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Developing a Pricing Mechanism for Electric Vehicle Charging Stations in Sri Lanka

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Abstract

Electric vehicle (EV) charging infrastructure/ service development is identified as a critical area to assist the expected rapid uptake of EVs in Sri Lanka. Optimal pricing of these services is necessary to ensure the sustainability of EV industry including EV owners and Charge point operators. The pricing of EV charging services is currently not regulated in Sri Lanka. Therefore, various tariff structures and rates within a wide range is observed. The cost of public charging stations is generally categorized as operational costs, energy costs and capital costs. Pricing structures set for recovering these costs are identified to be based on three main types of Time based, Energy based or Fixed fee. This study proposes two pricing structures of 'Energy based pricing structure' and 'Energy and time-based pricing structure' for EV charging service in Sri Lanka. The tariff rate calculation for each structure is described. Further, the tariff structures are comparatively analysed to evaluate the suitability of these to be adopted in Sri Lanka.

Keywords: *Electric Vehicles, EV charging Tariff, Pricing of EV charging, EV charging stations, EV charging tariff structures*

1. Introduction

Transport sector in Sri Lanka is in the path of transitioning into a sustainable model, amidst the global warming concerns and as directed by numerous international conventions and organizations, including the United Nations', "Sustainable Development Goals". In the transition process, the fossil fuel based internal combustion (IC) engine vehicles are to be phased out gradually. The vacuum created is expected to be taken up by the vehicles powered with alternate energy sources, such as Electric Vehicles (EV), Hydrogen driven vehicles and Biofuel vehicles. Among these, the EVs can be identified as the most established technology currently, for large scale adaptation. Jayasinghe et al (2018) estimate the EVs to be about 2% -3% of the total vehicle stock in the country by 2030. However, certain studies indicate that the EV uptake in Sri Lanka is slower than anticipated. Alawathugoda and Jayawardane (2025) have identified factors influencing the conventional fuel vehicle owners in Sri Lanka to switch to EVs. The reliability of charging infrastructure and the competency of service operators is one such factors identified. Realizing the importance of EV charging service and infrastructure development, this study initiated with the focus on pricing these services.

This study is conducted with the objectives of developing a suitable pricing mechanism for Electric Vehicle (EV) charging stations in Sri Lanka, through the review and analysis of EV charging tariff frameworks operational globally. In the context of EV charging tariffs, the tariffs at two points need to be discussed. That is the distribution system operator's sale tariff to the EV charging station (public/individual) and the charging station's sale tariff to the EV users. Currently, the Public EV charging stations in Sri Lanka are eligible for the subsidized "Industry" category tariff from the distribution operator. In addition to this, the household consumers are provided with an optional Time of Use tariff, which is ideal for EV charging, considering the low off-peak rates offered. The charging station sale tariffs to EV users is not regulated in Sri Lanka at present. Only the sale tariff of Distribution utility [Ceylon Electricity Board (CEB)] owned charging stations is determined by the Public Utilities Commission of Sri Lanka.

2. Literature Review

2.1. Distribution operator tariff to EV charging stations

As stated by Yeboah (2022), the distribution operator tariff for charging stations is usually determined considering the cost of supply, and to encourage flexible charging behaviours. Anyhow, as per the current approved tariffs in Sri Lanka, the charging stations are supplied at a subsidized rate, potentially to encourage greater EV penetration in the country. Considering the EV eco system in Netherland, Van Oorschot (2022), emphasizes limiting congestion in the grid with tariffs, mentioning "Currently most customers connected to the low voltage distribution grid pay a flat rate for the grid tariffs. However, by restructuring these grid tariffs incentives can be provided in order to make sure EVs use the flexibility which exists in the charging sessions in order to limit congestion issues". This implies the possibility of offering dynamic tariffs to pass price signals, in the view of managing grid congestion. Considering the present Sri Lankan context, Time of Use tariffs are already in place for public charging stations and domestic EV charging consumers, though these rates not necessarily based on the grid congestion. Further, Jeewandara et al (2023) state, "The existing TOU tariff structure for domestic consumers in Sri Lanka is not so attractive as the price rates are high when compared to the existing block tariff rates".

