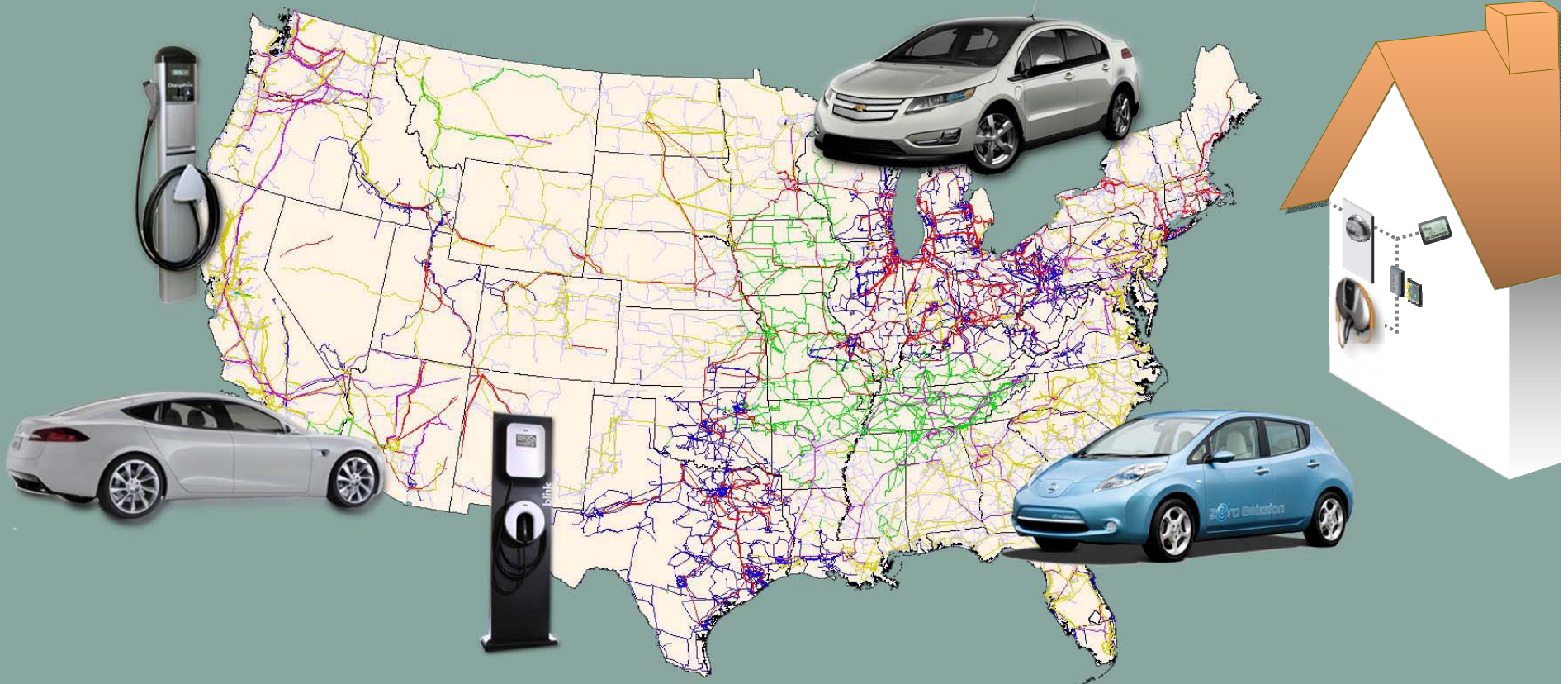


# VEHICLE TECHNOLOGIES PROGRAM

U.S. DEPARTMENT OF  
**ENERGY** | Energy Efficiency &  
Renewable Energy



## DOE Perspective on the Codes & Standards Landscape for Electric Vehicles

ANSI PEV Standards Workshop, March 5-6, 2011

### Lee Slezak

Manager, Vehicle Systems  
Vehicle Technologies Program  
US Department of Energy  
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## Enabler of Market Penetration

