

**Amendments in
Model Building Bye-Laws
(MBBL - 2016)
for
Electric Vehicle Charging Infrastructure**

**Town and Country Planning Organization
Ministry of Housing and Urban Affairs
Government of India**

February, 2019

Preamble

To address the quantum of emissions from the "Transport" sector powered by fossil fuels, "electric vehicle" is considered a viable option for short distance / inter-city trips with adequate "charging stations" available. It is necessary to make provisions for establishing Public Charging Stations (PCS) in the local areas including urban CBDs for vehicle re-fuelling / recharging.

Hence, amendments are required for addition of norms for charging Infrastructure provisions in Development Control Regulations and enabling provisions for installing "*Charging Infrastructure*" in the building premises and core urban areas of the cities.

Based on available charging technologies and their evolution, type of vehicles, the types of chargers, indicating number of charging points required for setting up adequate PCS within the local urban areas including the building premises of all building types and with the long term vision of implementing 'electric mobility' during the next 30 years, amendments are made in the relevant sections (Chapter 10) of the Model Building Bye-laws, 2016.

Amendments to Model Building Bye-Laws, 2016

In Chapter 10: Sustainability and Green Provisions

After section 10.3 "Various Guidelines for Green Rating Systems".

Provision of "Electric Vehicle Charging Infrastructure" to be added at clause 10.4

10.4 Electric Vehicle Charging Infrastructure (EVCI):

Based on the occupancy pattern and the total parking provisions in the premises of the various building types, charging infrastructures shall be provided only for EVs, which is currently assumed to be 20% of all 'vehicle holding capacity'/'parking capacity' at the premise.

Additionally, the building premise will have to have an additional power load, equivalent to the power required for all charging points (in a PCS) to be operated simultaneously, with a safety factor of 1.25 (refer *Explanatory Note- Annexure III*).

10.4.1 Residential Buildings (plotted house)

Table 1: Charging Infrastructure requirements for individual house/ self-use

Building Type	Plotted House
Ownership of Station	Private (Owner)
Connection and Metering	Domestic meter
Type of Charger	Slow chargers as per owner's specific requirements
Modes of Charging	AC (Single charging gun)
Norms of Provisions	Min. 1 SC and additional provisions as per the owner individual.

Note:

- The charging infrastructure installed by a home owner shall be construed as a Private CI meant for self-use (non-commercial basis) as per the note at clause no 4 of the explanatory note at Annexure III.

10.4.2 All other buildings (including Group Housing)

Any PCS installed at Public/Private areas or building premises of any category that caters to commercial mode of charging of EVs shall be deemed as a Public Charging Station and shall have to install the minimum requirements of chargers as specified in the Guidelines dated 14.12.2018 of Ministry of Power (refer Annexure IV for MoP Guidelines). However, in order to provide sufficient charging points for the EV share in all vehicles (refer clause 3 of the *Explanatory Note- Annexure III*), ratio of types of chargers is recommended in the table below -

Table 2: Charging Infrastructure requirements for PCS (commercial use)

Building Type	Any building type			
Ownership of Station	Service provider			
Connection and Metering	Commercial Metering and Payment			
Types of Charger	as per min. requirements specified in MoP Guidelines (refer Annexure IV)			
Additional chargers	PCS service providers shall install additional number of kiosk/chargers beyond the minimum specified requirements to meet the ratio of charging points as prescribed below (by the type of vehicles).			
Norms of Provisions for charging points	4Ws 1 SC - each 3 EVs 1 FC - each 10EVs	3Ws 1 SC - each 2 EVs	2Ws 1 SC - each 2 EVs	PV (Buses) 1 FC - each 10 EVs

Note:

- Charging bays shall be planned currently at 20% capacity of all vehicles including 2Ws and PVs(cars)
- Open metering and on-spot payment options to be available for all users.
- Provision of FCB CS and BS shall not be mandatory, and will be at the discretion of the service provider.

Abbreviations used:

2Ws	-	Two wheelers
3Ws	-	Three wheelers
4Ws	-	Four wheelers / PV(cars)
PVs	-	Passenger Vehicles
EV	-	Electric Vehicle
SC	-	Slow Charger / Slow Charging (AC)
FC	-	Fast Charger / Fast Charging (DC and a few AC ones)
PCS	-	Public Charging Stations
MBBL	-	Model Building Bye-Laws, 2016
FCB CS	-	Fluid Cooled Battery Charging Station
BS	-	Battery Swap

**Annexure III
(MBBL 2016)**

**Explanatory Note
on
Electric Vehicle Charging Infrastructure
(For MBBL, 2016)**

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Abbreviations:

UNFCC	-	United Nations Framework Convention on Climate Change
IPCC	-	Intergovernmental Panel on Climate Change
GHG	-	Green House Gases
2Ws	-	Two wheelers
3Ws	-	Three wheelers
4Ws	-	Four wheelers / PV(cars)
PVs	-	Passenger Vehicles
CVs	-	Commercial Vehicles
EV	-	Electric Vehicle
EVSE	-	Electric Vehicle Supply Equipment
SC	-	Slow Charger / Slow Charging (AC)
FC	-	Fast Charger / Fast Charging (DC and a few AC ones)
BS	-	Battery Swap
PCS	-	Public Charging Stations
PCI	-	Public Charging Infrastructure
Private CI	-	Private Charging Infrastructure
MBBL	-	Model Building Bye-Laws, 2016
URDPFI	-	Urban and Regional Development Plan Formulation and Implementation Guidelines, 2014
NSP	-	Network Service Provider (information network)
SP	-	Service Provider

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1. Rationale for EVCI establishment

Rapid urbanization coupled with adoption of mechanized transportation modes has resulted in high emissions of Green House Gases that goes on to impact Global warming. Unless, the global surface temperature rise is restricted to no more than 2°C compared with pre-industrial levels, the IPCC has warned that the world will see irreversible catastrophic climate change.

India being a signatory to the UNFCCC, has pledged for efforts to assess the Greenhouse Gas Emissions (GHG) of anthropogenic origin and removal by sinks. India's per capita emissions are still considered low at 1.9 tonnes (2013), but its total emissions are next only to China and the US and is likely to overtake those of the EU by 2019.

While comparing the Indian cities for their emission scores, Delhi is on top as the biggest emitter at over 38 million tonnes of carbon dioxide equivalent overall emissions, followed by Greater Mumbai at 22.7 million tonnes and Chennai at 22.1 million tonnes, Kolkata at 14.8 million tonnes, Bangalore at 19.8 million tonnes, Hyderabad at 13.7 million tonnes and Ahmedabad at 9 million tonnes were the other cities whose emissions for the year were calculated sector wise.

As per the statistics of Transport Department (GNCTD), total number of vehicles in Delhi is more than the combined total vehicles in Mumbai, Chennai and Kolkata. Delhi has 85 private cars per 1000 population against the national average of 8 cars per 1000 population. In terms of CO₂ emissions due to motor vehicles, Delhi emits about 12.4 million tonnes while the city of Bengaluru emits about 8.6 million tonnes.⁽¹⁾

Therefore, addressing the quantum of emissions from the "Transport" and "Domestic" sector emerges to be the high priority subjects under the overarching umbrella of "*Climate change mitigation*" as committed to the UNFCC.