In some studies, demand charge from the distribution operator to charging stations is found to be concerning. Yong et al (2023), mention that the Australian Electrical Vehicle Council in 2020 has stated the necessity to revise the EV tariff at the time, due to the demand charge being a significant portion of the cost of the charging stations. Zachary et al (2020) explains the demand charge being significant for sites with synchronised charging events such as in the charging stations located within workplaces, where a large peaks in demand followed by long periods of low utilization is likely. This results in high demand charges for relatively low number of energy units consumed. Also, as per Yong et al (2023), US has begun implementing EV specific tariffs to tackle traditional demand charge related problem. Furthermore, Fitzgerald and Nelder (2017) also highlight the same matter, by saying "For tariffs that apply to public DCFC, demand charges for distribution circuit and upstream costs should be deemphasized—or better, eliminated. If demand charges must be a feature of tariffs for EVs, then those charges should be time varying and reflect actual system costs at a given time, in keeping with the principle of sending accurate price signals based on marginal costs". In Sri Lanka, these demand charges are applicable only for the charging stations with the installed capacity of above 42 kVA. Under this framework, it is possible that the charging stations might look to stay within the limit of42kVA, in setting up charging infrastructure, to avoid the demand charge.

Vehicle to Grid (V2G) can be seen as an emerging technology for EVs, whereby the EVs can send electricity from their batteries to the grid during the times of high demand and EV excessive battery state of charge (SoC). This provides an opportunity for EV users to set off the charging costs with the revenue earned selling electricity/ providing grid support services to the distribution system operator. Baumgartner et al (2022) have developed an EV tariff considering V2G. This tariff comprises of two levels. In the first level, EV charges until a self-selected minimum battery state of charge. In the next level, the EV charged or discharged as per the individual settings for the desired range and time of departure.

Considering the findings from the literature, it is recommendable to revisit the tariffs offered by distribution operators in Sri Lanka to EV charging stations, to make it more EV specific, going beyond the use of generalized 'Industrial' category tariff.

2.2. Public charging station pricing mechanisms to EV users

As per the literature, the rates paid by EV users to public charging stations is seen to be showing a wide range of variations based on multiple factors. Borlaug et al (2020) state, "The cost to charge an electric vehicle (EV) varies depending on the price of electricity at different charging sites (home, workplace, public), vehicle use, region, and time of day, and for different charging power levels and equipment and installation costs". In similar lines, Marchi et al (2023) compare the EV recharging experience with traditional internal combustion engine vehicle refilling and identifies the pricing ecosystem to be more competitive and diverse. The EV charging has several variations based on the capacity of the charger. Lanz et al (2022) have categorized these as Low AC (< 2.3 kW), Medium AC (3.7 – 7.4 kW), High AC (11 – 22 kW) and DC (50 kW), charging. The time taken for a full charge decreases with the increased charger capacity. Therefore, inherently the pricing for these chargers would vary.

As per the literature, EV charging fee structures were also found to be diversified. Based on a study covering eight countries by USAID/India and EESL (2020), three prominent types of public charging station tariff structures have been identified. These include, Time based fee – Charged solely based on the time duration the vehicle was connected, Energy based fee – Charged based on electricity consumed in charging and Fixed fee – Flat fee charged for the charge session irrespective of the time or electricity consumption. The same study also states that the Time-based charge structures are widely accepted by consumers due to the ease of understanding. Meanwhile the charge station operators too prefer this structure, as it encourages consumers to move out as soon as the full charge level is reached, improving the availability of charging infrastructure. EV Club Sri Lanka (n.d.), has published in its website the details on public charging stations in Sri Lanka. As per these details, majority of the charging stations are DC fast charging type. The charging prices mentioned are also showing a considerable variation and both time-based as well as energy-based structures are observed. USAID/India and EESL (2020), has studied on the evolvement of EV charging structures from free charging to smart charging. The information extracted from USAID/India and EESL (2020) study are given in the table below.

