The Future of Transportation in the Heartland

Dan Bowerson, Alliance for Automotive Innovation
U.S. Light-Duty Vehicle Electrification Policies and the Necessary Conditions to Meet Them

Midwestern Legislative Conference
Wichita, KS

July 12, 2022
### California
- **Advanced Clean Cars (ACC I)**
  - GHG, 2021-25MY (GHG, Fuel Economy)
    - Adopted 2012
  - LEV III, 2015-25MY (Criteria Emissions)
    - Adopted 2012
  - ZEV, 2015-25 (Criteria Emissions, GHG, Fuel Economy)
    - Adopted 2012

### U.S. EPA
- GHG, 2023-26MY (GHG, Fuel Economy)
  - Adopted Dec, 2021
  - Tier 3, 2017-25MY (Criteria Emissions)
    - Adopted 2012

### NHTSA
- CAFE, 2024-26MY (Fuel Economy)
  - Adopted Apr 2022

**Regulatory Environment**

- **March 2023 Update**
- **August 2022 Update to ACC 2.0**
California ACC II – ZEV Mandate

ZEV States (~ 35% of U.S. Market)

16 Existing ZEV States*
- CA  MN*  OR
- CO  NJ  RI
- CT  NM*  VA*
- MA  NY  VT
- MD  NV*  WA*
- ME

Most of these states will need to officially adopt ACC II or revert to Federal standards.

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Backdrop for U.S. GHG and Fuel Economy Post-2026

California Air Resources Board (CARB) Advanced Clean Cars Rule
• Target almost 70% EV sales in over 35% of U.S. market by 2030
• 100% EV sales by 2035*

U.S. Federal Administration expected to propose and finalize rules through at least 2030
• Biden EO 14037: Goal of 50% EV sales by 2030; expectation of 60% reduction in new vehicle GHG relative to 2020
• EPA expects to issue a proposed rule by Q1 2023 and a final rule by Q1 2024
• NHTSA mandate to set maximum feasible fuel economy standards

*The draft regulations allow up to 20% plug-in hybrids
Keys to Expanded Electric Vehicle Expansion

- Convenient, easy to use, everywhere
- Top reason to reject an EV “Nowhere to Charge”
- Buy-in from all new vehicle purchasers

- EVs still more expensive than gas - Incentives help bridge the gap
- Fuel must be cheaper than gas

- Automakers investing $330 billion by 2025 (starting line)
- Building a new global supply chain from scratch, hundreds of factories.

- Infrastructure
  - Home/work Charging
  - Public Charging
  - H2 Fueling

- Costs
  - Vehicle
  - Fuel
  - Minerals

- Customers
  (Retail/Fleet)
  - Awareness
  - Choice/Capability
  - Convenience

- Production
  - Factories
  - Labor
  - Supply side security
  - Critical Minerals

Many challenges remain
EV Charging Infrastructure Gap

<table>
<thead>
<tr>
<th>Currently Available</th>
<th>Total Ports</th>
<th>Non-Proprietary</th>
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<tbody>
<tr>
<td>Level 2</td>
<td>96,261</td>
<td>84,489</td>
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<tr>
<td>DC Fast Chargers</td>
<td>24,407</td>
<td>10,148</td>
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</table>

To reach 100% EV sales by 2035, $39B required for publicly-available charging by 2030

(Analysis assumes all DCFCs are 350kW. If chargers are 150kW, cost increases to $52B)

Sources:
Infrastructure Investment & Jobs Act EV Charging Infrastructure

$7.5B EV Charging Infrastructure Funding

- $2.5B Corridor Charging, aka "National Electric Vehicle Formula Program"
- $5B Charging and Refueling Competitive Grant

National EV Formula Program
- FY22 – FY26; Federal share = 80%
- Funds allocated to states using formula (23 U.S. Code § 104 subsection (c))
- To be used for EV charging on alternative fuel corridors
  - If alt. fuel corridors fully built out, funding may be used for publicly available chargers
- States must submit plans to DOT on intended funding usage
- DOT and DOE must provide guidance to states to prioritize investments, i.e.:
  - "current and anticipated market demands for [EV] charging infrastructure, including with regard to power levels and charging speed, and minimizing the time to charge current and anticipated vehicles"

Charging and Refueling Infrastructure Grants
- FY22 – FY26; Federal share up to 80%
- Charging and hydrogen, propane, and natural gas fueling
- 50% along FHWA-designated Alt. Fuel Corridors & 50% “Community Grants”
- Publicly accessible projects outside of Alt. Fuel Corridors given priority for rural, low income and underserved communities, and multi-unit dwellings
State EV Charging Funding through National Electric Vehicle Formula Program

EV Charging Investment in IIJA National Electric Vehicle Formula Program

Notes:
- Values rounded to the nearest $million.
- Does not take into account $2.5B for competitive grants.
- Source - White House Fact Sheets

State applications due to the Joint Office of Energy & Transportation by August 1
MLC State EV Charging Funding through National Electric Vehicle Formula Program

IIJA EV Charging Investment in MLC States

Notes:
• Values rounded to the nearest $million.
• Does not take into account $2.5B for competitive grants.
• Source - White House Fact Sheets
EV Charging Infrastructure Summary

• Significant gap in pending funding and charging needs to support electrification goals
  • Additional public and private investment is necessary

• $39B to $52B investment estimated needed in publicly-available charging by 2030
  • Investment range depends on power level of DC Fast Chargers (350 kW versus 150 kW)

• $7.5 billion in Infrastructure Investment & Jobs Act is a good down payment
  • Begins to address corridor charging, but charging at other locations is still needed
Automaker Announcements, Goals, and Aspirations

- $250+ billion invested globally
- Ford doubles $11B to $22B investment
- Multiple new 100% EV brands
- Volkswagen and Audi: no new ICE designs
- BMW 90% of market categories BEV available

2020 to 2024
- Ford $29 billion investment by 2025
- Mini all new models EV
- GM $27 billion investment by 2025 & 40% of models EV; 20 EVs in N.A.
- Cadillac 100% EV available
- Jaguar 100% EV
- Bentley 100% plug-in
- Jeep 100% plug-in available
- Chrysler 100% by 2028
- Toyota 60 new hybrid/electric/fuel cell vehicles
- Volvo 50% of global sales EVs
- Stellantis 40% EV in U.S. market by 2030
- Mercedes-Benz all electric by 2303, where conditions allow; only EV for new architectures starting 2025

2025 to 2029
- Cadillac potential 100% BEV
- JLR electric available on all
- Mazda some level of electric on all models
- Bentley 100% BEV
- Volvo 100% BEV
- Kia EVs 40% of production
- Subaru hybrid/electric available across models
- Stellantis 30% electrified (70% in EU)

2030 to 2034
- Ford 100% passenger car BEV (Europe)
- GM 100% BEV

2035 to 2039
- Volvo carbon neutral
- Daimler carbon neutral
- Honda 100% EV/FCV
- Carbon neutral / near- or net-zero: Ford, Nissan, VW, Honda, Mazda, Toyota, Mitsubishi

2040 to 2044
- Stellantis 40% EV in U.S. market by 2030
- Mercedes-Benz all electric by 2303, where conditions allow; only EV for new architectures starting 2025

2050
- Stellantis 30% electrified (70% in EU)