IEEE I&CPS — ASIA 2026

2026 IEEE IAS Industrial and Commercial Power System Asia

July 11-14, 2026 | Kunming, China

Special Session 10

Vehicle-Storage-Grid System Interaction Optimization and Control

Introduction and Topics

The large-scale integration of electric vehicles (EVs) and distributed energy storage systems (DESSs) is fundamentally reshaping modern power distribution networks. While offering flexibility and decarbonization potential, the uncoordinated operation of EVs and storage units introduces significant challenges, including voltage violations, feeder congestion, and accelerated battery degradation. Effective interaction among vehicles, storage, and the grid—forming a Vehicle-Storage-Grid (VSG) system—is therefore critical for achieving both economic and technical efficiency.This VSG framework requires a holistic approach that spans battery system lifecycle management (from health-aware charging to second-life utilization), steady-state distribution network optimization (e.g., voltage control and loss minimization), and real-time bidirectional power coordination. Unlike conventional grid-to-vehicle (G2V) approaches, advanced VSG control strategies enable vehicle-to-grid (V2G) and storage-to-grid (S2G) services, transforming EVs and stationary batteries into active grid-supporting assets. However, practical implementation faces key challenges: balancing battery aging constraints with grid service revenues, ensuring voltage stability under high renewable penetration, and coordinating heterogeneous distributed resources with low communication overhead.

Topics including but not limited to:

1. Coordinated voltage regulation in distribution networks using EV and storage flexibility under steady-state conditions
2. Health-aware V2G/V2H (vehicle-to-home) strategies that integrate battery degradation models into dispatch optimization
3. Data-driven and distributed control (e.g., multi-agent reinforcement learning, ADMM) for VSG systems
4. Second-life battery integration from retired EV packs into stationary storage for grid support
5. Economic and market frameworks for aggregated VSG resources participating in ancillary services

Special Session Chairs

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Paper Submission

Submission Method

* View paper submission instruction on website
https://www.ieee-icps.com/sub.html

* Submit your paper through the website or QR code
https://easychair.org/conferences/?conf=ieeeicpsasia2026

Important Dates

Submission Deadline	April 30, 2026
Notification Deadline	May 31, 2026
Early-bird Registration Deadline	June 15, 2026
Author Registration Due	June 15, 2026

Publication

Submissions to IEEE I&CPS 2026 will be peer reviewed on the basis of technical quality, relevance to conference topics, originality, significance, clarity, etc. Accepted papers will be submitted for inclusion into IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements.

Excellent papers will be recommended for review by **IEEE Trans on Industry Applications** (proportion can reach up to 50%), **Global Energy Interconnection** and **DeCarbon**.

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