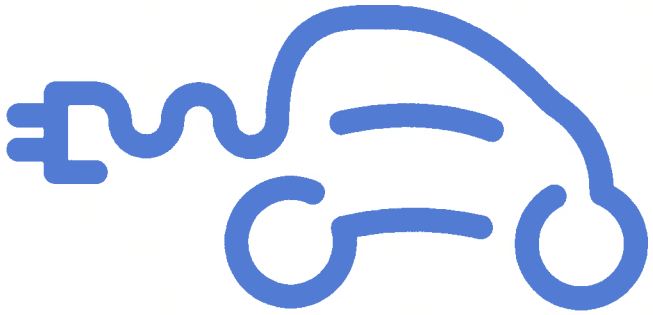
# Electric Vehicles, Charging, & The Future
## What you need to know

Economic and Rural Development Committee Meeting

September 5, 2018



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# Otero County Electric Co-op Chevy Bolt……


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# Market is coming……

**Pace of electric vehicle adoption in the coming years**

"Electric mobility is like with an upside-down ketchup bottle. You know that at some point something will come out. You don't know when, but once it comes, it really does. Then it's bad if you're not prepared."

~ Dr. Dieter Zetsche, CEO, Mercedes-Benz

# It's about the global market……

Markus Schäfer, Member of the Divisional Board of Mercedes-Benz Cars, Production and Supply Chain, commented:

> *"Our electric vehicles will be built in six plants on three continents. We address every market segment, from the smart fortwo seater, to the large SUV. The battery is the key component of e-mobility. As batteries are the heart of our electric vehicles we put a great emphasis on building them in our own factories. With our global battery network we are in an excellent position. As we are close to our vehicle plants we can ensure the optimal supply of production. In case of a short-term high demand in another part of the world our battery factories are also well prepared for export. The electric initiative of Mercedes-Benz Cars is right on track. Our global production network is ready for e-mobility. We are electrifying the future".*

They released the following map to illustrate the production network with electric-related manufacturing facilities in blue


USA TODAY

COOL IDEAS TO STAY WARM

Mercedes-Benz makes a $1B bet it can take down Tesla

Mercedes-Benz

VOLVO

ENERGY & ENVIRONMENT

*Volvo, Betting on Electric, Moves to Phase Out Conventional Engines*

Ford

BloombergTechnology — Ford Goes 'All In' on Electric Cars

Ford Motor Co. will more than double spending on electrified vehicles, amplifying its investment in a segment that the auto industry sees growing from what's now just a fraction of the market.

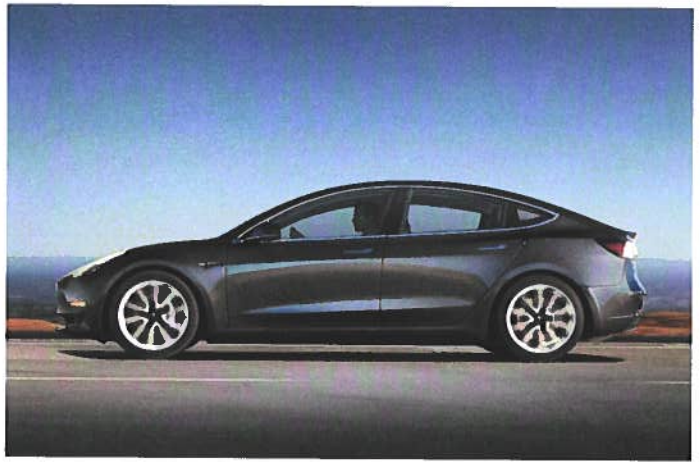
The carmaker will shell out $11 billion bringing 40 electrified vehicles to market by 2022, Jim Farley, president of global markets, said during a presentation at the Detroit auto show. That's up from the $4.5 billion that Ford said in late 2015 it would invest through the end of the decade.

