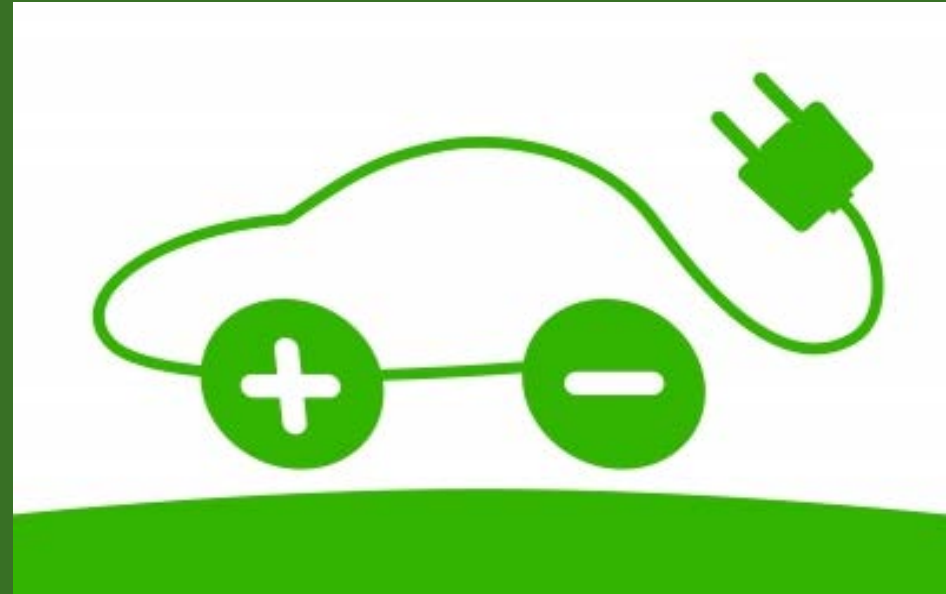


ELECTRIC VEHICLES: WHAT, WHY, AND HOW



Kimberlin To and Rachel Linnewiel

Dallas-Fort Worth Clean Cities Coalition

North Central Texas Council of Governments



**Dallas-Fort Worth
CLEAN CITIES**



**North Central Texas
Council of Governments**

Dallas-Fort Worth Clean Cities Coalition

www.dfwcleancities.org

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□ **Goals:**

- ▣ **Facilitate Use of Alternative Fuel Vehicles and Supporting Infrastructure**
- ▣ **Accelerate Sales of Electric and Hybrid Electric Vehicles**
- ▣ **Promote Informed Consumer Choice on Fuel Economy**
- ▣ **Encourage Use of Idle Reduction Strategies**

Dallas-Fort Worth Clean Cities Coalition

www.dfwcleancities.org

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- **Free Stakeholder Membership**
 - Fuel-Specific Subcommittees
 - Monthly E-Newsletter and other Communications
 - Access to Stakeholder Directory, Vendor Directory,
 - Downloadable Resources
 - Presentations and Recognition
 - Local Staff Support and Funding Assistance
- **Stakeholder Expectations**
 - Attend at Least 1 Meeting and 1 Event per Year
 - Completed Annual Report
 - Adopt Clean Fleet Policy

