EUCI - 2019 Electric Vehicle-Utility Industry Nexus: *Charging Forward*

EV's… At Home, Work and throughout our Communities

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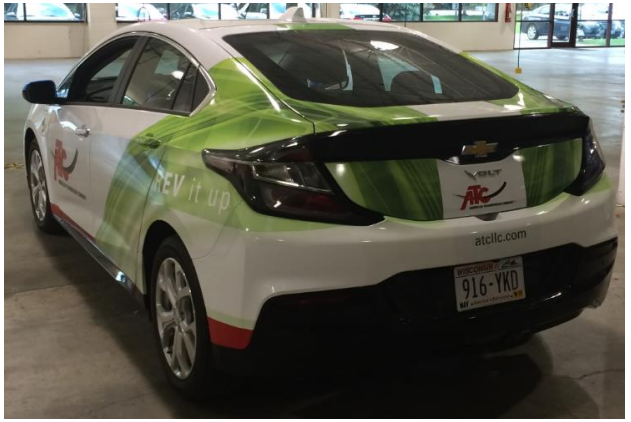
EVs… At Home, Work and throughout our Communities

- What EV Research is telling us
- Utility & Community Perspective
- How to transition to EV's
- EV Public and Workplace Policy



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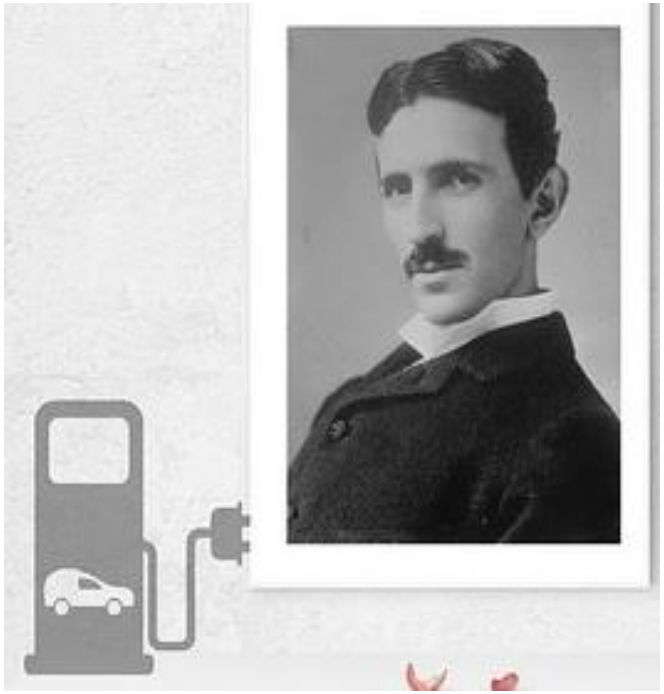
What is EV Research telling us?

- Emissions
- Maintenance
- Safety
- Charging
- Cost / Affordability
- Acceptance



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Emissions

- Based on where EVs are being sold in the United States today, the average EV driving on electricity produces global warming emissions equal to a gasoline vehicle with a 68 MPG fuel economy rating.*

- EVs will become even cleaner as more electricity is generated by renewable sources of energy.*

- (sneak peek: yes, they're cleaner by 50 percent)*

* Rachael Nealer - Union of Concerned Scientists 4/13/18

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Emissions

- Average EV emissions have continued to decline over time thanks to accelerating coal plant closures and the decarbonization of America's power sector (down 28% since 2007)*

- while burning gasoline won't get much cleaner, driving on electricity can get cleaner every year – saving billions in health expenses and climate impacts along the way*

* Silvio Marcacci, Communications Dir. At Energy Innovation Policy and Technology –Quotes in Forbes Article 3/14/18-

