

Roundtable

on

EV Charging Tariff Framework

31st October, 2019

Senate Hall, The Claridges, New Delhi

Background Note

Introduction

In India, there is growing interest among policymakers to encourage adoption of Electric Vehicles (EVs) for road transport and phase out fossil fuel consuming Internal Combustion Engine (ICE) driven vehicles in view of three major imperatives – (i) to reduce petroleum imports and thus secure the country’s energy supply; (ii) to reduce the carbon footprint of the economy by leveraging higher efficiency of EV over ICE vehicle and through effective off-take of renewable energy; and (iii) to reduce vehicular emissions of particulate matter, different polluting gases and GHGs. In 2013, India released its National Electric Mobility Mission Plan (NEMMP) 2020, which aimed to promote hybrid and electric vehicles to enhance national energy security, mitigate adverse environmental impacts from road transport vehicles. Followed by this, the GoI launched Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME) in April 2015. FAME is an incentive scheme which aims to reduce the upfront purchase price of hybrid and electric vehicles to stimulate early adoption and market creation of hybrid and electric vehicles. Recently, the Phase-II of the FAME scheme has been announced which has a budgetary provision of ₹ 100 billion.

EV charging infrastructure is the backbone of electric mobility and has been the most contentious issue. Availability of adequate number of charging stations to avoid range anxiety is a vital requirement to encourage EV adoption. Charging infrastructure which closely binds mobility with electricity sector is not only going to transform transport, it has the potential to revolutionise the electricity sector. The inter-linkages of mobility and electricity make the role of power distribution utilities critical.

EV charging has dual implications for distribution utilities. One on hand, additional electricity sales due to EV charging would help increase the revenue of a utility. On the other hand, charging demand may accentuate the peak load in the utility’s service area which has a significant bearing on its cost of power procurement and network management. Tariff for EV charging becomes a critical fiscal and regulatory tool in this regard. Tariff needs to be designed in a way which would allow the utility to recover the costs, while making EV charging cost-effective to a user and enabling charging service a commercially viable business.

State Specific EV Tariffs

Following the clarification issued on 13th April 2018 by the Ministry of Power (MoP) regarding delicensing of the EV charging activity, a handful of states such as Delhi, Karnataka, Haryana, and Maharashtra announced EV specific tariff rates. However, at that time, there was no specific direction or guideline with respect to tariff determination for EV charging. On 14th December 2018, MoP issued “Charging Infrastructure for Electric Vehicles – Guidelines and Standards -reg.” to promote affordable EV adoption in the country. Among a range of measures, the guideline sheds clarity on the possible electricity tariff for EV charging. It provides the guidance that the tariff to be determined by the appropriate commission should not exceed the average cost of supply (ACoS) by more than 15%. The guideline also allows setting up of captive or domestic charging stations which will attract tariffs applicable for those consumer-categories. Several states such as Uttar Pradesh, Telangana, Andhra Pradesh, *etc.* have announced EV specific tariffs keeping the MoP guideline as the basis.

Table 1 gives a snapshot of the state-wise tariffs (energy charges and demand charges) for EV charging at public charging stations. The table also provides comparison of EV tariffs with residential and commercial tariffs. For most of the states, EV tariff rates varies from ₹ 4/kWh to ₹ 6/kWh. Uttar Pradesh is the only state with tariff rate of more than ₹ 7/kWh for EV charging stations. In comparison with other categories, EV specific tariff rates are

higher than their residential tariff and lower than their commercial tariff rates. This hold true in most of the states and UTs.

Most of the EV charging tariffs have a flat energy rate irrespective of the type of connection (LT/ HT). However, some states have taken additional steps and specified tariff separately for LT and HT customers (such as Delhi, Uttar Pradesh, Andhra Pradesh, Maharashtra, Gujarat, etc.).

Highlights of State Specific EV Tariff Frameworks

Most of the regulatory commissions at states and UTs have already announced EV specific rates in their respective tariff orders (**Figure 1**). However, the consideration related to EV specific tariff is not the same across states. Some states introduced a separate category called Public EV Charging stations (such as UTs, Goa, Punjab, etc.) which is distinct from existing consumer categories. However, some states have specified tariffs for EV under the existing categories such as non-domestic or non-commercial category (such as Andhra Pradesh, Chhattisgarh and Punjab). Jharkhand is the only state which introduced EV tariff under the commercial category. Such categorization of EV specific tariff rate will have an implication on the commercial viability of EV charging business as tariff rates under commercial category is significantly higher than residential or domestic category as shown in **Table 1**. There is also significant variation across states in terms of demand and energy charges. Few states have introduced demand charges, which include Maharashtra, Karnataka, Haryana, Gujarat, etc. On the other hand, some states have notified only energy charges such as Uttar Pradesh, Andhra Pradesh, Delhi, Chhattisgarh, Telangana etc.

