



# ANSI Summary of US-China Exchange on EV Standardization

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Battery Technology Workshop

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# Background - Why the Need for a U.S. Standardization Roadmap for EVs?



- Many U.S. based standards developing organizations (SDOs) produce globally relevant standards following an open, consensus-based process (SAE, UL, NFPA, IEEE, and others)
- A standardization roadmap would . . . Maximize coordination among SDOs and provide guidance on standards participation and progress
- Enable the U.S. to speak more coherently with international partners in policy and technical discussions regarding EVs
- Help achieve government policy objectives: reduced petroleum consumption and greenhouse gas emissions, energy independence and security, and enhanced economic growth
- Foster the dissemination of safe, interoperable technology for EVs and charging infrastructure, and respond to consumer expectations

# Background - ANSI's Role



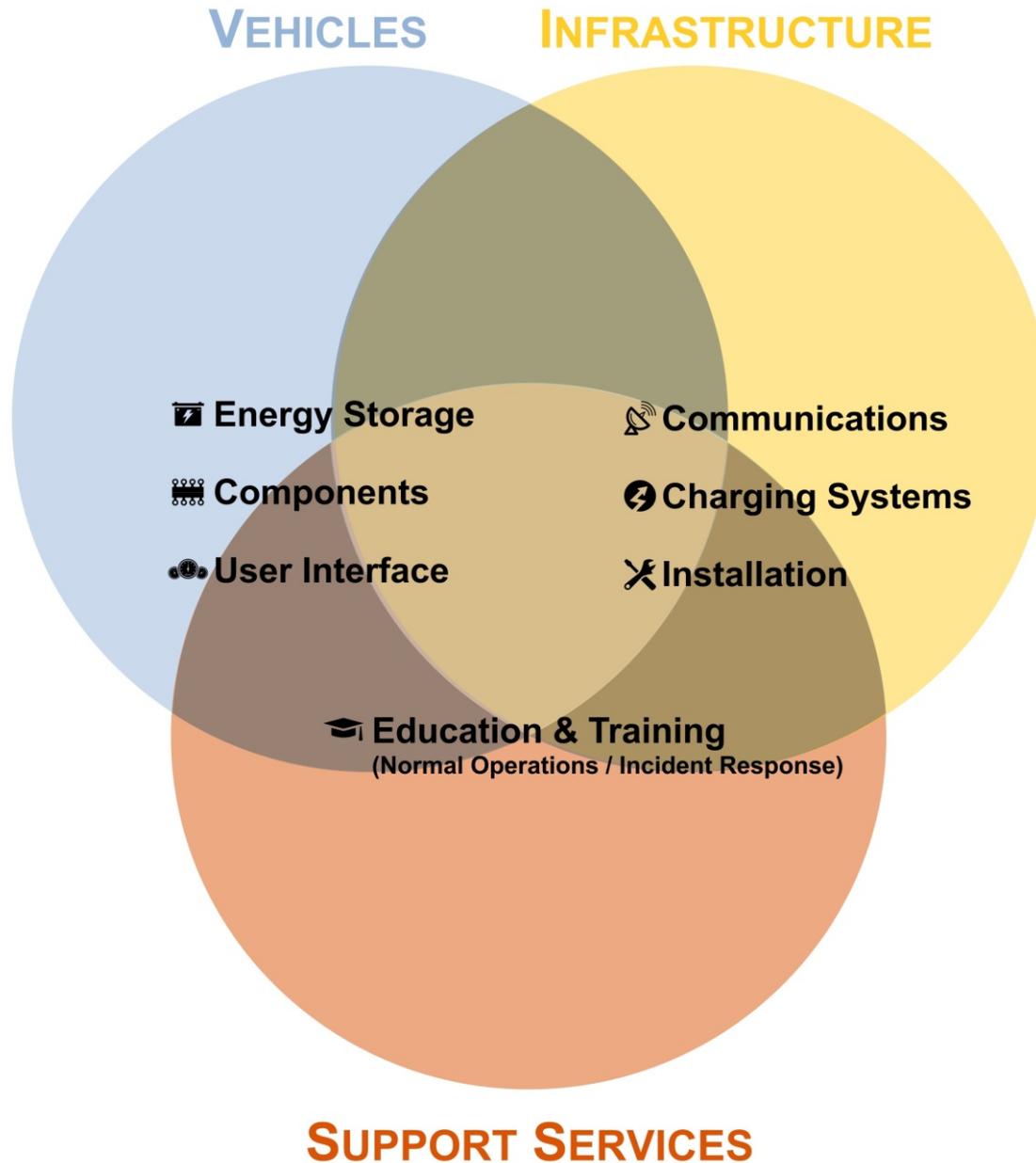
- ANSI uniquely positioned to facilitate public-private partnership needed to ensure EV standards and technology are safe and effective
- ANSI serves as administrator and coordinator of U.S. private sector voluntary standardization system
- ANSI is the U.S. member of the International Organization for Standardization (ISO) and, via the U.S. National Committee, the International Electrotechnical Commission (IEC)
- ANSI is a neutral forum where standards coordination issues can be addressed
- ANSI has provided such coordination services in other industry sectors where it was needed