Encouraging "Electric Vehicles" as a viable option for phased transportation in terms of short and long distance trips with appropriate "Charging Infrastructure" is therefore, the pre-condition for this paradigm shift / phased migration to sustainable transportation.

For this changes are required in Infrastructure provisions (at Regional and City levels) and in Development Control Regulations (in terms of provisions therein) to include the formulations of norms and standards for "*Charging Infrastructure*" in the said Mater Plan Regulations and State Bye-Laws for adoption across the country suiting local conditions.

2. EV Charging Technology

2.1 Electric Vehicle Supply Equipment (EVSE):

An EVSE is a wall mounted box that supplies electric energy for recharging of electric vehicle batteries. Also EVSEs have a safety lock-out feature that does not allow current to flow from the device until the plug is physically inserted into the car.

EVSEs can be customized with added features like:

- Authentication
- Integrated payment gateways
- Software for remote monitoring.

As electric vehicle charging technology continues to advance, several standards and guidelines have become widely accepted across the industry. This section gives a brief overview of charging infrastructure technology, standards, and terminology.

2.2 Different types of EVSE:

Charging speeds- Charging power, which determines the time required to charge a vehicle, can vary by orders of magnitude across charge points, as shown in Table 1. A small household outlet may charge as slowly as 1.2 kW, while the most advanced rapid charging stations can charge at up to 350 kW. Charging infrastructure is broadly broken into three categories based on speed: Level 1, Level 2, and direct current (DC) fast charging (sometimes referred to as Level 3).

(Source: "Emerging Best Practices for Electric Vehicle Charging Infrastructure", Oct' 2017)

Private Charging

Charging batteries of privately owned cars through domestic charging points. Billing is mostly part of home/domestic metering.

AC "Slow" Charging:

The home private chargers are generally used with 230V/15A single phase plug which can deliver a maximum of up to about 2.5KW of power. The EVSE supplies AC current to the vehicle's onboard charger which in turn converts the AC power to DC allowing the battery to be charged.

Public Charging

For charging outside the home premises, electric power needs to be billed and payment needs to be collected. The power drawn by these chargers may need to be managed from time to time.

DC "Fast" Charging:

DC current is sent to the electric car's battery directly via the charge port. FC chargers (usually 50 KW or more) can supply 100 or more kilometers of range per hour of charging. The fast chargers would generally be used as a top-up, rather than fully charging vehicles. These are important for cab companies and corporate users who have a fleet of electric cars.

3. Options for EV Charging

There is an urgent need to offer flexible charging infrastructure for different vehicle segments to drive adoption of EVs. Charging infrastructure is the most crucial enabler in the entire EV value chain. The exploration of different charging models according to the local conditions shall enable faster deployment of electric vehicles in the country.

EV share in all vehicles - It has been broadly projected that by the current rate of adoption of EVs, about 15% of all vehicles in the country would be EVs by the year 2020. Therefore, while assuming percentage composition of all proposed capacities in Public facilities of vehicle holding capacity, the Metropolitan and 'Tier I' cities will be assumed to have a higher percentage share of EVs, say **20% for now**. The charging infrastructure prescriptions in all urban development guidelines shall, therefore, be in consonance with the said percentage.

Power Load sanction to premises – While adding these Charging Infrastructures to the proposed set of building types of the Indian cities, **enhanced Power Load shall have to be had for each such building type by the Power DISCOMs**, commensurate to the total additional power requirement of simultaneous operation of all the prescribed charging points in the premise. With further advancement of charging technologies and the enhanced capacity of chargers to draw more power, it is advised that the **load capacity assigned to each premise should be kept with a safety factor of 1.25** with a long-term vision of 30 years.

Table 1: EVs charging “modes” and ‘availability’

Vehicle type	Slow Charging	Fast Charging	Public CI
2 Wheelers	Y	N	Yes/Limited
3 Wheelers	Y	N	Yes/Limited
PVs (Cars)	Y	Y	Yes
PVs (Buses)	N	Y	Yes

Table 2: Charging options for EV types (by ownership)

Vehicle type	Private CI	Public CS	Predominant place of charging
2 Wheelers	SC/BS	SC	Point of residence / Work
3 Wheelers	SC/BS	SC/BS	Residence / Parking stations
PVs (Cars)	SC/BS	FC	Residence / Point of work / other public places
PVs (Buses)	-	FC/BS	Bus Terminals/Depots

Note:

- The option of Battery Swapping (BS) for privately owned 2Ws and PV(Cars) is limited to Private CI.
- For 3 Ws the BS is proposed to be made available in PCS, for faster recharge experience only
- For PV (Buses), Captive Fast charging infrastructure for 100% internal use for fleets may be adopted by privately owned Depots/Garages.

Based on the above stated EV charging technologies available and the current trend of evolving technologies of faster charging experience, the Ministry of Power has issued **Guidelines and Standards for setting up Charging Infrastructure for Electric Vehicles** [Ministry of Power (MoP) Guidelines dated 14.12.2018] for charging infrastructure to be installed at every Public Charging Station (PCS). 'Connectivity regulations and Safety norms' shall be defined by respective authorities such as Central Electric Authority/MoP for grid access to such PCS / any other charging station/infrastructure.

4. Charger Specifications and PCS Infrastructure

Any installed PCS shall have one or more electric kiosk/boards with installation of all charger models as prescribed in the **Guidelines and Standards notified by Ministry of Power, dated 14 December 2018 for "Charging Infrastructure for EVs"** (at Annexure II), with other necessary arrangements as deemed necessary.

Public Charging Station service providers shall be free to create charging hubs and to install additional number of kiosk/chargers in addition to the minimum chargers prescribed vide the MoP Guidelines, including options for installation of additional chargers, if required.

Note:

1. *Minimum infrastructure requirements do not apply to Private Charging Points meant for self-use of individual EV owners (non-commercial basis).*
2. *Captive charging infrastructure for 100% internal use for a company's own fleet will not be required to install all type of chargers and to have NSP tie ups.*

5. Location of PCS / FCB CS in local area / building precincts

In accordance with the Guidelines issued by the *Ministry of Power (MoP)*, following minimum standards with regard to density of / distance between PCS in local level facilities in building premise / urban precincts shall be followed as per provisions in the Model BBL-2016

1. **At the Local levels (within the urban area):**

- At least 1 Public Charging Station is to be available within a grid of 3Km x 3Km.

2. **At the Building premise levels (for various building types)**

- Private charging infrastructure (non-commercial use) for individuals.
- For all commercial modes of charging EVs, at least 1 PCS, as per minimum specifications laid under MoP guidelines.
- Standalone Battery Swapping Stations may be added with the PCs.



No.12/2/2018-EV
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg,

New Delhi, the 14th December, 2018

To,

1. The Secretaries of all the Ministries/Departments of Government of India.
2. The Chief Secretaries of the States/UTs.

Sub: Charging Infrastructure for Electric Vehicles – Guidelines and Standards -reg.

Sir/Madam,

Government of India have undertaken multiple initiatives to promote manufacturing and adoption of electric vehicles in India. With support of the Government, electric vehicles have started penetrating in the Indian market. However, availability of adequate Charging Infrastructure is one of the key requirements for accelerated adoption of electric vehicles in India. It is proposed to encourage this by laying down an enabling framework.

