AGENDA: STATUS UPDATE ON FIELD DEMONSTRATION OF V2G/V2H AND ON STUDY "IMPLEMENTATION OF VEHICLE-TO-EVERYTHING (V2X) IN INDIA"

Venue: **MS Teams**

Date: **28th May,2024**

Time: 3:00 pm to 5:00 pm (IST)

Agenda Items

Time (hrs)	Description	Speaker
15:00 – 15:05	Opening Inaugural Remarks	*Prof. Shireesh Kedare, Director, IIT Bombay*
15:05 – 15:10	Keynote address	*Shri A.K Rajput, Member Power systems, CEA, Ministry of Power*
15:10 – 15:45	Dissemination of V2X study findings and status update on V2G/V2H field trials	*Prof. Zakir Rather IIT Bombay*
15:45 – 16:45	Panel Discussion on V2G Technology and its Adoption	*Panelist* *1. Mr. Bjoern Christensen (Next Dimension)* *2.Prof. Mattia Marinelli (DTU)* *3. Mr. Ramkrishna Singh (TATA Power)* *4.CEA representative* *Moderator* Prof. Zakir Rather
16:45 – 16:55	Q&A	*Open to all*
16:55 – 17:00	Vote of thanks	*Ms. Ruchi Kushwaha (IIT Bombay)*

Brief Description on V2X Field Trials:

Grid Integration Lab(GIL), IIT Bombay is conducting two pilot field demonstrations : V2X(V2L,V2H,V2B) and V2G technologies, demonstrating how vehicles can efficiently interact with grid, home, load etc. These field demonstrations, for the first time in India offer real life insights into the potential of V2X (V2G, V2H, V2L) applications in Indian context. Through these trials, GIL IIT Bombay is exploring how such emerging technologies could contribute to smart, efficient, and sustainable mobility solutions. To stay tuned about the progress of the V2G, V2H field trials, interested persons may visit 'V2G Field Trials' tab of Grid Integration Lab IIT Bombay website.

Brief Description of the study:

Climate change is considered as the 'biggest threat modern humans have ever faced', with profound implications across multiple sectors. To address the climate issue, the transportation sector is gradually transitioning from conventional internal combustion engine-based vehicles to battery-powered electric vehicles (EVs). However, charging the load of EV batteries introduces additional stress on the electricity distribution grid. As the proportion of EVs in the distribution system rises, the impact of EV charging on distribution system may become significant. While EV integration can introduce several technical challenges, such as impact on voltage, increased losses, congestion, power quality and unbalancing issues, the EV charging technology can be potentially managed to not only minimize the grid impacts, but also exploited to help the distribution system

management in several ways. V1G (managed charging), which can control the charging rate of vehicles to ease stress on the grid, and V2X, which is the bidirectional flow of power from/to the vehicle. Such solutions can assist utilities in meeting the problem of maintaining network resilience in the presence of significant EV penetration.

This study "*IMPLEMENTATION OF VEHICLE-TO-EVERYTHING (V2X) IN INDIA*" is primarily focused on a detailed technical review and market survey of V2X technology, and techno economic analysis backed recommendations for V2X adaption in Indian context. The review of V2X technology includes a detailed review of bidirectional charging technology and EVs. The system architecture which involves the interaction between different stakeholders of V2X, the communication infrastructure, and the roles and responsibilities of different stakeholders for implementation of different V2X use cases has been also critically analyzed in this study. These use cases include the utilization of V2X for peak load management, increased renewable energy (RE) integration, voltage and frequency support, vehicle to home (V2H), vehicle to building (V2B), vehicle to load (V2L), etc.

A detailed analysis, for gaining an understanding of the technical know-how of V2X has also been performed in this study, followed by techno-economic analysis to determine viability of V2X implementation in the Indian context. This study is expected to play a key role in determining techno-economic gaps including the policy and regulatory issues that need to be addressed for smooth V2X roll-out in India. The study finally provides recommendations to promote the growth of V2X in the Indian EV ecosystem.

About Reports

The outcome of the study is documented in a series of technical reports. Each of these reports cover different aspects of V2X in a structured manner for effective, organized, and easy dissemination of the study outcome.
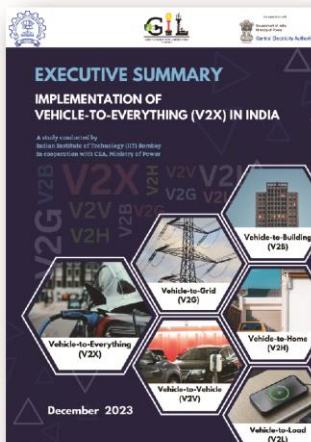
Executive Summary

Implementation of Vehicle-to-Everything (V2X) in India
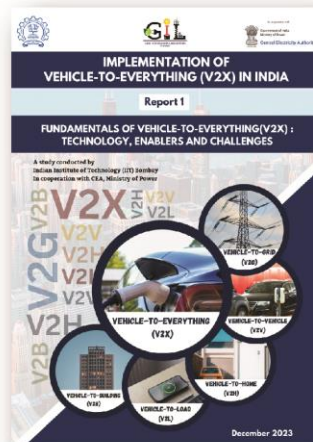
Report 1

Fundamentals of Vehicle-to-Everything (V2X): Technology, Enablers and Challenges
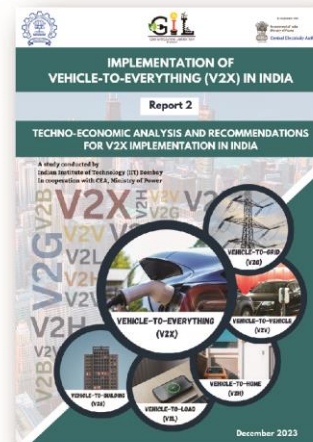
Report 2

Techno-economic analysis and recommendations for V2X implementation in India