



# CHARGING ELECTRIC VEHICLES - A TARIFF CONUNDRUM?

G.N.BHARATH RAM

As electric vehicles (EVs) gain popularity for their ecofriendliness and cost-effectiveness, monitoring their electricity consumption becomes crucial. The Central Electricity Authority's recent report titled "Electric Vehicle Charging Station/ Power Consumption Report, 2023" highlighted that Indian EVs consumed 204.99 million units of electricity from Public Charging Stations (PCS). In Tamil Nadu alone, 2.93 million units were consumed across various regions such as Coimbatore, Villupuram, Tirunelveli, Chennai North, and Vellore. This is the first time that all Indian Electricity Distribution Companies (Discoms) have monitored the consumption of electric vehicles to make it accountable.



### TABLE OF CONTENTS

Editorial – 1 • P. 1

Editorial - 2 • P. 5

News • P. 7

Consumer Focus • P. 8

Other • P. 9

Like any other electricity consumption, electric vehicles also have tariff rates. Electric vehicles can be recharged in public or private charging stations.

- 1. <u>Public charging stations</u> are set under public-private partnerships at public places like petrol stations, EV retail outlets, etc. Generally, public charging stations have more charging points comprising all the major electric vehicle brands.
- 2. <u>Private charging stations</u> are set up by individual or group housing societies or residential welfare associations with fewer charging points based on the number of electric vehicles present. Consumers can install charging stations in their premises, or common areas in residential blocks.

#### Tariff Provisions for EV charging stations in Tamil Nadu

The first <u>Electric Vehicle Policy</u> of 2019 introduced in Tamil Nadu allowed consumers to install private charging stations at home under the domestic tariff 1A. This means that if a consumer wishes to have a private charging station on their premises, the electricity consumed for charging their electric vehicle will be charged under LT tariff 1A, which is the same applicable for domestic consumption. This incentive was put in place to encourage consumers to purchase more electric vehicles.

Following that, in the <u>Tariff Order</u> of 2022, a new tariff category was introduced - Public EV Charging Stations (Low Tension (LT) Tariff VII). This tariff applies to consumers who are interested in setting up public charging stations for electric vehicles. The government also introduced subsidies for setting up public charging stations for capital investment.

The second <u>Electric Vehicle Policy</u> of 2023 created a provision for setting up private EV charging stations. The supply of electricity to Public and Private Charging Stations & Public was to be classified as LT Tariff VII category.

In accordance with this, TANGEDCO, the utility company, in the <u>Tariff Order</u> of 2023 extended the Low Tension consumer category (LT Tariff VII) for both private and public charging stations, referred to in the Order, jointly as **EV Charging Stations.** This states that if a consumer opts for setting up a separate private charging station in their own premises, irrespective of whether this is for his own or public use, tariff rates will be charged under LT VII. However, the consumer can also continue charging in already available ports at home (without requesting a new, purpose-specific connection), and continue to be charged under the domestic tariff (LT 1A).

Tariff	Range in kWh (units) and billing period (one or two months)	Fixed Charges (Rupees per kW per month)	Energy charges in paise/kWh*	
Low Tension Tariff I-A	From 0 to 200 units per month or 0-400 units for two months	Nil	460	
	From 201 units to 250 units per month or 401 units to 500 units for two months	Nil	615	
	From 251 units to 300 units per month or 501 units to 600 units for two months	Nil	815	
	From 301 units to 400 units per month or 601 units to 800 units for two months	Nil	920	
	From 401 units to 500 units per month or 801 units to 1000 units for two months	Nil	1020	
	From 501 units and above per month or 1001 units and above for two months	Nil	1125	
*To be partly subsidised by the Government				

FY 2023-24						
(Commi Time slot in hours	ssion Determin Energy charge in Paise per kWh(Unit)	ed Tariff) Fixed Charge in Rs./kW/month				
06.00 to 09.00 and 18.00 to 22.00	900	0-50kW -	25			
09.00 to 16.00	600	50-112 kW -	75			
16.00 to 18.00 and 22.00 to 06.00	750	Above 112kW -	138			

