UNITED REPUBLIC OF TANZANIA
MINISTRY OF ENERGY
ENERGY AND WATER UTILITIES
REGULATORY AUTHORITY
(EWURA)

GUIDELINES FOR E-MOBILITY CHARGING STATIONS AND BATTERY SWAPPING

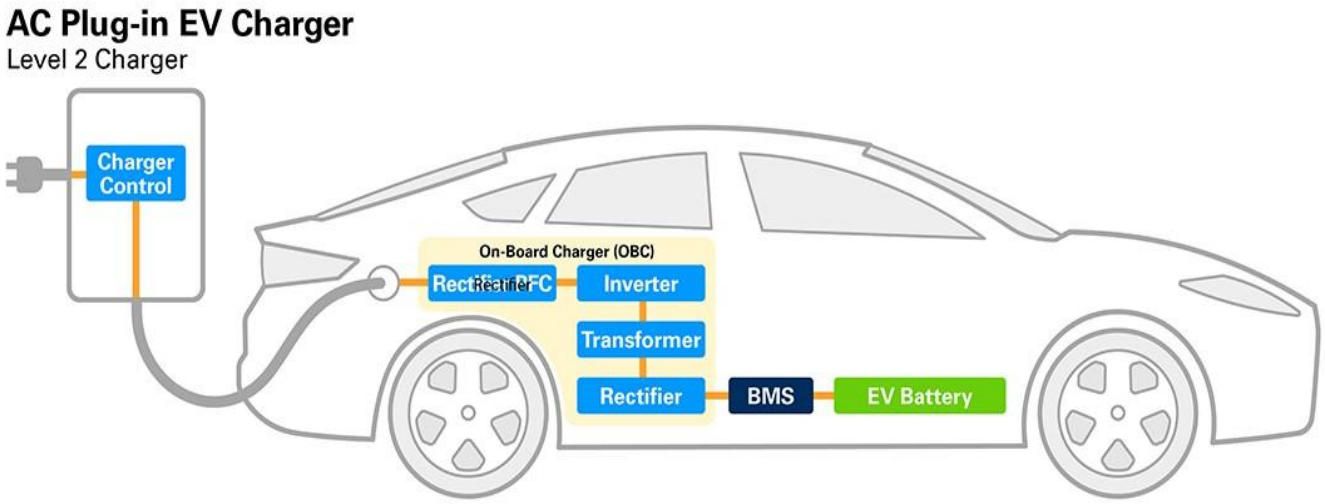

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TABLE OF CONTENTS

LIST OF ACRONYMS

BCS	Battery Charging Station
BMS	Battery Management System
BSSS	Battery System Swapping Station
CPO	Charging Point Operator
E-MSP	Electric Mobility Service Provider
EV	Electric Vehicle
EVCI	Electric Vehicle Charging Infrastructure
EVSE	Electric Vehicle Supply Equipment
EWURA	Energy and Water Utilities Regulatory Authority
PCS	Public Charging Station
RO	Retail Outlet
TBS	Tanzania Bureau of Standards
COSTECH	Commission for Science and Technology
AfEMA	Africa E-Mobility Alliance
IEC	International Electrotechnical Commission
IEA	International Energy Agency
UK	United Kingdom
USA	United State of America
KWh	Kilowatt-hour
CCS	Combined Charging System
DNO	Distribution Network Operator
FCB	Fluid-cooled batteries
NEMC	National Environmental Management Council
KW	Kilowatt
NEES	National Energy Efficiency Strategy
PSMP	Power Sector Master Plan
TANROAD	The Tanzania National Roads Agency

TARURA	Tanzania Rural and Urban Roads Agency
LGAs	Local Government Authorities
TCRA	Tanzania Communication Regulatory Authority
ISO	International Organization for Standardization

DEFINITION OF TERMS

Battery Charging Station	A facility where discharged or partially discharged electric vehicle batteries are electrically recharged (charging vehicles directly and charging batteries that are not in the vehicles).
Electric Mobility Service Provider	An entity with which the EV driver contracts for all services related to electric charging. The e-MSP has various responsibilities, including providing charging passes/cards and applications, locating and navigating charging stations, billing, invoicing, and customer management.
Slow charger	Provides a low-rate charging option for EVs (level I chargers) and operates between 2.3kW and 3.6 kW, featuring 3-pin plug EV chargers suitable for overnight or extended charging sessions at home and office work locations.
Battery Management System	A system that monitors and manages a rechargeable battery (or group of batteries).
Battery Swapping Station	A station where any electric vehicle can get its discharged battery or partially charged battery replaced with a charged battery.
Charging Bay	A designated area or space where electric vehicles can be parked and connected to a charging point.
Charging Control	An Electric Vehicle Supply Equipment within Electric Vehicle Charging Infrastructure that provides electrical energy for recharging the batteries of electric vehicles.
Charging Point Operator	An entity that installs and manages the operations of the charging infrastructure. A Charging Point Operator may own the charging infrastructure or provide services on behalf of the charge station owner.
Charging Station	A site or location with one or more charging points that allow electric vehicles to charge.
Connector	means a cable that connects an EV vehicle to an electric charging point.
Captive Charging Station	Refers to an EV charging station that is restricted for use by a specific group rather than the general public.
Electric Vehicle	A vehicle capable of being propelled by electrical power derived from a storage battery.
E-mobility	The use of electrified vehicles for transportation purposes, such as cars, buses, trucks, or any other vehicle that is fully or partly electric, like a hybrid.

