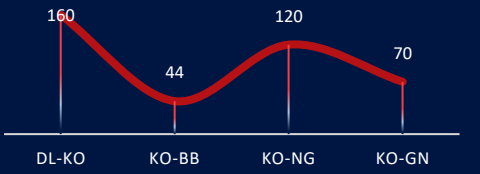
Total EV charging stations targeted to be installed by 2022

Opportunity for Setting EV Charging States (In Numbers) Across key Highways





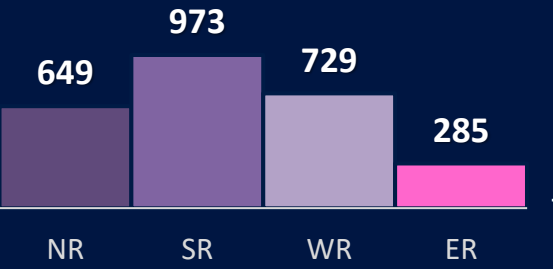




1370

Minimum no of EV charging stations targeted to be installed on selected Highways

DL-SR : Delhi-Srinagar Highway
DL-KO: Delhi – Kolkata Highway
AG-WA: Agra-Wagpur Highway
MR-GN: Meerut-Gangotri Highway
MM-DL: Mumbai-Delhi Highway
MM-PN: Mumbai-Panaji Highway
MM-NG: Mumbai-Nagpur Highway
MM-BN: Mumbai-Bengaluru Highway



Region wise breakup of total no of targeted EV Charging Stations targeted for installation by 2022

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Key Signpost – Indian states are rolling out their plans for setting EV charging stations, significant opportunity underway for value chain players till 2030. ABB, Acme, Fortum India and a few Dutch firms are actively considering setting up EV charging stations.

Policy changes at both central and state level are being implemented to pave way for accelerated charging infrastructure capacity creation. This encouragement from the government has increased the interest of many private players to invest across India's EV charging space. For instance, Japanese electronics company Panasonic has planned to set up around one lakh charging station for e-vehicles across 25 top Indian cities. The Japanese company is planning to set up these stations by 2024. These charging stations are expected to power over one million vehicles. The company has planned charging stations across top cities like Delhi, Pune, Bengaluru, Chennai, Amravati, Hyderabad, Gurgaon, Noida, and Ghaziabad, etc. The charging facilities will be set up at petrol pumps, malls, parking lots, etc. Indian EV maker Ather Energy also aims to develop biggest EV charging infrastructure network and terms it as "Ather Grid". The company plans to set up 6500 charging stations across the country by 2022. State-run companies like NTPC, GAIL India, Indian Oil Corp, and Power Grid Corp have been exploring diversification into electric vehicle charging infrastructure business.

What's our difference margin for market research?

1 Our Market Research Coverage Range

- Evaluating the market opportunities for players into manufacturing, installation & repair of FGD systems & APCE on regional basis with comprehensive market research feed
- Assessing business case for FGD systems, ESPs, Auxiliary equipments & air pollution control equipment manufacturers across varied large industrial segments in India with eninrac's intense D2I model
- Competition landscaping and benchmarking of the product offerings and service capabilities of major OEMs into APCE manufacturing in India