Objectives

- To enable faster adoption of electric vehicles in India by ensuring safe, reliable, accessible and affordable Charging Infrastructure and eco-system
- To promote affordable tariff chargeable from EV owners and Charging Station Operators/Owners
- To generate employment/income opportunities for small entrepreneurs
- To proactively support creation of EV Charging Infrastructure in the initial phase and eventually create market for EV Charging business
- To encourage preparedness of Electrical Distribution System to adopt EV Charging Infrastructure.

In light of the above, it has been decided as follows:

1. Private charging at residences / offices shall be permitted. DISCOMs may facilitate the same.
2. Setting up of Public Charging Stations (PCS) shall be a de-licensed activity and any individual/entity is free to set up public charging stations, provided that, such stations meet the technical as well as performance standards and protocols laid down below as well as any further norms/standards/specifications laid down by Ministry of Power and Central Electricity Authority from time to time.

- 2.1 Any person seeking to set up a Public Charging Station may apply for connectivity and he shall be provided connectivity on priority by the Distribution Company licensee to supply power in the area.
- 2.2 Any Charging Station/ Chain of Charging Stations may also obtain electricity from any generation company through open access.

3. **Public Charging Infrastructure (PCI)- Minimum Requirements:**

3.1 Every Public Charging Station (PCS) shall have the following minimum infrastructure:

- i. An exclusive transformer with all related substation equipment including safety appliance.
- ii. 33/11 KV line/cables with associated equipment including as needed for line termination/metering etc.
- iii. Appropriate civil works.
- iv. Adequate space for Charging and entry/exit of vehicles.
- v. Current international standards that are prevalent and used by most vehicle manufacturers internationally are CCS and CHAdMO. Hence, Public Charging Stations shall have, one or more electric kiosk/boards with installation of all the charger models as follows:

Charger Type	Charger Connectors*	Rated Voltage (V)	No. of Charging Points/No. of Connector guns (CG)
Fast	CCS (min 50 kW)	200-1000	1/1 CG
	CHAdMO (min 50 kW)	200-1000	1/1 CG
	Type-2 AC (min 22 kW)	380-480	1/1 CG
Slow/Moderate	Bharat DC-001 (15 kW)	72-200	1/1 CG
	Bharat AC-001 (10 kW)	230	3/3 CG of 3.3 kW each

*In addition, any other fast/slow/moderate charger as per approved BIS standards whenever notified.

- vi. The kiosk/board may have options for installation of additional chargers if required.
- vii. The Public Charging Station Providers are free to create Charging Hubs and to install additional number of Kiosk/Chargers in addition to the minimum number of chargers prescribed above.
- viii. Tie up with at least one online Network Service Providers (NSPs) to enable advance remote/online booking of charging slots by EV owners. Such online information to EV owners should also include information regarding location, types and numbers of chargers installed/available etc.
- ix. Share charging station data with appropriate DISCOM and to maintain appropriate protocols as prescribed by such DISCOM for this purpose. CEA shall have access to this database.
- x. Appropriate public amenities.



- xi. Where, in addition to the above, fast charging facility is also planned to be provided at the PCS by the PCI provider, the following additional infrastructure must be provided:
 - a. Appropriate Liquid Cooled cables if High Speed Charging Facility for onboard charging of Fluid Cooled Batteries (FCBs) is also planned.
 - b. Appropriate Climate Control Equipment for Fast Charging of Batteries to be used for swapping (i.e. not onboard)
- 3.2. Every Public Charging Station (PCS) shall be operational only after inspection and clearance as communicated by a suitable clearance certificate, by the concerned electrical inspectors/technical personnel designated specifically by the respective DISCOM for this purpose. DISCOMs may also empanel one or more third party authorized technical agencies for this purpose.
- 3.3. Electric Vehicle Service Equipment (EVSE) shall be type tested by an appropriate reputed authority.
- 3.4. The above minimum infrastructure requirements do not apply to Private Charging Points meant for self-use of individual EV owners (non-commercial basis).
- 3.5. Captive charging infrastructure for 100% internal use for a company's own/leased fleet for its own use will not be required to install all type of chargers and to have NSP tie ups.
- 3.6. Public Charging Station can also have the option to add Standalone battery swapping facilities in addition to the above mandatory facilities, provided space/other conditions permit.
- 4. **Public charging Infrastructure (PCI) for long distance EVs and/or heavy duty EVs:**
- 4.1. Public charging stations for long distance EVs and/or heavy duty EVs (like trucks, busses etc.) shall have the following minimum requirements:
 - i. At least two chargers of minimum 100 kW (with 200-1000 V) each of different specification (CCS & Chademo) and with single connector gun each in addition to the minimum charging infrastructure requirements as mandated for Public Charging Stations in para 3.
 - ii. Appropriate Liquid Cooled Cables for high speed charging facility for onboard charging of Fluid Cooled Batteries (currently available in some long range EVs).
 - iii. In addition to 4.1 (i) and (ii) above, the Fast Charging Stations (FCS) for Long Distance EVs and/or Heavy Duty EVs may also have the option of swapping facilities for batteries for meeting the charging requirements as per para 3 and para 4.1(i)&(ii) above. It is notable that Fluid Cooled Batteries (FCBs) are generally necessary for Fast Charging / Long Distance use of EVs and/or for Heavy Duty Vehicles like buses/trucks etc. FCBs will have higher charging rate and longer life.
- 4.2. Such Fast Charging Stations (FCS) which are meant only for 100% in house/captive utilisation, for example buses of a company, would be free to decide the charging specifications as per requirement for its in- house company EVs.



5. **Location of Public Charging Stations:**

5.1 In case of Public Charging Stations, the following minimum requirements are laid down with regard to density/distance between two charging points:

- i. At least one Charging Station should be available in a grid of 3 Km X 3 Km. Further, one Charging Station be set up at every 25 Km on both sides of highways/roads.
- ii. For long range EVs (like long range SUVs) and heavy duty EVs like buses/trucks etc., there should be at least one Fast Charging Station with Charging Infrastructure Specifications as per para 4.1 at every 100 Kms, one on each side of the highways/road located preferably within/alongside the stations laid in para 3 above. Within cities, such charging facilities for heavy duty EVs shall be located within Transport Nagars, bus depots. Moreover, swapping facilities are also not mandatory within cities for Buses/trucks.

5.2 Additional public charging stations shall be set up in any area only after meeting the above requirements.

5.3 The above density/distance requirements shall be used by the concerned state/UT Governments/their Agencies for the twin purposes of arrangement of land in any manner for public charging stations as well as for priority in installation of distribution network including transformers/feeders etc. This shall be done in all cases including where no central/state subsidy is provided.

5.4 The appropriate Governments (Central/State/UTs) may also give priority to existing retail outlets (ROs) of Oil Marketing Companies (OMCs) for installation of Public EV Charging Stations (in compliance with safety norms including 'firewalls' etc.) to meet the requirements as laid above. Further, within such ROs, Company Owned and Company Operated (COCO) ROs may be given higher preference.

5.5 Any deviation from above norms shall be admissible only after specific approval of State Nodal Agency in consultation with the Central Nodal Agency.

6. **Database of Public EV Charging Stations:**

Central Electricity Authority (CEA) shall create and maintain a national online database of all the Public Charging Stations through DISCOMs. Appropriate protocols shall be notified by DISCOMs for this purpose which shall be mandatorily complied by the PCS/BCS. This database shall have restricted access as finalised between CEA and Ministry of Power.

