



Reincarnation and Evolution of the Electric Vehicle

SAE PEV Communication Task Force Status

Major Documents and Functions

- J2836TM - Use Cases
- J2847 – Corresponding Requirements (to use cases)
- J2931 – Communication Requirements
- J2953 - Interoperability

Summation of SAE Communication Standards

J2836™ – General info (use cases)

Dash 1 – Utility programs *

Dash 2 – Off-board charger communications

Dash 3 – Reverse Energy Flow

Dash 4 – Diagnostics

Dash 5 – Customer and HAN

Dash 6 – Wireless charging/discharging

J2847– Detailed info (messages)

Dash 1 – Utility programs *

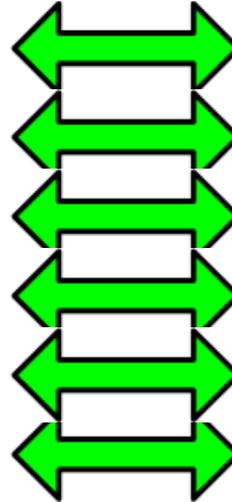
Dash 2 – Off-board charger communications

Dash 3 – Reverse Energy Flow

Dash 4 – Diagnostics

Dash 5 – Customer and HAN

Dash 6 – Wireless charging/discharging



J2931– Protocol (Requirements)

Dash 1 – General Requirements

Dash 2 – InBand Signaling (control Pilot)

Dash 3 – NB OFDM PLC over pilot or mains

Dash 4 – BB OFDM PLC over pilot or mains

Dash 5 – Security

Dash 6 – RFID/DSRC (wireless charging)

J2953– Interoperability

Dash 1 – General Requirements

Dash 2 – Testing and Cert

Dash 3 –

• * Published

Ballot Objectives for Communication Standards

Minimum number of ballot steps expected with objectives:

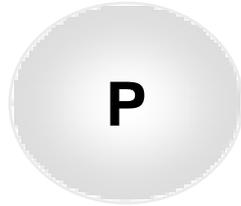
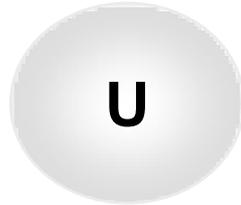
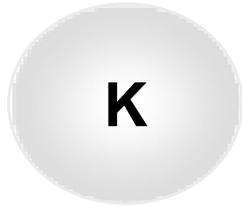
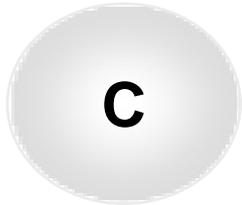
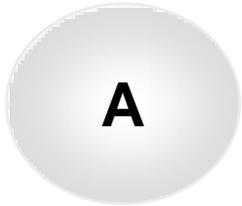
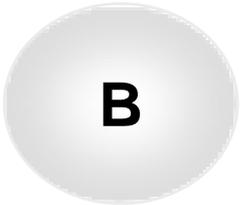
- **Step 1:** Record as much info into the task force documents on “what we think works” and publish (move beyond committee draft). This allows the document to move towards step 2 for public review, initiating additional comments and viewpoints, while the task force also continues additional testing and early implementation. **Expected time is 1 to 1 ½ years.**
- **Step 2:** Implement step 1 (simulate, model, start pilot production, etc.) so we can verify, correct and update the step 1 version. Re-ballot with updates. **Another year to 1 ½ years.**
- **Step 3:** Final ballot to clean up and include any new items plus delete things that no longer apply. **6 months to a year.**

Status

- J2836/1™ & J2847/1 - Utility (SEP2)
 - Step 2 in process:
 - Continuing to list of updates to match SEP 2.0
 - SAE & SEP 2.0 continuing to harmonize with ISO/IEC JWG 15118 documents
- J2836/2™ & J2847/2 - DC Charging
 - Step 1 complete, in affirmation ballot stage to Hybrid committee
- J2836/3™ & J2847/3 - Reverse Energy Flow
 - J2836/3™ Re-kicked off April, 2011 (monthly meetings)
- J2826/4™ & J2847/4 – Diagnostics
 - J2836/4 Kicked off April, 2011 (monthly meetings)
- J2836/5™ & J2847/5 - Customer to PEV and HAN (& NAN)
 - J2836/5 Kicked off April, 2011 (monthly meetings)