# ANSI EVSP



- In March 2011 ANSI formed the Electric Vehicles Standards Panel (ANSI EVSP)
  - 80 private and public sector organizations involved from automotive, utility, electrotechnical industries, SDOs, government agencies
  - Strictly a coordinating body; it does not develop standards
- Mission: To foster coordination and collaboration on standardization matters among public and private sector stakeholders to enable the safe, mass deployment of electric vehicles and associated infrastructure in the U.S. with international coordination, adaptability and engagement

# Roadmap Structure



# Roadmap Released - 23 April 2012



- *Standardization Roadmap for Electric Vehicles, Version 1.0*
  - Free Download at [www.ansi.org/evsp](http://www.ansi.org/evsp)
- Identifies standards, codes, and regulations that exist or that are in development, gaps where new or revised standards are needed, related conformance and training programs, and harmonization efforts
- Includes prioritized timelines for when standardization should occur and identifies SDOs that may be able to do the work
  - Priorities based on acuteness of risk and current work in progress
- Focus is on-road plug-in EVs, both battery electric and plug-in hybrids, charging systems and associated support services for U.S. market
- *ANSI EVSP Standards Compendium*, a searchable spreadsheet of standards related to issues identified in the roadmap

# Roadmap Conclusions



- 365 standards identified from 34 organizations (including voluntary standards, mandatory codes and regulations)
- Many SDOs are involved and many are U.S.-based
- 36 gaps or partial gaps identified
  - A “gap” means no standard or conformance program currently exists to address a safety, performance, or interoperability issue
  - 22 are near-term priorities (should be addressed in 0-2 years)
  - 12 are mid-term priorities (should be addressed in 2-5 years)
  - 2 are long-term priorities (should be addressed in 5+ years)
- 16 issues where no gap identified

# Near-Term Priorities (0-2 years)



- Delayed battery overheating events
- Safe storage of li-ion batteries
- Packaging/transport of waste batteries
- Audible warning systems
- Graphical symbols
- Wireless charging
- Battery swapping - safety
- Battery swapping - interoperability
- Power quality
- EVSE charging levels
- Off-board charging station / portable EV cord set safety in North America



## Near-Term Priorities (0-2 years) (contd.)

- EV coupler safety in North America
- EV coupler interoperability globally
- Conformance programs for EV coupler interoperability in the U.S.
- Vehicle as supply / reverse power flow
- Use of alternative power sources
- Charging of roaming EVs between EV service providers
- Access control at charging stations
- Communication of standardized EV sub-metering data
- Vehicle emergency shutoff, labeling of high voltage batteries, power cables, disconnect devices
- Labeling of EVSE and load management disconnects
- Safe battery discharge / recharge in emergencies



## Mid-Term Priorities (2-5 years)

- Terminology
- Power rating methods
- Loss of control/dual mode failure in battery
- Battery performance parameters/durability testing
- Battery packaging/transport to workshops/battery swapping stations
- Off-board charger safety within North America
- Off-board charger, off-board charging station and portable EV cord set safety globally
- EV coupler safety globally
- Locating and reserving a public charging station
- Guarding of EVSE
- Accessibility for persons with disabilities to EVSE
- Cable management