**Safety**

**Usability**

**Interoperability**

**Acceptance**

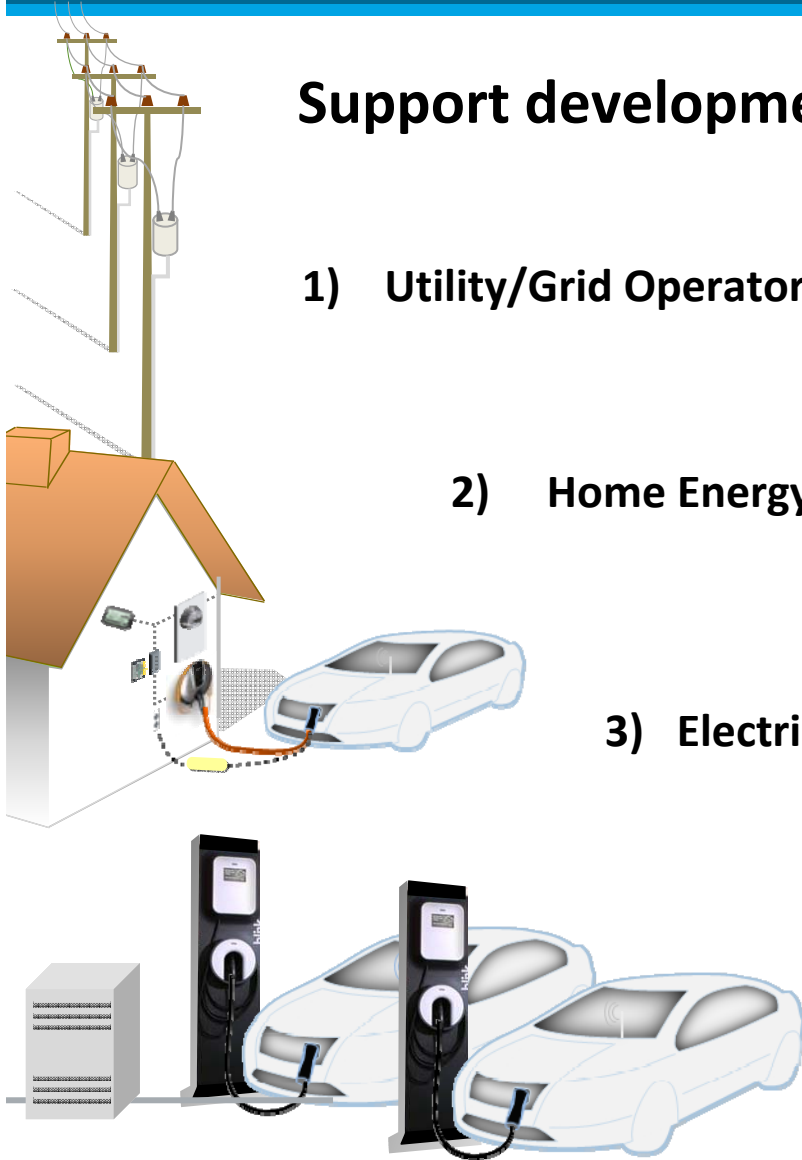
## Support development & Validation

1) Utility/Grid Operator

2) Home Energy Management/Home Area Network (HAN)

3) Electric Vehicle Supply Equipment (EVSE)

4) Plug-In Electric/Hybrid Vehicle (PEV)



- **SAE standards committees participation**
- **Development and validation of standards**
- **Technology development**

**Safety J2344** – Electric, HEV & Plug-in Vehicle Safety

**J1766** – Crash Integrity Testing

**J2578** – FCV Safety

**Connector/inlet & EVSE J1772™** – PEV Conductive Charge Coupler

**J2954** – PEV Wireless Charge

**Communications J2836™** – General Information (use cases)

.../1 – interface with utilities

.../2 – off-board charger communications

.../3 – reverse energy flow

.../4 – diagnostics

.../5 – customer/HAN

.../6 – wireless charging/discharging

**J2847™** – Detailed Information (messages)

(same sub-categories as J2836)

**J2931** – Protocol (requirements)

**J2953** – Interoperability

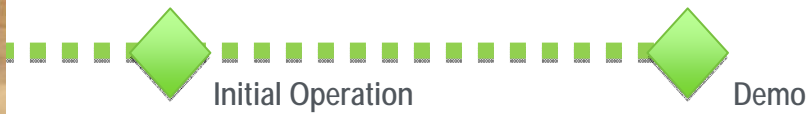
# Tools for Standards Verification



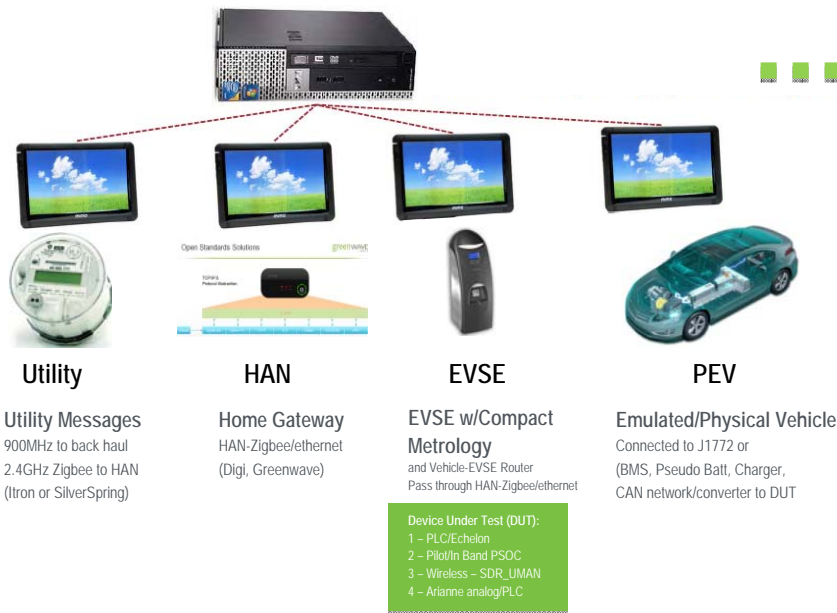
## EVSE-EUMD-HAN Connectivity (SAE J2836/2847)



Connectors/connectivity- Zigbee, USB, serial, power, status  
Allows user to emulate Grid messages/power flow, etc.

