Electric Vehicles

September 25, 2017
Outline

- Electric vehicle market update
- Electric vehicle charging
- Community electric vehicle adoption strategies
Electric Vehicle Sales

Sales increased by 37%
Electric Vehicle Sales

- Wisconsin – 50% increase from 2015 to 2016
- Dane County – 60% increase
- Other countries higher adoptions, plans to ban diesel and gasoline
  - Norway – 42% new vehicles registered
  - Britain, France – ban by 2040
- Manufacturer goals
  - Volvo – 100% electrified by 2019
EV Technology Advancement

• Batteries becoming cheaper and more efficient
  – Batteries make up 1/3 of the vehicle cost
  – Prices have fallen 77% in six years
  – Increased driving range while managing vehicle costs

• Vehicles’ driving ranges are increasing
  – Drivers can use vehicles for local and long-distance driving

• More manufacturers offering more vehicles in different classes
  – Vehicles available for a wider range of driver needs
  – Competition manages vehicle costs
More Customer Choice

- Customers want more vehicle options for families, travel
  - More SUVs and crossovers coming
  - Chrysler Pacifica PHEV available now
  - Volkswagen microbus

- Electric pickups a reality
  - Workhorse PHEV, partnership with Ryder
  - Tesla pickup available in 2018 or 2019
More Customer Choice

• 30+ PHEV arriving through 2021
EV Costs are Declining

- More reasonably priced, higher driving range vehicles are available – more on the way
  - Chevy Bolt
  - Tesla Model 3
- As prices fall, more drivers purchase EVs
Medium/Heavy Duty EVs

- Medium and heavy-duty truck options
  - Cummins announced electric drive train, class 7 truck
  - Ryder will be leasing 3 EV trucks
  - Tesla plans to roll out electric semi
Electric Buses

- MGE has partnered with Madison Metro Transit on FTA low or no-emission funding opportunity
  - Madison Metro awarded $1,278,950
  - MGE contributed the required local match
  - Buses will charge overnight at depot
- Fewer than 1% of transit buses in the U.S. are pure electric
- Expect that number to grow
  - Lower emissions, maintenance and fuel costs
  - Availability of longer range buses (Proterra 1,100 mile range)
EV Charging 101

Charging can seem complicated, but there are just a few basics you should know. There are three main charging types: Level 1, Level 2 and DC fast.

Level 1 is just plugging in to a typical 110-volt household outlet and can take 16 hours to charge an EV with 100 miles of range.

Level 2 requires a 240-volt outlet and special charging station, but can charge about 6X faster than Level 1, filling up a battery with 100-mile range in about 4 hours.

DC fast converts AC power to DC, to get many EV batteries charged to 80 percent in 20-30 minutes.

Electric Power Research Institute (EPRI)

ChargePoint
DC Fast Charging

• Important to grow EV market
• Move from “city” vehicle to all-purpose vehicle
• Today – 50 kW stations charge to 80% in about 30 min
  – Higher speed stations being tested
  – Similar experience to filling your vehicle with gas
• Utilities and third parties are installing and owning stations
• VW Settlement ZEV funding will be used to expand DC fast charging network along major interstates and highways
DC Fast Charging Network

Tesla Super Charger Network

DC Fast Charging Network
EV Charging Infrastructure

• Who owns them?
  – Public entities (e.g., UW-Madison, City of Middleton)
  – Businesses to attract customers (e.g., HyVee, Kohls, Monona Tire West, Treysta, Pick ‘n Save)
  – Automobile dealerships (e.g., Rosen and Zimbrick Nissan)
  – MGE to support transportation electrification

• How are they paid for?
  – Fees to use the stations (offset some equipment/O&M costs)
  – Prices for goods and services (as an amenity)
  – No one is making a profit offering public EV charging
Public Charging Locations

46 Locations (L2, DCFC)
- MGE-Owned (19)
- Private Business (9)
- Auto Dealers (7)
- UW Madison (7)
- Alliant (2)
- Tesla (1)
- City of Middleton (1)

