

Uttar Pradesh Electricity Regulatory Commission

Vidyut Niyamak Bhawan, Vibhuti Khand, Gomti Nagar, Lucknow-226010

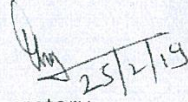
No. UPERC/Secy/D (Tariff)/19-1953

Dated: 25 February, 2019

PUBLIC NOTICE

In the matter of:
Tariff for Electric Vehicle Charging

The Commission has designed tariff for electric vehicle charging. The draft is put on the Commission's website: www.uperc.org for valuable comments of all stakeholders and public at large. The Comments must reach to the Commission in hard and soft copies within 10 days of issue of this Notice. The Public Hearing on the matter shall be held on **7th March 2019** at **11:30** hours in the office of the Commission.


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NOTE ON DESIGN OF TARIFF FOR ELECTRICAL VEHICLE CHARGING

Introduction

With increased attention to non-fossil fuel based IC engines and environmental concerns, transportation sector has witnessed increased growth of the use of Electric Vehicles (EVs). As per International Energy Agency (IEA), more than 1 million EVs were sold in 2017, leading to a 54% of growth in new EVs sale in comparison to 2016. However, there is a need for significant energy management approaches for the existing grid to sustain the integration of EVs to it.

India is aiming to reduce its overall oil import bill and pollution levels across cities in the coming years. Electric vehicles will play a significant role in achieving this target. The National Electric Mobility Mission Plan 2020 was released by the Ministry of Heavy Industry and Public Enterprises, Government of India with a view to enhance national energy security, mitigate adverse environmental impacts (including CO₂) from road transport vehicles and boost domestic manufacturing capabilities for electric vehicles (GoI, 2012). The government had initially decided to promote only electric vehicles to reduce pollution levels. It had also proposed to shift all public transport and 30% of private vehicles to electric by 2030. Later, it shelved its plan to form an India EV policy and decided to promote zero-emission technologies. As per information available on Fame India website, presently 2,66,251 Electrical Vehicles in India reduced the 1,30,109 Kg / day CO₂ emission by saving of 52,489 Litres fuel / day.

Indian electric mobility market is at a nascent stage. However, State policies and public transport tenders are set to accelerate growth in the market. Support for public charging infrastructure to precede EVs and a clear government intention for private sector uptake have been a key growth driver for EV adoption globally. Falling battery prices is also contributing to the economical ownership of vehicles.

According to the data available on community.data.gov.in¹ as on March 2015 there is total of 210 million registered vehicles in India. Uttar Pradesh has a share of 10% in the total number of vehicles. Similarly, information available on the FAME India website (Scheme launched by Ministry of Heavy Industries) currently there are 2,66,251 Electric Vehicles in India. The total strength of EVs in Uttar Pradesh is around 27,206 out of which 21,423 are 2 wheelers, 336 are 3 wheelers and 5,447 are 4 wheelers (<https://www.fame-india.gov.in/>). Thus, it can be said that in Electric vehicle segment as well the share of Uttar Pradesh is 10.22%. Considering the daily

¹ <https://community.data.gov.in/registered-motor-vehicles-in-india-as-on-31-03-2015/>

travelling of an individual is 100 kms i.e. 3000 kms per month, the cost incurred in a month using different fuels is shown below:

Type of Vehicle (4Wheel)	Price (Rs./ Litre)	Mileage (Km/ Litre)	Total Monthly Cost (Rs.)
Petrol	70 Rs./ Litre	12 Km/ Litre	Rs. 17,500
Diesel	65 Rs./ Litre	15 Km/ Litre	Rs. 13,000
Electricity	7.75 Rs./ kWh	5 Km/ kWh	Rs. 4,650

From the above table it can be said that there is potential to reduce the monthly spending by around 74% in case of shift from petrol based vehicle to EV and 64% in case of shift from diesel vehicles to electric vehicles. However there will be a reduction of 20% to 25% on the above saving if the charging is done at Public Charging Stations.

A. Snapshot of Electric Vehicle Charging Tariff in Different States of India

Comparative analysis of the tariff structure adopted by various States is summarised in the table below:

Regulatory Commission Name	Category of Consumers	Tariff		
		Fixed/Demand Charge/Customer Charge (Rs./kVA/Month)	Energy Charge / Total Variable Charge (Rs./kWh)	Time of Day (ToD) / Surcharge / Rebate
Andhra Pradesh Electricity Regulatory Commission (APERC) ACoS = $(31982.87Cr*10)/54391.87$ MU) = 5.88	LT: II (C) Non-domestic	Rs. 250 per Month	Rs. 6.95 per Unit	Additional charge of Rs. 1.00 / kWh levied for usage from 06 AM to 10 AM and 06 PM to 10 PM. Rebate of Rs. 1.00 / kWh offered for usage between 10 PM to 06 AM
	HT CATEGORY-II(E): Electric Vehicles (EVs) / Charging Stations	-	Rs. 6.95 per Unit	
Delhi Electricity Regulatory Commission (DERC) ACoS = $(19807.74Cr*10)/27761.19$ MU) = 7.14	Supply at LT	-	Rs. 5.50 per Unit	May-September Peak Hours: 1400 Hrs – 1700 Hrs & 2200 Hrs – 0100 Hrs Surcharge-20% Off Peak Hours: 0400 Hrs – 1000 Hrs Rebate-20%
	Supply at HT	-	Rs. 5.00 per Unit	
	LT	Rs. 25 per installation	410 Paise per Unit	-