Fast Charger	A device that can charge a battery faster than a standard/regular charger rated (22kW, 43kW, 150kW, 200kW).
Public Charging Station	An EV charging station where any electric vehicle can recharge its battery.
Smart Charging	A charging system for electric vehicles, charging stations, and charging operators share data connections.
Swappable Battery Charging Station	Is the exchange of a depleted battery for a fully charged one instead of waiting for the vehicle to recharge for electric vehicles.
Warranty	A document of assurance or guarantee provided to the purchaser or system owner by a manufacturer, vendor, or installer, stating that a product or installation will perform as promised, is reliable, and is free from known defects. Furthermore, the manufacturer, vendor, or installer shall repair or replace defective parts at no charge within a specified time limit and under certain conditions.

1. INTRODUCTION

Transportation systems worldwide are undergoing significant changes, with electric vehicles (EVs) at the forefront of these changes. Electric mobility has shown numerous positive effects on the economy and society. Switching from internal combustion engine (ICE) vehicles to EVs helps decrease local air pollution and can save thousands of lives, especially when the power generation is from sustainable and clean sources. EVs will also help Tanzania meet its internationally determined contributions to the global effort against climate change. Additionally, they will help Tanzanian drivers save money on fuel and maintenance, reduce reliance on oil imports, and boost the local economy. Over the past decade, the global electric vehicle market has experienced strong growth, driven by falling costs, increasing consumer demand, and political support, which have improved the variety, quality, and availability of EVs, mainly for 2-wheelers and 3-wheelers.

In Tanzania, the number of two- and three-wheeler vehicles has increased significantly in recent years, reaching over 10,000 (AfEMA Data Portal, 2025). This is the most significant number of all EVs combined in East Africa. Additionally, over the past few years, at least ten companies have entered the e-mobility industry in Tanzania. They see significant opportunities in the relatively open market and the large ICE fleet.

Moreover, Technical Training Institutions such as Arusha Technical College have started emerging with their role in engineering capacity building, training, research, testing, and technology transfer in e-mobility. Arusha Technical College (ATC) has established renewable energy and e-mobility training programs and provides local technical capacity for safe installation, testing, and operation. ATC has been recognized as the Centre of Excellence for research and training in renewable energy generation and applications, which will be useful for electric vehicles adoption in Tanzania.

Electric vehicles are a relatively new technology, and Tanzania is now developing policies to promote e-mobility adoption. The policy is expected to address issues of legal framework and enabling structure, including siting, designing, installing, and operating electric vehicle charging points or stations. The Ministry of Transport currently spearheads the initiative.

The adoption of e-mobility for Tanzanians will facilitate, among other things, emission reduction, job creation, provide better public transport, lower local transportation costs, reduce noise pollution, and reduce air pollution.

Therefore, pending the establishment of the fully functioning e-mobility policies and legislation, the Authority has developed guidelines for E-Mobility Charging and swappable batteries infrastructure to guide the e-mobility market industry on matters relating to charging and battery swapping.

2. OBJECTIVE

2.1 Main Objective

To provide a regulatory framework for safe, reliable, accessible, interoperable, and affordable e-mobility charging and battery swapping infrastructure, in alignment with national energy, transport, and climate policies and the Electricity Act.

2.2 Specific Objectives

Specific objectives of the guidelines:

2.2.1 To promote e-mobility users/owners to get access to the charging infrastructure.

2.2.2 To enable faster adoption of electric mobility in Tanzania by ensuring safe, reliable, accessible, and affordable charging infrastructure and ecosystem.

2.2.3 To promote E-Mobility charging infrastructure and create a market for the E-mobility charging business.

2.2.4 To reassure the preparedness of Electricity Distribution Network Operators to adopt E-Mobility Charging Infrastructure.

2.2.5 To support achievement of the national targets under the Tanzania Development Vision 2050, PSMP 2024, NEES 2024-2034, and future National E-Mobility Policy.

2.2.6 To promote and guide the safe conversion of internal combustion engine (ICE) vehicles to electric vehicles, thereby supporting job creation and local industrial participation.