Table 1: Evolvement of charge structures

	Type of Charge Structure	Details on the Charging Structure
1.	Free charging	In initial years, several OEMs or government subsidized charging stations provided free unlimited access to its network to increase uptake and demand
2.	Fee for charging (Energy)	Introduction of the fee beyond a threshold (e.g. Tesla charges a fee of $0.26 per kWh beyond charging of 400 kWh annually via superchargers)
3.	Idle fees to optimize time usage	Introduction of idle fees for vehicles connected to the charging station beyond full charge. E.g. ~$0.08-1.00/minute (Tesla/Blink)
4.	Time and Energy based options	Time based only Energy based only Combination of both Third parties also entered the market significantly
5.	Membership/Premium	Annual/monthly membership to lock-in consumers and establish user base Discounts on energy/time charges Applicable when no. of chargers are more & competition begins to show up
6.	Time of Use/Smart charging	Advanced mechanism where utilities have tied up with operators to provide different electricity rates for peak and off-peak hours (lower rate), to motivate their vehicles during off-peak hours.

Public charging stations may also be established as an auxiliary service to support some other mainstream activity. In such situations, the EV charging tariff determination should be done in a different perspective. Study of Satterfield and Nigro (2020) has shown that the retail shops are ideal hosts for accommodating public EV charging stations. There is a potential of increasing sales revenue of the mainstream business activity, with the consumers being tended to spend more time while the EV is being charged. In Sri Lanka, these kinds of EV charging stations are currently available in certain supermarkets and hotels.

The public charging station pricing is done considering multiple factors that affect the costs incurred and revenue streams generated. Yong et al (2023), from the perspective of public charge station owners, identify the pricing of EV charging to be based on consumer behaviour and to enhance and attract more consumers. In terms of public charging station costs; operational costs, cost of power and capital expenditure are identified as the main components by USAID/India and EESL (2020). Further, it mentions the land rental for parking, insurance premium, payment gateway fee, facility management cost, etc., to be identified as operational costs. Cost of power is considered as the cost approved by the respective regulatory commission and the state. The capital expenditure considered includes costs related to the civil works, power supply connection, installation of EV Supply Equipment (EVSE) and related infrastructure such as Charger Management System (CMS), meters, LED screens, CCTV camera, barricading, etc. Satterfield and Nigro (2020) identifies EV charging station pricing structure as 'No Fee', 'Nominal Fee to Cover Costs' and 'Profit Center'. Further, these structures are explained as, 'No Fee' – Charging is provided as an amenity and no cost for EV owner, 'Nominal Fee to Cover Costs' – Applicable fee covers the operational and/or installation costs, and 'Profit Center' – Fee set to earn profit from EV charging service.

Roca et al (2023) have proposed a generalized formula as below for determining the cost of any charging station under the commonly used pricing structures or combinations of these structures.

$$C_{i,j}{}^{s} = C^{cs}_{i,j} + T^{f}_{i,j} + \underbrace{m_{i,j} \cdot \max[(d_s - f_d)\,,0]}_{\substack{\text{Cost per time} \\ \text{(Duration of session)}}} + \underbrace{n_{i,j} \cdot \max[(e_s - f_e)\,,0]}_{\substack{\text{Cost per energy} \\ \text{(Energy charged)}}} + \underbrace{p_{i,j} \cdot \max[(d_e - f_p),0]}_{\substack{\text{Cost of parking} \\ \text{(Time parked)}}} + T^{excess}_{i,j}(t,e)$$

Figure 1: Generalized formula for determining the cost of a EV charging session

The terms of the formula are explained below;

$C^{CS}_{i,j}$ – *Subscription fee for i type vehicle in j technology charger of CS charging station*

$T^{f}_{i,j}$ – *Minimum charging related fee for a session*

$m_{i,j}.\max[(d_s - f_d), 0]$ – *Time based charge for the time above minimum session*

$n_{i,j}.\max[(e_s - f_e), 0]$ – *Energy based charge for the consumption above minimum session*

$p_{i,j}.\max[(d_e - f_f), 0]$ – *Time based parking charge for being parked over a specified limit*

$T^{excess}_{i,j}(t,e)$ – *Time or Energy based charge after reaching a specified SoC of EV*

It should be noted that all terms of the formula are not necessarily used in all cases. The charging station can choose the terms to be used as per the pricing strategy it has formulated. As per Roca et al (2023), this formulation can be done considering factors such as station utilization, parking times without charging, availability of chargers, long use of slow chargers, etc.