Status (Cont)

- J2931/1 – Communication Requirements
 - Finalizing Requirements, almost ready to re-ballot to task force.
 - Coordinating into EPRI's test plan and schedule
- J2953/1 – Interoperability
 - Finalizing Approach
 - Prioritizing systems (AC & DC levels)
 - Determining testing methods



J2836/1™ & J2847/1 Status

In Step 2 but have not re-opened documents

- Continue to liaison with SEP 2.0 TRD & Application spec (utility messages)
 - ZigBee Alliance (SEP 2.0) is addressing the TRD and Application spec public comments
- Coordinating with ISO/IEC JWG
 - ISO/IEC 15118-1 (J2836/1 & /2™) CD ballot
 - ISO/IEC 15118-2 (J2847/1 & /2) CD ballot
 - ISO/IEC 15118-3 (J2931/1) in WD

J2836/2™ & J2847/2 Status

Completing Step 1

- J2836/2™ Affirmation ballot to Hybrid committee
 - Comments are addressed
- J2847/2 – Affirmation ballot to Hybrid committee
 - Comments are addressed
 - Next is MVC ballot, then publish

- EPRI's Test Plan includes DC charging

J2836/3™ & J2847/3 Status

In Step 1

- J2836/3™
 - Further defining use cases
 - Reviewing Architecture (on-board and off-board conversions)
 - V2G
 - V2H
 - V2L
 - V2V
- J2847/3 – not started
 - Chrysler and TARDAC projects will feed into this and use cases

J2836/4™ & J2847/4 Status

Kickoff in April, 2011

Need to review the categories and determine content in each

- **Basic diagnostics**

- Detectable failures for control pilot and detection circuit
- DC charger/discharger faults