3. SCOPE

3.1 Shall apply to individuals, companies, and institutions that aim to install, operate, and maintain public and private charging stations and Battery Swapping Stations in Mainland Tanzania.

3.2 Implementation shall be coordinated with relevant authorities, including but not limited to TBS (technical standards), NEMC (environmental and waste management), TANROADS/TARURA, and LGAs (road and land use approvals), as well as TCRA (communication systems), as shall be applicable.

3.3 The guidelines apply to all EVs, including 2-wheelers, 3-wheelers, and 4-wheelers, E-Vans, E-buses, and E-trucks, charging stations, and battery swapping procedures.

4. GUIDELINES

4.1 Overview of Electric Vehicles

Electric vehicle technology was developed in the United Kingdom during the 19th century. Utilising electricity for motor vehicle propulsion is regarded as the most environmentally

friendly alternative method compared to internal combustion engines (ICEs), specifically in using power generation from sustainable and clean sources.

According to the International Energy Agency's (IEA) 2019 report, there were over 5 million electric vehicles worldwide in that year. There are several ongoing developments of electric vehicles worldwide, including in the USA, Norway, Japan, the Netherlands, China, Canada, and many other countries, which are attempting to eliminate internal fuel combustion engines. Tanzania also needs to strive for technology adoption, as well as develop a proper policy and regulatory framework that supports the acceptance of technology for the general purpose of improving the social and economic welfare of its people.

Climate and emissions concerns have brought the adoption of E-Mobility to the forefront in recent times. The governments of some of the largest automotive markets around the world have not only declared their intentions but have taken bold steps to embrace EVs and take dramatic steps to curb emissions. For instance, France and the United Kingdom (UK) are looking to ban the sale of gas and diesel-powered vehicles entirely by 2040. Globally, Norway leads in electric vehicle sales, with a 60% share, while China follows with a 58% share. In addition, China and Norway, leaders in electric vehicle sales, are planning to ban vehicles powered by internal combustion engines.

The African continent lags in the adoption of e-mobility as compared to other parts of the world. However, the continent has been blessed with high solar insolation, which has not been harnessed productively for electricity generation to support e-mobility. EVs convert about 59%–62% of the electrical energy from the grid into motive power at the wheels, compared to conventional gasoline vehicles, which only convert about 17%–21% of the energy stored in gasoline into power at the wheels. Studies have shown that travelling 300 miles in the USA using petroleum products costs approximately $35, while driving 300 miles in a small EV passenger car would require only 75 kWh of battery, costing around $7.50.

Therefore, EVs are significantly less expensive to operate; however, they have higher initial purchase costs and some risks associated with battery disposal after their lifespan, which is typically 8 to 10 years. Consequently, the Tanzanian Government, through the Ministry of Energy and EWURA, has developed the guidelines for charging infrastructure and tariff management. The guidelines supplement efforts to quickly adopt e-mobility in Tanzania by recommending procedures and standards to govern this rapidly growing technology. The details of the guidelines are as follows:

4.2 Public Charging Infrastructure Requirements

A person seeking to set up a PCS may apply to the Distribution Network Operator for connectivity in the specified area. The minimum infrastructure requirements for PCS shall be as follows:

4.2.1 A dedicated or adequately sized supply line and, where technically justified by the Distribution Network Operator (DNO), a dedicated transformer and

protection equipment, in accordance with applicable grid codes, supply Rules with connection conditions. A smaller AC charger may share existing transformers, subject to DNO load assessment and protection upgrades.

4.2.2 Appropriate cables and electrical work ensure the safety and stability of the electricity grid.

4.2.3 To have safety operating procedures in place, such as inspection of charging cables and connectors weekly, do not charging visibly damaged EVs, avoiding extension cords, implementing automatic shutoff if overheating detected and current irregularities occur and keeping flammable material away from chargers.

4.2.4 Installation of charging stations shall comply with prevailing rules and regulations. CPO shall arrange the land for the charging station, provide an entry driveway to the charging station, and obtain all approvals relating to civil works for mounting the charging equipment from the relevant authorities.

4.2.5 Adequate space for charging and entry/exit of vehicles. It is recommended 40-60m^2 for small 2-chargers, 100-200m^2 for medium chargers (4-6 chargers), and 300-600m^2 for larger DC fast charging.

4.2.6 Appropriate fire protection equipment and facilities.

4.2.7 EV charging safety guidance will be as per the International Electrotechnical Commission (IEC 61851).

4.2.8 Appropriate public services which shall be able to support road users, energy and utilities (meet supply and available regulation), and environmental protection. The public services(like water supply, adequate lighting, toilets/sanitation facilities, and security features (CCTV, guards) requirement must be optional, considering the size and location of the charging and swapping stations to ensure safety, accessibility, and user convenience.