FIGURE 1: TARIFF RATES - EV CHARGING STATION FOR FY 2023-2024

FIGURE 2: TARIFF RATES - DOMESTIC CONSUMERS (LOW TENSION 1A) FOR FY 2023-2024

#### Provision for separate connection for EV - Amendments in the Electricity Rules:

The Union Power Ministry's proposed amendments to the Electricity (Consumer Rights) Second Amendment Rules, 2023 aim to provide separate connections for EV charging systems. This allows individual consumers, housing societies, residential colonies, and associations to request a dedicated connection. The proposed amendments facilitate the utilities (i) better tracking of consumption units and (ii) revenue collection for separate connections.

#### Difference between the Policy and Amendment:

While Tamil Nadu's Electric Vehicle Policy and Tariff Order lack clarity on whether consumers in independent houses or group housing can apply for separate connections, the proposed amendments indicate broad eligibility. The news article suggests potential electricity bill reductions of up to 20% with separate connections. To better understand the potential savings, the article provides an example to illustrate how the reduction will impact the bill.

As per the news article, an electric vehicle (EV) user typically recharges their EV battery once per day for a billing cycle of 60 days. During this period, the EV consumes 60 units of electricity i.e. one unit per day. If the household's total electricity consumption during this billing cycle is 500 units, then the total consumption, including EV usage, is 560 units.

Let's assume the consumption charges for domestic purposes is 500 units = Rs.1725						
Electricity units used to charge the EV = 1 unit/ day						
Electricity units used to charge the EV (Bimonthly) (1*60) = 60 units						
EV Low Tension Tariff VII		Domestic (Low Tension Tariff 1A)				
Energy charges for using the EV (60*Rs.9)	Rs.540	Energy consumed is 500 units for domestic use plus 60 units for EV use, giving a total of 560 units	Rs. 2430			
Fixed charges (Rs./kW/bimonthly) (Rs.25*3*2)	Rs.150	Fixed charge	Rs. 0			
Electricity bill for just EV	Rs. 690	Electricity bill for domestic use plus EV	Rs.2430			
Total electricity bill (1725+690) = Rs.2415		Total electricity bill is Rs. 2430				
Difference in bill, (with two different tariffs working out to be cheaper) = Rs. 2430- 2415 = Rs.15						

#### **SCENARIO 1**

The consumer will receive two separate bills if a private charging station is installed on the premises. There is a marginal reduction of Rs.15 (0.62%) in the electricity bill by having a separate connection for charging the EV.

However, the average two-wheeler EV battery, with a battery capacity of 3kWh, consumes 4 units to charge the battery fully. The battery charging time will be 5 to 6 hours. The electricity cost under this tariff and the previous tariff will be discussed below.

Note: A popular EV brand "Ather" has been taken as an example.

#### SCENARIO 2

In an independent house, a domestic consumer has two service connections (i) tariff LT 1A for household purposes and (ii) tariff LT VII with a connected load of 3kW for charging the electric vehicle. If the user is charging during non-peak hours daily, below is the cost required to pay for it.

Let's assume the consumption charges for domestic purposes is 500 units = Rs.1725					
Electricity units used to charge the EV = 4 unit/ day					
Electricity units used to charge the EV (Bimonthly) (4*60) = 240 units					
EV Low Tension Tariff VII		Domestic (Low Tension Tariff 1A)			
Energy charges (in Rs) (240*Rs.9)	Rs.2160	Energy consumed is 500 units for domestic use plus 240 units for EV use, giving a total of 740 units	Rs. 4010		
Fixed charges (Rs./kW/bimonthly) (Rs.25*3*2)	Rs.150	Fixed charge	Rs. 0		
Electricity bill for just EV	Rs. 2310	Electricity bill for domestic use plus EV	Rs.4010		
Total electricity bill (1725+2310) = Rs.4035		Total electricity bill is Rs. 4010			
Difference in the Bill (with Tariff 1A working out to be cheaper) = Rs. 4010- 4035 = (Rs. 25)					

The consumer will receive two separate bills if a private charging station is installed on the premises. The consumer will pay Rs.25 more for the electricity bill by having a separate connection for charging the EV.

