

Transportation & Innovation Expo



Argonne National Lab DOE Megawatt Charging Requirements Study Industry Work Group

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Argonne National Lab EV-Smart Grid Interoperability Center

ANL hosts the US EV-Smart Grid Interoperability Center, in conjunction with JRC in Ispra Italy, to develop and validate EV charging standards as well as research grid impacts



Smart Energy Plazas
at bldgs 300 and 362



ANL Workplace Charging Resources

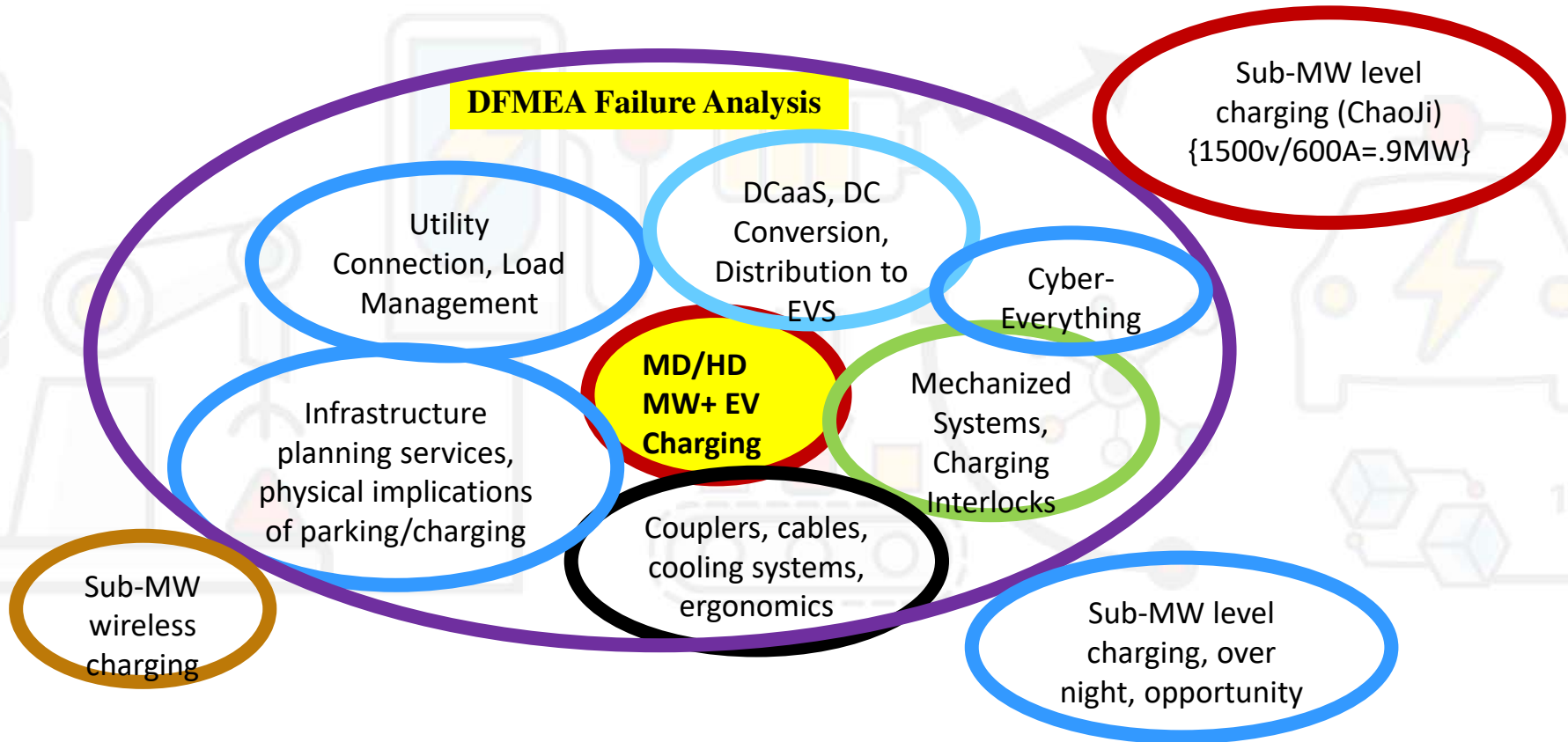
50 AC EVSEs Site-wide

PV Fed Charging- 80kW

DC Fast Chargers: 25kW, 50kW,
200kW, 350kW

Wireless: 50kW

Overlapping Areas Of Common Benefit to MD/HD Electric Vehicle Charging (\geq MW and other levels)



Overview of Charging Levels (from CharIN)

Level 1



Level 1 chargers use standard 120V electrical outlets. 120V circuits are also used by most home electronics.

7-8 miles of i3 range per hour charging

1.4 kW power delivery

Level 2

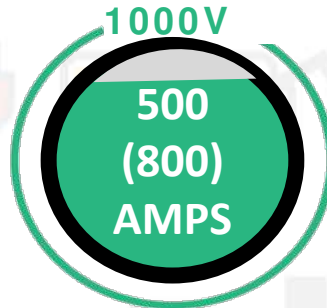


Level 2 chargers use 240V electrical circuits. 240V circuit are also used by electric dryers & electric stovetops.

10 - 26 miles of i3 range per hour charging

3.7 - 7.7 kW power delivery

CCS DC charging

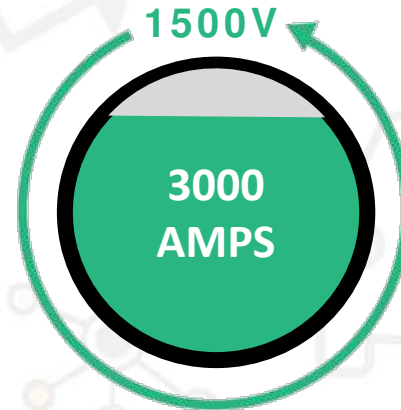


CCS can deliver up to around 200Amps with traditional copper cables, while higher currents are delivered via cooled cables.

Up to 80% of 100kWh battery in less than 20 minutes

Up to 350kW power delivery, Some units up to 500/800kW

Commercial Vehicle High Power (proposed)



The High Power Commercial Vehicle charging standard would allow users to recharge their large, commercial vehicles (Classes 6, 7 & 8) in 20-30 minutes.

Up to 80% of Class 8 truck, carrying 500kWh, in 20 minutes

Up to 4.5 MW power delivery

Example Charging Equipment Site Layout

350kW max per port, w/AC coupled storage

Single and dual output
dispensers at curb

480vac to DC power
converter cabinets in back

480vac switchgear and local
peak shaving energy storage



Proposed Modular Prefabricated Charging Station Power Electronics/Battery



(1MW Delta Electronics Factory Built Data Center Power Source)