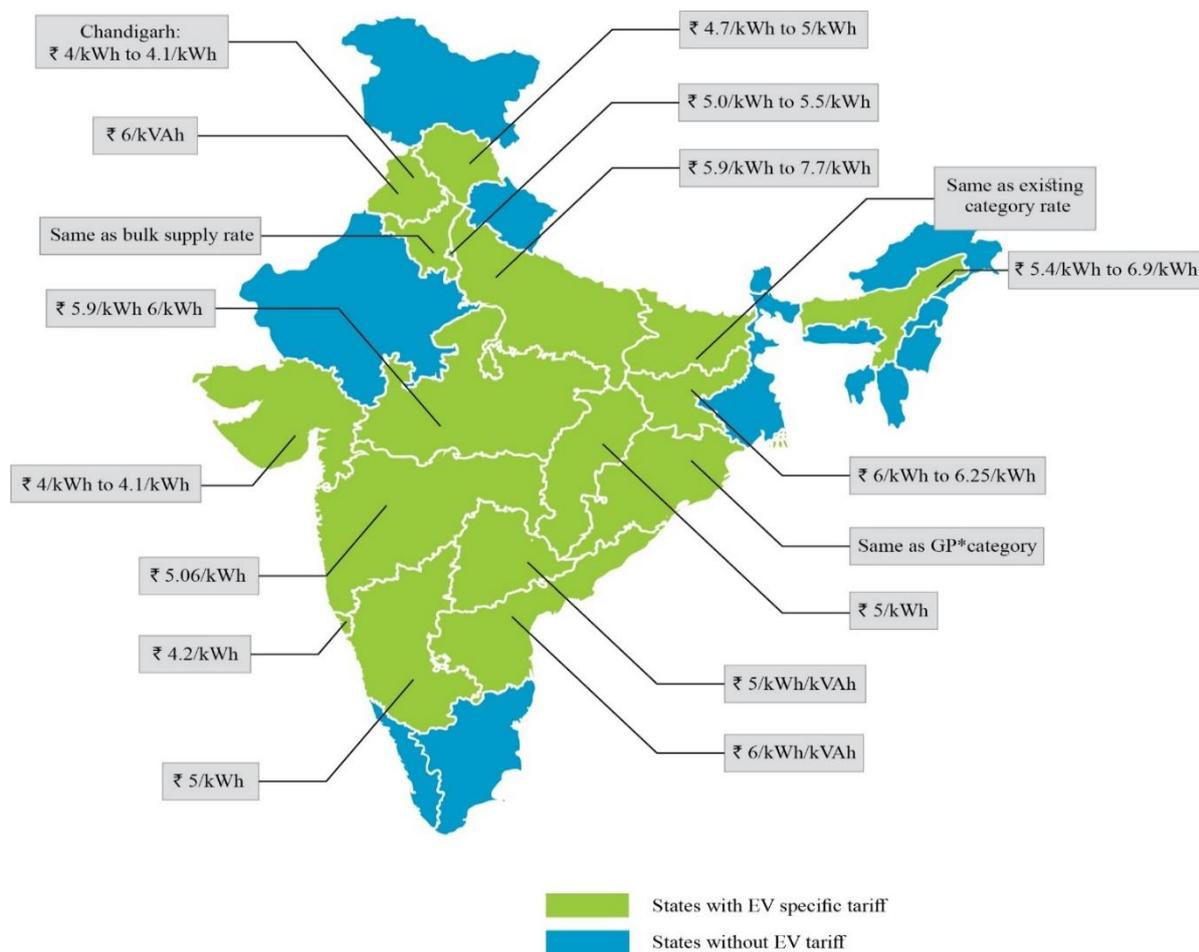


Figure 1: Map showing states with or without EV specific tariffs

Source: Own construction based on tariff orders of states of FY19 and FY20

*GP: General Purpose Category

Table 1: Comparison of EV specific tariff rates with Residential and Commercial tariff rates announced by select states