Considering some dominating factors on EV charging tariffs discussed in the literature, the land rental has been found to be a detrimental factor in setting the public charging prices by the USAID/India and EESL (2020). They have proposed, using the loss in parking revenue due to the allocation of the space for the charging, as the basis for calculating the costs to recover through charging tariffs. USAID/India and EESL (2020), highlighted the requirement to consider internal energy losses such as AC to DC conversion losses in costing for the energy. Further, the utilization rate of public charging stations has a major impact on the tariff charged, as identified in the study by USAID/India and EESL (2020). The low utilization prompts charging higher tariffs, and this is demonstrated by USAID/India and EESL (2020), considering different utilization scenarios. Accordingly, the EV charging tariff at a utilization rate of 80% is estimated to be only about 49% of the tariff at 10% utilization scenario.

Utilization of public charging stations would depend on several factors including the location of the charging station, the EV penetration in the region, consumer behaviors and charging station density. USAID/India and EESL (2020), explain the consumer behavior in India stating, "Most of the charging sessions (more than 70%) take place at home or workplaces with rest of the charging done at public charging stations."

2.3. EV tariff comparisons

Lanz et al (2022) has developed comparison of Levelized Cost of Charging of EVs in different regions under various charging powers and charging destinations. The results show the least cost for low AC charging and highest cost for DC charging in each country. Also, in general the DC fast charging cost is seen to be about 4 to 5 times the cost of AC slow charging. However, USAID/India and EESL (2020), state, "People value time and are ready to pay a premium for fast charging service", indicating the public acceptability of

DC fast charging. Simulation results of the study by Abed Kazemtarghi et al (2024), also acknowledge this fact by stating, "Maximum occupancy rate of CSs with level-2 charging is about 25% at the peak time, while more than 75% the DC-fast chargers are occupied over the peak demand time. This study shows that DC-fast charging is a promising technology, which leads to both high customer satisfaction and more revenue for the CSO.". Use of solar photovoltaic (PV) in residential charging is also considered in the study of Lanz et al (2022). This is seen to be beneficial for EV users as it provides charging at a lower cost compared to the grid only scenario. Pasetti et al (2019), have studied EV charging in the presence of PV and identify the cost to vary upon the season of the year and daytime connection duration.

2.4. Challenges surrounding EV charging

EV industry around the globe has been booming during the last decade. Anyhow, several challenges surrounding EV charging is identified in the literature. Bopp et al (2020), state, "Limited data around mainstream EV consumer preferences and behaviors is currently a major challenge to proactive planning. Although EVs have been available in some countries for about a decade, uncertainty around customer expectations, usage patterns, and charging behavior is still a reality". Furthermore, Roca et al (2023), recognize establishment of adequate charging network as a major requirement for acceptance of electric vehicles by the users. For this reason, Roca et al (2023) emphasizes the necessity to incentivize public charging stations until a critical mass of the same is developed. Many studies identify the increasing charging station loads to impose challenges on distribution system operation and planning. Argade et al (2019) state, "The additional loading of EV charging has the potential to affect distribution transformers more than any other distribution level components, which normally have higher power-carrying capability than transformers.". Van Oorschot (2022) also recognizes the same issue and call for a change in the tariff design or other alternative solutions to address this. The requirement of coordinated charging, optimization and smart charging are identified as solutions in multiple studies. Dynamic time of use tariffs are proposed by Zhong et al (2024), for avoiding formation of concentrated charging peaks during valley hours. Further, a multi-objective charging load optimization model is also proposed for the determination of dynamic tariffs. On the other hand, the complexity of EV tariffs is also seen as another challenge, and this also should be a consideration in EV charging tariff design. Hildermeier et al (2022) state, "Many EV drivers are not aware of the economic advantages of smart charging tariffs and services: if they were, it would be likely to increase the beneficial integration of EVs into power grids, along with benefits to the system more broadly."