7. **Tariff for supply of electricity to EV Public Charging Stations:**

7.1 The tariff for supply of electricity to EV Public Charging Station shall be determined by the appropriate commission, provided however that the tariff shall not be more than the average cost of supply plus 15 (fifteen) percent.

7.2 The tariff applicable for domestic consumption shall be applicable for domestic charging.

8. **Service charges at PCS/BCS:**

8.1 Charging of EVs is a service as already clarified by Ministry of Power vide letter No. 23/08/2018-R&R dated 13.04.2018.



8.2 The State Nodal Agency shall fix the ceiling of the Service Charges to be charged by the Public Charging Stations.

9. **Priority for Rollout of EV Public Charging Infrastructure:**

After extensive consultations with State Governments and different Department/Agencies of Central Government, phasing as follows are laid down as national priority for rollout of EV Public Charging Infrastructure:

9.1 **Phase I (1-3 Years):**

All Mega Cities with population of 4 million plus as per census 2011, all existing expressways connected to these Mega Cities & important Highways connected with each of these Mega Cities shall be taken up for coverage. A list of these Mega Cities and existing connected expressways is attached at Annexure 1.

9.2 **Phase II (3-5 Years):**

Big cities like State Capitals, UT headquarters shall be covered for distributed and demonstrative effect. Further, important Highways connected with each of these Mega Cities shall be taken up for coverage.

9.3 The above priorities for phasing of rollout shall be kept in mind by all concerned, including, different agencies of Central/State Governments while framing of further policies/guidelines for Public Charging Infrastructure of EVs, including for declaring further incentives/subsidies for such infrastructure and for such other purposes.

10. **Implementation Mechanism for Rollout:**

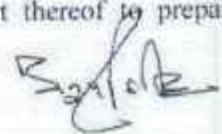
10.1 Ministry of Power shall designate a Central Nodal Agency for the rollout. All relevant agencies including Central electricity Authority (CEA) shall provide necessary support to this nodal agency.

10.2 Every State Government shall nominate a Nodal Agency for that State for setting up charging infrastructure. The State DISCOM shall generally be the Nodal Agency for such purposes. However, State Government shall be free to select a Central/State Public Sector Undertaking (PSU) including Urban Local Bodies (ULBs), Urban/Area Development Authorities etc. as its Nodal Agency.

11. **Selection of Implementation Agency for Rollout:**

11.1 The Central Nodal Agency shall finalize the cities and expressways/highways to be finally taken up from the above phasing, in consultation with the respective State Governments.

11.2 An Implementation Agency shall be selected by the respective State Nodal Agency and shall be entrusted with responsibility of installation, operation and maintenance of PCS/FCS/BCS/BSF for designated period as per parameters laid down in this document and as entrusted by the concerned Nodal Agency. The Implementation Agency can be an Aggregator as mutually decided between Central and State Nodal Agencies. However, they can also decide to choose different PCS/FCS providers for bundled packages or for individual locations as mutually decided. Further, whenever bundled packages are carved for bidding, such packages shall necessarily include atleast one identified expressway/highway or part thereof to prepare a



cohesive regional package; the selected identified cities may be divided into one or more parts as necessary for such purposes.

- 11.3 Where Implementing Agency is selected by bidding, all bidding shall be conducted by the State Nodal Agency.
- 11.4 There shall be an upper cap on the Service Charges declared by the State Nodal Agency as per para 8.2 above. Subsidy, if admissible from Central/State governments, shall be suitably factored in such calculations of Upper Cap/Bid Variable.

This issues with the approval of Hon'ble Minister of State (IC) for Power and New & Renewable Energy.



(Anoop Singh Bisht)

Under Secretary to the Govt. of India

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Copy to:

1. Prime Ministers Office/Cabinet Secretariat.
2. CEO, NITI Aayog
3. The Secretaries of the CERC/State Commissions/JERCs.



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5. PPS to Director (UMPP), MoP



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Annexure I

I. List of 4 million plus cities (as per census 2011)

1	Mumbai
2	Delhi
3	Bangalore
4	Hyderabad
5	Ahmedabad
6	Chennai
7	Kolkata
8	Surat
9	Pune

II. List of corridors

1	Mumbai-Pune Expressway
2	Ahmedabad-Vadodara Expressway
3	Delhi-Agra Yamuna Expressway
4	Delhi-Jaipur
5	Bengaluru-Mysore
6	Bengaluru-Chennai
7	Surat-Mumbai Expressway
8	Agra - Lucknow Expressway
9	Eastern Peripheral Expressway
10	Delhi-Agra NH2 Expressway
11	Hyderabad ORR expressway
12	5 connected highways to each megacity



Amendments in
Urban and Regional Development Plans
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(URDPFI - 2014)
for
Electric Vehicle Charging Infrastructure

Town and Country Planning Organisation
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Government of India

February, 2019

Preamble

To encourage "Electric Vehicles" as a viable option for long distance trips / inter regional trips with adequate "charging stations", it is necessary to make provisions for establishing Public Charging Stations (PCS) in the regional facilities for re-fuelling/recharging of vehicles.

Hence, amendments are required for addition of norms for charging Infrastructure provisions in Development Control Regulations and provide "*Charging Infrastructure*" in the City Master Plans / Regional Plans.

Based on available charging technologies and their evolution, type of vehicles, the types of chargers indicating number of charging points required for setting up adequate PCS as regional facilities and with the long term vision of implementing 'electric mobility' during the next 30 years, amendments are made **Under Chapter 8: Infrastructure Planning, at section 8.4.7 "Distribution Services"**, Table 8.57 – "Norms for Distribution Services" of URDPFI Guidelines, 2014 (Volume I) as detailed in clause 3 of this document.

2. Existing provision in Urban and Regional Development Plans Formulation and Implementation Guidelines (URDPFI, 2014)

Chapter 8: Infrastructure Planning (Volume I of URDPFI Guidelines 2014)

At section 8.4.7 "Distribution Services",

Table 8.57 – "Norms for Distribution Services"

Sr. No.	Category	Population served per unit	Land Area Requirement		Other Control
			Type of facility	Area requirement	
1.	Petrol/Diesel filling and Service Centre				
	Permitted in:		i. Only filling station	30m x 17m	<ul style="list-style-type: none"> Shall not be located on road having Right of Way less than 30m.
	Central District		ii. Filling cum service station	36m x 30m	
	Sub central district				<ul style="list-style-type: none"> Special cases in old city areas may be considered based on the approval by statutory authorities.
	District centres		iii. Filling cum service station cum workshop	45 x 36m	
	Community Centres (Only Filling Station)			18m x 15m	
	Residential & Industrial Use Zone in Urban Areas		iv. Filling station only for two and three wheelers		<ul style="list-style-type: none"> Shall be approved by the explosive/ fire department.
	Along National and State Highways				
	Villages identified as growth centres				
	Freight Complex				
	Proposed major roads				
	Police/security forces services (for captive use only) (MPD, pg 125)				
2.	Compressed Natural Gas (CNG)/filling centre				
	Permitted in:		CNG mother station	1080 sqm	<ul style="list-style-type: none"> Shall not be located on road having Right of Way less than 30m.
	All use zones (except in Regional Parks and Developed District Parks)		(Including building component - control room/office/dispensing room/store, pantry and W.C.)	(36m x 30m)	
	Along National and State Highways				<ul style="list-style-type: none"> Shall be approved by the explosive/fire department.
	Villages identified as growth centres				
	Freight Complex				
	Proposed major roads				
3.	LPG Godown/Gas Godown	40,000 to 50,000	Capacity = 500 cylinders or 8000 kg of LPG Area (inclusive of guard room)	520 sqm (26m x 20m)	<ul style="list-style-type: none"> The major concern for its storage and distribution is the location, which shall be away from the residential areas and shall have open spaces all around as per the Explosive Rules.
4.	Milk Distribution	5000	Areas inclusive of service area	150sqm	---