# The Game Changers

## Chevy Bolt EV


*238 miles/charge (60kW Battery)*
*Top Speed 93 mph*
*0-60 mph in 6.5 seconds*
*$36,620 MSRP*

## Tesla Model 3



*220 miles/charge (55kW Battery)*
*Top Speed 130 mph*
*0-60 mph in 5.6 seconds*
*$35,000 MSRP*

# Economics … Annual Operating Costs

## Annual Fuel & Maintenance Cost Comparison

*Driving 15,000 per year*

| | Toyota Camry (ICE) | Chevy Bolt EV ($0.22/kWh) | Chevy Bolt EV ($0.09/kWh) |
|---|---|---|---|
| Gas (25 mpg)<br>600 gal. @ $2.80 | $1,680.00 | $0.00 | $0.00 |
| Oil Change<br>$40 every 5000 miles | $120.00 | $0.00 | $0.00 |
| Electricity<br>Assume 4154 kWh/yr. | $ 0.00 | $913.88 | $373.86 |
| Total | $1,800.00 | $913.88 | **$373.86**<br>**Savings of 80%** |

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# Electric Vehicle Market Landscape

## Electric Vehicles Available in the United States

Plug-In Models

**34+** currently available
with many more coming in 2018

**Plug-In Hybrid EV**
**PHEV**


**Battery EV**
**BEV**


**BEV with DC Fast Charge**


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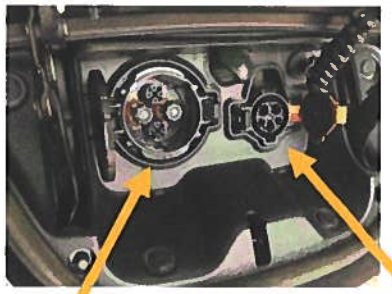
# Charging Levels

## Level 1 – 1.4 kW (20A)

- Charger comes with the vehicle and cord plugs into a normal 120 V outlet
- Comes free with the vehicle

## Level 2 - Ranges from 3.3 kW to 7.68 kW (40A)

- Requires an upgraded EVSE (Electric Vehicle Supply Equipment) "Plug-in Cord"
- Also requires a 240 V (40A) outlet wired in the garage or charging area
- Considered an upgrade and range in cost from $300 - $1000



Level 3 Charging Port

Level 1 & Level 2 Charging Port

**AC Level 2 Charging**
10 to 20 miles of range per 1 hour of charging

J1772 charge port

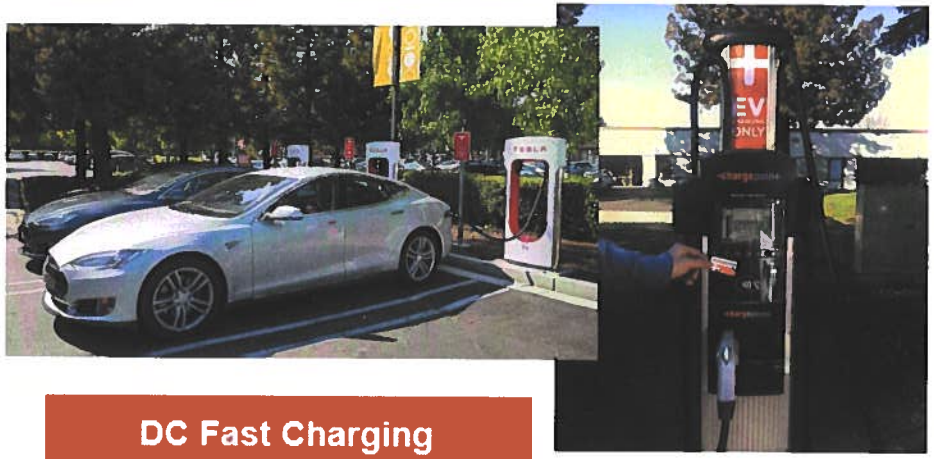
**AC Level 1 Charging**
2 to 5 miles of range per 1 hour of charging

