



Government of Kerala
Abstract

Transport Department – The Draft Policy on Electric Vehicles for the State of Kerala - approved – Orders Issued.

Transport(B) Department

GO(Ms) No. 58 /2018/Trans

Dated, Thiruvananthapuram 29/09/2018

Read : GO(Rt) No.242/2017/E&ITD dated 10/10/2017

Order

The vehicular transport of the State predominantly depend on fossil fuels. The extensive use of fossil fuels leads to environmental pollution and health hazards, which necessitates the exploration of alternative energy. The over dependancy of fossil fuels badly affects the balance of payment of the Country and the political instability of oil producing countries always remains as a threat to the economic stability of our nation.

In this alarming circumstance, the State of Kerala, which is a forefront runner in many reforms and innovations, initiated early steps in the direction of framing a road map to an Electric Vehicle Policy for the State. As per the GO read above, Government have appointed a Special Task Force under the chairmanship of Prof.Jhunhunwala, Principal Advisor to the Minister for Power, Govt. Of India, for framing a draft EV Policy for the state. The committe had prepared a draft policy and submitted before the Government.

The Government have examined the draft EV policy in detail. After evaluating and modifying the same with the prevailing circumstances of the State , the Government are pleased to approve the draft Electric Vehicle Policy for the State of Kerala appended herewith .

By Order of the Governor

K R JYOTHILAL

Principal Secretary to Government

To :

The Transport Commissioner, Thiruvananthapuram
The Chairman, K-DISC, Thiruvananthapuram
The Principal Secretary, Finance Department
The Principal Accountant General(Audit), Kerala, Thiruvananthapuram
The Director, Information & Public Relations Department

GA(SC) Department
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Private Secretary to Minister (Transport)
PA to Principal Secretary (Transport)

Forwarded By Order



Section Officer

Government of Kerala

Policy on Electric Mobility

Introduction

The high vehicle population of over ten million vehicles on road in Kerala State has made mobility a challenge, and it is accompanied by increase in road accidents and air pollution. The State Government took several measures like improving the conditions of road, upgrading and widening the National Highway to 45 meters, constructing a Coastal Highway, and improving the Inland Waterways to permit large cargo traffic from Thiruvananthapuram in the south to Kasaragod in the north.

Electric Vehicles (EV) or e-mobility is another step forward. Kerala, known for its environmental sensitiveness, bio diversity and tourist attractions wishes to maintain its texture and ensure a sustainable development for its people. The transition to electric vehicles is a natural choice for the State in line with its development ethos.

The number of vehicles on the road will get reduced with the introduction of modern shared transport systems like the air-conditioned Electric Bus and e-Autorickshaw. They will provide comfortable and fatigue free ride, with no polluting gases, and much reduced vibration and noise. This will attract vehicle owners to move to shared mobility. The State plans a no-subsidy regime for EV, as articulated by the NITI Aayog. An air-conditioned bus is only 10% more costlier than the regular EV Bus. Large scale introduction of 3-wheelers (e-autos) can be made economically viable using battery swapping, with the CAPEX/ OPEX for the e-autos becoming similar or less compared to petrol autos.

The State Government plans to ensure a robust infrastructure for electric vehicles, that includes adequate power availability, network of charging points, and favorable power tariff. KSEBL will provide quality power for 24x7 throughout the year for a rate variable based on time of the day and season of the year.

The development of e-mobility must be integrated to the State's manufacturing ecosystem, particularly for the EV components. Kerala has developed a large number of start-ups and some of this talent pool is expected to be utilized for the e-mobility initiative.

Registered Vehicle in the state 2016 Economic Reveiw

		Kerala	TVM	ERKM	KZHKD
Goods	3 W	419857	36478	69643	34296
	4 W	136938	12188	17124	13984
Buses	Stage	42707	13247	4074	3630
	Contract	64051	10251	9945	3802
4 Wheeler	Cars	2070635	278468	336445	155605
	Taxis	107567	9027	17276	9729
3 Wheeler	Autorickshaw	610235	70689	58271	51449

2 Wheeler	Scooter/Motor cycle	6472302	834151	1004232	639437
Tractor/Trailer	Tractor	14213	741	2117	434
	Trailer	699	143	147	35
Others		232609	25211	39996	14987
	Total	10171813	1290592	1559270	927388

Vision

To embrace electric mobility as a tool to promote shared mobility and clean transportation and ensure environmental sustainability, pollution reduction, energy efficiency and conservation and to create an ecosystem for manufacturing EV components in Kerala.

EV Population targets

2022: 1 million EV's on the road

2020: Pilot Fleet of 200,000 two-wheelers, 50,000 three wheelers, 1000 goods carriers, 3000 buses and 100 ferry boats.