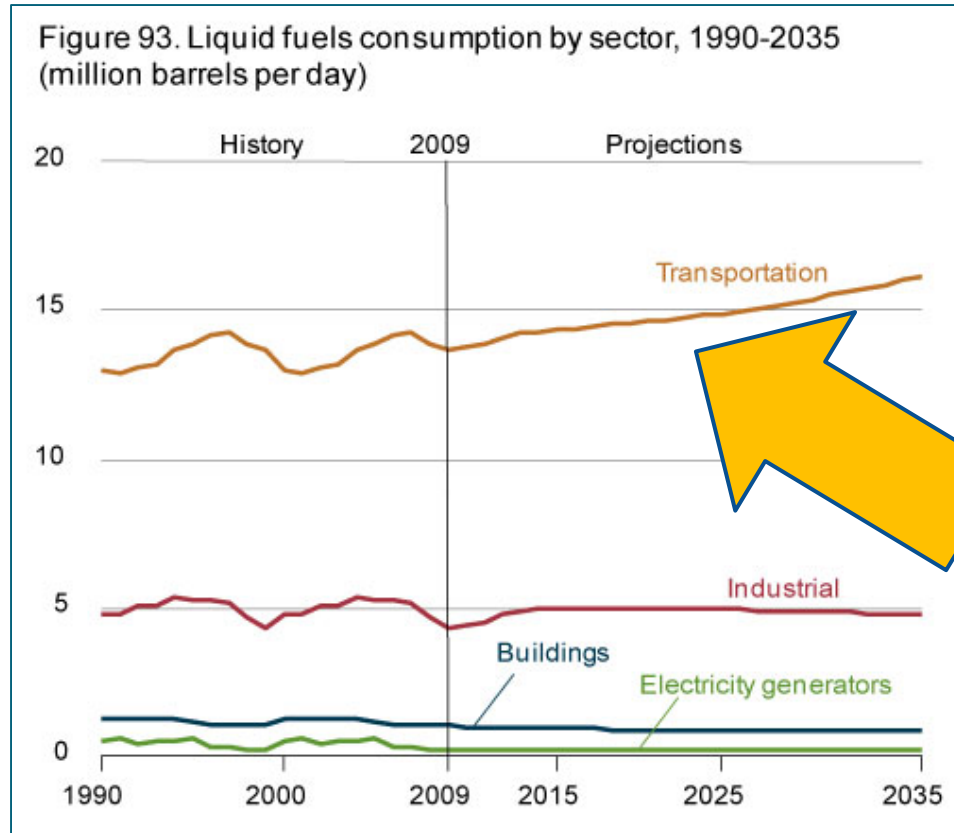
Current US Petroleum Consumption

4

- We Use About **290 Billion Gallons** of Oil Each Year.
- That's Enough to Fill 1,016 AT&T Stadiums!