# Long-Term Priorities (5+ years)

- Battery recycling
- Battery secondary uses



# 23 July 2012 Workshop in Beijing



- Sino-U.S. Workshop on New Energy Standardization:  
*Technical Exchange on Electric Vehicle (EV) Standardization*
- Organized by:
- China Association for Standardization (CAS)
- American National Standards Institute (ANSI)



## Participating Organizations - US

- American National Standards Institute (ANSI)
- U.S. Department of Commerce
- Better Place
- Qualcomm
- General Motors
- Magna E-car
- Underwriters Laboratories Inc.
- Intertek
- SAE International

# Participating Organizations - China



- China Association for Standardization (CAS)
- Standardization Administration of the People's Republic of China (SAC)
- China Automotive Technology and Research Center (CATARC)
- SPX Mechanical and Electrical Products (Suzhou) Co., Ltd.
- Volkswagen Group China
- Beijing Polytechnic EV National Engineering Laboratory
- Guodian United Power Technology Company Limited

# Topics Covered



- Opportunities for Cooperation
- Standardization Roadmaps (U.S. and China)
- Battery Swapping
- Wireless Charging
- Electric Vehicle Supply Equipment
- Conductive Charging
- Propulsion Systems
- Safety of EV Infrastructure and Batteries
- Testing and Certification
- Vehicle-to-Grid Communications
- Hydrogen Fuel Cell Vehicles
- Wind Energy Standardization

# Workshop Proceedings



- ANSI press release / photos  
[http://www.ansi.org/news\\_publications/news\\_story.aspx?menuid=7&articleid=3319](http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=3319)
- Electronic version of workshop book / presentations  
[http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/International%20Standardization/Regional/Asia%20Pacific/China/China\\_EV\\_WorkshopBook\\_20120723.pdf](http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/International%20Standardization/Regional/Asia%20Pacific/China/China_EV_WorkshopBook_20120723.pdf) (Note before clicking: 58 MB file)

# China Roadmap Overview (CATARC)



- China has 56 recommended EV standards (national standards and industry standards) for BEVs, HEVs, FCEVs, electric motorcycles, energy storage, electric motors/controllers, charging and communication
- MIIT requires that EVs meet 26 special test standards
- 24 technical elements are evaluated within the broad categories of whole vehicle performance and safety, electric machine systems, electronic control systems, energy storage, and infrastructure
- Constantly working to improve EV standards and standards system to promote technical progress and industrialization
- International cooperation with US, Germany, Europe, Japan
- Participant in ISO, IEC & WP.29 work on global technical regulations

# Overarching Workshop Messages



- Sharing information promotes understanding of EV technologies
- We learned a lot - excellent presentations
- Already a lot of technical cooperation underway
- Doors have been opened for future collaboration
- Mutual exchange of EV standards and technology information between U.S. and China should continue
- Bilateral participation in meetings would help to facilitate harmonization and avoid divergent solutions and non value added costs

# Overarching Workshop Messages (contd.)



- It is less expensive to work together now than to have to harmonize later
- Example from General Motors: If we do not harmonize charging standards . . .
- Vehicle OEMs need to package different charge receptacles and have different vehicle controls and communications software and hardware
- Infrastructure cannot be shared by different vehicles
- Costs are higher (vehicle and infrastructure) with no benefit to customers

## Next Steps



- ANSI EVSP is working to promote the U.S. standardization roadmap and tracking implementation of its recommendations
- We welcome comments from China on the roadmap
- ANSI EVSP participation is open to non-U.S. based organizations that have operations in the U.S.
- The roadmap will be updated as standardization work progresses with a targeted release of Version 2.0 in or about April 2013

## Next Steps (contd.)



- This is a critical time in the development of EV technology and standards, where decisions that are made today will affect the market for EVs for years to come
- It is mutually beneficial for the U.S. and China to continue to work together on EV standardization issues
- We are planning a similar technical exchange on EV standardization with CEN CENELEC in Europe in November on opportunities for transatlantic cooperation and harmonization
- We welcome your input on continued opportunities for collaboration

Thank You!



Questions? Comments?



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