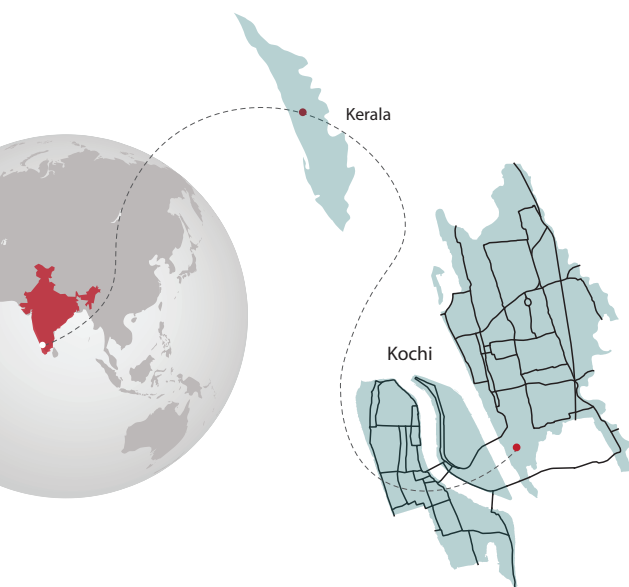




## City Information Note

# Kochi

## EV Readiness



## City overview

Kochi is a major port city in the state of Kerala, located on the western coast of India. The city is known as the “Queen of the Arabian sea” and has been an important spice trading centre since 14th century. It is the most densely populated city in Kerala and is part of an extended metropolitan region and the largest urban agglomeration in Kerala, with a population of 2.1 million. Major industries of fertilisers and chemicals, machine tools and tyres are located in the planning area of Greater Cochin Region, which is witnessing growth outside the municipal limits of Kochi city.

### Demographics



#### Population

6.02 Lakhs (MC),  
20 Lakhs (UA).



#### Area

94.88 sq. km.

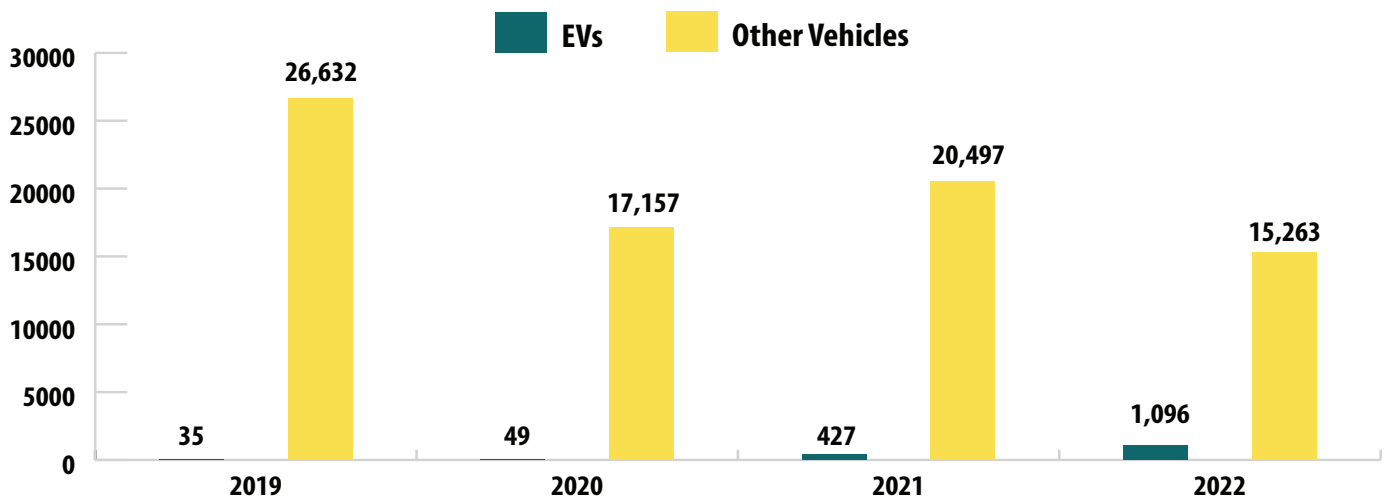


#### City Type

Tier-II

## Vehicles Registered\*

EVs comprise of almost 6.7% of registered vehicles in 2022 which was 0.1% in 2019, illustrating gradual adoption of EVs. The registration trend of EVs vs other vehicles from 2019 to 2022 is as below:



