UITP
ADVANCING PUBLIC TRANSPORT

3rd UITP INDIA BUS SEMINAR
E-MOBILITY AND TECHNOLOGY INNOVATION

Session II
An electric solution for urban bus networks - Global Case Studies

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Government of India is targeting a fully electric fleet for public transport, including buses, taxis and auto-rickshaws under the second phase of FAME India scheme. Department of Heavy Industries (DHI) emphasised that public transport should be 100 percent electric, as it will help to reduce pollution to a great extent. The government has sanctioned 40 buses each to nine big cities (Delhi, Ahmedabad, Bengaluru, Jaipur, Mumbai, Lucknow, Hyderabad, Indore and Kolkata), while Jammu and Guwahati received subsidy for 15 buses each. There is need to learn from international experience for the implementation of electric bus operation in India.

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SESSION II - An electric solution for urban bus networks - Global Case Studies

Chairperson - Ananda Rao

Executive Director
Association of State Road Transport Undertakings (ASRTU)

Time	Title
12:00 – 12:05	**Opening Remark by Chairperson**
12:05 – 12:20	**Implementation of Electric Buses in China – Key Lessons** Paul Bromley, Partner, Phoenix Business Consulting
12:20 – 12:30	**Electrification of Public Transport – from Pilots to Rollout** Pihlatie Mikko, Research Team Leader, Project Manager, VTT Finland
12:30 - 12:40	**Charging supporting infrastructure** Sajid Mubashir, Scientist, Department of Science & Technology, Ministry of Science & Technology
12:40 – 12:50	**Grid connectivity** Pankaj Batra, Office of Member (Planning), Central Electricity Authority
12:50 – 13:00	**Deployment of Electric Buses in Indian Cities** Ankit Singhvi, President, Electric Mobility Alliance (EMA)
13:00 – 13:15	**Questions & Answers**

Ananda Rao
Executive Director
Association of State Road Transport Undertakings (ASRTU)

Chairperson

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1. **BIOGRAPHICAL NOTE:**

1. **BIOGRAPHICAL NOTE:**

Shri Ananda Rao is working as The Executive Director, Association of State Road Transport Undertakings (ASRTU), an Apex body of all the State Road transportation Undertakings across the country. He has served in various positions in Karnataka state Road Transport Corporation handling important responsibilities, particularly in the fields of Engineering & Environment conservation in Transport sector.

He has presented National and International papers on Transport related issues with special emphasis to Environment Safety and climate change. He has been associated with formulation of number of important projects including development of Parking policy, non-mechanized transport, intermodal bus terminals etc. for the preparation of the state of Environment Report for Bangalore City and Karnataka State for the Transport Sector. He has presented technical paper on the Innovative trials relating to development of Alternate fuel and Energy projects in the country. He was instrumental for implementation of the ITS and IES project funded under the SUTP assisted GEF - World Bank for the city of Mysore, Karnataka State.

He has been instrumental in formulating several Transport related programmes & policies, including Ethanol blended Diesel, Bio Diesel and exhaust after treatment systems (SCR-DPF) / AD BLU for bus application in the country. He holds Bachelors in Mechanical Engineering and Master Degree in Traffic Environment and Safety Management from Sweden.

Paul Bromley
Partner
Phoenix Business Consulting

Implementation of Electric Buses in China – Key Lessons

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2. BIOGRAPHICAL NOTE:

A Chartered Engineer who graduated from Loughborough University in the UK with a degree in Automotive Engineering & Design and has now been based in Hong Kong for 13 years. He has previously worked with Bedford, Goodyear, Plaxtons, Leyland Trucks, Green Dynamic Electric Vehicles as well as Alexander Dennis and it's predecessor companies.

With 30 years' industry experience including a variety of senior roles such as New Product Introduction Manager, Test & Development, Product Manager for truck and bus, Head of Engineering and Chief Technical Officer has career conceived, championed and overseen the successful launch of many groundbreaking products such as the Dennis Dart, Rapier Fire Truck, Trident 2-axle and 3-axle double deck & Enviro500 buses.

Having worked on diesel emissions reductions programmes and CNG projects previously as well as leading the introduction of hybrid buses into Hong Kong Paul has spent the past 3 years working on the wider introduction of e-vehicles across the Asia market from minivans, minibuses through to heavy duty vehicles sourced from both China and elsewhere.

3. Abstract

Apart from the regular pressures the bus operating industry faces, with the rapid increase in urbanisation which increases concerns about urban air quality, particularly at the roadside, there is a strong demand for the vehicle suppliers to deliver zero emissions vehicles.

We will initially talk briefly about the background of electric vehicle technology and how it has effectively declined for over 100 years until the more recent large adoption of electric vehicles primarily within the China market.