2.5. Policies and Regulations on EV charging

The studies in the literature provide numerous policy and regulatory insights on EV charging. Subsidizing EV charging tariffs is a popular policy decision for increasing EV adaptation. This is specifically identified as a policy call by Lanz et al (2022), for charging stations in the areas with low utilizations, to combat range anxiety and to offer equitable access to public charging infrastructure. Yong et al (2023) states, "Before 2018, EV charging rates in China were priced at relatively low levels to encourage EV adoption. However, Beijing municipal government removed caps on EV charging tariffs in early 2018 in response to failing business cases of EV charging providers due to low utilization and increasing land prices". On the other hand, Lanz et al (2022), identify other means for bringing down tariffs, such as standardizing grid connection, simplifying administrative processes and regulating grid connection charges. Another policy directive on public charging stations is mentioned by USAID/India and EESL (2020), as the de-licensing the activity of setting up public charging stations by the government of India in 2018, to open the market and encourage the EV uptake. Hildermeier et al (2022), focused on the consumer education and state, "Policymakers and planners can support better consumer information by running education campaigns and providing backing for innovative pilots; for instance, trials in which service providers test new smart charging tariffs or services, involving local grid operators in selected areas or with smaller customer groups, and thus create learning opportunities and encourage quicker adoption of smart charging services.". Hildermeier et al (2022), mention on UK 2021 regulation regarding smart EV charging points, that requires installers of smart charging equipment to set the home charger to off-peak charging as its default mode, for encouraging users in to optimize charging. The three policy strategies of: cost-reflective pricing, intelligent technology, and integrated infrastructure planning has been recognized as the most effective ones by Hildermeier et al (2019), for increasing the uptake of EVs.

3. Proposed pricing mechanisms for EV charging stations

This study develops two alternative cost-based tariff structures for EV charging stations in Sri Lanka, considering the key observations from literature on EV charging tariffs. Nuwan et al (2025) find energy cost and availability of widespread recharging stations as prominent factors impacting the EV purchase intention of consumers in Sri Lanka. Accordingly, the pricing mechanisms are developed in this study, with the objective of maximizing the EV uptake in Sri Lanka. The proposed structures are comparatively analysed to evaluate their ability to satisfy the underlying objective.

Even though numerous studies indicate the necessity of reviewing the utility tariffs for EV charging stations in Sri Lanka, it is not considered under the scope of this study. The existing utility tariff is considered in developing the EV charging pricing mechanisms for EV charging stations. However, the proposed pricing mechanisms consider the utility energy tariff as a passthrough and hence these are flexible for changes in utility tariff.

The following cost components of the charging station are identified for recovery through EV charging tariffs, in line with the findings from USAID/India and EESL (2020).

a. Power purchase cost - Cost incurred to purchase electricity from the distribution utility or any other means to supply EV charging, at the applicable approved tariff is considered.
b. Land rental - Rental cost of the land allocated for the installation of charging point infrastructure and for parking the charging vehicle, is considered.
c. Other operational expenditure - Operational expenditure excluding power purchase and land rental costs, is recognized under this category. This includes expenditure such as Personnel costs, Maintenance costs, Information/Communication service costs, Insurance costs, Finance costs, etc.
d. Capital Cost - Capital costs incurred in setting up the charging point and this may include charging equipment cost, and cost of any other relevant infrastructure development.

Sri Lankan is an emerging EV market. Therefore, ensuring cost recovery along with substantial return on investment for charging stations would be necessary to attract more investment on infrastructure. In contrary, the EV charging prices being equitable and affordable is a necessity to induce consumer confidence to purchase an EV. In the proposed pricing structures, premium/subscription-based elements are avoided to limit market power concentration, as these are still early days of the market and only a handful of operators are currently functioning. Considering these factors, the following pricing structures are proposed for Sri Lankan EV charging stations.