\*Information source: VAHAN Dashboard, accessed on 30 September, 2022

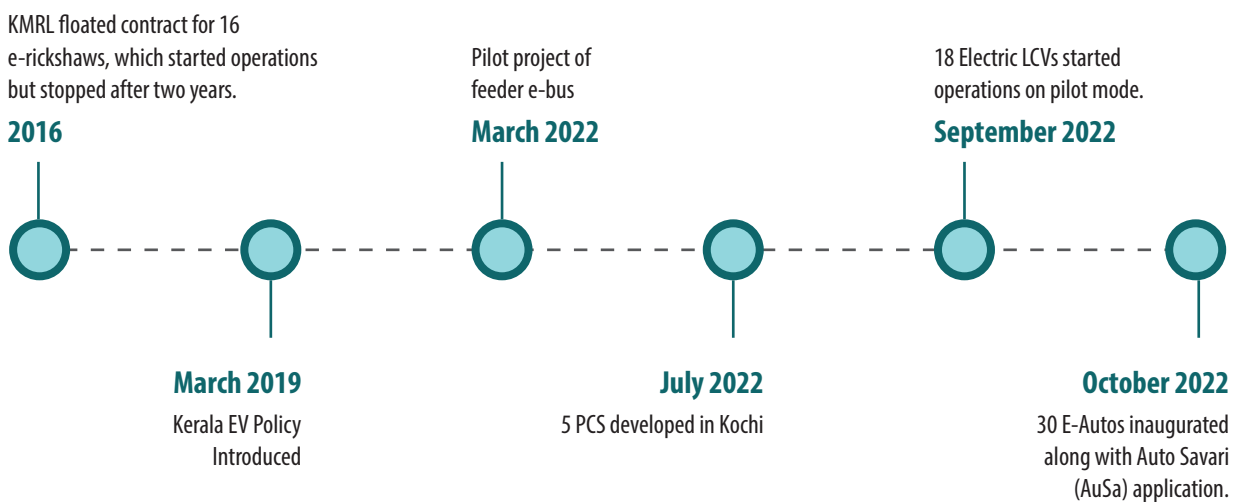
This documentation is a part of the ICLEI South Asia's initiative 'Support Indian cities to take leadership on EVs'. Ten cities including Coimbatore, Gangtok, Kochi, Lakshadweep, Meerut, Nagpur, Panaji, Rajkot, Shimla and Surat were visited and the status of EV transition (till September 2022) was documented.

## Background

The electric mobility revolution is gaining momentum in Indian cities and is being promoted by the central government through various incentives to reduce the country's reliance on fossil fuels and to reduce Greenhouse Gas (GHG) emissions from the transport sector. Indian cities are also aiming to integrate sustainable and low emission alternatives in urban transport. But long-term actions are required for mass adoption of e-mobility in Indian cities. ICLEI South Asia embarked on an initiative to "Support Indian Cities in Taking Leadership on Electric Vehicles (EV)" to aid the cities in identifying priority interventions and to take necessary steps towards an accelerated transition to EVs.

This initiative included several interactions and discussions with the city stakeholders during visits to 10 project cities - Coimbatore, Gangtok, Kochi, Lakshadweep, Meerut, Nagpur, Panaji, Rajkot, Shimla and Surat. Consultations were held with major stakeholders impacting the EV transition in cities, such as advisory groups, industry experts including the advocacy group, charging infrastructure developers, vehicle technology/OEMs and financial institutions. As part of the initiative, the ICLEI South Asia team visited **Kochi on 20th – 21st July, 2022 to interact with the stakeholders and to understand the existing EV transition situation in the city, as well as challenges and opportunities and to suggest a way forward.**

## EV related developments in Kochi











## Key stakeholders

The stakeholders in Kochi associated with the EV transition, with whom interactions were held were:

	Stakeholders	Roles
State Government Stakeholder	Kerala State Electricity Board Limited (KSEBL)	<ul style="list-style-type: none"> <li>Nodal agency for charging infrastructure in the state</li> <li>Ensure that the energy requirement of the city and additional demand for EV charging is met.</li> <li>Provide connectivity to PCS on priority basis, cost of supply to be met by the investors.</li> <li>Set up bulk charging cum swapping stations on its own or on PPP model</li> <li>Finalise the tariff of EV charging</li> </ul>
City Government Stakeholders	Kochi Municipal Corporation (KMC)	<ul style="list-style-type: none"> <li>Land owner- Provide land for charging infrastructure</li> <li>Float tender for development of charging infrastructure.</li> </ul>
	Cochin Smart Mission Limited (CSML)	<ul style="list-style-type: none"> <li>Implement the projects under Smart City Mission in Kochi.</li> </ul>
	Kochi Metropolitan Transport Authority (KMTA)	<ul style="list-style-type: none"> <li>Plan, supervise, coordinate, develop and regulate urban transportation and ensure optimum mobility of people</li> </ul>
	Kochi Metro Rail Limited (KMRL)	<ul style="list-style-type: none"> <li>Kochi Metro planning and operations</li> <li>Last mile connectivity to metro</li> </ul>
	Kleen Smart Bus Limited	<ul style="list-style-type: none"> <li>Bus procurement and operations in Kochi</li> <li>Finalise tariff of e-buses</li> </ul>
	Regional Transport Office (RTO)	<ul style="list-style-type: none"> <li>Registering the vehicles</li> <li>Prioritisation of EVs through single window clearance</li> </ul>
Others	The Department of Town and Country Planning LSGD (Ernakulam)	<ul style="list-style-type: none"> <li>Ensure planned development of urban settlements in the State</li> </ul>
	NGO and Institutions	<ul style="list-style-type: none"> <li>Cater to the technical trainings and capacity building needs of the officials</li> <li>R&amp;D</li> </ul>
	OEMs	<ul style="list-style-type: none"> <li>Manufacture and supply of EVs and parts</li> </ul>

## State EV Policy

Key points of Electric Vehicles Policy for the State of Kerala, 2019 are listed below:

 <p>Approved on 10th March 2019</p>	 <p>EV expo, e-mobility zones (pilot in tourist spots) and fiscal and non-fiscal incentives to encourage users to transition to EVs.</p>
 <p>Target - about 1million EVs on road by 2022 and 3000 buses, 2 lakh two-wheelers, 50000 three-wheelers, 1000 goods carriers, and 100 ferry boats by 2020.</p>	 <p>Capacity building and re-skilling through development of training centres, including EVs and autonomous vehicles (AVs) in curriculum, skilling programme and testing AVs in mobility corridor.</p>
 <p>Incentives for localisation including support to local manufacturers to acquire and develop technology, local R&amp;D, priority land allotment and developing EV clusters (for the manufacture of EVs and its parts)</p>	 <p>Time of the Day (ToD) tariff will be made applicable for all Public Charging Stations (PCS), Bulk Charging Stations (BCS) and all charging infrastructures having Connected Load / Contract Demand above a specific limit.</p>
 <p>Incentives to setup charging stations in existing buildings and all new buildings with more than 10 equivalent car space (ECS) to have 20% EV-ready spots with conduits installed.</p>	 <p>'E-mobility State Level Task Force' set up by the state government to initiate, develop and sustain e-mobility in the state</p>