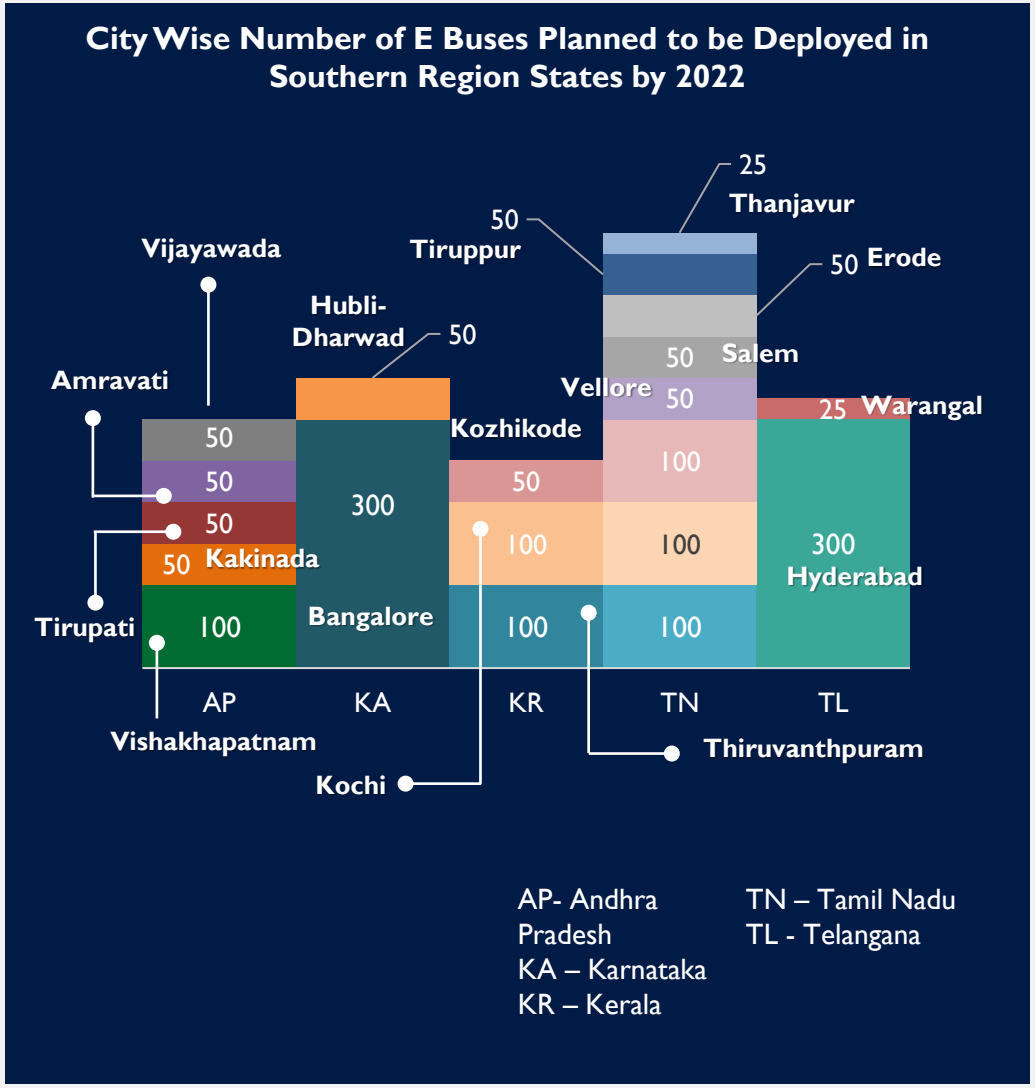
2 Our Market Research DNA & Team of Domain Specialists

- We boast a highly qualified and experienced team of market research professionals having experience of working in top companies across different domains
- Our focus on nurturing industry connect is paramount which helps us generate high quality robust market feed which is filtered and sourced through from different levels
- Any market research report follows strict turn-around-time procedures with cross-vetting from our Knowledge Grid Experts which adds immense value to our research credentials for the deemed subject

3 Our Satisfied Patrons and Retention rate of over 97.6% on yoy basis

We have been bestowed with a phenomenal client retention rate and many satisfied clientele. Our client's have been from wide variety of industry domains and from different geographic locations across the globe. Eninrac consulting is a trusted market research partner and an objective resource augmenting value for more than 257+ Group companies & 1000+ organization across 40+ countries.

What environment is transpiring business case for setting electric vehicle charging infrastructure in India – Push from the Central and State governments is the biggest driver.



Government of India has approved the roll out of 5595 electric buses to be functional till 2022 for intra-city and intercity operation under FAME scheme phase II

India targets to deploy more than 15,000 electric buses by 2030. Country's intent to meet this target can be well observed with DHI approving 5595 electric buses to 64 Cities / State Govt. Entities / STUs for intra-city and intercity operation. It is pertinent to note that DHI received 86 proposals from 26 States/UTs for the deployment of 14988 e-Buses were received. After evaluation of these proposals as per EoI, on the advice of Project Implementation and Sanctioning Committee (PISC) the Government sanctioned 5095 electric buses to 64 Cities / State Transport Corporations for intra-city operation; 400 electric buses for intercity operation and 100 electric buses for last mile connectivity to Delhi Metro Rail Corporation (DMRC). Further, it is also noticeable that many of the state agencies/public sector departments have already initiated the procurement process for the e- buses in order to support the vision of central government. For instance, The Bangalore Metropolitan Transport Corporation (BMTC) has invited bids on November 12, 2020 to select a service provider to procure 300 electric buses on a gross cost contract (GCC) model. The contract will also include the operation and maintenance (O&M) services. Kerala state road transport corporation has also invited bids for hiring 50 electric buses on wet lease for the Thiruvananthapuram zone. The construction and Design services of Uttar Pradesh Jal Nigam has invited bids to set up charging stations for 225 electric buses at Prayagraj, Ghaziabad, Gorakhpur and Kanpur.