Investment targets

Component Manufacturing: Attract investments and create employment opportunities around Power Electronics, Battery Pack Assembly, Battery Management System (BMS), Electric Motors, Accessories and skilled areas like IT and R&D etc

Electric Vehicle manufacture in the long term: Create an enabling ecosystem of skilled manpower, infrastructure, R&D centers, favourable regulations and initial volumes through Government programs.

Centers of Excellence (CoE) in the EV value chain; build world class training/skilling centers for EV professionals with niche skills for the global EV industry

Key Policy Drivers

The transition to EVs is logical, as Kerala is committed to environment and welfare of the people. The EV drive has been triggered by multiple forces viz.,

- promoting shared mobility and clean transportation balancing of the peak and off-peak power demand for the electric utility (KSEBL),
- operational efficiency and savings for the transport utility (KSRTC), pollution reduction from fossil fuels
- the strategic intent to boost hardware and software manufacturing in the State.

Managing the Electricity Grid

The Kerala State Electricity Board (KSEBL) is looking at EV population as an option for generating demand during the off-peak hours. It would mean cheap electricity for EVs and load balancing for the grid. In Kerala nearly 80% of the

demand is the variable load from the domestic sector - unpredictable because a variation in atmospheric temperature can spike the power consumption. KSEBL will participate in the e-mobility development for ensuring a firm and optimally high baseload on the grid at attractive power tariffs.

Upgrading the Bus Transport Fleets

The Kerala State Road Transport Corporation (KSRTC) should transition a part of its fleet of 6000+ buses into Electric Vehicles by 2025 through funding from Govt. This is expected to substantially reduce heavy outflow due to fuel cost. KSRTC currently procures around 1000 new buses annually and some of these can be replaced with EVs and with appropriate sizing of the batteries, charging infrastructure and innovative electricity tariff, the cost of the bus operations is expected to be comparable with the present fleet of diesel buses. The huge reduction in maintenance cost of electric buses, reduced break down losses coupled with the reduction of fuel cost per KM can be securitised for a longer period and used to service the initial capital cost of deploying the EV Buses.

Industrial Growth

Kerala needs to focus on growing its internal manufacturing ecosystem and turn away from being an export-dependent, consumption-driven economy. This drive can be given an initial boost by providing an early market in the Government driven programs (aggregation of demand). The highly skilled manpower and a buoyant domestic demand will help to establish high tech manufacturing in niche areas like design, power electronics and IT components for Electric Vehicles.

Transition Strategy

The transition strategy would be multipronged, which would include the creation of common charging infrastructure, incentivising the transition (end user), standardising the specifications, creating enabling policies and regulations, promoting localisation coupled with training and skill development.

Technical Advisory Committee

A technical advisory Committee-Mobility State Level Task Force (e-MobSLTF) has been set up by the State Government to initiate, develop and sustain e-mobility in the State. This Committee shall be mandated to define the policies and strategies for the development and growth of the sector in the State.

The eMobSLTF shall scrutinise the technology adoption and manufacturing proposals in this area and recommend to the Government for the adoption of the same.

Categories of Vehicles

Light Electric Vehicles

Electric Vehicles with battery packs of below 120V is considered as Light EV, and in India they include the two-wheelers, three-wheelers and some car models also.

Two wheelers:

- e-Scooters with a built in 50KM range battery (suitable for charging at home) with provision for additional 50 KM range extension battery (that could be swapped at public stations as and when required).
- e-Scooters with two swappable batteries (as in international models like Gogoro etc).
- e-Bikes to leverage the tourism potential of the state in the coastal and hilly destinations.

Three wheelers:

Currently, Auto-rickshaws in the State have base price of Rs. 1.40 to 1.70 Lakhs with a running cost in the range Rs.1.30 to 1.40 per KM. Converting these as e-autoes can be made Revenue Neutral, if the EV battery is addressed as a separate component from the base EV. The cost of an e-Auto without battery can be in the range of Rs 1.40 to 1.70 lakhs, with sufficient assured numbers to enable the auto manufacturers to go for adequate supply tie ups. It would be necessary to provide promotional incentives wherever possible in the form of concessions in road tax, toll fee, parking fee etc. A policy decision has to be taken to give new/renewed permit only for e-autos leading to a gradual ban on ICE autos. Schemes would be devised to procure 15,000 + 25,000 + 50,000 e-autos year-wise from 2019 onwards, which could attract local manufacturing. In order to enable the State to realize the transition to e-Autos, there is a need to start manufacturing facility within the State. For this, discussions have already initiated on the revival of Kerala Automobiles Ltd (KAL) which will be taken forward.