Regulatory Commission Name	Category of Consumers	Tariff		
		Fixed/Demand Charge/Customer Charge (Rs./kVA/Month)	Energy Charge / Total Variable Charge (Rs./kWh)	Time of Day (ToD) / Surcharge / Rebate
Gujarat Electricity Regulatory Commission (GERC) ACoS = (43184.46 Cr*10)/57957.2 MU) = 7.45	HT	For billing demand up to contract demand Rs. 25/- per kVA per Month	400 Paise per Unit	-
		For billing demand in excess of contract demand Rs. 50/- per kVA per Month	400 Paise per Unit	-
Karnataka Electricity Regulatory Commission (KERC) ACoS = (19002.05 Cr*10)/28286.75 MU) = 6.72	LT	Rs.50 /KW/month	485 paise/unit	-
	HT	Rs.180 /KVA/month		
Maharashtra Electricity Regulatory Commission (MERC) ACoS = (66556.98 Cr*10)/103713.93 MU) = 6.42	LT Tariff for FY 2018-19, effective from 01.09.2018	Rs. 70/kVA/ Month	Rs. 6.00 per Unit	-
	LT Tariff for FY 2019-20, effective from 01.04.2019			
	HT Tariff for FY 2018-19, effective from 01.09.2018			
	HT Tariff for FY 2019-20, effective from 01.04.2019			

B. MoP Issues Guidelines on Charging Infrastructure for Electrical Vehicles

On December 14, 2018, MoP issued guidelines on charging infrastructure for Electrical Vehicles. The key features of the guidelines are as hereunder:

1. Any Charging Station / Chain of Charging Stations may obtain electricity from any generation company through open access.

Private Charging

1. At residences / offices to be permitted.

2. Minimum infrastructure requirements as per these guidelines do not apply to Private Charging Points.
3. 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 Network Service Providers (NSP) tie ups.
4. Fast Charging Stations (FCS) which are meant only for 100% in house / captive utilization, for example buses of a company, would be free to decide the charging specifications as per its requirement.
5. The tariff applicable for domestic consumption will be applicable for domestic charging.

Public Charging Stations (PCS)

1. De-licensed activity; any individual/ entity is free to set up public charging stations.
2. Connectivity on priority basis for PCS.
3. Minimum Requirements:
 - i. PCS will have one or more electric kiosk / boards with installation of all the charger models as follows.
 - ii. The PCS 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.
 - iii. Tie up with at least one online NSP to enable advance remote / online booking of charging slots by EV owners.
 - iv. Fast charging facility is also planned to be provided at the PCS.
 - v. PCS can also have the option to add Standalone battery swapping facilities in addition to the above mandatory facilities, provided space / other conditions permit.

Location of Public Charging Stations

1. At least one Charging Station should be available in a grid of 3 km x 3 km.
2. One Charging Station to be set up at every 25 km on both sides of highways / roads.
3. For long range EVs (like long range SUVs) and heavy duty EVs like buses / trucks etc., there should be at least one Fast Charging at every 100 kms.

Tariff Service Charge

1. The Tariff for PCS will not be more than the average cost of supply plus 15%.
2. State Nodal Agency will fix the ceiling of the Service Chargers to be charged by the PCS.

EV PC Infrastructure

Phase I (1-3 years): All Mega Cities with Population of 4 million plus i.e. Mumbai, Delhi, Bangalore, Hyderabad, Ahmedabad, Chennai, Kolkata, Surat and Pune. Important Highways of these Mega Cities to be connected.

Phase II (3-5 years): Big cities like State Capitals, UT headquarters will be covered for distributed and demonstrative effect. Further, important Highways connected with each of these Mega Cities will be taken up for coverage.

Nodal Agency

MoP will designate a Central Nodal Agency for the rollout and State Government will nominate a Nodal Agency for the State for setting up charging infrastructure. Further, Ministry of Power (MoP) in the notification dated February 12, 2019 has notified that Bureau of Energy Efficiency (BEE), a statutory body under Ministry of Power, would act as the Central Nodal Agency for the purpose of provisions of “Charging Infrastructure for Electric Vehicles – Guidelines & Standards”.

Implementation Agency

1. An implementation Agency will be selected by the respective State Nodal Agency (SNA) which will be entrusted with responsibility of installation, operation and maintenance of PCS, FCS Battery Charging Station and Battery Swapping Station.
2. Where Implementing Agency is selected by bidding, all bidding will be conducted by the SNA.
3. There will be an upper cap on the Service Charges declared by the SNA. Subsidy, if admissible from Central / State governments will be suitably factored in such calculations of Upper Cap / Bid Variable.