#### Findings from the two scenarios(1&2):

Two scenarios were compared to determine the costs of charging an electric two-wheeler in an independent house. In the first scenario, a consumer consumed one unit per day, and in the second scenario, the consumer consumed 4 units per day. The results showed that the consumer could save Rs. 15 per day if they charged only one unit per day. However, for hassle-free driving, it is necessary to fully charge the EV. This means that if the consumer opts for a separate meter connection for EV charging, they will have to pay an additional Rs. 25. This challenges the assumption that there are monetary benefits to obtaining a separate EV charging connection. Many consumers may be hesitant to obtain a separate EV charging connection because they fear higher bills with increasing consumption.

#### **Conclusion:**

Despite the higher cost, a separate connection offers advantages such as precise consumption monitoring and protection against power surges. The proposed amendments motivate consumers for separate meters for EV charging at consumer premises. In the future, lower electricity tariffs for separate connections may encourage EV owners to choose dedicated meters for widespread adoption.

# SIMPLE MEASURES FOR ELECTRICITY CONSUMERS TO PARTICIPATE IN THE CIRCULAR ECONOMY - DO IT YOURSELF SERIES (PART- 7)

#### G.N.BHARATH RAM

The <u>previous issue</u> discussed how the R's (Repair and Reuse, Refurbish, Repurpose, Recycle) of the circular economy can be put into everyday use, concerning televisions. This part explores the practice of R's in the use and purchase of personal computers, thus contributing to a circular economy.

#### 5. Personal computers:

A personal computer (PC) is a general-purpose computing device designed for individual use. It is a microcomputer that is typically used by one person at a time for a variety of tasks, such as word processing, internet browsing, gaming, multimedia applications, and more. Personal computers use electricity to power their various components such as the power supply unit, central processing unit, and display monitors. Personal computers are made up of various components, including metals, plastics, and electronic circuitry. Examples of personal computers are desktops, laptops, and all-in-one computers. Since their invention, there has been a large supply of personal computers all around the world, with many personal computers now unusable, and obsolete. These computers usually end up in dump yards and landfills, as a source of pollution.

Obsolete computers end up in dumpyards and landfills, as a source of pollution

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### Simple measures for Electricity consumers to participate in the circular economy - Do It Yourself series (Part-7)



### PERSONAL COMPUTER -CIRCULAR CONSUMPTION



Personal computer hardware is susceptible to electrical issues. Hardware components such as the Switched Mode Power Supply in desktops, and the adapters, chargers & batteries in laptops are particularly prone to malfunctioning due to power fluctuations. If the computer does not turn on due to a hardware problem, it can be used after repairing the problem component. Repairing the damaged hardware can save money and prevent the need to purchase a replacement.



Refurbishing electronics helps to reduce electronic waste by extending their lifespan through a series of processes. Personal computer refurbishment involves restoring old or used computers to a good working condition. By purchasing a refurbished computer instead of a new one, you can reduce the environmental impact associated with the manufacturing and disposal of electronic devices. Choosing a refurbished personal computer is a much greener option to buying one new.

# REPURPOSE

Old personal computer components that are no longer used for their original purpose can be repurposed for a different function. Personal computer components such as central processing units, monitors, and hard disks can be repurposed into a digital photo frame, additional back devices, or a home server.

## e-waste RECYCLE

Recycle the computer only when it is truly obsolete or broken beyond repair. Recycle the hardware by taking it to a certified e-waste collection centre. Personal computers contain a complex mix of materials {plastics (23%), lead (10%), barium (0.04%) mercury (0.01%), and cadmium (0.01%)}, which can be harmful to the environment if not handled properly. Recycling initiatives aim to recover valuable materials from old computers while minimizing the environmental impact of electronic waste.



### NEWS FROM TAMIL NADU

#### Demand for electricity in T.N. increases by more than 7.5% in 10 months

The energy demand in Tamil Nadu increased by more than 7.5%, in the 10-month period from January to October this year, negating the feared impact of the steep power tariff revision effected last year for low- and high-tension consumers. Chennai city, which accounts for one-fourth of the energy consumed in the State, also reported an increase in demand by more than 8%.