PlugShare.com
Public Charging (DCFC)

7 Locations

- MGE-Owned (1)
- Third-Party Installer(2)
- Auto Dealers (3)
- Tesla (1)
- Sun Prairie (1)

PlugShare.com
MGE’s Public Stations

- Installed to study the need and understand grid impacts
- First 6 charging stations installed in 2009
- Now 28 chargers at 19 locations
- MGE’s pilot program tracks use patterns
  - Stations were free until May 2015
  - Now L2 stations cost $1.00/hour for study participants
  - DCFC stations are $2.50/hour for study participants
- Pilot analyzes drivers’ needs and preferences
Public Charging Trends

• More drivers are using them over time
• Drivers became more efficient once fees were charged
  – Fees based on time plugged in regardless of energy drawn
  – Incentive to move vehicle once fully charged rather than use parking space longer
  – Result: Drivers get the same amount of energy but in a shorter time making spaces more available for others
Public Charging Trends

Sessions Custom

Unique Drivers Custom

Jul 2017
- Unique Drivers: 161
- No. of Ports: 39
Charge@Home Pilot

- MGE manages the installation process and owns and maintains the EV chargers
- Upgrade from L1 to L2 EV charging
  - Up to six times faster
  - More flexible in when to charge (TOU rate benefits)
  - Better EV ownership experience
Charge@Home Pilot

- What do participants like
  - Turnkey installation and maintenance
    - No upfront cost
    - Participants pay $20/month for 5 years plus the cost of the electricity
Charge@Home Pilot

ChargePoint Home EV Chargers

- Customer can control charging sessions remotely using their ChargePoint app
- MGE can monitor and manage charger power flow remotely through our ChargePoint portal
Apartments and Condos

- MGE educates and assists
  - Partner with developers and property managers who are considering charging stations at apartments and condos
  - About 10 properties in Madison area have installed charging stations for residents – Ovation, Galaxie, Factory District
Apartments and Condos

- Condos can be a challenge
  - Condo residents own parking spots but not the common area where upgrades may be needed
  - Disputes on who will bear the cost
  - HOA and condo owner need to work together
Workplace Charging

- Why workplace charging?
  - Enables employees who commute longer distances to own EVs
  - Recruit and retain employees, support sustainability initiatives

- MGE educates and assists
  - Partners with business customers to install charging stations for employee use
  - Approximately ten businesses have installed stations for employees (American Family, Sub-Zero, Promega)
Workplace Charging

- Barriers
  - Human Resources question offering a “benefit” not available to all employees
  - Installation costs
  - Reconfiguring parking facilities/station location
Education and Outreach

• Residential Customers
  – Community events (ride ‘n drives)
  – Neighborhood outreach (festivals, newsletters)
  – Customer communications (newsletters, social, videos)

• Businesses, Developers and Property Managers
  – Outreach through trade associations
  – Customer communications (newsletters, social, videos)
  – Chambers of Commerce
  – Site assessments
Dealerships

- Driver survey showed poor EV buying experience
- Partner with dealerships
  - Offer training to sales staff on EV charging
  - Provide online resources with information they can share with customers
  - Invite to ride and drives and other community events
Community EV Strategies

• Develop city-wide electric vehicle strategy
• Implement policies and ordinances that encourage EV adoption and use
  – Designate and enforce EV only parking
  – Develop EV-ready provisions for construction projects
  – Consider EV-ready construction requirements for new City buildings or major renovation projects that have parking
• Add electric vehicles to municipal, transit and school bus fleets (lead by example)
Community EV Strategies

- Encourage electrification of ride sharing services – Lyft, Uber, taxi
- Offer and/or promote incentives, grants and programs to encourage electric vehicle adoption (Nissan Leaf Discount)
- Educate residents, businesses, developers and other stakeholders (e.g., host EV ride and drive events, lunch and learns)
- Work with utility to provide technical assistance to building managers and homeowners to install EV chargers
Thank you!

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