J1772 charge port

# Charging Levels

## Level 3 - DC fast charger *(bypasses the vehicle on-board charger)*

- Allows for quick charge by charging battery directly
- Requires 3 PH 480V service
- Multiple options of manufacturers
- Range in cost from $15K – $30K
- Full charge of battery in around 30 minutes



**DC Fast Charging**

60 to 80 miles of range per 20 minutes of charging

J1772 combo | CHAdeMO | Tesla combo

# Federal Tax Credits

## Federal Level Electric Vehicle Tax Incentive

- Tax Credit for purchase of new qualified plug in vehicle
  - Battery of at least 5 kwh of capacity
  - Uses external source of energy to recharge the battery
  - Gross vehicle rating up to 14,000 pounds
  - Meets emission standards
- Credit value of $2,500 - $7,500 based on battery capacity and vehicle weight
- Credit is phased out in the 2nd quarter following the calendar quarter in which the *manufacturer* sells the 200,000th vehicle
  - Phased down to 50% credit then for two quarters; then 25% for two quarters
- Reference Public Law 112-240, Section 403; and 26 U.S. Code 30D
  - https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d

# Oklahoma State Tax Credits

## Oklahoma State Level Infrastructure Tax Incentive


- Alternative Fueling Infrastructure Income Tax Credit
  - For tax years beginning before January 1, 2020, the state provides a per-location Oklahoma income tax credit of 75% of the cost of equipment related to the delivery of certain alternative fuels into the fuel tank(s) of a motor vehicle and installation costs for certain alternative fueling infrastructure, not including a building and its structural components.
  - Alternative fuels eligible for this credit are compressed natural gas (CNG), liquefied natural gas (LNG), liquefied petroleum gas (LPG or propane), and electricity.
  - Eligible electric vehicle recharging infrastructure must be a metered-for-fee, public access recharging system.
  - The infrastructure must be new and must not have been previously installed or used to fuel alternative fuel vehicles.
  - This income tax credit may be carried forward for up to five years. (Ref. Title 68 O.S. Section 2357.22 and OTC Rule 710:50-15-81)

# State Tax Credits 2018 Session

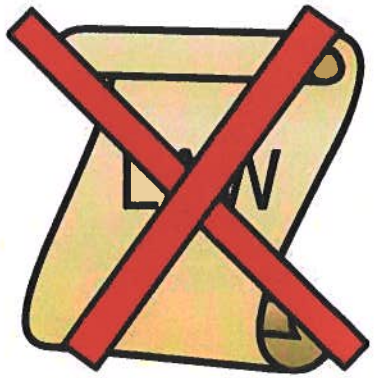
**HB 2756** – 2018 Oklahoma Legislative Session

OKLAHOMA TAX COMMISSION

- Proposal to Update/Modify the Statute
  - Would extend credit eligibility from January 1, 2020 to **January 1, 2024**
  - Added back in credit for electric vehicles, based on similar language for federal tax credit
    - Credit of $5,500 for vehicles up to 6,000 pounds
  - Struck "metered for fee" language for public electric charging stations
  - Added additional vehicle tax credit levels based on weight
    - 6,001 – 10,000 pounds - $9,000 max credit
    - 10,001 – 26,500 pounds - $26,000 max credit
    - Over 26,501 pounds - $50,000 max credit
  - Changed Infrastructure tax credit to 45% from 75% effective January 1, 2019
  - Added one year of carryover for a total of six (6) years carryforward
  - Added home charging tax credit to be same as CNG home fueling – 50% up to $2,500
  - Cap of $16 million/year – kept bill to zero fiscal impact on state budget

# State Tax Credits 2018 Session

**HB 2638** – 2018 Oklahoma Legislative Session



- New Law – Motor Vehicle Registration Tax for Electric & Hybrid Vehicles
  - Would begin January 1, 2019
  - $150 fee for electric drive vehicles
  - $30 fee for hybrid drive vehicles
    - Fee is paid per year at time of vehicle registration
  - Fee to be paid to State Treasury to State Highway Construction & Maintenance Fund
  - Portion of fees made available for development and maintenance of alternative fuel corridors as defined by Federal Highway Administration
- Bill failed – anticipated to try again next year