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What environment is transpiring business case for setting electric vehicle charging infrastructure in India – Push from the Central and State governments is the biggest driver.

The Business Case for Market Research on Fitment Analysis Indexation & Value Chain Players Wise Opportunity Breakup of Setting EV Charging Stations on Major Highways and Expressways – The very business case lies in the need for public charging infrastructure for electric vehicles, which shall increase if consumers who do not have access to a garage or other private or semiprivate residential parking – a large share of people living in cities – also adopt EVs. For instance, in Germany almost two-thirds of all households have a garage or parking space. Looking at the urban metropolis of London, however, two-thirds of homes have neither a garage nor off-street parking . **Adoption of small-format mobility could accelerate, especially for EV options** Some of the most exciting developments relate to small-format mobility, which includes 2Ws and 3Ws. Sales of entry-level scooters and motorcycles are already seeing a strong bounce back, with leading 2W manufacturers reporting a fourfold increase in sales between May and June 2020. Much of the demand comes from migrants, originally from rural areas, who work in large cities. The lockdown has prompted many of these migrants to move back to their hometowns in the countryside, which is driving demand for affordable mobility options. For the 3W market, prospects are also strong. Further, **lowering battery pack prices in India shall also pump up the sales of electric vehicles** in the country, hence encouraging supportive charging infrastructure for the same as well. It is significant to note that the price of battery packs in India are likely to range between INR 7700-8500 by 2030, making electric vehicles much more affordable. Rising demand of share mobility, especially 3W vehicles, passenger mobility will be the greatest demand driver, with expected YoY growth of e-vehicles in this segment to be 40 to 50 percent, followed by goods delivery. **Incentives & initiatives from central and state governments to encourage EVs and charging infrastructures,** the GoI has sanctioned 2636 charging stations in 62 cities across 24 States/UTs under II phase of FAME scheme. As many as 317 EV charging stations have been allotted in Maharashtra, 266 in Andhra Pradesh, 256 in Tamil Nadu, 228 in Gujarat, 205 in Rajasthan, 207 in Uttar Pradesh, 172 in Karnataka, 159 in Madhya Pradesh, 141 in West Bengal, 138 in Telangana, 131 in Kerala, 72 in Delhi, 70 in Chandigarh, 50 in Haryana, 40 in Meghalaya, 37 in Bihar, 29 in Sikkim, 25 each in Jammu &Kashmir and Chhattisgarh, 20 in Assam, 18 in Odisha and 10 each in Uttarakhand, Puducherry and Himachal Pradesh. The state governments are also aggressively pushing the case of e mobility. It is significant to note that during October 2020, Telangana state government launched the 'Telangana Electric Vehicle & Energy Storage Policy' with a vision to make the state a hub for EVs and energy storage systems (ESS). The policy aims to attract private investments worth USD4 billion in the EV sector. The policy notifies 100% exemption of road tax for e-2W, e-3W and also for electric tractors. The policy notified that the government would facilitate setting up of an initial batch of fast charging stations in Hyderabad and other towns in a phased manner, by state entities and private players. Further, Telangana State Electricity Regulatory Commission will provide a special power tariff category for EV charging stations. In addition, TSREDCO (State Nodal Agency) is given the responsibility to evaluate directly or under the licensee/franchise/PPP model the establishment of public charging stations. Tamil Nadu government has informed NGT that it will set up EV charging stations across in Chennai, Coimbatore, Thirupur . Madurai, Salem and Tirunelveli. The charging stations will also be set up on NHAI and state highways and 100% tax exemption shall be there on EV related manufacturing, charging infrastructure facilities etc. The New Delhi EV policy aims to have 25% of all vehicles sold in Delhi to be electric by 2024. To encourage the rapid adoption of e-vehicles, Delhi government is focusing on the speedy rollout of Electric Vehicle charging infrastructure. Key government agencies that have shown interest in support EV charging infrastructure in the state are – State Transport Department, Delhi Transport Corporation (DTC), Indian Oil Corporation Ltd. (IOCL), Hindustan Petroleum Corporation Ltd.(HPCL), Bharat Petroleum Corporation Ltd. (BPCL) Delhi Metro Rail Corporation (DMRC), Delhi Integrated Multi-Modal Transit System Ltd.(DIMTS) .The Agency for New and Renewable Energy Research and Technology (ANERT) has plans to equip Kerala with an electric vehicle charging station every 50 km. As electric-vehicle demand looks increasingly likely to grow and EVs emerge as viable alternatives to ICE cars, an ecosystem of industries needs to stack hands on actions that can enable their broader use. Closing the charging gap is one such action, and resolving it will require a concerted, collaborative effort. That's why finding the answers to the key queries like – ***need for charging stations for EV and what are the conditions for setting it ? What business environment the Indian states are promoting for EVs – incentives etc ? what shall be the cost breakup for setting EV charging stations ? What shall be ideal locations for establishing EV charging infrastructure ?What shall be the opportunity for value chain players? What shall be business case for battery swapping? etc*** should top the agendas of all stakeholders across the EV ecosystem, especially if charging access becomes the number-one impediment to EV penetration. Understanding specific local needs for early demand and adaptation will be the key to making effective targeted investments, matching demand and supply, and enabling quick returns on investments.