4.2.9 Practice generally accepted international standards.

4.2.10 The PCS shall have one or more chargers or any combination of chargers as marked in Figure 1 below:

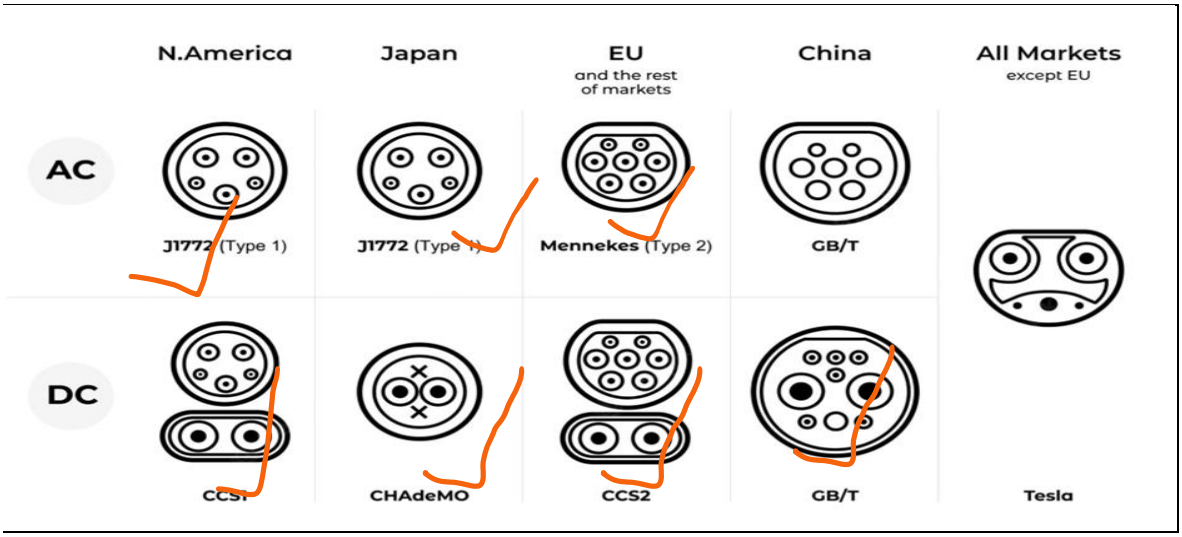

Figure 1: The recommended electric vehicle charger connector types (marked)

4.2.11 AC CHARGING

Below are recommended AC connector charging types for use:

a) J1772-Type 1 (J-Plug) for slow and moderate a.c charging**: Level 2 (230 volts) 7kW slow charging**. It is a single-phase connector that can charge at a speed of 30-45km/hour, charging rate 2-5hours, and applicable for home, work, shopping centers, and car parks. **Level 2 fast charging, three-phase (public),** 11- 22kW, 50-130km/h range, charging time 30 minutes to 2 hours. It can be used in urban roadside areas.
b) IEC 62196 -Type 2 (Mennekes). These are **level 3 fast/slow chargers**, ranging from 25 to 350kW, with a charging speed of 150-300km/hour. The charging time is 10-60 minutes. It is a three-phase plug-in charger.

4.2.12 DC CHARGING

a) The Combined Charging System (CCS) Type 1 & Type 2 (CCS1 & CCS2) **fast chargers** are recommended to be used as DC chargers, as shown in Fig. 3. Note that CCS is incompatible with CHAdeMO and GB/T charging stations due to the different use of communication protocols. The CCS connector utilizes a Type 1 J1772 charging inlet and combines it with two high-speed charging pins to enable DC charging. These connectors can handle power up to 400kW.

b) GB/T 20234 and IEC 62196-3 (CCS2) are accepted standards. Tesla GB/T accepts all voltages, so there's no need for a different connector specifically for DC fast charging, unlike other standards, the use of tesla vehicles compatibility depends on agreements and adapters, as shown in Fig. 2, known as D.C Superchargers. Tesla also provides adapters for different types of plugs, allowing their vehicles to use charging stations with Type 1 or CHAdeMO. Therefore, this is an appropriate recommended charging connector for those who will opt for Tesla electric cars. However, these are recommendations, but any connector for 2&3-wheelers can be used, provided it meets IEC 62196 for EVs charging connectors safety standards.