3. **Amendments to URDPFI Guidelines 2014:- Necessary provisions for EV Charging have been incorporated at Sr. No. 1 and Sr. No. 3 of table 8.57. The revised table will be as under:**

Table 8.57 – “Norms for Distribution Services”:

Sr. No.	Category	Population served per unit	Land Area requirement		Other controls
			Type of Facility	Area required	
1.	Petrol/Diesel filling/EV charging* and service centre				
	Permitted in:		i. Only filling station	30m x 17m	<p>Shall not be located on road having Right of Way less than 30m.</p> <p>Special cases in old city areas may be considered based on the approval by statutory authorities.</p> <p>Shall be approved by the explosive/ fire department.</p> <p>Charging station and all equipment layout with respect to nearest dispensing unit (DU)/fuel tank to be as per PESO rules.</p> <p>Equipped with CCE and LCC, as required in addition to requirements of PCS.</p> <p>Optional addition to PCS by the SP</p>
	Central District		ii. Filling cum service station	36m x 30m	
	Sub central district		iii. Filling cum service station cum workshop	45 x 36m	
	District centres		iv. Filling station only for two and three wheelers	18m x 15m	
	Community Centres (Only Filling Station)		v. Public Charging Station (PCS) (minimum requirement as per MoP guidelines)	Min. 13.5m x 5.5m	
	Residential & industrial Use Zone in Urban Areas		vi. FCB CS 1 CCS 1 CHAdeMO	Min. 15m x 7m	
	Along National and State Highways		vii. Battery Swapping Station (optional)	Earmarking area for "battery fitting"	
	Villages identified as growth centres				
	Freight Complex				
Proposed major roads					
Police/security forces services (for captive use only) (MPD, pg 125)					
2	Compressed Natural Gas (CNG)/filling centre				
	Permitted in:		CNG mother station (Including building component - control room/office/dispensing room/store, pantry and W.C.)	1080 sqm (36m x 30m)	<p>Shall not be located on road having Right of Way less than 30m.</p> <p>Shall be approved by the explosive/ fire department</p>
	All use zones (except in Regional Parks and Developed District Parks)				
	Along National and State Highways				
	Villages identified as growth centres				
	Freight Complex				
Proposed major roads					

Sr. No.	Category	Population served per unit	Land Area requirement		Other controls
			Type of Facility	Area required	
3. Standalone Public Charging Stations (PCS)					
A	Public Charging Stations	Every 25 Kms, both sides along the highways/roads	PCS with charger ratio (minimum requirements of PCS, as per MoP) - 1 FC for every 10 EVs 1 SC for every 3 EVs	Additional area as per total parking capacity at the Restaurants /Eateries.	Equipped with CCE and LCC, as may be required for fast charging.
B	Fast Charging facility / FCB CS (for Long Distance & Heavy Duty EVs)	Every 100 Kms, both sides along the highways/roads	At least 2 chargers 1 CCC type 1 CHAdeMO type (min 100KW each)	Min. 15m x 7m	May be coupled with the PCS at item A above, with CCE and LCC.
C	Battery Swapping Station	Optional provisions as per MoP Guidelines.	Standalone Provided along with FBC charging Stations	Min 5.5m x 2.75m	May be coupled with PCS at item A or FCB CS at item B above.
4	LPG Go down/ Gas Go down	40,000 to 50,000	Capacity = 500 cylinders or 8000 kg of LPG Area (inclusive of guard room)	520 sqm (26m x 20m)	The major concern for its storage and distribution is the location, which shall be away from the residential areas and shall have open spaces all around as per the Explosive Rules
5	Milk Distribution	5000	Areas inclusive of service area	150 sqm	---

* A detailed explanation is given at Appendix 'P' – "Explanatory Note on EVCI" and Appendix 'Q' – "Guidelines issued by Ministry of Power on EVCI, dated 14.12.2018" (in Volume IIA & IIB).

Notes:

- Super Kerosene Oil/Light Diesel Oil storage for industrial uses shall be given separately.
- Large petrol/diesel storage centers to be located outside city limits.
- To be organized by a service provider for connection and metering, available 24x7 for all users.
- Provision of FCB CS & BS shall not be mandatory, and will be at the discretion of the service provider.
- Size recommended for FCB CS is subject to variance as per technical specifications of the SP.
- Fuel filling stations (including COCO outlets) shall conform to specifications and safety norms as per the amendment in Petroleum Rules or, PESO Act and obtain clearances as maybe necessary from the 'Competent Authority', for adding PCS to Retail outlets/ Fuel filling stations.

For Standalone PCS:

- The ratio of provision of charging points (FC/SC) with respect to total parking capacity will be considered for only 20% (i.e. 20% of total parking capacity will be considered EVs & ratio will be applied on them)
- Land allocation is preferably to be contiguous/in close proximity to commercial land of the Mid-way Restaurant.
- "General Conditions of Siting" of Standalone PCS shall follow clause 4.1-4.4 of IRC:12 (latest revision) except for the distance between stations which shall be as per the Guidelines issued by MoP, dated Dec, 2018.

Abbreviations used:

2Ws	- Two wheelers
3Ws	- Three wheelers
4Ws	- Four wheelers / PV(cars)
PVs	- Passenger Vehicles
CVs	- Commercial Vehicles
EV	- Electric Vehicle
SC	- Slow Charger / Slow Charging (AC)
FC	- Fast Charger / Fast Charging (DC and a few AC ones)
BS	- Battery Swap
PCS	- Public Charging Stations
URDPFI	- Urban and Regional Development Plans Formulation and Implementation Guidelines, 2014
CCS	- Combined Charging System
CHAdeMO	- A DC Fast charging standard
FCB CS	- Fluid Cooled Battery Charging Station
CCE	- Climate Control Equipment
LCC	- Liquid Cooled Cables
NSP	- Network Service Provider (information network)
SP	- Service Provider

----- x x x -----

Explanatory Note
on
Electric Vehicle Charging Infrastructure
(For URDPFI Guidelines 2014)

Town and Country Planning Organization
Ministry of Housing and Urban Affairs
Government of India

February, 2019

Abbreviations:

UNFCC	-	United Nations Framework Convention on Climate Change
IPCC	-	Intergovernmental Panel on Climate Change
GHG	-	Green House Gases
2Ws	-	Two wheelers
3Ws	-	Three wheelers
4Ws	-	Four wheelers / PV(cars)
PVs	-	Passenger Vehicles
CVs	-	Commercial Vehicles
EV	-	Electric Vehicle
EVSE	-	Electric Vehicle Supply Equipment
SC	-	Slow Charger / Slow Charging (AC)
FC	-	Fast Charger / Fast Charging (DC and a few AC ones)
BS	-	Battery Swap
PCS	-	Public Charging Stations
PCI	-	Public Charging Infrastructure
Private CI	-	Private Charging Infrastructure
MBBL	-	Model Building Bye-Laws, 2016
URDPFI	-	Urban and Regional Development Plans Formulation and Implementation Guidelines, 2014
NSP	-	Network Service Provider (information network)
SP	-	Service Provider

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1. Rationale for EVCI establishment

Rapid urbanization coupled with adoption of mechanized transportation modes has resulted in high emissions of Green House Gases that goes on to impact Global warming. Unless, the global surface temperature rise is restricted to no more than 2°C compared with pre-industrial levels, the IPCC has warned that the world will see irreversible catastrophic climate change.