3.1. Energy based pricing structure

This pricing structure allocates the total cost of charging station as an Energy charge, to be applied based on the total number of electricity units consumed during the charging session. This structure is simple and easy to adapt, due to the requirement of measuring only the energy consumption. The rates are based on the average cost. Comparing with the generalised formula proposed by Roca et al (2023) for determining the cost of a charging session, this structure utilizes only the energy related term. The cost allocation principle based on the forecast cost and sales for a period of one year is shown in the diagram below.

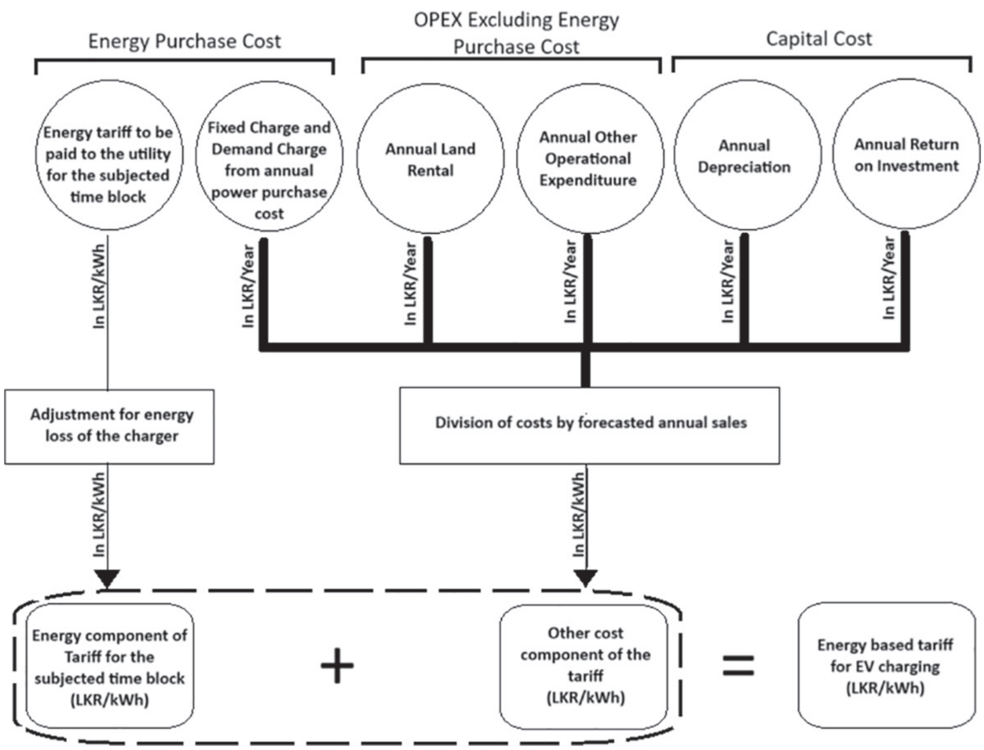

Figure 2: Cost allocation under energy based pricing structure

3.2. Energy and time-based pricing structure

This pricing structure allocates the total cost of charging station as an Energy charge and time-based charge, to be applied based on the total number of electricity units consumed during the charging session and the duration of charger being connected to the EV. The time-based rate is determined, in line with the USAID/India and EESL (2020) study, which suggests, using the loss in parking revenue due to the allocation of the space for the charging, as the basis for calculating the land rental related cost in the charging tariff. Accordingly, the land rental cost is allocated into the time-based tariff, while leaving the other cost components under the energy-based tariff. This charging structure comprises of two terms from the generalised formula of Roca et al (2023), as discussed above. The cost allocation principle based on the forecast cost, sales and charging time duration for a period of one year is shown in the diagram below.