Figure 2:Tesla Supercharger

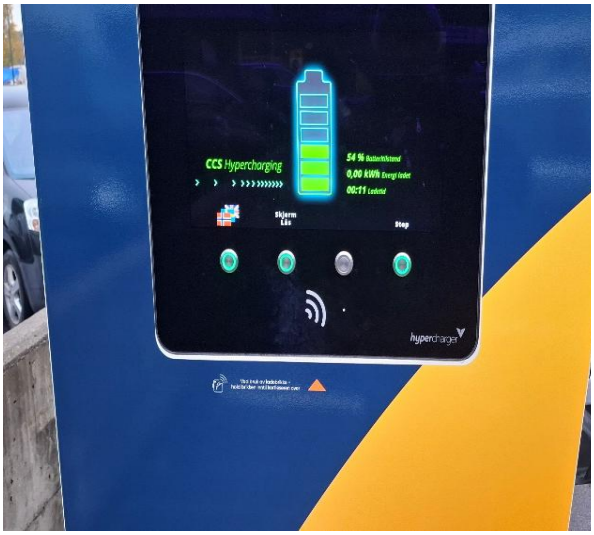

Figure 3: 150KW CCS Charger

4.2.13 The charging station may offer options for installing additional charging points if needed, and may utilize connectors that provide optimal solutions.

4.2.14 The charging station (CS) for two- or three-wheelers shall be free to install any chargers other than those specified above, subject to compliance with technical and safety standards.

4.2.15 The Charging Point Operator (CPO) may opt to partner with at least one online electric mobility service provider (e-MSP) to enable advanced remote/online booking of charging slots by EV owners. Such online information for EV owners should also include details about the location, types, and availability of chargers in specific areas, allowing them to decide where to charge.

4.2.16 A Charging Point Operator (CPO) shall ensure that the workforce installing, maintaining, and operating chargers has a minimum of a class C licence from EWURA, minimum level III certificate from VETA, and certification from training institutions (NACTVET and NIT), to ensure that the installation, operation, and maintenance of chargers are performed safely and meet public safety standards. However, a grace period of three months from the date of approval of these guidelines shall be offered for CPOs to use licensed and certified personnel from the chargers' suppliers. The given grace period offers a period for technical training institutions to align itself on e-mobility trainings and certificates offered to various applicants and allow e-mobility market growth before licence requirements.

4.2.17 No Public Charging Station (PCS) shall be operational without inspection, testing, and issuance of a completion certificate issued by licensed electrical installation personnel from the Authority.

4.2.18 Public charging stations may be installed in residential estates, malls, office complexes, restaurants, hotels, and other similar premises.

4.2.19 The PCS may have the option to add stand-alone battery swapping facilities, provided that space and other conditions permit.

4.3 Private Charging Infrastructure

4.3.1 Private charging at residences/offices shall be permitted.

4.3.2 Captive Charging Infrastructure for 100% internal use by a company's own or leased fleet for its own use will not be required to install chargers with tie-ups to e-MSPs.

4.3.3 Captive charging infrastructure for 100% Internal use may determine charging capacities and configurations based on operational needs, subject to compliance with national technical and safety standards (TBS/IEC/ISO) and DNO connection requirements. For chargers above 22kW, DNO has to be notified for grid impact assessment before connection.

4.3.4 Private charging infrastructure shall be operational only after inspection, testing, and issuance of a completion certificate issued by licensed electrical personnel.

4.3.5 Private chargers integrating Solar PV and/or BESS shall comply with regulatory rules requirements, Distribution Code, and TBS PV/BESS technical standards." Prevents unsafe hybrid installations, unintentional back-feeding, or protection failures. Aligns with Distributed Energy Resources integration norms, standards, managing high solar penetration, voltage stability, and grid safety.

4.3.6 To integrate renewable and Off-Grid solutions, solar -based charging systems and battery swapping mini-grids are highly encouraged, provided complies with Section 4.3.4 above.

4.4 Battery Swapping Stations Requirements

4.4.1 There must be adequate space for battery charging and swapping.

4.4.2 Every Battery Swapping station shall only be operational after inspection, testing, and issuance of a completion certificate issued by licensed electrical installation personnel with class C and above from EWURA. The foreign experts must have a work permit and the same licence class qualifications or above to do such business in the Tanzania Mainland.

4.4.3 Fire Detection & Suppression Systems will be required at battery swapping areas.

4.4.4 The batteries need to have a Battery Management System (BMS)-enabled for efficient battery monitoring, data analysis, and safety.

4.4.5 The battery swapping provider shall ensure that the appropriate Battery Management System (BMS) is in place to protect the battery from conditions such as thermal runaway (operating temperature control), charge and discharge control, input/output current and voltage control, battery cells monitoring, power management control, battery protection, as well as fault diagnosis and assessment.

4.4.6 Battery swapping operators will store the usage history and required performance data of the battery.

4.4.7 Battery Swapping Station operators shall ensure that the workforce installing, operating, and maintaining chargers has an appropriate electrical installation licence certification and training to ensure that the installation, operation, and maintenance of chargers and swappable batteries are performed safely.

4.4.8 Verification and standardization of battery swapping systems (technical testing, calibration, and safety validation roles) shall be supported by the Tanzania Bureau of Standards.