U.S. Petroleum Use by Sector



http://www.eia.gov/forecasts/aeo/source_oil.cfm

Pollution

Criteria Pollutants

- Impact Human Health
- Are Addressed in Federal Legislation
 - ▣ Clean Air Act

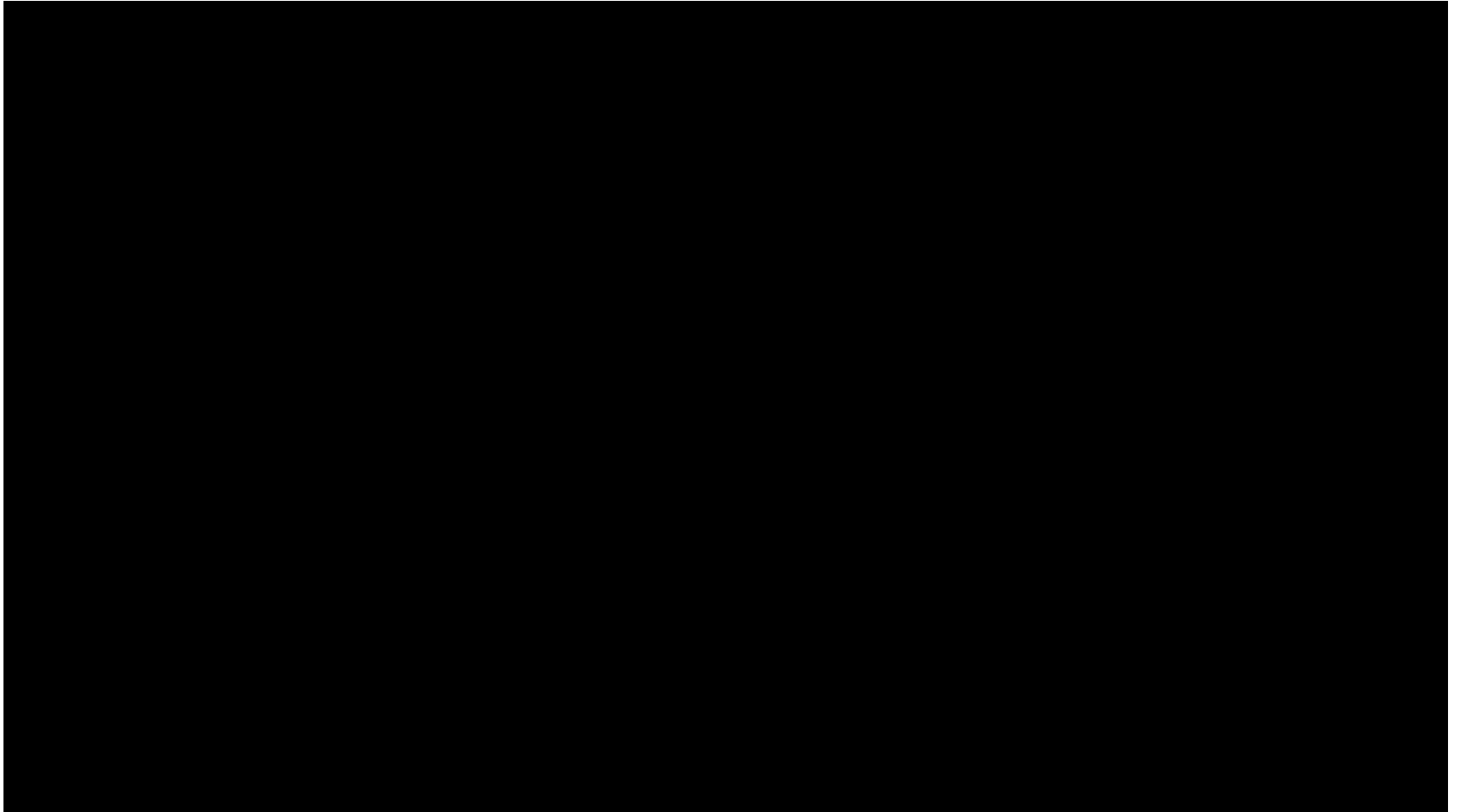


Greenhouse Gas (GHG) Pollutants

- Taken Individually, Are Not Necessarily Damaging to Human Health
- Affect the Environment by Trapping Heat in the Earth's Atmosphere Over Time

Energy 101: Electric Vehicles

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https://www.youtube.com/watch?v=M69GBL0IDzI&feature=player_embedded

Electric Vehicles (EVs)

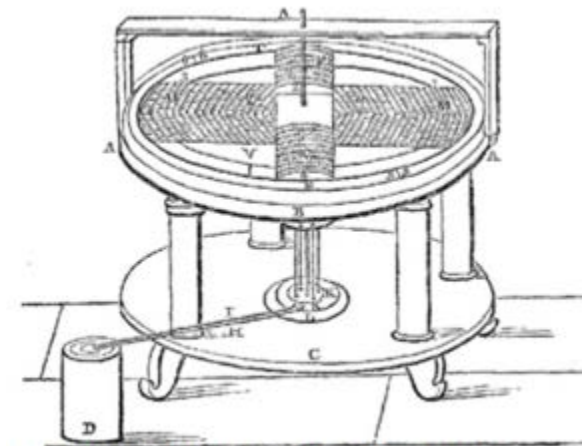
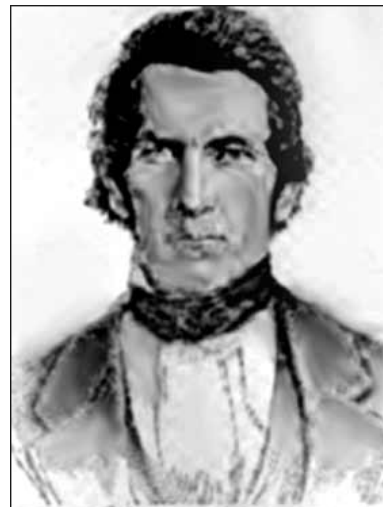
- History of EVs
- EV vs. Plug-in vs. Hybrid
- Easy Refueling
- Emissions Benefits
- National Drive Electric Week



History of the Electric Vehicle

9

- EVs Were First Invented in the 1830s
 - ▣ Robert Anderson
 - ▣ Thomas Davenport



Davenport's patented motor, February 1837

History of the Electric Vehicle

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- But Then...
 - ▣ 1890
 - William Morrison