Four Wheelers

Electric Cars can be introduced for government use and as modern, eco-friendly taxi cars. Technologically the optimal solution would be to have electric cars with built in batteries with hire-able 'Range extension batteries' of different capacities for different models of EV.

- Built in batteries could be charged at home over night and could run for about 80 - 100 KM distance daily, which would be the normal demand of the car owners, whereas the range extension batteries could be hired for longer drives.
- There could also be a number of DC fast charging stations as well as swapping stations for range-extension batteries established in strategic locations in the cities and along the national highways and state highways.
- It would also be possible to provide the public the list and geographic location of all available swapping stations over as mobile app accessible to all.

Once the availability of sufficient electric vehicles and charging-swapping stations are in place, State may also take up certain environmentally fragile locations -like Munnar - and mandate to convert all four wheelers as electric vehicles, enforcing them as pollution free EV zones.

Small Cargo carriers would be another category that may be converted to EVs through policy mandates.

Heavy Electric Vehicles/ Electric Buses

Electric Vehicles with a battery pack of more than 500 Volts is considered as Heavy EV.

Buses are the first preference for conversion to e-vehicle regime, due its large impact on the on-road vehicle population, potential to reduce pollution and promote shared mobility. Buses, primarily for public transport shall be of 9 meter and 12 meter length, with an average driving range of 50 km to 100 km. The Bureau of Indian Standards is developing standards for the following type of Bus Battery Charging Options, as India specific solutions.

Fixed Battery System: Buses are expected to charge at the bus depots using 3-phase AC connections dedicatedly connected to each parked bus. In addition, small top up charging done en-route. This system is currently under consideration in Kolkata.

Replaceable Battery Systems: Battery Swapping at Bus Depots/Terminals to cater to trip lengths of up to 35 km. A battery pack that provides 50 km range could be adopted for use across the State. This option is being closely watched as there are no large scale deployments of it and the robotic arm or battery switch systems is presently under demonstration stage.

Automated Bus Charging Systems: This is an emerging option, currently being deployed and evaluated in Northern Europe . It involves deployment of pantograph-charger (or "docker") at the Bus Terminal every time the bus returns to the terminal. The battery size can be configured similar to option 2 or 5 above, depending on system configuration.

Electric Boats

Boats - Kerala has already done a pilot in this area with solar charging. However optimising the economics and looking for specific technology improvement is an area that may be looked into with specific details on the type of boats, loads to be carried and the requirements of its shuttling distance per day. This is to be studied and evaluated separately.

EV Charging Infrastructure:

Fast Charging and swapping stations will be established all over cities and on highways to create the infrastructure for EVs. The Central Electricity Authority (CEA) has prepared an Approach Paper for Standardizing the Grid Access for the EV Charging Infrastructure. These will be adopted as standards or regulations by the CERC. The solutions planned in Kerala State will adhere to such grid side requirements, including power quality assurance, power tariff, central management system etc.

These stations could be set -up by DISCOMs or companies in partnership with DISCOMs. Besides, DISCOM will set-up AC charging stations (as per DHI standard AC-001) on streets and parking lots, including locations where vehicles are parked over-night (if not parked at home). These will be standard 15A outlets for slow-charging of vehicles. They would have payment mechanism, time-of day metering and facility where the user can decide to charge vehicles overnight, but only in off-peak hours. Single vehicle charger of this kind should cost no more than ₹5000.

However the conversion of three wheelers and transport buses would be of first priority of the State along with promotional role in conversion of four wheelers and two wheelers.

KSEB will setup battery charging stations. Swapping operations will be done by independent player found through a transparent process by KSEB.

Strategic Initiatives

The policy aims at improving affordability and acceptance leading to adoption of electric vehicles through the following strategic initiatives:

1. Addressing the viability gap for buses and Government fleet (if any)
2. Creating adequate charging infrastructure that are interoperable with several models of EVs,
3. Promotion of local manufacturing,
4. Awareness creation and promotion of shared mobility
5. Human capacity building and re-skilling

1. Addressing the Viability Gap

The Government shall consider the following fiscal and non-fiscal incentives to the vehicle owners to adopt EVs.

The Road tax on the electric vehicles may be fully exempted for the initial 3 years (new registration)

2. Creating Adequate Charging Infrastructure - Interoperable

The KSEBL would setup the entire charging infrastructure and shall be the power provider for the system. Further it is possible to establish additional battery swapping stations as part of the present petrol bunks itself, which could be taken up jointly by oil companies like BPCL and KSEBL.

Demand aggregation of home and workplace chargers (AC charging) shall be adopted to reduce prices and achieve scale.

Employers shall be incentivized to allow employees charge at subsidized rate.