4.4.9 The station shall require provisions on ventilation, fire detection/suppression, separation distances, and hazardous area classification for indoor/outdoor swap facilities.

4.4.10 The station shall have minimum technical specifications on swappable batteries (IP rating, mechanical robustness, state-of-health monitoring, communication with vehicle/BMS as per TBS and best international practice standards.

4.4.11 The charging station will provide requirements for interoperability within a network (example, standardized battery interface within each swapping ecosystem) and clear labelling for voltage, as well as keeping a log of swapped batteries and any incidents

4.4.12 Comply with the IEC 62840 general requirements standard and guidance for battery swapping. This enables the station owner to contribute to equipment interoperability while reducing fire, explosion, and operational safety risks associated with battery swapping.

4.5 **Battery Disposal**

4.5.1 Battery lifespan is estimated to be 8-10 years. The battery disposal procedures shall be in accordance with the applicable Environmental Management Council legislation.

4.5.2 The battery swapping station owners should establish a collection point for disposable batteries. The transportation and disposal of the batteries shall comply with the applicable Environmental Management legislation. The higher learning and research institutions will be responsible for studies on battery reuse, recycling, and waste management innovations.

4.5.3 The battery swapping station shall prove to EWURA that it has contracted the recycling company for the deposition of the batteries before starting operation.

4.5.1 Installation Documentation, Warranty, and Insurance.

Installers of charging points and/or battery swapping stations shall, upon completion of electrical installation work, issue the system owner with the following documentation:

a) A completion certificate including a declaration that the system owner has been trained on the safe use and maintenance of the charging point(s), as well as commissioning test results;

b) The “as-built” system design and drawings;
c) Appropriate operations and user manuals.

4.6 Location and Database of Public Charging Stations

The following may be the maximum distance requirement between two public charging stations:

a) One Charging Station is recommended to be set up at most 50km on both sides of the highway, and installing charging stations every 50KM along major city routes and key transport corridors to ensure convenient access for EVs and support growing demand in urban areas.
b) Long-range EVs and heavy-duty EVs, such as buses/trucks, may have at least one Fast Charging Station with an appropriate charging infrastructure at a distance of every 100km, preferably located on each side, within/ alongside the charging stations.
c) The existing Retail Outlets (ROs) of Oil Marketing Companies (OMCs) may install Public EV Charging Stations in compliance with the applicable safety requirements.
d) PCS/BSS operators will update standardized EV Charging stations data semi-annually and will submit it to EWURA. The data format includes (location of the charging stations, connector types, power rating, accessibility, operating hours, and pricing).
e) The Public Charging Station (PCS) shall share data with the electric distribution network operator (DNO) and will maintain appropriate protocols as prescribed by such companies/company for this purpose. The Authority shall have access to this data when needed.
    i. It is recommended to use appropriate liquid-cooled cables if a high-speed charging facility is required for onboard charging of fluid-cooled batteries (FCBs).
    ii. Use appropriate Climate Control Equipment for Fast Charging of Batteries planned for swapping.

4.7 Signage, Markings, and Accessibility Considerations

a) During the installation of charging points, Charging Point Owners must install appropriate signage and pavement markings to guide motorists and ensure their safety.
b) The charging station should be designed in a manner that makes it accessible, easy to use, and safe for all motorists, including those with disabilities.
c) Charging stations shall be designed in accordance with TBS/adopted accessibility standards to ensure accessible parking bays, clear maneuvering space, safe cable routes, accessible user interfaces, and payment devices for persons with disabilities.

Figure 4: Example of an accessible residential charging station

4.8 Connection Charges and Tariff of Electricity to EV Charging Stations/Points

4.8.1 The connection charges for supplying electricity to E-mobility charging stations shall be as approved by the Authority to the DNO.

4.8.2 A Charging Point Operator shall clearly display the tariff for charging services.

4.9 Charge Point Measuring System

A public charge point shall be configured so that:

4.9.1 A figure measured or calculated is accurate to within ±1% of the actual figure;

4.9.2 Any inaccuracies are not systematic. For these Guidelines, an inaccuracy is systematic if, as a consequence of the design or manufacture of the charge point, it is predictable.

4.9.3 There shall be at least two bill payment modes available at the charging stations, Cash payment model and the credit/Debit card model.