ISSUING AGENCY	STATE	RESIDENTIAL TARIFF		COMMERCIAL TARIFF*		EV TARIFF		YEAR
		ENERGY CHARGE	DEMAND CHARGE	ENERGY CHARGE	DEMAND CHARGE	ENERGY CHARGE	DEMAND CHARGE	
DERC	Delhi	₹ 3 to ₹ 7.75/kWh	₹ 125 to ₹ 250/kW per month	₹ 8.0/kVAh	₹ 250/kVA per month	₹ 5.5/kWh and ₹ 5.0/kVAh	Nil	FY19
UPERC	Uttar Pradesh	₹ 3 to ₹ 6.5/kWh	₹ 50 to ₹ 100/kW per month	₹ 5 to ₹ 18/kWh	₹ 95 to ₹ 430/kW per month	₹ 5.9 to ₹ 7.7/kWh	Nil	FY19
GERC	Gujarat	₹ 1.5 to ₹ 5.2/kWh	₹ 15 to ₹ 70 per month	₹ 4.35 to ₹ 4.65/kWh	₹ 50 to ₹ 195/kW per month	₹ 4 to ₹ 4.1/kWh	<ul style="list-style-type: none"> ₹ 25 per month per installation ₹ 25 to ₹50 per kVA per month 	FY20
KERC	Karnataka	₹ 7.02 to ₹7.80/kWh	₹ 45 to ₹ 70/kW per month	₹ 6.40 to ₹ 9.0/kWh	₹ 65 to ₹ 95/kW per month	₹ 5.00/kWh	₹ 60/kW per month and ₹ 190/kVA per month	FY20
MERC	Maharashtra	₹ 4.6/kWh	₹ 190/kVA per month	₹ 3.9 to ₹ 4.35/kVAh	₹ 190 to ₹ 220/kVA per month	₹ 5.06/kWh	₹ 70/kVA/ Month	FY20
APERC	Andhra Pradesh	₹ 1.45 to ₹ 9.05/kWh	Nil	₹ 5.4 to ₹ 10.15/kVAh	₹ 55 to ₹ 75/kW per month	₹ 5/kWh and ₹ 5/kVAh	Nil	FY20
TSERC	Telangana	₹ 1.45 to ₹ 9.5/kWh	Nil	₹ 5.3 to ₹ 12.0/kVAh	₹ 50 to ₹ 60/kW per month	₹ 6.00/kWh	Nil	FY19
CSERC	Chhattisgarh	₹ 1.0 to ₹ 2.45/kWh	₹ 2.40 to ₹ 4.85/kWh	₹ 5.40 to ₹ 7.25/kWh	₹ 50 to ₹ 180/kW per month	₹ 5/kWh	Nil	FY20
MPERC	Madhya Pradesh	₹ 3.1 to ₹ 6.3/kWh	₹ 35 to ₹ 90 per connection	₹ 6.1 to ₹ 8.5/kWh	₹ 55 to ₹ 260/kW per month	₹ 5.9 to ₹ 6.0/kWh	₹ 100 per kVA to ₹ 120 per kVA of Billing Demand	FY19
PSERC	Punjab	₹ 4.99 to ₹ 7.41/kWh	₹ 35/kW to ₹ 80/kVA per month	₹ 6.32 to ₹ 7.29/kWh	₹ 45/kW to ₹ 110/kVA per month	₹ 6/kVAh	Nil	FY20
BERC	Bihar	₹ 6.15 to ₹8.60/kWh	₹ 20 to ₹ 40/kW per month	₹ 6.4 to ₹ 7.5/kWh	₹ 30 to ₹ 180/kW per month	Same tariff for EV as the respective category rate	Nil	FY20
OERC	Orissa	₹ 2.5 to ₹ 5.7/kWh	Nil	₹ 5.4 to ₹ 7.1/kWh	₹ 200 to ₹ 250/kVA per month	₹ 4.2 to 5.7/kWh	Nil	FY20
HERC	Haryana	₹ 2.7 to ₹ 7.1/kWh	Nil	₹ 6.35 to ₹ 7.05/kVAh	₹ 160/kW per month	₹ 6.5/kVAh	₹ 160/kW or 160/kVA	FY19

Source: Tariff Orders of respective States for Year 2018-19 and 2019-20

*Commercial considered as non-domestic by various SERCs.