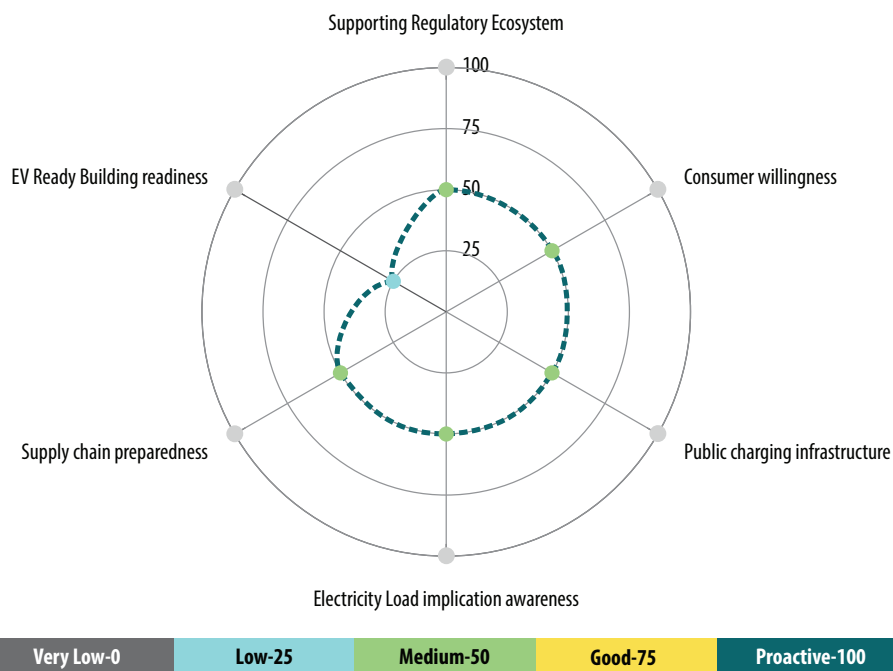
## City- EV related actions-status\*

This information was collected during the city visit through interaction and discussions with the government and private stakeholders related to EVs in Kochi

<p><b>Policy and Advocacy</b></p> <ul style="list-style-type: none"> <li>State level Policy- Yes</li> <li>City level Policy- No</li> <li>Initiatives- Yes</li> </ul>	<p><b>Charging Infrastructure</b></p> <ul style="list-style-type: none"> <li>Public charging stations- yes (11 PCS operational-7 operated by KSEBL/ANERT and 4 by private operators)</li> <li>E-bus charging depot- Yes (1 charging depot for e-buses at Vytilla Bus Depot)</li> </ul>
<p><b>Financial Incentives</b></p> <p><b>State level - Yes</b></p> <ul style="list-style-type: none"> <li>Charging infrastructure - 25% capital subsidy on first 300 charging stations (max. INR 10 Lakhs) and first 50 swapping stations (max. INR 6 lakhs)</li> <li>Subsidy for EV buyer - INR 30000 or 25% of EV (whichever is less) for three-wheeler.</li> <li>Exemption from road tax (for three years), toll charges and free parking</li> </ul> <p><b>City level- No</b></p>	<p><b>Vehicle Technology - Supply chain</b></p> <ul style="list-style-type: none"> <li>Absence of second-hand market for EVs</li> <li>Voltage fluctuations during peak hours while charging EVs</li> <li>Lack of end-of-life solutions for batteries</li> </ul>







## City Readiness

Kochi city's readiness was synthesised after the parameters impacting the EV transition were scored. Twenty-five parameters were listed under six categories- supporting regulatory ecosystem, supply chain preparedness, consumer willingness\*, public charging infrastructure, EV-ready building readiness and electricity load implication awareness. The city was scored on the basis of the information collected during city visits. The readiness of the city was assessed as follows:



\*Consumer willingness has been rated on the basis of the responses of dealers of EV and discussions with the city government officials.

The required push from the city as well as the state government is under process, to encourage users to transition to EVs by developing charging infrastructure, sensitising the users, encouraging EV-ready buildings and by improving grid readiness. The sector-wise observations from the city readiness assessment are:

	The existing regulatory ecosystem requires focus at the city level, in addition to the Kerala state EV policy. The city officials are aware and acknowledge the importance of a planned process for transitioning to EVs.
	Consumer willingness is impacted by the awareness of EV performance, EV charging tariff and charging station locations, this will improve with planned awareness sessions.
	11 PCS already exist in the city, while the locations of public charging infrastructure for three-wheelers are being discussed and will be developed in metro stations and commercial areas, plan to install 100 kerbside charging units on electric light poles by KSEBL.
	The city officials are aware of the expected electricity load implications and are suggesting that the existing grid can cater to the rise in demand due to slow charging in residences. The grid is currently operating at 50-60% capacity. Fast charging infrastructure will require a grid update.
	Development of local repair and maintenance shops will improve the existing supply chain preparedness.
	The readiness and awareness related to EV-ready buildings is low and officials suggest that a mandate in buildings byelaws will be useful. The planning department is currently working on this amendment in the building rules (Kerala Municipality Building Rules and Kerala Panchayat Building Rules).