However, given the particular demands and constraints upon the Chinese market, whilst this has achieved a strong local adoption, for this growth to extend outside of the PRC will take understanding of the market conditions therein and how it needs to be adapted for the wider global market. This implies consideration not just about government subsidy but also about policy support and technological innovation to accelerate the wider spread adoption of electric buses.

With an objective assessment of the experience gained with electric bus operation in the PRC and future technologies this presentation aims to demonstrate the potential for the evolution of e-bus operation within future cities for a zero-emissions solutions.

Pihlatie Mikko
Research Team Leader, Project Manager
VTT Finland

Electrification of Public Transport – from Pilots to Rollout

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1. BIOGRAPHICAL NOTE:

Dr. Mikko Pihlatie, Senior Scientist. He holds a D.Sc (Tech) from Aalto University in the field of engineering physics and has several years of international experience in nuclear and fuel cell materials research.

He is project manager at VTT and his current research is mostly related to materials in electrochemical energy conversion systems, including high temperature corrosion of metallic SOFC components, protective coatings, chromium evaporation, stack development and cell testing, as well as Li ion batteries and battery systems.

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Sajid Mubashir
Scientist, Department of Science & Technology
Ministry of Science & Technology

Charging supporting infrastructure

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1. BIOGRAPHICAL NOTE:

Mr. Sajid Mubashir is Scientist G in Department of Science & Technology. He is currently engaged in developing a technology program to support the electric mobility mission, and chairs the committee of the Bureau of Indian Standards (BIS) to develop the EV Charging Standards for the country. He has been engaged with the effort to develop Technology programs in the automotive sector in a public-private-partnership mode for research and development for almost 15 years now. The first effort was called the Collaborative Automotive Research Program, subsequently he moved to the Department of Heavy Industries as the Member Research & Development at the National Automotive Board and participated in the FAME-1 program of DHL. With this background of having close interactions with the technology leaders in the automotive sector, Mr Mubashir is now attempting to carry out the mandate set by the Niti Ayog for developing Indian standards for the electric vehicle charging infrastructure. In this workshop by DIMTS & UITP, he would attempt to explore the potential for creating a design group for electric bus charging infrastructure.

2. Abstract

NITI Aayog has decided to develop indigenous Indian standards for AC & DC charging of Electric Vehicles. The Indian Standards would provide a level playing field to all the manufacturers & take into consideration Indian climatic and on-ground conditions like temperature, humidity and other parameters such as grid conditions, public safety etc. Meanwhile, till the time these standards are developed and notified, the car manufacturers and charging stations provider can opt for any of the existing global standards. To promote "Make In India" campaign, charging points complying to Indian Standards should mandatorily be provided, for every charging point of any other standards. Fiscal assistance to the charging station/service provider would be for deploying chargers compliant to Indian standards. **In the case of Electric Buses, the issue of Charging Standards and devices are not yet clear. We could aim to separate the EV Bus purchase decision to be independant of the charger preferred by the supplier. The decision has to rest with the Bus Company, and uniform national standards would be helpful in this regard.**

Pankaj Batra
Office of Member (Planning)
Central Electricity Authority

Grid connectivity

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1. BIOGRAPHICAL NOTE:

Shri Pankaj Batra is Member (Planning) in the Central Electricity Authority (CEA), and ex-officio Additional Secretary to the Government of India and oversees various policy and planning functions, including Electric Power Survey Report on long term demand forecasting, National Electricity Plan on generation planning, coal and gas supply to power stations, renewable sources of energy, etc.

He hasworked as Chief (Engineering) in Central Electricity Regulatory Commission (CERC) formulating various Regulations,including various provisions related to wind and solar power inthe revised IndianElectricity Grid Code. He also started the Division on Regulatory Affairs in CEA and worked in Financial and Commercial Appraisal of power generation and transmission projectsin the CEA, and various financial and commercial matters. He was involved in making theStandard Bidding documents for procurement of generation and transmission services, Tariff Policy and National Electricity Policy, etc.

He did his B.Tech in Electrical Engineering, Diploma in Systems Management, Diploma in Financial Management and Diploma in Public Speaking.

Ankit Singhvi
President
Electric Mobility Alliance (EMA)

Deployment of Electric Buses in Indian Cities

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1. BIOGRAPHICAL NOTE:

Ankit Singhvi is Founder and Mangaging Director of NN4Energy. He is also President of Electric Mobility Aliance (EMA). Prior to this, he served as General Manager of Business Development at SunBorne Energy Services India Private Limited. Mr. Singhvi joined SunBorne from McKinsey & Co, where he has focused on energy and power sectors across the value chain from generation to distribution. At McKinsey, he engaged leading US utilities in developing strategies to manage their CO2 emissions from renewable energy generation, heat rate improvements to energy efficiency. Earlier at ITC Limited, he managed operations involving technology commercialization and new product manufacturing on the shop floor.