# New Mexico Electric Vehicle Market

## Light Duty Electric Vehicle Sales

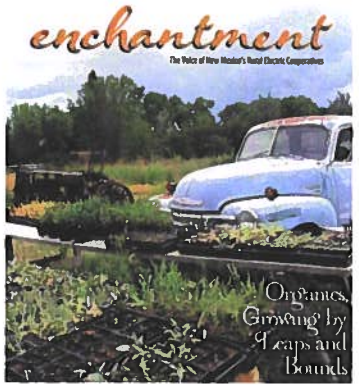
- Battery Electric Vehicles (BEV)
- Plug In Hybrid Electric Vehicles (PHEV)
- Data for vehicles sold between 2011 and June 2018

# Education is Critical

## Coordinated Messaging Around EV's

- Feature News Articles
  - Set up series of messages based around quarterly themes
  - Newsletter articles, social media posts

- State Electric Vehicle Coalition Website
  - Partnership with various stakeholders across the state to provide a central, single source for unbiased and accurate information on electric vehicles
  - Enables market development through unified voice and accurate information

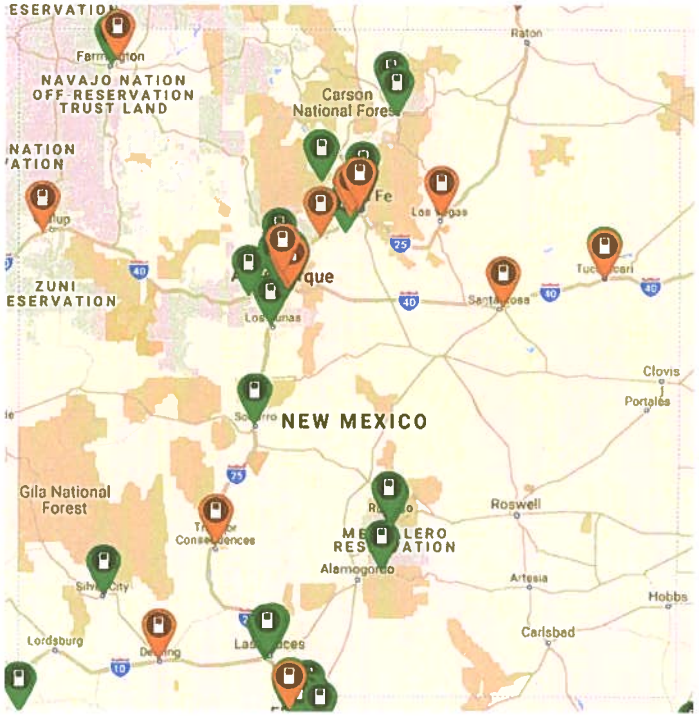



ChooseEV

# New Mexico Existing Charging Infrastructure

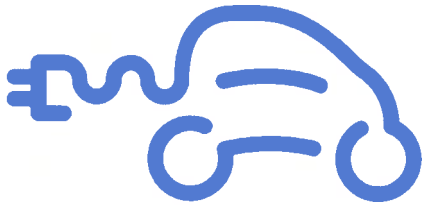
## Strategic Planning for Infrastructure

- 61 public charging stations (DC fast, Lvl 2)
  - Some through companies that require subscriptions
  - Some of these Tesla
- If consider available outlets – up to 146 charging points
  - Not practical for travel
- Need to plan for quick growing market



# Takeaways

- The electric vehicle market is coming!
  - Coming faster than you think
- Vehicle options will only grow – enabling market growth
- There is a need for infrastructure development
  - Will take commitment from multiple players
- WFEC is committed to electric vehicles & its market growth and development
  - Education and marketing through various efforts



# Questions?

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