History of the Electric Vehicle

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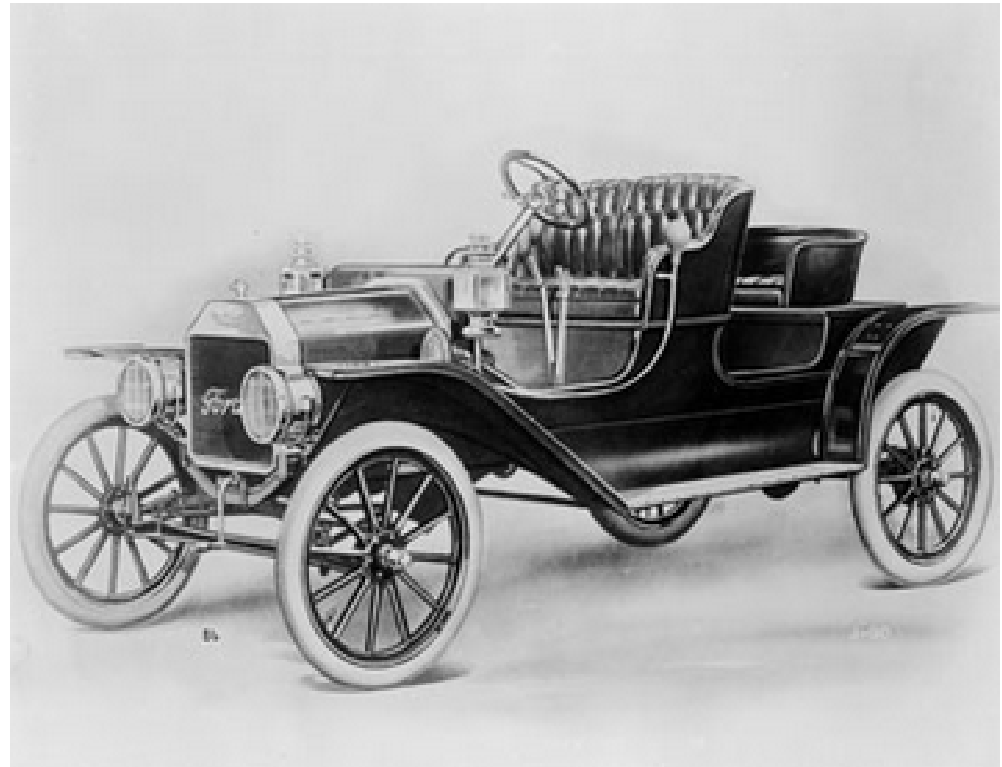
- The First Electric Taxi Cabs
 - ▣ New York City, 1897



History of the Electric Vehicle

12

- The Model T
 - ▣ 1908
 - ▣ Henry Ford introduced the mass-produced and gasoline-powered vehicle