India being a signatory to the UNFCCC, has pledged for efforts to assess the Greenhouse Gas Emissions (GHG) of anthropogenic origin and removal by sinks. India's per capita emissions are still considered low at 1.9 tonnes (2013), but its total emissions are next only to China and the US and is likely to overtake those of the EU by 2019.

While comparing the Indian cities for their emission scores, Delhi is on top as the biggest emitter at over 38 38 million tonnes of carbon dioxide equivalent overall emissions, followed by Greater Mumbai at 22.7 million tonnes and Chennai at 22.1 million tonnes, Kolkata at 14.8million tonnes, Bangalore at 19.8million tonnes, Hyderabad at 13.7 million tonnes and Ahmedabad at 9million tonnes were the other cities whose emissions for the year were calculated sector wise.

As per the statistics of Transport Department (GNCTD), total number of vehicles in Delhi is more than the combined total vehicles in Mumbai, Chennai and Kolkata. Delhi has 85 private cars per 1000 population against the national average of 8 cars per 1000 population. In terms of CO₂ emissions due to motor vehicles, Delhi emits about 12.4 million tonnes while the city of Bengaluru emits about 8.6 million tonnes.^[1]

Therefore, addressing the quantum of emissions from the "Transport" and "Domestic" sector emerges to be the high priority subjects under the overarching umbrella of "*Climate change mitigation*" as committed to the UNFCC.

Encouraging "Electric Vehicles" as a viable option for phased transportation in terms of short and long distance trips with appropriate "Charging Infrastructure" is therefore, the pre-condition for this paradigm shift / phased migration to sustainable transportation.

For this changes are required in Infrastructure provisions (at Regional and City levels) and in Development Control Regulations (in terms of provisions therein) to include the formulations of norms and standards for "*Charging Infrastructure*" in the said Mater Plan Regulations and State Bye-Laws for adoption across the country suiting local conditions.

2. EV Charging Technology

2.1 Electric Vehicle Supply Equipment (EVSE):

An EVSE is a wall mounted box that supplies electric energy for recharging of electric vehicle batteries. Also EVSEs have a safety lock-out feature that does not allow current to flow from the device until the plug is physically inserted into the car.

EVSEs can be customized with added features like:

- Authentication
- Integrated payment gateways
- Software for remote monitoring.

As electric vehicle charging technology continues to advance, several standards and guidelines have become widely accepted across the industry. This section gives a brief overview of charging infrastructure technology, standards, and terminology.

2.2 Different types of EVSE:

Charging speeds- Charging power, which determines the time required to charge a vehicle, can vary by orders of magnitude across charge points, as shown in Table 1. A small household outlet may charge as slowly as 1.2 kW, while the most advanced rapid charging stations can charge at up to 350 kW. Charging infrastructure is broadly broken into three categories based on speed: Level 1, Level 2, and direct current (DC) fast charging (sometimes referred to as Level 3).

(Source: "Emerging Best Practices for Electric Vehicle Charging Infrastructure", Oct' 2017)

Private Charging

Charging batteries of privately owned cars through domestic charging points. Billing is mostly part of home/domestic metering.

AC "Slow" Charging:

The home private chargers are generally used with 230V/15A single phase plug which can deliver a maximum of up to about 2.5KW of power. The EVSE supplies AC current to the vehicle's onboard charger which in turn converts the AC power to DC allowing the battery to be charged.

Public Charging

For charging outside the home premises, electric power needs to be billed and payment needs to be collected. The power drawn by these chargers may need to be managed from time to time.

DC "Fast" Charging:

DC current is sent to the electric car's battery directly via the charge port. FC chargers (usually 50 KW or more) can supply 100 or more kilometers of range per hour of charging. The fast chargers would generally be used as a top-up, rather than fully charging vehicles. These are important for cab companies and corporate users who have a fleet of electric cars.

3. Options for EV Charging

There is an urgent need to offer flexible charging infrastructure for different vehicle segments to drive adoption of EVs. Charging infrastructure is the most crucial enabler in the entire EV value chain. The exploration of different charging models according to the local conditions shall enable faster deployment of electric vehicles in the country.

EV share in all vehicles - It has been broadly projected that by the current rate of adoption of EVs, about 15% of all vehicles in the country would be EVs by the year 2020. Therefore, while assuming percentage composition of all proposed capacities in Public facilities of vehicle holding capacity, the Metropolitan and 'Tier I' cities will be assumed to have a higher percentage share of EVs, say **20% for now**. The charging infrastructure prescriptions in all urban development guidelines shall, therefore, be in consonance with the said percentage.

Power Load sanction to premises – While adding these Charging Infrastructures to the proposed set of building types of the Indian cities, **enhanced Power Load shall have to be had for each such building type by the Power DISCOMs**, commensurate to the total additional power requirement of simultaneous operation of all the prescribed charging points in the premise. With further advancement of charging technologies and the enhanced capacity of chargers to draw more power, it is advised that the **load capacity assigned to each premise should be kept with a safety factor of 1.25** with a long-term vision of 30 years.

Table 1: EVs charging "modes" and 'availability'

Vehicle type	Slow Charging	Fast Charging	Public CI
2 Wheelers	Y	N	Yes/Limited
3 Wheelers	Y	N	Yes/Limited
PVs (Cars)	Y	Y	Yes
PVs (Buses)	N	Y	Yes

Table 2: Charging options for EV types (by ownership)

Vehicle type	Private CI	Public CS	Predominant place of charging
2 Wheelers	SC/BS	SC	Point of residence / Work
3 Wheelers	SC/BS	SC/BS	Residence / Parking stations
PVs (Cars)	SC/BS	FC	Residence / Point of work / other public places
PVs (Buses)	-	FC/BS	Bus Terminals/Depots

Note:

- The option of Battery Swapping (BS) for privately owned 2Ws and PV(Cars) is limited to Private CI.
- For 3 Ws the BS is proposed to be made available in PCS, for faster recharge experience only
- For PV (Buses), Captive Fast charging infrastructure for 100% internal use for fleets may be adopted by privately owned Depots/Garages.

Based on the above stated EV charging technologies available and the current trend of evolving technologies of faster charging experience, the Ministry of Power has issued **Guidelines and Standards for setting up Charging Infrastructure for Electric Vehicles** [Ministry of Power (MoP) Guidelines dated 14.12.2018] for charging infrastructure to be installed at every Public Charging Station (PCS). 'Connectivity regulations and Safety norms' shall be defined by respective authorities such as Central Electric Authority/MoP for grid access to such PCS / any other charging station/infrastructure.