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Contents & Coverage – on Market Assessment of Electric Vehicle Charging Infrastructure in India

01 Analyzing conditions for setting EV charging infrastructure

This section shall examine the key prerequisite conditions for setting EV charging stations such as- EV penetration rate, availability of power & connectivity, conditions approved by FAME II scheme, guidelines of ministry of power, demand incentives etc

04 Examining RE connectivity, solar rooftop and grid stability across all the Indian states for supporting EV charging infra

This section shall track the state wise opportunity for renewable energy generation players in supporting the power supply to EV charging stations via rooftop solar, battery energy storage systems, mini / micro grids etc.

07 Region wise opportunity track for fuel suppliers & oil marketing companies in supporting EV charging stations

This section shall include opportunity for OMCs in establishing new EV charging stations or sharing the space with the existing fuel supply stations for charging EVs

02 Fitment analysis index for setting EV charging infrastructure across all the regions in India

This section shall cover the value chain player wise opportunity analysis for setting EV charging infrastructure at shortlisted highways and expressways across all the regions in India.

05 Opportunity assessment for power distribution & transmission companies across all the Indian states for EV charging infrastructure

This section focuses on tracking opportunity for power distribution companies – state owned, private licensees & distribution franchises in India in order to secure power supplies. Also, it tracks the business case for transmission companies – CTUs, STUs and PTUs

08 Market opportunity for RE power generation companies

This section shall track the state wise opportunity for renewable energy generation players in supporting the power supply to EV charging stations via rooftop solar, battery energy storage systems, mini / micro grids etc.

Fitment Analysis Indexation & Value Chain Players Wise Opportunity Breakup of Setting EV Charging Stations on Major Highways and Expressways in India

03 Cost breakup analysis for setting EV charging infrastructure as per industry & global benchmarks

This section covers cost analysis of EV chargers, EV supply equipments, power management & control systems, upstream connection equipments and cost of operation & maintenance and analysis of break even point for bidders as per revenue model

06 Examining opportunity for EV charging infra providers across all the Indian states

This section shall track opportunity for infrastructure providers/ EPC players in setting electric vehicle charging stations in India

09 Demography & economic suitability analysis for return on investment in EV infrastructure

This section shall cover the location wise analysis on return of investment in setting EV infrastructure. The analysis shall be based on parametric evaluation covering factors – economic profiling , urbanization rate, rate of industrialization, proximity to a mega city and frequency of travel etc.

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Contents & Coverage – on Market Assessment of Electric Vehicle Charging Infrastructure in India

10 Examining the requirement of EV chargers as per their configuration across all the states in India

This section shall cover the demand assessment of electric vehicle chargers for all the categories - CCS (Minimum 50kW) or CHAdeMO (Minimum 50kW) , Higher Capacity Than 50 kW, DC 001 (15 kW) Chargers, Operational EV Chargers (Bharat AC 001 – 10 kW) & Type 2 AC (22 kW) for the sanctioned EV charging stations to be set up in India

13 Opportunity for supply of EV and EVSE for OEMs and EPC players in India

This section covers the quantification of opportunity for the players in value (INR) and volume (in terms of numbers), market opportunity for EV charger's configuration, opportunity for players regards the EV supply equipments and upstream electrical infrastructure inclusive of transformers

11 Anticipated growth assessment in the number of electric vehicles in India for all the states

What shall be the anticipated growth of electric vehicles in India till 2025. This section shall cover growth assessment of electric two wheelers, three wheelers , four wheelers and electric buses in India for each distinct state till 2025.

