



SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution)

COIMBATORE-35

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UNIT V: BUSINESS

TOPIC: **V2B , V2H**



Introduction

- Overview of V2X (Vehicle-to-Everything) technology.
- Importance of sustainable energy solutions.
- Role of electric vehicles (EVs) in energy management.
- Focus on V2B and V2H applications.

What is V2B?

- Definition: Vehicle-to-Building (V2B) involves using an EV's battery to supply energy to buildings.
- Key Features:
 - Energy cost savings by offsetting peak demand.
 - Support for renewable energy integration.
 - Enhances building resilience during power outages.
- Example: Powering commercial buildings, schools, or offices during emergencies or high-demand periods.

What is V2H?

- Definition: Vehicle-to-Home (V2H) allows EVs to supply energy directly to residential homes.
- Key Features:
 - Backup power during outages.
 - Reduced electricity bills by utilizing stored energy during peak hours.
 - Supports smart home energy management systems.
- Example: Using an EV to power essential appliances during a grid outage.



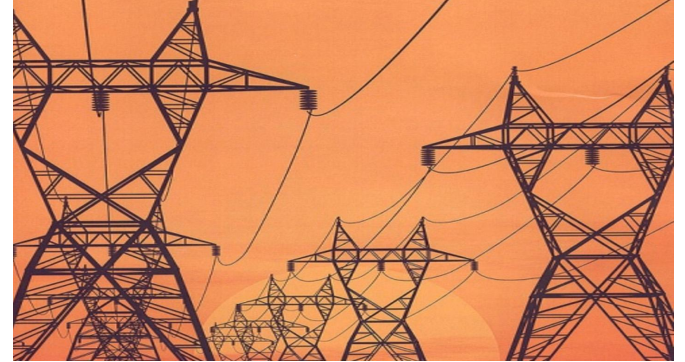
How V2B and V2H Work

- Bidirectional charging technology enables energy flow between EVs and buildings/homes.
- Key Components:
 1. EV with bidirectional charging capability.
 2. Bidirectional charger or inverter.
 3. Energy management system (EMS).
- Process Overview:
 1. Energy stored in the EV battery.
 2. Energy transferred to building/home as needed.
 3. Grid synchronization to maintain stability.



Benefits of V2B and V2H

- Cost Savings:
 - Reduced peak demand charges.
 - Lower reliance on grid electricity.
- Sustainability:
 - Better integration of renewable energy.
 - Reduced carbon footprint.
- Energy Resilience:
 - Backup power during outages.
 - Enhanced grid stability.
- Optimized Energy Usage:
 - Demand response programs.
 - Smart load balancing.





Challenges and Limitations

- High Initial Costs:
 - Expensive bidirectional chargers.
 - Advanced EV models required.
- Battery Degradation:
 - Frequent charging/discharging impacts battery life.
- Regulatory and Technical Barriers:
 - Lack of standardized protocols.
 - Grid compatibility issues.
- Awareness and Adoption:
 - Limited public knowledge and acceptance.



Case Studies and Examples

- Example 1: V2B Implementation in a Commercial Building
 - Location: [Specify location if known]
 - Results: Reduced peak energy costs by 25%.
- Example 2: V2H Backup Power Usage
 - Scenario: Power outage during a storm.
 - Results: Powered essential appliances for 12 hours.
- Leading Companies:
 - Nissan's Leaf-to-Home systems.
 - Tesla's Powerwall integration.





Future Prospects

- Advancements in EV battery technology.
- Wider adoption of renewable energy sources.
- Development of smart grids and V2X standards.
- Government incentives for V2B and V2H technologies.
- Potential integration with IoT and AI for smarter energy management.



Conclusion

- V2B and V2H are transformative solutions for energy sustainability and resilience.
- They unlock the potential of EVs beyond transportation.
- Collaboration among stakeholders is essential for overcoming challenges.
- The future is promising with advancements in technology and policy support.



...THANK YOU