4. Charger Specifications and PCS Infrastructure

Any installed PCS shall have one or more electric kiosk/boards with installation of all charger models as prescribed in the **Guidelines and Standards notified by Ministry of Power (MoP), dated 14 December 2018 for "Charging Infrastructure for EVs"** (at Annexure II), with other necessary arrangements as deemed necessary.

Public Charging Station service providers shall be free to create charging hubs and to install additional number of kiosk/chargers in addition to the minimum chargers prescribed vide the MoP Guidelines, including options for installation of additional chargers, if required.

Note:

- *Minimum infrastructure requirements do not apply to Private Charging Points meant for self-use of individual EV owners (non-commercial basis).*
- *Captive charging infrastructure for 100% internal use for a company's own fleet will not be required to install all type of chargers and to have NSP tie ups.*

5. Regional location of PCS / FCB Charging Stations

In accordance with the Guidelines issued by the *Ministry of Power*, following minimum standards with regard to density of / distance between PCS in regional level facilities shall be followed as and regulated by the URDPFI Guidelines-

1. **Along Highways and inter-city corridors:**

- At every 25 Kms on both sides of highways/roads, at least 1PCS is to be set up.
- At every 100 Kms on both sides of highways/roads, at least 1 Fast Charging/FCB Charging Station as per specifications. (may be coupled with PCS)
- Standalone Battery Swapping Stations may be added with the PCS.

2. **In Regional level Industrial SEZs / other Industrial Parks/Estates**

- Land for at least 1PCS is to be reserved within a grid of 10 Km x 10 Km of the designated industrial area/park/estates.



No.12/2/2018-EV
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg,

New Delhi, the 14th December, 2018

To,

1. The Secretaries of all the Ministries/Departments of Government of India.
2. The Chief Secretaries of the States/UTs.

Sub: Charging Infrastructure for Electric Vehicles – Guidelines and Standards -reg.

Sir/Madam,

Government of India have undertaken multiple initiatives to promote manufacturing and adoption of electric vehicles in India. With support of the Government, electric vehicles have started penetrating in the Indian market. However, availability of adequate Charging Infrastructure is one of the key requirements for accelerated adoption of electric vehicles in India. It is proposed to encourage this by laying down an enabling framework.

Objectives

- To enable faster adoption of electric vehicles in India by ensuring safe, reliable, accessible and affordable Charging Infrastructure and eco-system
- To promote affordable tariff chargeable from EV owners and Charging Station Operators/Owners
- To generate employment/income opportunities for small entrepreneurs
- To proactively support creation of EV Charging Infrastructure in the initial phase and eventually create market for EV Charging business
- To encourage preparedness of Electrical Distribution System to adopt EV Charging Infrastructure.

In light of the above, it has been decided as follows:

1. Private charging at residences / offices shall be permitted. DISCOMs may facilitate the same.
2. Setting up of Public Charging Stations (PCS) shall be a de-licensed activity and any individual/entity is free to set up public charging stations, provided that, such stations meet the technical as well as performance standards and protocols laid down below as well as any further norms/standards/specifications laid down by Ministry of Power and Central Electricity Authority from time to time.

- 2.1 Any person seeking to set up a Public Charging Station may apply for connectivity and he shall be provided connectivity on priority by the Distribution Company licensee to supply power in the area.
- 2.2 Any Charging Station/ Chain of Charging Stations may also obtain electricity from any generation company through open access.

3. **Public Charging Infrastructure (PCI)- Minimum Requirements:**

3.1 Every Public Charging Station (PCS) shall have the following minimum infrastructure:

- i. An exclusive transformer with all related substation equipment including safety appliance.
- ii. 33/11 KV line/cables with associated equipment including as needed for line termination/metering etc.
- iii. Appropriate civil works.
- iv. Adequate space for Charging and entry/exit of vehicles.
- v. Current international standards that are prevalent and used by most vehicle manufacturers internationally are CCS and CHAdMO. Hence, Public Charging Stations shall have, one or more electric kiosk/boards with installation of all the charger models as follows:

Charger Type	Charger Connectors*	Rated Voltage (V)	No. of Charging Points/No. of Connector guns (CG)
Fast	CCS (min 50 kW)	200-1000	1/1 CG
	CHAdMO (min 50 kW)	200-1000	1/1 CG
	Type-2 AC (min 22 kW)	380-480	1/1 CG
Slow/Moderate	Bharat DC-001 (15 kW)	72-200	1/1 CG
	Bharat AC-001 (10 kW)	230	3/3 CG of 3.3 kW each

*In addition, any other fast/slow/moderate charger as per approved BIS standards whenever notified.

- vi. The kiosk/board may have options for installation of additional chargers if required.
- vii. The Public Charging Station Providers are free to create Charging Hubs and to install additional number of Kiosk/Chargers in addition to the minimum number of chargers prescribed above.
- viii. Tie up with at least one online Network Service Providers (NSPs) to enable advance remote/online booking of charging slots by EV owners. Such online information to EV owners should also include information regarding location, types and numbers of chargers installed/available etc.
- ix. Share charging station data with appropriate DISCOM and to maintain appropriate protocols as prescribed by such DISCOM for this purpose. CEA shall have access to this database.
- x. Appropriate public amenities.



- xii. Where, in addition to the above, fast charging facility is also planned to be provided at the PCS by the PCI provider, the following additional infrastructure must be provided:
 - a. Appropriate Liquid Cooled cables if High Speed Charging Facility for onboard charging of Fluid Cooled Batteries (FCBs) is also planned.
 - b. Appropriate Climate Control Equipment for Fast Charging of Batteries to be used for swapping (i.e. not onboard)
- 3.2 Every Public Charging Station (PCS) shall be operational only after inspection and clearance as communicated by a suitable clearance certificate, by the concerned electrical inspectors/technical personnel designated specifically by the respective DISCOM for this purpose. DISCOMs may also empanel one or more third party authorized technical agencies for this purpose.
- 3.3 Electric Vehicle Service Equipment (EVSE) shall be type tested by an appropriate reputed authority.
- 3.4 The above minimum infrastructure requirements do not apply to Private Charging Points meant for self-use of individual EV owners (non-commercial basis).
- 3.5 Captive charging infrastructure for 100% internal use for a company's own/leased fleet for its own use will not be required to install all type of chargers and to have NSP tie ups.
- 3.6 Public Charging Station can also have the option to add Standalone battery swapping facilities in addition to the above mandatory facilities, provided space/other conditions permit.
- 4. **Public charging Infrastructure (PCI) for long distance EVs and/or heavy duty EVs:**
- 4.1 Public charging stations for long distance EVs and/or heavy duty EVs (like trucks, busses etc.) shall have the following minimum requirements:
 - i. At least two chargers of minimum 100 kW (with 200-1000 V) each of different specification (CCS & Chademo) and with single connector gun each in addition to the minimum charging infrastructure requirements as mandated for Public Charging Stations in para 3.
 - ii. Appropriate Liquid Cooled Cables for high speed charging facility for onboard charging of Fluid Cooled Batteries (currently available in some long range EVs).
 - iii. In addition to 4.1 (i) and (ii) above, the Fast Charging Stations (FCS) for Long Distance EVs and/or Heavy Duty EVs may also have the option of swapping facilities for batteries for meeting the charging requirements as per para 3 and para 4.1(i)&(ii) above. It is notable that Fluid Cooled Batteries (FCBs) are generally necessary for Fast Charging / Long Distance use of EVs and/or for Heavy Duty Vehicles like buses/trucks etc. FCBs will have higher charging rate and longer life.
- 4.2 Such Fast Charging Stations (FCS) which are meant only for 100% in house/captive utilisation, for example buses of a company, would be free to decide the charging specifications as per requirement for its in- house company EVs.