A senior official of Tangedco said the State and the city had shown positive power demand and consumption patterns this year, compared with the same period last year. The official said the State posted a growth of 7.56% in demand, with the highest demand of 19,387 mega watt (MW) recorded in April and the consumption touching a high of 11,625 million units (MUs) in August. The city, which recorded an overall increase of 8.17% in demand, registered the highest demand of 4,300 MW and the highest consumption of 2,494 MUs in June. The consumption increased by 6.38% in the State, and 7.76% in the city.

The official said that since 2013, the peak demand touched an all time high of 4,300 MW this year, up 14.27% over the previous year and the highest in a decade. The annual consumption in the city has also increased over the years and stands at 24,000 MUs as against 14,872 MUs in 2013. The official attributed the increase in demand and consumption to various factors, including extended summer, commercial activities picking up, and a good harvest season.

SOURCE: THE HINDU, 02 DECEMBER 2023

## NEWS FROM ACROSS THE COUNTRY

# Non-fossil fuels account for 44% of India's power generation capacity - power minister

Non-fossil fuel sources accounted for about 44% of India's power generation capacity as of October end, the country's Power and Renewable Energy Minister R K Singh told Parliament on Tuesday.

The world's third-largest greenhouse gas emitter, India aims to boost the share of non-fossil fuel sources in its electricity generation capacity to 50% by 2030. These include solar and wind energy, nuclear and hydro power, and bio-power. "So far, a total of 186.46 GW (gigawatts) capacity from non-fossil fuel-based energy resources has been installed in the country as on 31.10.2023," the minister submitted in a written statement.

Another 114.08 GW of capacity is under implementation, with a further 55.13 GW under tendering, he added. India has utilized about 50% of the funds allocated for development and deployment of renewable energy in the first ten months of the year, data shared by the minister showed.

Although coal remains the dominant source of electricity in India, accounting for over half of its power generation capacity, the country's rate of addition of renewable energy capacity is second only to China among major nations in the Asia-Pacific region.

The government previously cited lower per capita emissions compared with richer nations to justify continued use of coal. India, at the ongoing COP28 climate summit, also signaled support for tripling renewable energy by 2030 but did not back the overall pledge made by about 118 governments, which pairs this ramp-up in clean power with a reduction in fossil fuel use.

SOURCE: <u>REUTERS</u>, 05 DECEMBER 2023

## CONSUMER FOCUS

The petitioner (consumer) lives in a ground plus three-floor building with three separate electricity connections viz (i) one service connection for the ground floor house (ii) one service connection for the duplex house constructed on the first & second floor (iii) one service connection for using the common utilities. However, the petitioner recently constructed a new house on the third floor and now requires a new electricity connection. The petitioner submitted an application to TANGEDCO (the utility) requesting a new electricity connection under tariff 1A for domestic purposes. After receiving the application, the Assistant Engineer/KK Nagar East inspected the building and found that the petitioner had not submitted a planning permit or completion certificate from the Chennai Metropolitan Development Authority (CMDA) for the third floor of the house. As a result, the assistant engineer rejected the application and advised the petitioner to apply again with the relevant documents.

The entire building was constructed in 2018 with planning approval for constructing a ground plus two floors obtained from the Chennai Metropolitan Development Authority (CMDA). Based on this, the petitioner has been paying property tax, water, and sewerage charges for the building. Therefore, the petitioner argued that the building was completed before 2019 and does not require a completion certificate to obtain a service connection. The petitioner approached the Consumer Grievance Redressal Forum (CGRF) to resolve this problem. However, the Consumer Grievance Redressal Forum (CGRF) to resolve this problem. However, the Consumer Grievance Redressal Forum (CGRF) stated that any consumer who applies for an electricity connection for a building with a ground plus three floors must submit a completion certificate, according to the Chief Engineer/Commercial <u>circular</u>. The forum disposed off the petitioner's petition and advised them to produce the relevant documents. Dissatisfied with the CGRF's decision, the petitioner approached the Electricity Ombudsman.