4.10 **Smart charging point**

4.10.1 Every public charge point shall have smart functionality.

4.10.2 A public charge point shall have smart functionality if:

a) It can send and receive information via a communication network.

b) It can respond to signals or other information received by:

i. Increasing or decreasing the rate of electricity flowing through the charge point.

ii. Changing the time at which electricity flows through the charge point.

c) It is capable of using the functionality referred to in (i) and (ii) above to provide demand-side response services.

d) At least one user interface is incorporated in the charge point or otherwise made available to the owner.

e) Technical Institutions shall be involved in developing and piloting smart charging systems and communication protocols.

f) A public smart charging point shall be designed, installed, and operated in accordance with internationally recognized standards for smart charging communication, functionality, and interoperability. In particular, compliance shall be guided by the ITU-T Y.4230 (01/2025) standard: Requirements and capability framework for a public smart charging service for electric vehicles, as well as other relevant communication and interoperability standards.

g) Every public charge point shall have smart functionality – A public charge point shall have smart functionality if:

i. It can send and receive information via a communication network;

ii. It can respond to signals or other information received by:

iii. Increasing or decreasing the rate of electricity flowing through

a. the charge point.

iv. charging the time at which electricity flows through the charge

a. point;

v. It is capable of using the functionality referred to in (a) and

i. (b) above to provide demand-side response services; and

vi. At least one user interface is incorporated in the charge point or otherwise made available to the owner.

4.11 **EV Charging Infrastructure Communication**

4.11.1 A charging point shall communicate with a charging network via a secure communication method.

4.11.2 Charging points shall remain functional if communication with the charging network is temporarily disrupted, allowing them to initiate and complete charging sessions.

4.11.3 Charging points and charging networks shall securely measure, communicate, store, and report energy and power dispensed, real-time charging-port status, real-time price to the customer, and historical charging-port uptime.

4.11.4 A charging network shall be capable of communicating with other charging networks to enable an EV driver to use a single method of identification to charge at charging stations that are a part of multiple charging networks.

4.11.5 Charging networks shall be capable of securing communication with electric utilities or other energy-independent providers.

4.11.6 Based on technological advancement, e-mobility can have wireless charging facilities.

4.12 **Customer Service, Data Privacy, Data Sharing, and Security**

4.12.1 PCS and BSS operators shall ensure that EV charging customers have mechanisms to report outages, malfunctions, and other issues with the charging infrastructure.

4.12.2 PCS and BSS operators must collect, process, and retain only the personal information in compliance with relevant legislation on personal data protection strictly necessary to provide the charging service to a consumer, including information to complete the charging transaction and to provide the consumer with the location of charging stations.

4.12.3 PCS and BSS operators shall ensure that the following data fields are made available to the third-party software developers through the Application Programming Interface (API):

a) Unique charging station name or identifier
b) Location of the charging station
c) Charging station operator name
d) Charging network provider name
e) Charging station status (under construction, operational, decommissioned)
f) Charging station access information
g) Number of charging ports
h) Connector types available by port
i) Charging level by port (AC Level 2, etc.)
j) Real-time status by port
k) Pricing and payment information.

4.12.4 When exposing API data, PCS and BSS operators shall ensure that:

a) No personal data, authentication tokens, or sensitive operational data are exposed through the API;
b) API access is secured with authentication, rate limiting, monitoring, and protection against misuse; and
c) Data shared with third parties follows data minimization and purpose limitation principles.

4.12.5 PCS and BSS operators shall implement physical and cybersecurity strategies

consistent with their respective EV infrastructure deployment plans to ensure that charging station operations protect consumer data and mitigate the risk of harm to, or disruption of, charging infrastructure and the electricity grid.

4.12.6 The PCS and BSS operators to ensure basic EV customer service standards are adhered to: ISO/TBS-aligned quality system, higher charger uptime (>98%), seamless plug & charge support, strong battery warranty transparency, fast digital support, clear billing and pricing, integrated vehicle &charging support, and data privacy and cybersecurity.

4.12.7 The minimum cybersecurity requirements will be in the following areas:

a) Secure -by-default configurations (remove default passwords);
b) Mandatory encryption and mutual authentication;
c) Use of secure protocols; and
d) Network segmentation between EV charging networks and corporate IT/internet.

4.12.8 For the matter of Consumer protection and safety assurance, PCS and BSS operators will provide mandatory insurance, warranties, and after-sales support for all installed charging and battery swapping systems. They will have to establish a service level obligation (SLO) for uptime (e.g >95%) and response time to customer complaints.

5. EFFECTIVE USE DATE

The effective date of use of the guidelines shall be **29th April 2026**

Annex 1: Recommended ISO/IEC Standards by Tanzania Bureau of Standards (TBS) on E-Mobility.

The International ISO and IEC standards applicable to electric mobility systems, including electric two-wheelers (2W), three-wheelers (3W), four-wheelers (4W), and electric vehicle supply equipment (EVSE). These standards form the international compliance framework for safety, charging infrastructure, batteries, communications, grid integration, and interoperability.