## Observations

Kochi has taken several initiatives towards electrification, such as development of charging infrastructure, procurement of 9 electric buses by KSBL out of which seven e-buses are operational and the operation of 18 electric freight vehicles and 30 e-autos on a pilot basis in the city. The key challenges identified after visiting the city and interacting with the stakeholders are as follows:



Lack of a strategy to finalise the locations of public charging stations



Absence of a second-hand market for EVs



Voltage fluctuations during peak hours while charging EVs



Lack of parking space in some locations kerbside charging units are planned to be installed



Lack of awareness about EV performance among users and EV-Ready buildings among officials.



Lack of provision for EV charging in building rules



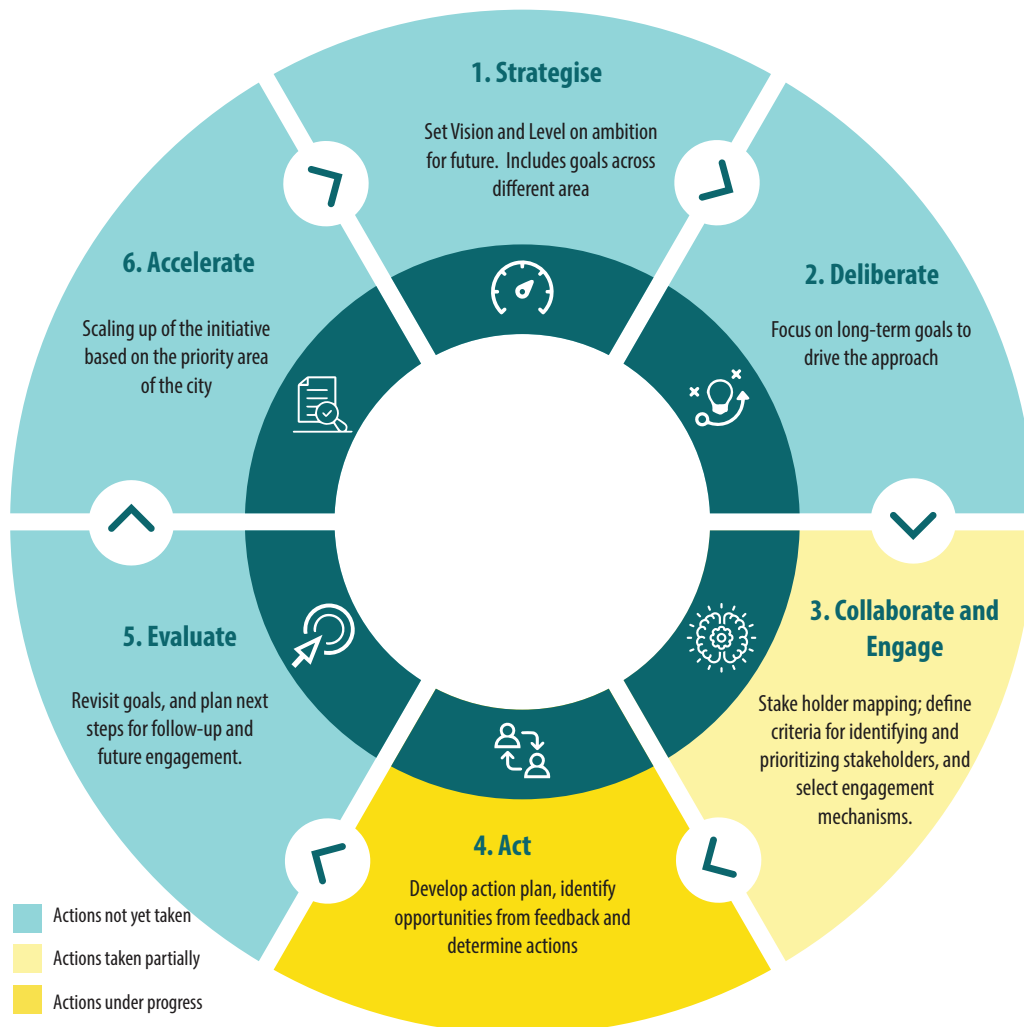
Lack of end of life solutions of EV batteries