Energy companies (like IOCL, HPCL, IGL) shall be encouraged to invest in charging networks,

Adoption of renewable electricity source would be encouraged.

Battery swapping infrastructure for 2-wheelers, 3-wheelers and buses will be as per the Standards for battery swapping to be formulated under the policy.

For city buses, depot charging mechanisms will be made based on techno-commercial feasibility and route planning.

State of the art Electric Vehicle Supply Equipment (EVSE) Management Systems will be deployed which will help EV drivers to locate nearest charging/swapping stations, schedule a charging slot, payment settlement etc.

3. Manufacturing in the State

The State is keen to promote manufacturing facilities in the following areas in an attempt to boost localisation of the components/vehicles. The following component manufacturing shall be promoted and they shall be eligible for the incentives under the ESDM and IT Policy

a. Drive Technology

Complete Vehicle: Steps are to be taken for constituting an e-Auto manufacturing facility as collaborative venture under Kerala Automobiles Ltd (KAL) with private sector partners

- b. Electric Drive Train and Power Electronics: This includes the major constituents of the electric drivetrain and power electronics viz., Motor, motor controller and Inverter, On board charger , Power distribution unit , DC/DC converter , Vehicle control unit
- c. Energy Systems and Storage. This includes the Battery management system (BMS), Cell technologies and battery pack assembly and Second life applications for retired batteries
- d. Charging Technology/Mode: The State envisions the adoption of the swappable battery model as a predominant mode of recharging the batteries.

4. Incentives and subsidies for localisation

The manufacturing units' setup for EV shall enjoy all the benefits (financial and regulatory) of manufacturing units applicable under the industrial and IT policies of the State.

Support to local manufacturers to acquire and develop technology and collaborate globally with technology suppliers. A Fund shall be created for technology acquisition for multiple manufacturers in the state.

To support local R&D for development of EV's as per the ESDM policy.

Concession in electricity tariff, property taxes and tax breaks as per IT& ESDM policy

Priority allotment of land and speedy execution of land allotment as per the IT policy

Investment allowance or capital subsidy provisioned in ESDM policy shall be available to EV manufacturers.

Support to the auto-component industry, especially for MSMEs, start-ups and academia. (In alignment with the respective policies)

Setting up of EV clusters where EV and EV component manufacturing can be incentivized through speedy land allotment, availability of reliable supporting infrastructure like roads, power and water.

Pilot Projects and Promotion

1. Creation of E Mobility Zones (pilot regions)

To familiarise the public on the e-mobility aspects and usage and to create initial demonstration hubs select regions will be adopted as e-mobility zones. The potential areas are:

Tourist villages/spots (Kovalam, Munnar etc) - ebikes, e scooters, e-autos

Technology hubs (Technopark/Infopark) - ebikes, e scooters, e-autos

CBD of Trivandrum, Kochi and Kozhikode - e-buses. e-autos, e-scooters

Last mile connectivity for urban transportation networks (eg. KMRL) - ebikes, e-scooters, e-autos

2. Support schemes for early adoption

To create awareness among public about EV's and to promote adoption of the same the following promotional schemes are proposed -

Incentives of Rs 30000 or 25% of the EV whichever is lower for the 3 wheelers that are procured by the public (under the scheme for promotion of EV's), will be only for the initial period of one year. In Thiruvananthapuram, Kochi and Kozhikode Corporation, hence forth permit would be given only for EV Autorickshaw.

other fiscal incentives on EVs such as state tax breaks, road tax exemptions, and free permits to fleet drivers.

Non-fiscal incentives such as exemption for free parking etc.

Subsidized electricity with tariff between Rs. 5-5.5 per unit for EV charging stations.

KSEBL to setup initial charging and swapping stations across vehicle segments. (charging stations 20 each in the initial pilot districts of Trivandrum, Ernakulam and Kozhikode and swapping stations 150 across the 3 districts for 2W/3W/4W. The bus charging stations could be in the depots)

3. Human Capacity Building

1. Centre of Excellence for Electric and Autonomous Vehicles:

The State Government shall establish centres of innovation and excellence for various components of EVs and Autonomous Vehicles (AV) Industry including battery technology, drive train technologies, software development and charging technologies.

2. Curriculum updates for EVs and AVs

The curriculum of the technical schools (in engineering and science) to be updated to incorporate emerging technologies in the industry

3. Skilling Programs for EV & AV industry

Specific skilling programs shall be formed to deliver hands on learning for the graduates and professionals in the areas related to EVs & AVs.

4. Connected and Autonomous vehicle testing corridor:

A state-of-the-art infrastructure for safely testing of autonomous and connected vehicle technologies shall be built in Trivandrum. This Mobility Corridor will be equipped with high-capacity fiber optic cable connecting various road infrastructure.