5. **Location of Public Charging Stations:**

- 5.1 In case of Public Charging Stations, the following minimum requirements are laid down with regard to density/distance between two charging points:
- i. At least one Charging Station should be available in a grid of 3 Km X 3 Km. Further, one Charging Station be set up at every 25 Km on both sides of highways/roads.
 - ii. For long range EVs (like long range SUVs) and heavy duty EVs like buses/trucks etc., there should be at least one Fast Charging Station with Charging Infrastructure Specifications as per para 4.1 at every 100 Kms, one on each side of the highways/road located preferably within/alongside the stations laid in para 3 above. Within cities, such charging facilities for heavy duty EVs shall be located within Transport Nagars, bus depots. Moreover, swapping facilities are also not mandatory within cities for Buses/trucks.
- 5.2 Additional public charging stations shall be set up in any area only after meeting the above requirements.
- 5.3 The above density/distance requirements shall be used by the concerned state/UT Governments/their Agencies for the twin purposes of arrangement of land in any manner for public charging stations as well as for priority in installation of distribution network including transformers/feeders etc. This shall be done in all cases including where no central/state subsidy is provided.
- 5.4 The appropriate Governments (Central/State/UTs) may also give priority to existing retail outlets (ROs) of Oil Marketing Companies (OMCs) for installation of Public EV Charging Stations (in compliance with safety norms including 'firewalls' etc.) to meet the requirements as laid above. Further, within such ROs, Company Owned and Company Operated (COCO) ROs may be given higher preference.
- 5.5 Any deviation from above norms shall be admissible only after specific approval of State Nodal Agency in consultation with the Central Nodal Agency.

6. **Database of Public EV Charging Stations:**

Central Electricity Authority (CEA) shall create and maintain a national online database of all the Public Charging Stations through DISCOMs. Appropriate protocols shall be notified by DISCOMs for this purpose which shall be mandatorily complied by the PCS/BCS. This database shall have restricted access as finalised between CEA and Ministry of Power.

7. **Tariff for supply of electricity to EV Public Charging Stations:**

- 7.1 The tariff for supply of electricity to EV Public Charging Station shall be determined by the appropriate commission, provided however that the tariff shall not be more than the average cost of supply plus 15 (fifteen) percent.
- 7.2 The tariff applicable for domestic consumption shall be applicable for domestic charging.

8. **Service charges at PCS/BCS:**

- 8.1 Charging of EVs is a service as already clarified by Ministry of Power vide letter No. 23/08/2018-R&R dated 13.04.2018.



8.2 The State Nodal Agency shall fix the ceiling of the Service Charges to be charged by the Public Charging Stations.

9. **Priority for Rollout of EV Public Charging Infrastructure:**

After extensive consultations with State Governments and different Department/Agencies of Central Government, phasing as follows are laid down as national priority for rollout of EV Public Charging Infrastructure:

9.1 **Phase I (1-3 Years):**

All Mega Cities with population of 4 million plus as per census 2011, all existing expressways connected to these Mega Cities & important Highways connected with each of these Mega Cities shall be taken up for coverage. A list of these Mega Cities and existing connected expressways is attached at Annexure 1.

9.2 **Phase II (3-5 Years):**

Big cities like State Capitals, UT headquarters shall be covered for distributed and demonstrative effect. Further, important Highways connected with each of these Mega Cities shall be taken up for coverage.

9.3 The above priorities for phasing of rollout shall be kept in mind by all concerned, including, different agencies of Central/State Governments while framing of further policies/guidelines for Public Charging Infrastructure of EVs, including for declaring further incentives/subsidies for such infrastructure and for such other purposes.

10. **Implementation Mechanism for Rollout:**

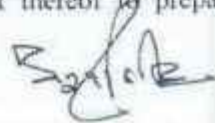
10.1 Ministry of Power shall designate a Central Nodal Agency for the rollout. All relevant agencies including Central electricity Authority (CEA) shall provide necessary support to this nodal agency.

10.2 Every State Government shall nominate a Nodal Agency for that State for setting up charging infrastructure. The State DISCOM shall generally be the Nodal Agency for such purposes. However, State Government shall be free to select a Central/State Public Sector Undertaking (PSU) including Urban Local Bodies (ULBs), Urban/Area Development Authorities etc. as its Nodal Agency.

11. **Selection of Implementation Agency for Rollout:**

11.1 The Central Nodal Agency shall finalize the cities and expressways/highways to be finally taken up from the above phasing, in consultation with the respective State Governments.

11.2 An Implementation Agency shall be selected by the respective State Nodal Agency and shall be entrusted with responsibility of installation, operation and maintenance of PCS/FCS/BCS/BSF for designated period as per parameters laid down in this document and as entrusted by the concerned Nodal Agency. The Implementation Agency can be an Aggregator as mutually decided between Central and State Nodal Agencies. However, they can also decide to choose different PCS/FCS providers for bundled packages or for individual locations as mutually decided. Further, whenever bundled packages are carved for bidding, such packages shall necessarily include atleast one identified expressway/highway or part thereof to prepare a



cohesive regional package; the selected identified cities may be divided into one or more parts as necessary for such purposes.

- 11.3 Where Implementing Agency is selected by bidding, all bidding shall be conducted by the State Nodal Agency.
- 11.4 There shall be an upper cap on the Service Charges declared by the State Nodal Agency as per para 8.2 above. Subsidy, if admissible from Central/State governments, shall be suitably factored in such calculations of Upper Cap/Bid Variable.

This issues with the approval of Hon'ble Minister of State (IC) for Power and New & Renewable Energy.



(Anoop Singh Bisht)

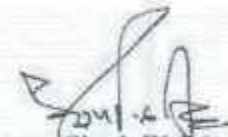
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Copy to:

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2. CEO, NITI Aayog
3. The Secretaries of the CERC/State Commissions/JERCs.



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4. PPS to Joint Secretary (Thermal), MoP
5. PPS to Director (UMPP), MoP



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I. List of 4 million plus cities (as per census 2011)

1	Mumbai
2	Delhi
3	Bangalore
4	Hyderabad
5	Ahmedabad
6	Chennai
7	Kolkata
8	Surat
9	Pune

II. List of corridors

1	Mumbai-Pune Expressway
2	Ahmedabad-Vadodara Expressway
3	Delhi-Agra Yamuna Expressway
4	Delhi-Jaipur
5	Bengaluru-Mysore
6	Bengaluru-Chennai
7	Surat-Mumbai Expressway
8	Agra - Lucknow Expressway
9	Eastern Peripheral Expressway
10	Delhi-Agra NH2 Expressway
11	Hyderabad ORR expressway
12	5 connected highways to each megacity