## Approach

A series of discussion and consultation with industry experts and advisory group and city stakeholders (during city visit) was conducted to develop the approach for cities. The process is as illustrated below:



The six-step approach which Kochi should preferably follow to address the challenges identified above are as follows:

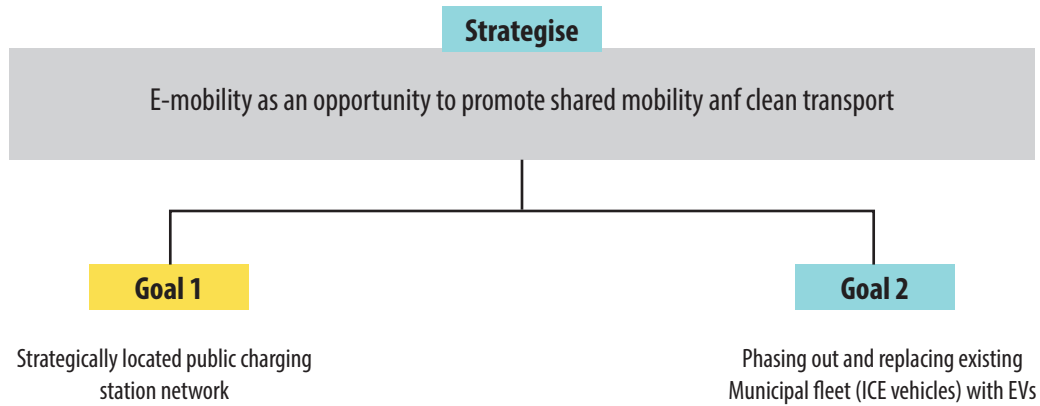


As per discussions, Kochi is currently focusing on the step of 'ACT' as evident from the e-bus, e-LCV and e-auto operations. It is also taking partial actions related to the step of 'COLLABORATE AND ENGAGE' by initiating discussions among stakeholders and departments related to EVs. There is a need to further focus on the other steps of the approach along with a long-term planning of electrification targets.

## Recommendations

The city should appoint a nodal person/ nodal team that leads the EV initiative and is assigned with all the tasks related to EV adoption.

Further, strategically located kerbside public charging stations and phasing out existing municipal fleet with EVs are two priority actions that the city can take to improve users' confidence and accelerate the EV adoption in the city.



Goal 1 - Strategically located public charging station network				
Deliberate	Collaborate and Engage	Act	Evaluate	Accelerate
Location and accessibility	<ul style="list-style-type: none"> <li>KMC</li> <li>KSEBL</li> <li>The Department of Town and Country Planning LSGD</li> </ul>	<ul style="list-style-type: none"> <li>Finalising location as per data-driven analysis of demand</li> <li>Accessibility to the charging locations</li> <li>Guideline for designing the charging station integrating recreational spaces where the users may wait/utilise their time till their vehicle is charged.</li> <li>Fast/slow charger installation decision</li> </ul>	<ul style="list-style-type: none"> <li>Visibility and full time access from roads to the charging stations</li> <li>Utilisation by users</li> <li>Increased EV adoption</li> </ul>	<ul style="list-style-type: none"> <li>Scaling up the charging network to other areas of the city.</li> </ul>
Approvals and additional infrastructure	<ul style="list-style-type: none"> <li>KMC</li> <li>KSEBL</li> <li>The Department of Town and Country Planning LSGD</li> <li>Charge Point Operators (CPOs) and E-Mobility Service Provider (e-MSPs)</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring effective electricity grid readiness</li> <li>Approvals from KMC, KSEBL, Town Planning</li> <li>Additional supporting infrastructure required and its implications on related stakeholders</li> <li>Awareness and capacity building of officials</li> </ul>	<ul style="list-style-type: none"> <li>Well connected and operational setup for EV chargers</li> <li>Improved understanding and awareness among officials and operators about approvals and additional infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Scaling up the charging network to other areas of the city.</li> </ul>
Operation and billing	<ul style="list-style-type: none"> <li>KMC</li> <li>Charge Point Operators (CPOs) and E-Mobility Service Provider (e-MSPs)</li> </ul>	<ul style="list-style-type: none"> <li>Finalise the tariff for charging of EVs</li> <li>Finalising the operational model</li> <li>Operation and maintenance</li> <li>Tariff and tariff collection</li> <li>Safety and security of equipment</li> </ul>	<ul style="list-style-type: none"> <li>Efficient tariff collection</li> <li>Well maintained charging station for public use</li> </ul>	<ul style="list-style-type: none"> <li>Scaling up the charging network to other areas of the city.</li> </ul>