Objective of the Roundtable

The roundtable aims to deliberate on some of the critical aspects of EV charging tariff framework, understand different perspectives and help bring clarity in EV tariff design. The outcome of the discussion will benefit the regulatory commissions, the DISCOMs, the potential investors in EV public charging infrastructure and the policymakers.

Key Areas for Deliberations

From the review of the EV charging tariff schedules across the states and UTs, following six areas have been identified that warrant specific deliberation.

- 1. Categorisation of EV charging in the tariff schedule** - Presently, different DISCOMs have adopted different approaches for EV charging. It is currently categorized as non-residential, commercial, non-industrial or bulk supply. In some cases, a separate category is also created for public charging stations. Such categorization of EV specific tariff rate will have an implication on the commercial viability of EV charging business as tariff rates under commercial category is significantly higher than residential or domestic category. Also, there is a need to provide EV customers with clear electricity price signals.
- 2. Application of demand charge** – Some states have not levied demand charge to encourage EV adoption. However, few have imposed demand charges such as Maharashtra, Karnataka, Haryana, Gujarat *etc.*
- 3. Introduction of ToD tariffs** – ToD tariffs *i.e.* surcharge during peak hours and rebate during off-peak hours of the day are an effective tool for a DISCOM to flatten the load curve. Depending on the time-pattern of EV charging, the charging load can potentially accentuate the peak demand within a DISCOM's service area. Few states have already announced the ToD rates for EV consumers such as Delhi¹, Uttar Pradesh, *etc.* However, a large number of states have not considered ToD tariffs for EV charging.
- 4. Applicability of EV charging tariffs** – As on June 12, 2019, 17 SERCs have introduced separate tariffs for EV charging. However, applicability of these tariffs is not clear. Tariff orders in different states have used different nomenclatures to refer to EV charging which are not well defined. It is not clear, for example, whether the special EV charging tariffs would be applicable for charging public electric buses or EV charging at public parking areas managed by different types of entities. The 14th December 2018 guidelines and standards issued by MoP is also quite vague on this.
- 5. Applicability of taxes and PPAC** – It is seen in many states that taxes (sometimes, cess), non-tariff surcharges and PPAC are included over and above the tariff amount in the final billable amount to an electricity consumer. Following similar bill structure, taxes and other charges are expected to be applicable for EV charging connections. It is worthwhile to mention in this context that the “Charging Infrastructure for Electric Vehicles – Guidelines and Standards -reg.” issued by MoP on 14th December 2018 stipulates that the tariff for supply of electricity to EV public charging stations “*shall not be more than the average cost of supply plus 15 (fifteen) percent*”. There is lack of clarity at present to infer whether the 15% is inclusive of all the applicable taxes and surcharges.
- 6. Socialising the cost of grid upgradation due to EV charging** – There is a school of thought that the cost of grid augmentation due to EV charging should be passed through only to EV charging station operators. This will possibly drive up the tariff for EV charging. However, it is not clear how this cost segregation can be implemented in the present regulatory framework. Moreover, discussion is necessary to understand the usefulness of such action.

With this background, the roundtable invites eminent representatives from the Regulatory Commissions and DISCOMs and key experts in the Indian power sector to deliberate on the various aspects of EV

¹ ToD tariff applicable for the consumer with sanctioned load/MDI is 10kW/kVA or above.

charging tariff, present their thoughts and facilitate in addressing the issues in areas listed above. The recommendations and suggestions from the roundtable will be considered in the ongoing study by AEEE.

Programme Schedule (Tentative)

- 12:30 – 13:30:** **Lunch and Registration** (*By Invitation Only*)
- 13:30 – 13:40:** **Welcome Address** by **Shyamasis Das**, *Principal Research Associate*, Alliance for an Energy Efficient Economy (AEEE)
- 13:40 – 14:00** **Presentation** on “**EV Tariff Frameworks adopted by States in India**” by **Bhawna Tyagi**, *Research Associate*, Alliance for an Energy Efficient Economy (AEEE)
- 14:00 – 16:30** **Discussion** on possible **EV Charging Tariff Framework** and deliberations on the issues listed in the background note
- Moderated by Dr Anoop Singh**, *Associate Professor*, IIT Kanpur
- 16:30 – 16:50** **Concluding Remarks** by **Dr Anoop Singh**, *Associate Professor*, IIT Kanpur
- 16:50 – 17:00** **Vote of Thanks** by **Vivek Chandran**, *Program Manager (Transport)*, Shakti Sustainable Energy Foundation (SSEF)
- 17:00 Onwards** **Networking Tea**

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