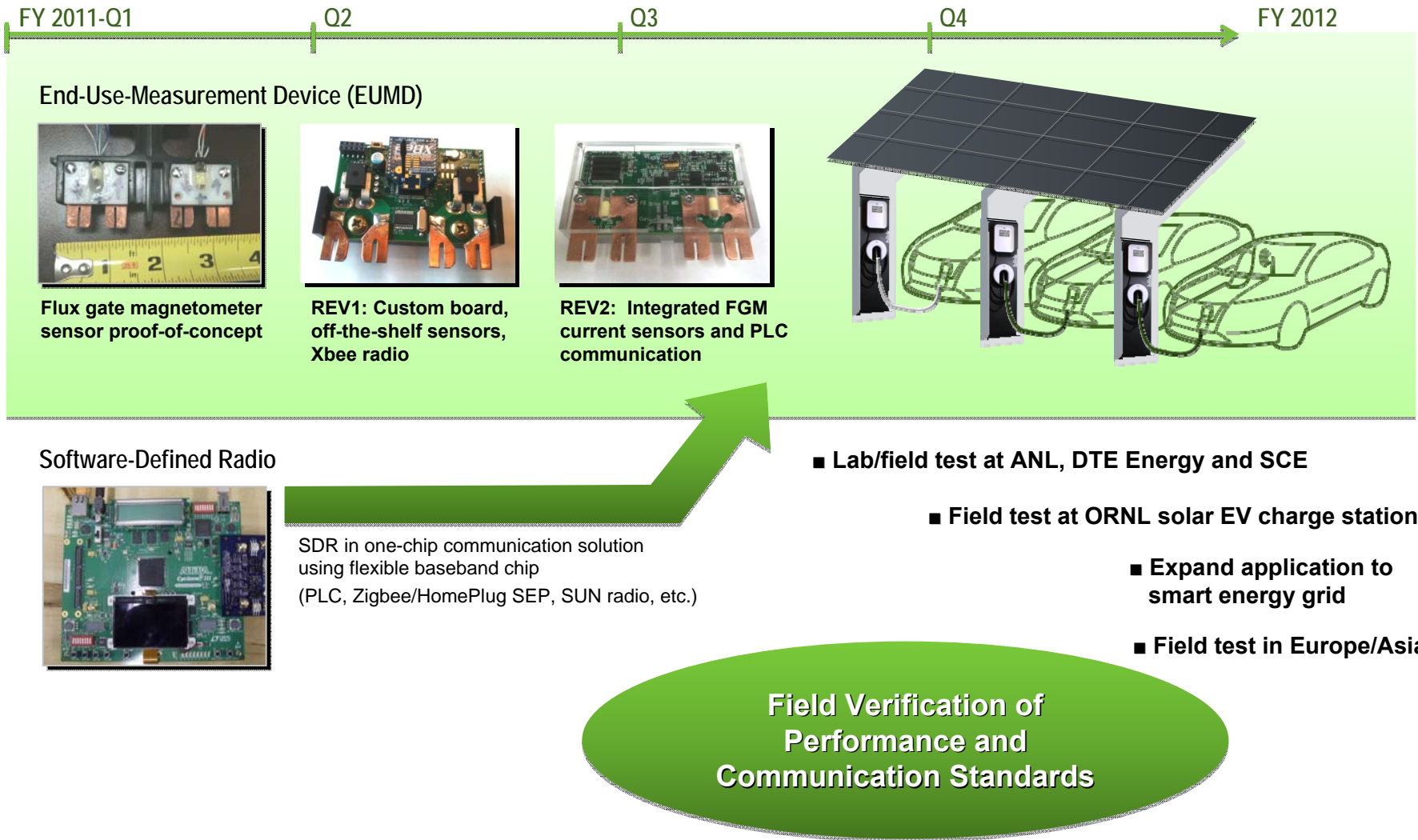


## Vehicle-Grid Interoperability (SAE J2953)



**Test Fixtures to Verify Compliance with SAE J2953 – Interoperability Between Key Elements of Vehicle Charging Infrastructure**

# EUMD with Universal Communication



- **Codes and Standards Enable Market Acceptance**
- **DOE Supports Industry & SDO Efforts**
- **DOE Supports Global Harmonization**