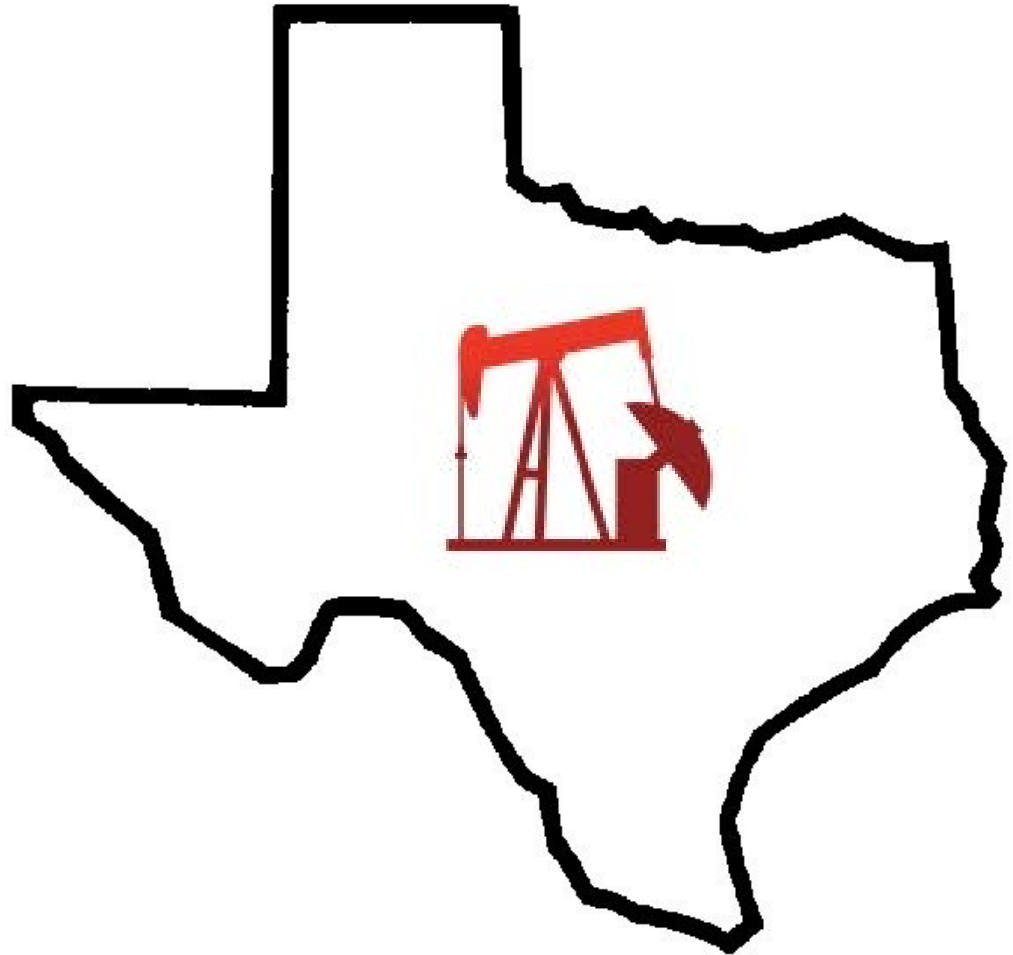
Downfall of the Early EV

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□ Downfall of the Early

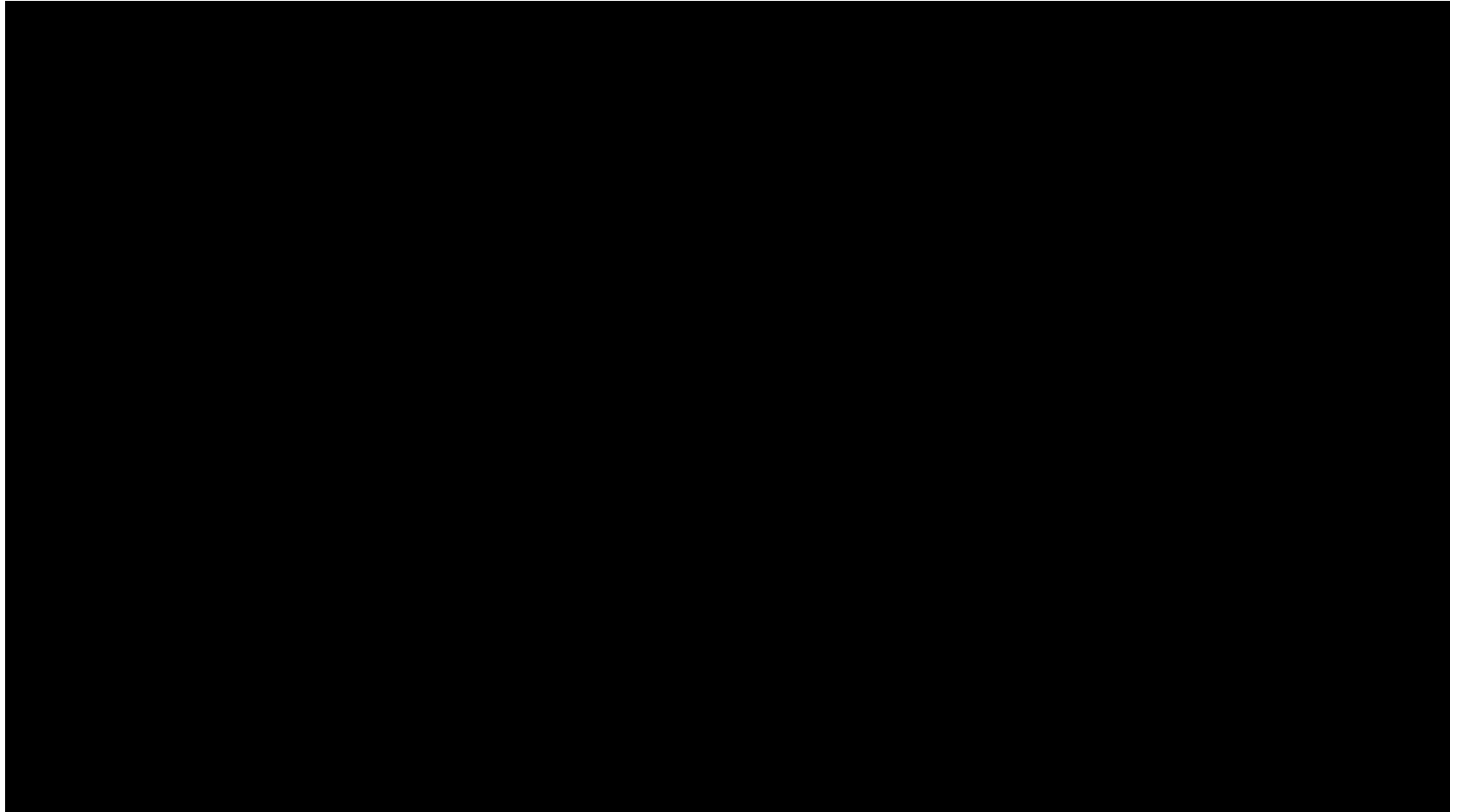
■ 1920

- Desire for Longer Distance Vehicles
- Lack of Horsepower
- Discovery of Texas Crude Oil
- Electric Starter