After hearing both parties, the Electricity Ombudsman found that

- 1. The petitioner had constructed a third floor without obtaining planning approval from CMDA and had been using electricity from the other service connections. The petitioner had applied for a new supply connection to reduce electricity costs. Although the petitioner had planning permission and a completion certificate for the ground plus two floors in 2018, the petitioner assumed that a completion certificate was not necessary for the third-floor extension.
- 2. The petitioner's application was rejected because the petitioner had not submitted the necessary compliances, which refer to the documents mentioned in the application. <u>Clause 24 of TN Electricity</u> <u>Distribution Code 2004</u> states that when a consumer applies for a new supply connection, they must pay the required charges and comply with mandatory rules and regulations to complete the application process.
- 3. According to <u>G.O.MS No.139</u>, <u>dt.15.10.2007</u>, a completion certificate is compulsory for a building that has a ground plus three floors (which totals four floors), i.e., special buildings and multi-storeyed buildings. The petitioner's building comes under special buildings and multi-story buildings. When applying for a new supply connection, CMDA requires TANGEDCO to have a completion certificate before the service connection can be affected.
- 4. Furthermore, <u>Rule 20 of the Tamilnadu Combined Development and Building Rules 2019</u> states that buildings exceeding a height of 12 meters and containing more than three dwelling units or 750 sq.m should obtain a completion certificate. As the petitioner's building has more than three dwelling units, a completion certificate is mandatory before an electricity connection can be provided to the third floor of the building.
- 5. The petitioner misunderstood the terms and conditions of the Chief Engineer's circular by assuming that a completion certificate was not required for buildings with a ground plus three floors built before 2019.

Based on the hearing of both sides, the Electricity Ombudsman found that the petitioner had not satisfied the TN distribution code. Therefore, the ombudsman ordered the petitioner's petition to be disposed of and instructed the utility to provide the service connection only after the submission of the completion certificate by the petitioner.

### WORLD NEWS

#### Countries promise clean energy boost at COP28 to push out fossil fuels

Governments launched new initiatives on Saturday to bolster clean energy and to wean themselves off fossil fuels at the U.N. climate summit in Dubai, where countries are grappling with how to halt the non-stop rise in planet-warming emissions. In one of the most widely supported initiatives, 118 governments pledged to triple the world's renewable energy capacity by 2030 at the U.N.'s COP28 climate summit on Saturday, as a route to cut the share of fossil fuels in the world's energy production. The pledge was among a slew of COP28 announcements on Saturday aimed at decarbonising the energy sector - source of around three-quarters of global greenhouse gas emissions - that included expanding nuclear power, cutting methane emissions and choking off private finance for coal power. Led by the European Union, United States and UAE, the pledge also said tripling renewable energy would help remove CO2-emitting fossil fuels from the world's energy system by 2050 at the latest.

Backers on Saturday included Brazil, Nigeria, Australia, Japan, Canada, Chile and Barbados. While China and India have signalled support for tripling renewable energy by 2030, neither backed the overall pledge on Saturday - which pairs the ramp-up in clean power with a reduction in fossil fuel use. Backers including the EU and UAE want the renewable energy pledge included in the final U.N. climate summit decision, to make it a global goal. The pledge also called for "the phase down of unabated coal power" and an end to the financing of new coal-fired power plants. It also included a target to double the global rate of energy efficiency by 2030. Climate vulnerable countries insisted that the goals must be paired with a deal among countries at COP28 to phase out the world's use of fossil fuels. "It is only half the solution. The pledge can't greenwash countries that are simultaneously expanding fossil fuel production," said Tina Stege, Climate Envoy for the Marshall Islands.



SOURCE: <u>REUTERS</u>, 02 DECEMBER 2023



### PUBLICATIONS

- Energy Efficiency 2023, <u>IEA</u>
- 2023 G20 Sustainable Finance Report Volume 1, G20 India 2023
- Securing Minerals for the Energy Transition, <u>World</u>
  <u>Economic Forum</u>
- Progress on the sustainable development goals: The Gender Snapshot 2023, <u>UN Women</u>

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helpdesk@cag.org.on

No.103 (First Floor), Eldams Road, Teynampet, Chennai 18