C. Proposed Tariff Design

The Commission conducted workshop on “Technosphere of EVs-Charging Infrastructure, power demand estimation and pricing issues” to get more inputs and insight into electric vehicle charging ecosystem. Further, it is proposed that a new category by the name ‘EV Charging’ may be created in the Rate Schedule keeping in view the guidelines of Ministry of Power of restricting the EV charging tariff to ACOS +15%. ACOS approved by the Commission for FY 2018-19 is Rs. 6.73 / kWh and with 15% margin the cap for EV charging is Rs. 7.75 / kWh. The same is as follows:

Proposed Tariff for EV Charging

For different categories of EV charging consumers:

1. Domestic Consumers

All the metered domestic consumers covered under the LMV-1 category will be allowed to charge their electric vehicle at their residence, provided the load of EV does not exceed the connected / contracted load. The tariff that is applicable as per the rate schedule will be applicable on electric vehicle charging as well. An illustration of the same is provided below.

2. Multi Storey Buildings (covered under LMV-1b & HV-1b of the Rate Schedule)

Those who wish to install electric vehicle charging station in the premises Multi Storey Building, will have to take a separate connection for EV Charging Station. The proposed tariff applicable for such Charging Station in the Multi Storey Building will be as follows:

Category	Demand Charge	Energy Charge
Multi Story Buildings (Covered under LMV-1b)	Nil	Rs. 6.20 / kWh
Multi Story Buildings (Covered under HV-1b)	Nil	Rs. 5.90 / kWh

The consumer will be required to pay one time charges etc. wherever applicable.

3. Public Charging Stations

The proposed tariff applicable for Public Charging Stations will be as follows:

Category	Demand Charge	Energy Charge*
Public Charging Station (LT)	Nil	Rs. 7.70 / kWh
Public Charging Station (HT)	Nil	Rs. 7.30 / kWh

* Less than cap prescribed by MoP (ACOS + 15%)

The consumer will be required to pay one time charges etc. wherever applicable.

Time of Day (ToD) Structure for public charging Stations:

Summer Months (April to September)

Hours	% of Energy Charges
05:00 hrs – 11:00 hrs	(-) 15%
11:00 hrs – 17:00 hrs	0%
17:00 hrs – 23:00 hrs	(+) 15%
23:00 hrs – 05:00 hrs	0%

Winter Months (October to March)

Hours	% of Energy Charges
05:00 hrs – 11:00 hrs	0%
11:00 hrs – 17:00 hrs	0%
17:00 hrs – 23:00 hrs	(+) 15%
23:00 hrs – 05:00 hrs	(-) 15%

4. Other Consumers

The consumers of other categories (metered consumers of LMV-2(a), LMV2(c), LMV-4, LMV-6, LMV-7, LMV-8 (Metered), LMV-9 (Metered), HV-1, HV-2, HV-3 and HV-4) that are not covered above, will be charged as per the tariff applicable for their respective category or to say they need not to take a separate connection, they can do the charging with in their respective connections, provided the load of EV does not exceed the connected / contracted load.

Note:

It is advised that the consumer should take precaution to take adequate contracted load in order to meet the load of charging of Electrical Vehicle. In case the contracted / connected load is breached then the consumer will be liable to pay penalty. Further, the other provisions of General Provisions of Rate Schedule and Electricity Supply Code will also come into effect in case consumers load breaches the contract demand.

Illustration: For example, say an existing consumer having a 2kW domestic metered connection, charges an electric car using existing connection with slow charger of 3kW. As can be seen that the contract load is exceeding the existing contract demand therefore consumer should get the contracted demand enhanced. Further, say this consumer who was having contracted load of 2kW with monthly consumption of 400 units. The monthly bill of the consumer will be as follows

Energy Charges (Rs. / unit)		Units	Charges (Rs.)
0-150 units	4.9	150	735
151-300 units	5.4	150	810
301-500 Units	6.2	100	620
501 and above	6.5	0	0
Fixed Charges (Rs./ kW)		Load (kW)	Charges (Rs.)
100		2	200
Total Charges* (Rs.)			2,365

* Regulatory Surcharge, Electricity Duty etc. will be charged extra

Now say this consumer purchases an electric vehicle (4 wheel) which he would be charging every night at his residence. Now the first thing that will have to be done is to get the contracted load enhanced to 5 kW (2kW for existing load and 3kW for slow charger required for charging his electric vehicle). Assuming that the electric vehicle consumes 10 units of electricity every night, the total monthly consumption of the consumer will be 700 units (400 units of monthly consumption plus 300 units of monthly consumption for charging electric vehicle). Accordingly, the monthly bill of the consumer will be as follows:

Energy Charges (Rs. / unit)		Units	Charges (Rs.)
0-150 units	4.9	150	735
151-300 units	5.4	150	810
301-500 Units	6.2	200	1240
501 and above	6.5	200	1300
Fixed Charges (Rs./ kW)		Load (kW)	Charges (Rs.)
100		5	500
Total Charges (Rs.)			4,585

* Regulatory Surcharge, Electricity Duty etc. will be charged extra