- **Optional diagnostics**

- Fault indicators on EVSE
- Functions displayed in PEV, EVSE and HAN

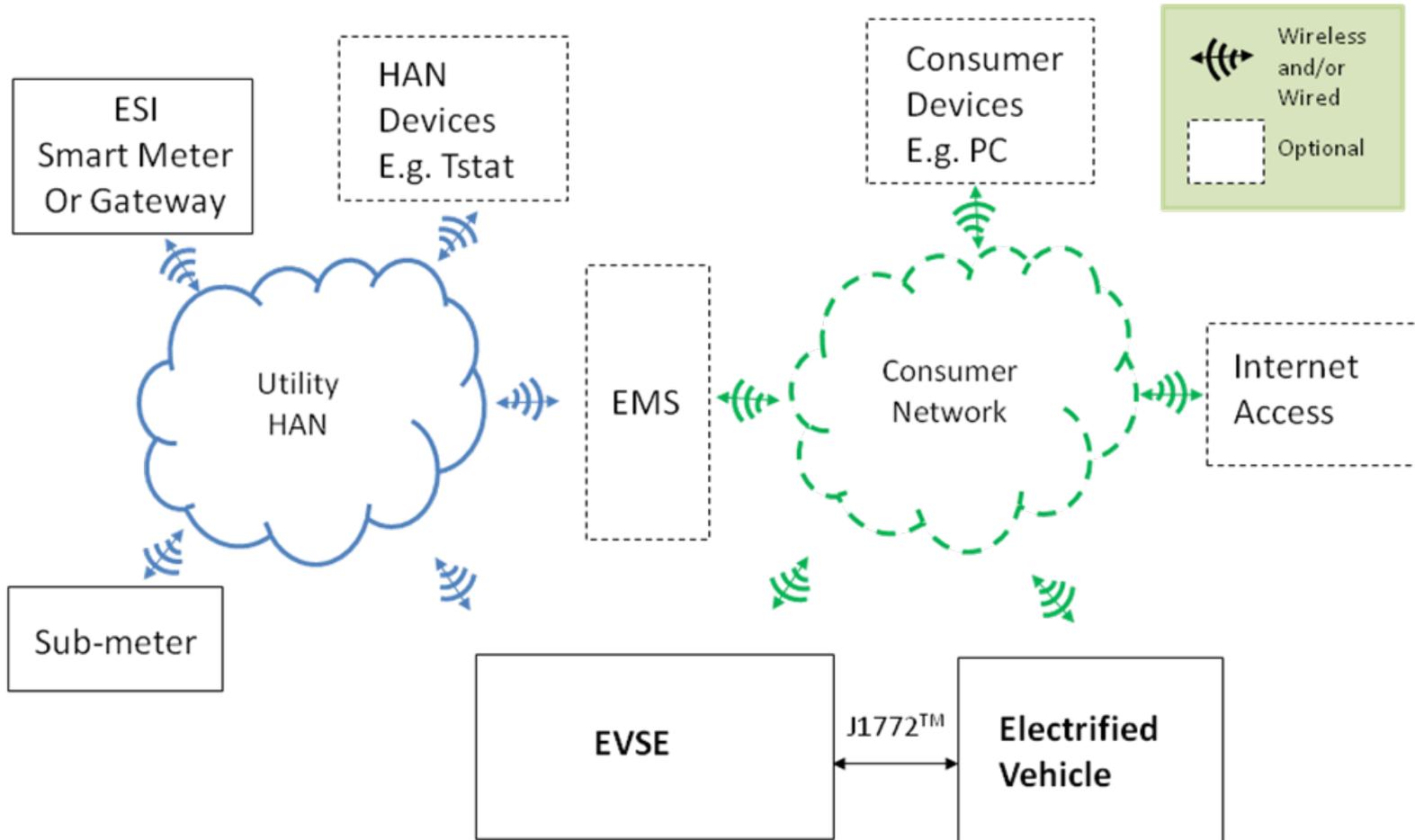
- **Enhanced diagnostics**

- Alerts from VM service centers
- PEV notifying customers of issues
- Software upgrades
- VM specific functions

J2836/5™ & J2847/5 Status

Kickoff in April, 2011

When two networks connect – for 2 seconds



J2836/5™ & J2847/5 Status

When two networks connect – for 2 seconds

1. Customer to PEV (world #1)

- Customer interacts 24/7 with PEV while at work, shopping, restaurant, home, etc.
- Uses tool and medium of choice offered by VM
 - Same medium as VM's include for other products (Wi-Fi, cell)
 - Customer interaction includes:
 - Select options based on price and energy needs (SOC & time)
 - Starts/ends charge
 - Starts/ends preheat/precool cycles (PEV and/or battery)
 - Views status (SOC)
 - Receives alerts of unplanned events/changes

J2836/5™ & J2847/5 Status (network #2)

2. Smart meter to HAN (or EVSE)

- Utility Interacts 24/7 with HAN (or EVSE)
- Uses medium of choice (ZigBee, Wi-Fi, PLC)
 - Bridging device in system is expected
 - HAN interaction includes
 - Receives pricing and home load info 24/7
 - Receives planned/unplanned demand response events
 - EMS can make decisions for load based on inputs and customer preferences/presets (e.g. charge PEV vs. run air conditioner)
 - Able to send alert to customer (world #1) for unplanned events and decision points

J2836/5™ & J2847/5 Status

For 2 seconds, the two networks connect

- Green light is displayed
 - No conflicts or changes from PEV to HAN
 - Charge/discharge event commences as planned
- Yellow or Red light is displayed
 - Conflicts exist
 - The price changed
 - DR send to home (HAN), not to PEV and/or was unplanned
 - Customer schedule change
 - Clean energy changed

J2836/5™ & J2847/5 Status

Decisions regarding conflicts

- Price changed
 - Decide on charge/discharge schedule adjustments
- DR send to home (HAN), not to PEV
 - Opt out or accept
- Customer schedule changed
 - Go out to dinner instead of discharging to home
 - Got home later than expected
- Clean energy changed
 - Clouds prevented solar panel from feeding home energy needs
 - Neighbor is out of town and their BEV will feed the NAN, instead of the utility thru the transformer or your PEV, during peak demand
- More

J2836/5™ & J2847/5 Status

What medium(s) will be used, and where will the customer use them?

- Conflicts - doubtful if customer will use PEV or EVSE display screen
 - Standing in the garage or staying in PEV is not seen as desired
 - Type of conflict may be displayed and customer can delay response for action.
- Customer is expected to enter home and use device and medium of choice
 - Device
 - Phone
 - Computer
 - In-Home Display
 - URC
 - Medium
 - Cell
 - Wi-Fi