Electrifying fleets: Lessons learned deploying high power charging stations

Steve Bloch – Western Regional Vice President
ABB Offers Solutions for the Complete Value Chain

Global install base of 10,000+ DC fast chargers since 2011

- DC fast chargers
  - Terra systems
- E-bus chargers
  - HVC 150
- Charging network software services
  - ABB Ability
- Energy storage
  - B.E.S.S.
- Power quality
  - PQF, PCS100
- Substations
  - Transformers
- Grid automation
  - SCADA & Ventyx
- Building automation
  - KNX, energy mngt.
- Components
  - DIN rail & distribution boards
- Renewable integration
  - HVDC, solar, wind

ABB’s solutions will work together seamlessly throughout the whole value chain.
Lessons Learned #1

Selecting the right size and number of stations

- How many vehicles?
- kWh of the different vehicle battery packs?
- How many miles driving per day?
- Charging at night only?
- Need to charge fast during day and slow at night?
- Station redundancy needs?
- Availability of power at site?
- Need/want to minimize electricity demand charges?

AC (7 to 16 kW) versus DC charging (24 to 350 kW)
Lessons Learned #2

How much power can the station output

\[ \text{Watts} = \text{Volts} \times \text{Amps} \]

<table>
<thead>
<tr>
<th>Watts</th>
<th>Volts x Amps</th>
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<tbody>
<tr>
<td>80,000</td>
<td>400 x 200</td>
</tr>
<tr>
<td>160,000</td>
<td>800 x 200</td>
</tr>
<tr>
<td>150,000</td>
<td>400 x 375</td>
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- DC Voltage of vehicle battery pack?
  - Station support that DC voltage?
- Greater than 200 amps requires liquid cooling
- Liquid cooled cables needed?
  - 11 to 13 feet long
  - Expensive
Lessons Learned #3

Cellular connectivity

- Major carriers: Verizon, AT&T
- Ethernet option?
- Will a cell booster help?
Lessons Learned #4

Site layout considerations

- Where is the receptacle on the vehicle?
- How much space is available at the depot?
- Head in or island parking design?
- Need pedestal or wall-mounted stations?
- Power Cabinet can be located 200 feet away from dispenser
Lessons Learned #5

Station accessibility

- Will charging be behind a gated fence?
- Dedicated to fleet charging only?
- Non-fleet drivers to pay for charging?
- Need control access via RFID cards?
Lessons Learned #6

Future proofing

- Transformer and/or switch gear sized for future expansion?
- Stations support adding power cabinets for higher capacity vehicles?
- Add “make-ready” stubs during construction
- Physical space to add more stations?
Questions?

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