Non-Tactical Vehicle Fleet Electrification

2019 Fall FUPWG Seminar

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“General Motors believes the future is all-electric... We are far along in our plan to lead the way to that future world.”  
– Mark Reuss, GM Head of Product Development

“...expect to see more change in the auto industry in the next five years than we had in the last 50.”  
– Mary Barra, GM CEO
Autonomous, Connected, Electric, and Shared

- **Economics:** prices ↓ as competition ↑
  - 85% ↓ in battery prices – 2010-2018
    - 2010: $1160/kWh → 2018: $176/kWh → 2021: ~$100/kWh
  - Li-ion manufacturing capacity ↑
    - 2019: 316GWh/yr → 2025: >1090GWh/yr

- **Technology:** maturing
  - 5-7% ↑ in battery energy density annually
  - EV sedan: ~115+ MPGGE - ICE sedan: ~30 MPG

- **Policy:** ↑ fuel economy and emissions requirements globally are pushing OEMs to electrify to remain competitive
  - All vehicle OEMs have electrification plans in near-term
  - Dieselgate fallout; ZEV / LEV mandates increasing

- **Interoperability b/w EVSE (charging stations) companies; oil & gas acqs**
  - ChargePoint and Electrify America partnership - 2019
  - Shell purchased Greenlots EVSE Network - 2019
  - BP invests heavily in FreeWire (2018) and PowerShare (2019)
  - GM partnership w/ ChargePoint, EVgo, Greenlots - 2019
Electric Vehicle Supply Equipment (EVSE)

**Level I** – 120 volt AC
- ~5 miles of range/hr
- $ 

**Level II** – 240 volt AC
- up to ~70 miles of range/hr, but ~25 more common
- $$ 

**DC Fast Charge** – typically 480 volt AC three-phase input
- ~40 miles of range / 10 minutes 
- $$$
Updated EVSE Criteria: UFGS 11 11 37

- Multi-agency criteria revision effort
  - Published on WBDG DEC 2018
  - Provides much needed DoD reference for EVSE installs

UFGS 11 11 37 Electric Vehicle Supply Equipment

Date: 11-01-2018
Division: Division 11 - Equipment
Status: Active
Page(s): 16
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Related Links
- Non-Government Standards (Limited Access)
- Military Standards: ASSIST database
- Corrosion Prevention & Control

Criteria Change Request: CCR

Federal Facility Criteria: Department of Defense, Unified Facilities Guide Specifications (UFGS)
EVSE Equipment Selection and Procurement

• **GSA BPA for EVSE:** [www.gsa.gov/EVSE](http://www.gsa.gov/EVSE)
  – Pre-competeted, streamlined procurement process
  – Provides uniform EVSE installs across enterprise since project teams are selecting from limited equipment list
  – NAVFAC standard EVSE configuration:
    • Dual port Level 2 w/cellular connection
    • CLINs 11A or 15A
Navy Workplace Charging Policy

- CNIC Instruction on Personnel Workplace Charging for EVs
  - Released summer 2019
  - Employees must pay for EVSE use in accordance with FAST Act and CEQ implementation guidance → Pay.gov or payroll deduction
  - Navy Regions currently identifying installations for pilots
    - Focus on opportunities to use existing EVSE for employee charging where feasible
    - Additional EV infrastructure will be needed across the enterprise to meaningfully support employee EV charging - Level 1 in employee parking lots
Level 2 and DC Fast Charger ports only; dedicated NAVFAC Level 1 EVSE number over 600 (primarily for EV golf carts)
Limited Distribution of Charging Stations

NAVFAC’s ChargePoint EVSE as of 30 SEP 2019. Not comprehensive.
Grid-Independent EVSE Solution

- EV ARC™ mobile solar-powered EVSE / emergency power supply
  - Naval Base San Diego
Next Steps

- Complete installation of planned EV infrastructure at bases where design work is complete

- Optimize fleet profile to electrify additional administrative vehicles as leases come up for renewal

- Maximize utilization of existing EVSE
  - Use dynamic fleet management to break away from 1:1 EV-to-charging-port ratio

- Explore opportunities for vehicle-grid integration (VGI) where appropriate for smart grid demand response capability
Questions?

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