Fitment Analysis Indexation & Value Chain Players Wise Opportunity Breakup of Setting EV Charging Stations on Major Highways and Expressways in India

12 Location suitability index – Pre cursor to feasible location analysis across all Indian states

This section of the report covers adaptability index for electric vehicles in India , financial viability of EV in terms of increased frequency of travel. Suitability of EV charging stations to connect from nearest Discom substation or low voltage transmission substation. Land availability and issues thereof, purchasing power parity and competition tracking from conventional fuel vehicles and phasing out the same. All the above-mentioned exercise shall be done for all the highways and expressways shortlisted by the GoI for setting EV charging infra.

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Fitment Analysis Indexation & Value Chain Players Wise Opportunity Breakup of Setting EV Charging Stations on Major Highways and Expressways in India

Key Highlights for Market Assessment of Electric Vehicle Charging Infrastructure in India

1. The Agency for New and Renewable Energy Research and Technology (ANERT) has plans to equip Kerala with an electric vehicle charging station every 50 km
2. Telangana rolls out 10-year Electric Vehicle Policy , aims to attract USD 4 Billion investments
3. Electric vehicle maker Ather Energy aims to set up more than 135 electric vehicle chargers by December 2020
4. Under phase II of FAME scheme a total of 27,201 electric vehicles have been supported by the way of demand incentive amounting to INR 95 crores
5. A total of 5595 electrical buses have been sanctioned to various State/ City Transport Undertakings under Phase-II of the FAME Scheme
6. In October 2020, GoI has invited proposals from interested entities to build and operate a minimum of 1370 EV charging infrastructure on highways and expressways
7. Okaya Power to install more than 10,000 EV charging solutions in India
8. Delhi EV Policy 2020, targets 25% of all new vehicle registrations by 2024 to be battery electric vehicles (BEV)

Differentiating Insights for Market Assessment of Electric Vehicle Charging Infrastructure in India

1. Analyzing conditions for setting electric vehicle (EV) charging stations in India
2. Analyzing opportunity for setting EV charging stations on highways
3. Analyzing opportunity for setting EV charging stations on expressways
4. Opportunity for supply of EVs & EVSE for OEMs , EPC players
5. Fitment analysis and indexation for setting EV charging stations across northern region states in India
6. Fitment analysis and indexation for setting EV charging stations across southern region states in India
7. Fitment analysis and indexation for setting EV charging stations across western region states in India
8. Fitment analysis and indexation for setting EV charging stations across eastern region states in India
9. Opportunity assessment for power generation companies in setting EV charging stations in India
10. Opportunity assessment for power transmission companies in setting EV charging stations across all the states in India
11. Opportunity assessment for power distribution companies in setting EV charging stations across all the states in India
12. Opportunity assessment for fuel suppliers & oil marketing companies in setting EV charging stations across all the states in India
13. Opportunity assessment for infrastructure providers in setting EV charging stations across all the states in India
14. Opportunity assessment for RE power generation companies in setting EV charging stations across all the states in India
15. Location suitability indexation – Examining feasible locations for setting EV Charging stations across all the states in India
16. Examining RE connectivity , solar rooftop and grid stability for supporting EV charging infrastructure across all the states in India

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Must Buy For

- Electric Vehicle Infrastructure Providers
- Electric vehicle chargers' manufacturers
- Electric vehicle manufacturers
- Electrical equipment manufacturers
- Power management and control system providers
- Original Equipment Manufacturers (OEMs)
- Equipment Sub contractors/Suppliers
- Engineering , Construction and Procurement Players
- O&M Service Providers
- Battery manufacturers
- Power generation companies
- Power Distribution companies
- Power transmission companies
- RE developers
- Oil marketing companies
- Government & Regulatory Bodies
- Research Institutions/Bodies
- Funding Bodies/Banks

For Queries

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Procurement: For queries regards the procurement of the report and applicable discounts , connect our team member Nitika Sharma, **email – nsharma@eninrac.com**

Please call at +91 7290016953/54 for any other queries

Fitment Analysis Indexation & Value Chain Players Wise Opportunity Breakup of Setting EV Charging Stations on Major Highways and Expressways in India

Companies Mentioned

- BHEL
- Siemens
- GE
- Tata Projects
- L&T
- NTPC
- Adani
- Greenko
- Renew Power
- SB Energy
- NHPC
- Kalpataru
- KEC
- Sterlite
- Torrent Power
- BEML
- EIL
- GAIL
- BPCL
- IOCL
- Reliance
- Essar Oil

> Truth is ever to be found in the simplicity, and not in the multiplicity and confusion of things
>
> **- Sir Isaac Newton**

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