## Goal 2 - Phasing out and replacing existing Municipal fleet (ICE vehicles) with EVs

Deliberate	Collaborate and Engage	Act	Evaluate	Accelerate
Demand analysis	<ul style="list-style-type: none"> <li>● KMC</li> <li>● Third party consultant</li> </ul>	<ul style="list-style-type: none"> <li>● Analyse the existing fleet size, age, performance, emissions</li> <li>● Aim to achieve zero tailpipe emissions in 10 years</li> </ul>	<ul style="list-style-type: none"> <li>● Impact of transitioning the Municipal fleet from ICE vehicles to EVs</li> </ul>	<ul style="list-style-type: none"> <li>● Reduce the tail pipe emissions from the municipal fleet by 100%</li> </ul>
Supporting infrastructure and approvals	<ul style="list-style-type: none"> <li>● KMC</li> <li>● KSEBL</li> <li>● The Department of Town and Country Planning LSGD</li> <li>● Charge Point Developer and Operators (CPOs) and E-Mobility Service Provider (e-MSPs)</li> </ul>	<ul style="list-style-type: none"> <li>● Finalise the location for charging</li> <li>● Approvals from KSEBL, Town Planning department,</li> <li>● Awareness related to additional power infrastructure required (if any) and attached financial obligations</li> </ul>	<ul style="list-style-type: none"> <li>● Improved awareness and capacity related to supporting infrastructure development and approvals</li> </ul>	<ul style="list-style-type: none"> <li>● Develop supporting infrastructure for the Municipal fleet</li> </ul>
Demand aggregation for bulk purchase	<ul style="list-style-type: none"> <li>● KMC</li> <li>● KSEBL</li> <li>● Charge Point Developer and Operators (CPOs) and E-Mobility Service Provider (e-MSPs)</li> <li>● Third party consultant</li> </ul>	<ul style="list-style-type: none"> <li>● Develop an action plan for phasing out and replacing existing fleet with EVs</li> <li>● Awareness and capacity building of operators and drivers of municipal fleet</li> <li>● Strict norms for emissions</li> <li>● Battery repurposing, recycling or other end-of-life solutions</li> <li>● End-of-life solutions for existing fleet</li> <li>● City scoring to improve adoption of EVs</li> </ul>	<ul style="list-style-type: none"> <li>● Pilot projects for improving confidence in EVs</li> </ul>	<ul style="list-style-type: none"> <li>● Phasing out and replacing the existing ICE vehicles in Municipal fleet with EVs</li> </ul>

## Way Forward

Kochi should have a clear set of targets and prioritise on the following actions for accelerate EV adoption:



Strategically located public charging station network



Phasing out and replacing existing IPT with EVs



Amendment in building rules with provision of EV-ready building



Analysis to understand for expected rise in electricity demand



Renewable energy based generation of electricity for charging EVs



Awareness programme for sensitisation of users



R&D related to development of second hand market for EVs



End-of-life solutions for EV batteries

### Acknowledgement

ICLEI South Asia would like to express its sincere gratitude to the officials from Kochi Municipal Corporation (KMC), Kerala State Electricity Board Limited (KSEBL), Kochi Metropolitan Transport Authority (KMTA), Cochin Smart Mission Limited (CSML), Kochi Metro Rail Limited (KMRL), Klean Smart Bus Limited (KSBL), RTO Kochi, Department of Town and Country Planning LSGD (Ernakulam) and OEMs in Kochi for their insights and guidance. The inputs from the Advisory Group members were crucial in finalizing the document.

### Disclaimer

This document includes preliminary recommendations and the way forward, based on interactions, fieldwork and background research. A detailed report, with recommendations, has been developed for Kochi.

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