Jay Leno and His 100-Year-Old EV

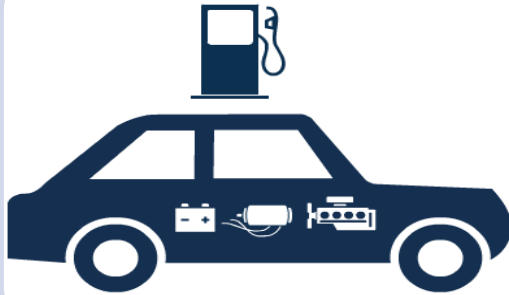
14



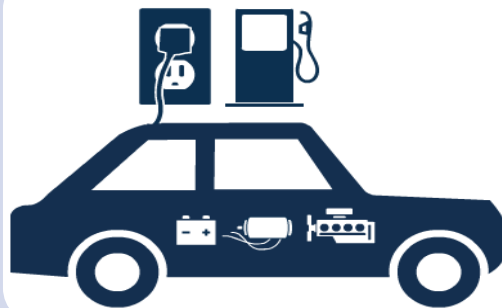
https://www.youtube.com/watch?v=CRwEXaHTwsY&feature=player_embedded

Types of EVs

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Hybrid
Electric
Vehicle (HEV)



Plug-In
Hybrid
Electric
Vehicle
(PHEV)