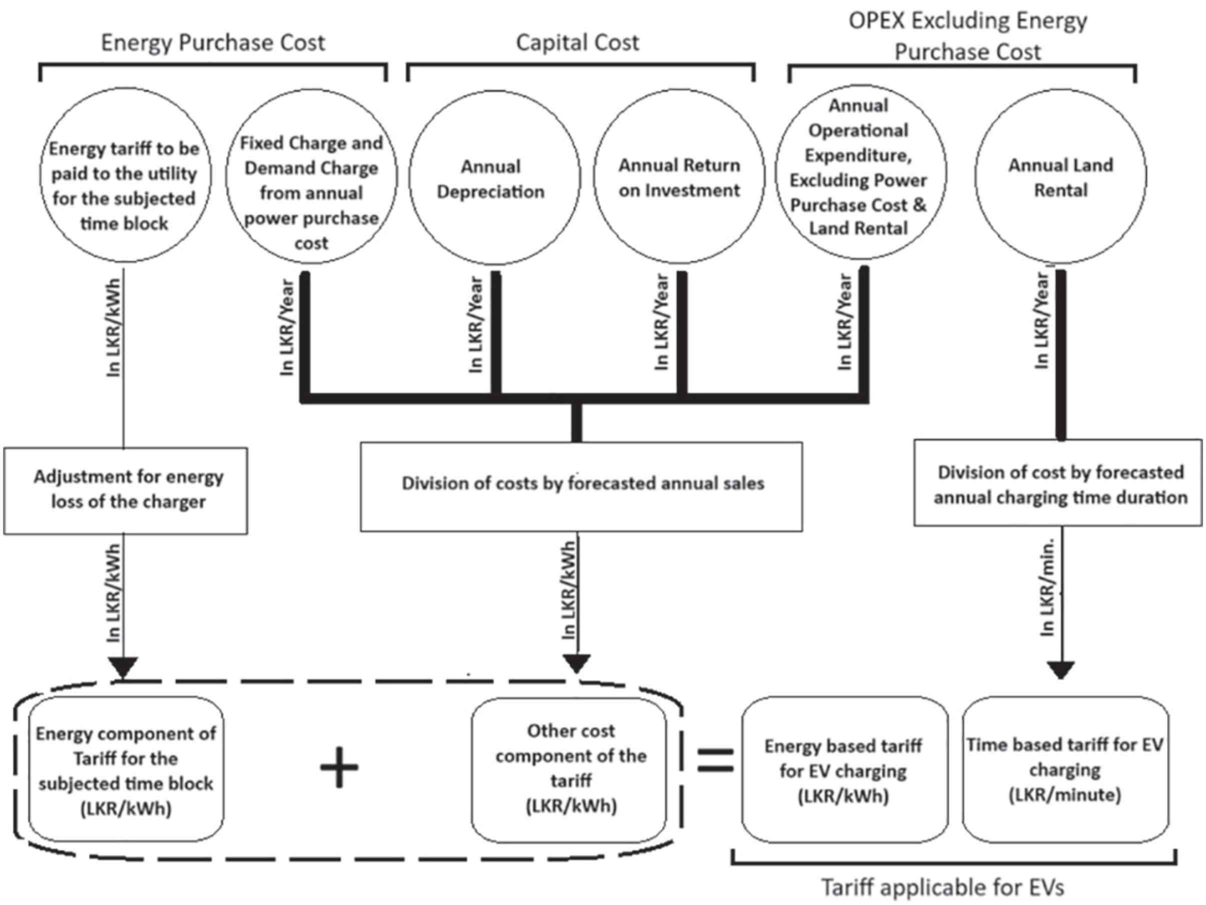

Figure 3: Cost allocation under energy and time-based pricing structure

3.3. Calculation of tariff rates

The calculation of EV charging tariffs rates for the above pricing structures requires a list of parameters with respect to the charger, as shown below.

Table 2: Parameters of EV charger

No.	Parameter for the charger	Unit	Value
1.	Energy component of the utility tariff in Time of Use regime	LKR/kWh	a_i
2.	Utility tariff for monthly electricity maximum demand	LKR/kVA	b
3.	Fixed charge component of the utility tariff	LKR/month	c
4.	Charger power rating	kW	d
5.	Charger power factor	-	e
6.	Average charger power utilization for charging, as a percentage of charger rated power	%	f
7.	Charger energy loss	%	g
8.	Total charger annual availability hours	Hours	h
9.	Time of Use tariff block number	-	i
10.	Annual charger utilization hours, as a percentage of total annual available hours	%	j
11.	Annual Land Rental	LKR/Year	k
12.	Other OPEX (Excluding land rental and power purchase cost)	LKR/Year	l
13.	Initial Capital Investment	LKR	m
14.	Depreciation	LKR/Year	n
15.	Annual expected return on capital investment	%	o

The EV charging tariff rates calculated are given in the table below.