S/N	Standard Number	Title	Applicable Vehicle Category (2W / 3W / 4W / EVSE)	Compliance Status	Remarks
1	IEC 61851-1	Electric vehicle conductive charging system — General requirements	2W,3W,4W, EVSE	Mandatory	Core charging safety
2	IEC 61851-21	EMC requirements for EVSE and on-board charger	2W,3W,4W, EVSE	Mandatory	Electromagnetic compatibility
3	IEC 61851-23	DC electric vehicle charging stations Fast DC: >22-50kW Ultrafast: >50-150kW High power: >150kW	3W,4W, EVSE	Mandatory	Public DC fast charging
4	IEC 61851-24	Digital communication between DC charger and EV	3W,4W, EVSE	Recommended	DC charging communication
5	IEC 62196-1	Plugs, socket-outlets and vehicle connectors — General requirements	2W,3W,4W, EVSE	Mandatory	Charging interface
6	IEC 62196-2	AC pin and contact-tube accessories Slow charger (AC level 1): ≤3.7kW Normal (AC level 2): 3.7 -22kW	2W,3W,4W, EVSE	Mandatory	AC charging
7	IEC 62196-3	DC and high-power charging connectors	3W,4W, EVSE	Mandatory	DC interface

S/N	Standard Number	Title	Applicable Vehicle Category (2W / 3W / 4W / EVSE)	Compliance Status	Remarks
8	IEC 62752	In-cable control and protection device (IC-CPD)	2W,3W,4W, EVSE	Mandatory	Mode 2 charging safety
9	IEC 62955	Residual DC detecting device (RDC-DD)	2W,3W,4W,EVSE	Mandatory	Leakage current safety
10	IEC 60364-7-722	Electrical installations — EV charging installations	EVSE	Mandatory	Building safety
11	ISO 15118-2	Vehicle-to-grid communication — Network and application protocol	3W,4W,EVSE	Recommended	Smart charging
12	ISO 15118-3	Vehicle-to-grid communication — Physical/data link layer	3W,4W,EVSE	Recommended	V2G interface
13	ISO 15118-20	Vehicle-to-grid communication — 2nd generation protocol	3W,4W,EVSE	Recommended	Plug & Charge
14	ISO 17409	Conductive power transfer — Safety requirements	2W,3W,4W	Mandatory	Charging safety
15	ISO 6469-1	EV safety — Rechargeable energy storage system (RESS)	2W,3W,4W	Mandatory	Battery safety
16	ISO 6469-2	EV safety — Protection against electric shock	2W,3W,4W	Mandatory	Electrical protection
17	ISO 6469-3	EV safety — Electrical safety	2W,3W,4W	Mandatory	System safety
18	ISO 6469-4	EV safety — Post-crash electrical safety	2W,3W,4W	Mandatory	Post-crash protection
19	IEC 62660-1	Li-ion propulsion cells — Performance testing	2W,3W,4W	Mandatory	Battery testing

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20	IEC 62660-2	Li-ion propulsion cells — Reliability & abuse testing	2W,3W,4W	Mandatory	Abuse safety
21	IEC 62660-3	Li-ion propulsion cells — Safety requirements	2W,3W,4W	Mandatory	Cell safety
22	IEC 62619	Safety of secondary lithium batteries (industrial)	2W,3W,4W,EVSE	Mandatory	Battery systems
23	ISO 12405-1	Battery pack tests — High-power applications	2W,3W,4W	Mandatory	Traction batteries
24	ISO 12405-2	Battery pack tests — High-energy applications	2W,3W,4W	Mandatory	Energy storage
25	ISO 12405-3	Battery pack/system safety performance	2W,3W,4W	Mandatory	System safety
26	IEC 62840-1	Battery swap systems — General & safety requirements	2W,3W	Recommended	Battery swapping
27	IEC 62840-2	Battery swap systems — Operational/interface requirements	2W,3W	Recommended	Swap infrastructure
28	ISO 26262	Road vehicles — Functional safety	3W,4W	Recommended	Electronic systems
29	IEC 61980-2	Wireless power transfer — System requirements	2W,3W,4W,EVSE	Recommended	Wireless charging
30	IEC 61980-3	Wireless power transfer — Off-board supply equipment	2W,3W,4W,EVSE	Recommended	Wireless EVSE
31	IEC 61850-7-420	Communication systems — DER & EV logical nodes	EVSE,Grid	Recommended	Grid integration
32	IEC 61000 series	Electromagnetic compatibility standards	2W,3W,4W,EVSE	Mandatory	EMC compliance

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33	CISPR 11/12/25	Radio disturbance limits for vehicles & EVSE	2W,3W,4W, EVSE	Mandatory	EMI compliance
34	IEC 62893-4-1:2020 © IEC 2020	charging cables for electric vehicles of rated voltages up to and including 0,6/1 kV. Max temp:90^{o}C	2W,3W,4W, EVSE	Mandatory	Fire protection
35	IEC 62443	compliance and local data hosting.	compliance and local data hosting	Mandatory	Prevents cyber threats to charging infrastructure, the electricity grid, and consumer data.