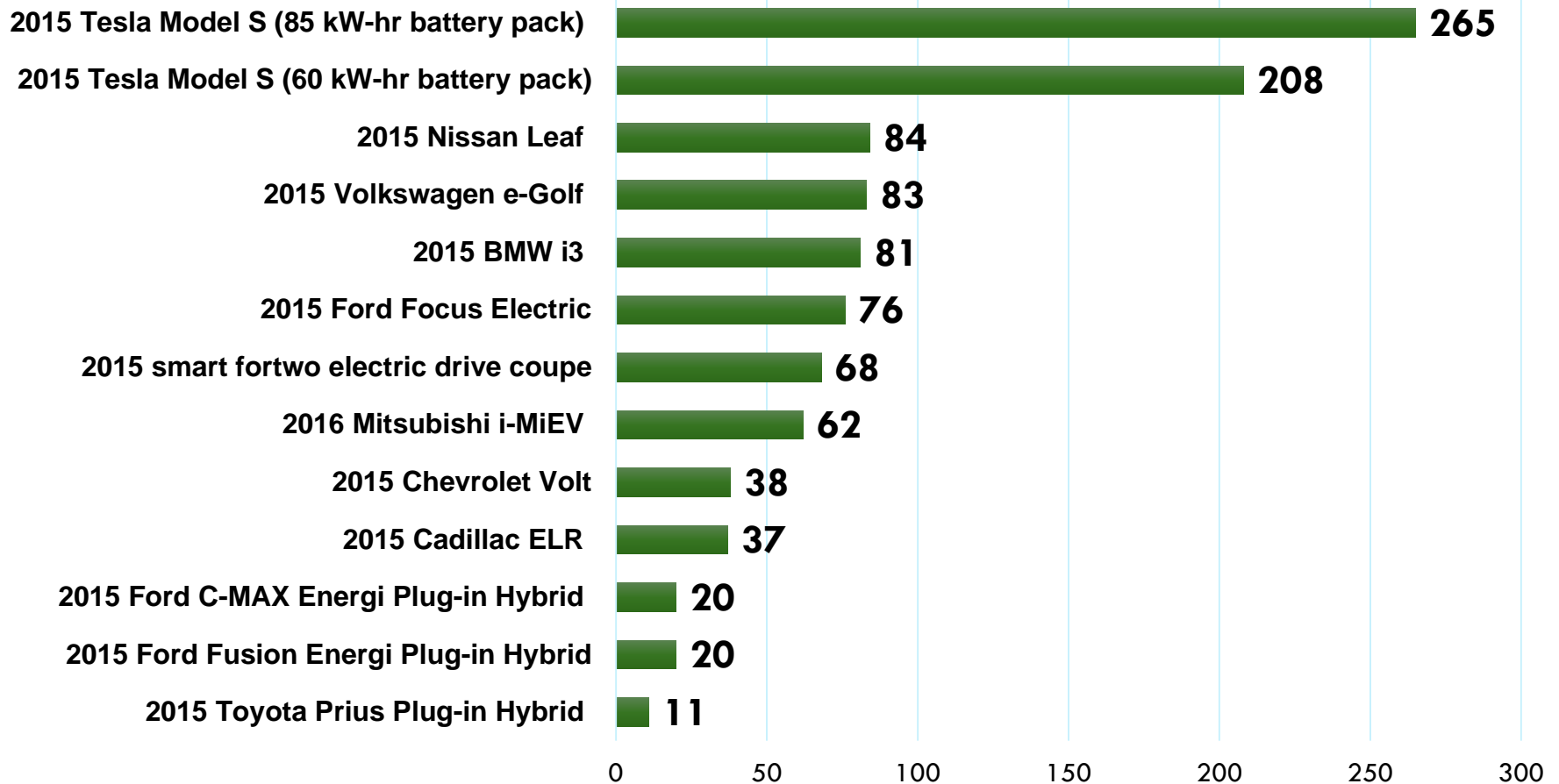


All-Electric
Vehicle (EV)
or Plug-In
Electric
Vehicle (PEV)

EV Range: How Far do They Go?

16

All-Electric Miles per Model



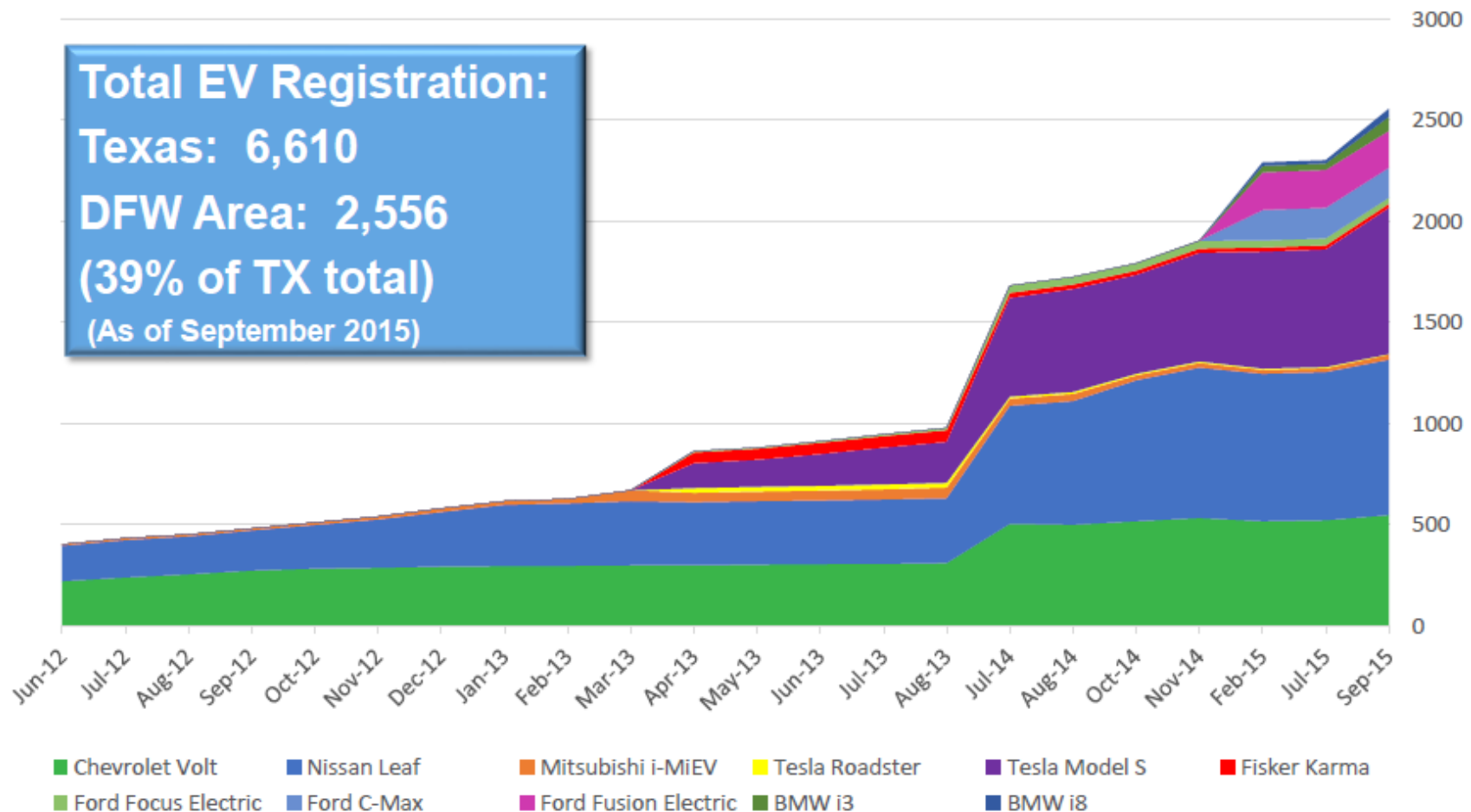
Electric Vehicle Service Equipment (EVSE) & Charging