Table 3: EV tariff rate calculation

1.	Energy based pricing structure	Energy Rate (RE_i) [LKR/kWh]	$\frac{a_i}{(1-g)} + \frac{12.b.\left(\frac{d.f}{e}\right) + 12.c + k + l + n + m.o}{d.f.h.j.(1-g)}$
		Time Rate (RT) [LKR/min.]	N/A
2.	Energy and time-based pricing structure	Energy Rate (RE_i) [LKR/kWh]	$\frac{a_i}{(1-g)} + \frac{12.b.\left(\frac{d.f}{e}\right) + 12.c + k + n + m.o}{d.f.h.j.(1-g)}$
		Time Rate (RT) [LKR/min.]	$\frac{l}{60.h.j}$

It is to be noted that the Energy Rate (RE_i) above can be differentiated based on pre-defined state of charge (SoC) ranges of EV battery, specifically in the case of DC chargers. This is possible by substituting the average charging power with respect to each of these ranges, in terms of the value of parameter 'f' in the above formulae. Accordingly, the energy-based tariff rate would increase at higher SoC ranges, due to low charging power utilization with the battery getting saturated. Hence, this could be used as a strategy for congestion management in DC fast charging, to dis-incentivize continuous charging of EV, after a certain battery SoC value.

4. Discussions

The EV adaptation in an emerging market depends on multiple factors. Alawathugoda and Jayawardane (2025) have listed the barriers surrounding this as, high purchase price, limited range, uncertainty regarding maintenance costs and battery lifespan, ambiguity surrounding fuel cost savings, uncertainty about power and performance, uncertain total cost of ownership over the vehicle's lifespan, lengthy recharging times and uncertainty about infrastructure for vehicle support and recharging. Accordingly, several barriers in the above list are linked to the pricing of EV charging service.

The energy-based tariff structure is straightforward and simple to understand even for new EV users. From the consumers perspective, this structure does not demand additional fee, even if the charger keeps connected to the vehicle after fully charging. Furthermore, the consumers are not penalised for cases where the charger slows down due to possible charger internal malfunctions, as the payment is mode only for the charged energy units. These features of energy-based pricing structure are ideal for establishing transparency in emerging markets like Sri Lanka. However, this structure does not incentivize efficient utilization of infrastructure. It is likely that the users may leave their vehicles plugged beyond the required charging period, in the absence of a time-based tariff. This reduces the charger availability and may contribute to congestion. Anyhow, congestion in public EV charging station is not yet a cause for concern in Sri Lanka.

The energy and time-based pricing structure encourages efficient charger use by penalizing prolonged occupancy. This in turn could improve the revenue and infrastructure utilization of the charging station. However, the introduction of time-based tariff along with the energy tariff, makes it complex for new users. Furthermore, this could be less attractive for situations where the prolonged parking times are anticipated.

5. Conclusions

A simple energy-based pricing structure is seen to be more suitable for Sri Lanka, considering the current state of the industry. In general, a phased approach to pricing is recommended to maximize EV uptake in emerging markets. The energy-based pricing minimizes user anxiety and supports early adoption. It satisfies the new EV user priorities such as affordability, clarity, and perceived fairness.

In the medium to long term, as the EVs fleet grows and public charging infrastructure expands, incorporating a time-based component would be necessary to ensure efficient use of charging infrastructure. Therefore, close monitoring of market dynamics is required to identify the right time for transition in EV charging tariff structure.

For future studies, it is recommended to study the sensitivity of EV charging tariff rates with the variation of parameters that go into the calculation and the means of establishing stable EV charging tariff rates.

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