17



Type	Time Needed to Charge 10 Miles
Level 1	1h 40 min
Level 2	~ 30 min
Fast Charging	< 5 min

EV Adoption in North Texas



*Not currently inclusive of all makes/models. NCTCOG staff plans to add data for additional models including: Cadillac ELR, Chevrolet Spark, Fiat 500e, Honda Accord Plug-In & Fit EV, Toyota Plug In Prius, & RAV4 EV

EV Emissions Benefits

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DFW EV Registration Emissions Impacts* Tons per Year

NO _x	2.72
VOC	0.69
CO ₂	16,980.38
PM	0.31
CO	168.59

2,556 EVs Registered as of 9/2***

* Assuming each EV replaces a vehicle certified to EPA Tier 2 Bin 5 emissions standards that drives 15,000 miles/year

** Based upon the EPA Greenhouse Gas Equivalencies Calculator

***Registration based on DMV registration data

CO₂ Emissions Reductions Equal to**:



-or-



- or offset by -

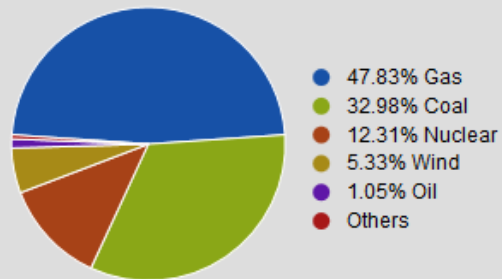


Well to Wheels Emissions

20

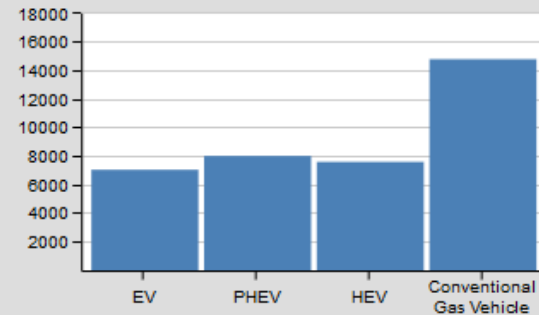
Texas - 75106

Electricity Sources



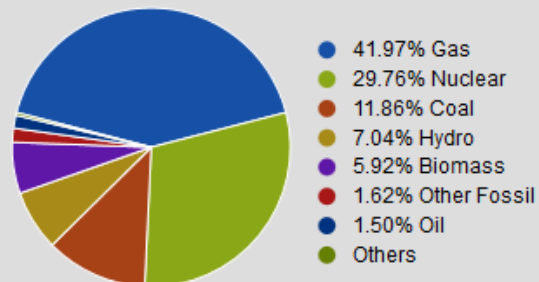
Annual Emissions per Vehicle

(lb of CO₂ equivalent)



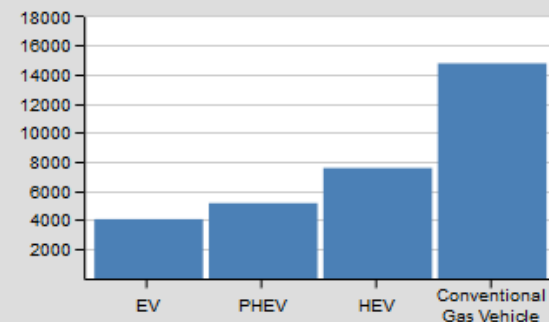
Massachusetts - 02108

Electricity Sources



Annual Emissions per Vehicle

(lb of CO₂ equivalent)



National Drive Electric Week

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Online Resources

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- Alternative Fuels Data Center
 - www.afdc.energy.gov
- Department of Energy's Fuel Economy Resource
 - www.fueleconomy.gov
- Green Vehicle Guide
 - www.epa.gov/greenvehicles
- DFW Clean Cities Coalition
 - www.dfwcleancities.org
- North Texas Electric Auto Association
 - www.nteaa.org

Thank You!

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