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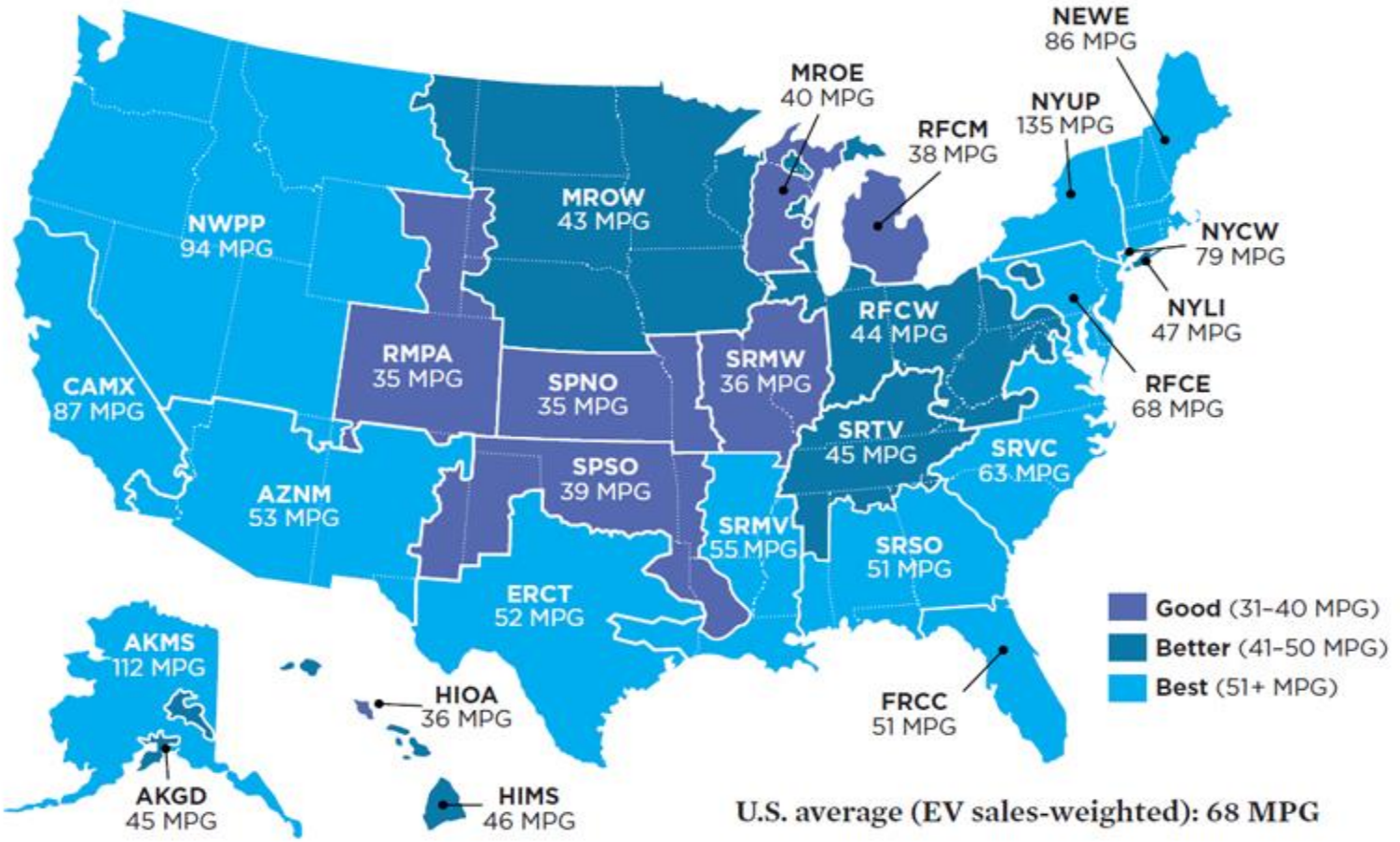
Electric Vehicle Global Warming Pollution Ratings and Gasoline Vehicle Emissions Equivalents by Region



Learn more at: ucsusa.org/EVlifecycle

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Maintenance

- Five of the most routine car repairs?
- What are the costs of those repairs?
- Five of the most expensive car repairs you have experienced?
- What are the costs of those repairs?
- Of those mentioned how many of them are reduced or eliminated with an EV?

Maintenance

- The completed combustion engine fitted into a BMW M5 is a 1,200 piece puzzle that weighs more than 400 pounds.*
- The electric-vehicle motor produced in the same factory is different in almost every respect: weighing about 70 lbs with just two dozen parts in total, and lacking an exhaust, transmission, or fuel tank.*
- Yet this slight battery-driven motor can outgun the combustion engine in BMW's fastest performance car from a standstill at a traffic light.*

*Elizabeth Behrmann with Bloomberg Businessweek

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Maintenance

Maintaining an electric car, according to some estimates, will cost about one-third the current cost of maintaining a gasoline-powered car.*

The bottom line is this:

Electric cars require considerably less maintenance than gas-driven cars.*

* Christopher Lampton, from How Stuff Works

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Charging

- There are currently 3 charging levels
- Level 1 is 120 volts standard outlet
- Level 2 is 240 volts
- Level 3 is 480 volts DC Fast Charger
- BMW, Porsche and others are working on a fourth level called FastCharge which will charge at up to 1000 volts and 450kw*

Note: Not all EV's can charge at Level 3

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Cost / Affordability

- Volkswagen, 50 EV models by 2025 and 40% of sales by 2030.
- BMW, 25 EV models by 2025 and 25% of sales by 2025.
- Volvo, 50% of sales to be BEV by 2025
- 85% reduction in battery prices since 2010
  Logan Goldie-Scot for Bloomberg
- Price Crossover 2025-2030
- Competition
- Economy vehicles

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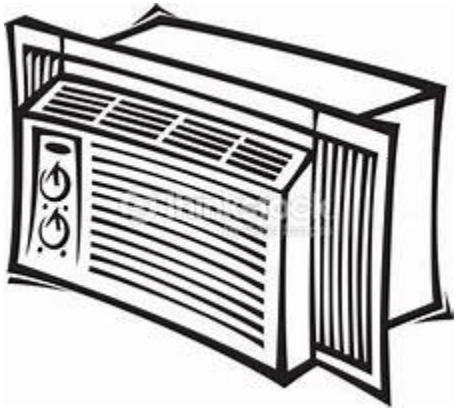
Acceptance

- Air Conditioner
- Dishwasher
- Microwave
- Cable TV, Dish, Direct TV



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Acceptance

- Computer- Desktop, Laptop, Tablet

- Internet- Dial-Up, High Speed

- Cell Phone, Blackberry, Smart Phone
- Social Media…





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Acceptance

- 2008, US was first out with the Tesla Roadster, by Jan 2010 sales reached 1000 vehicles

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Acceptance

- December 2010 GM started selling Chevy Volt and Nissan started selling the Leaf

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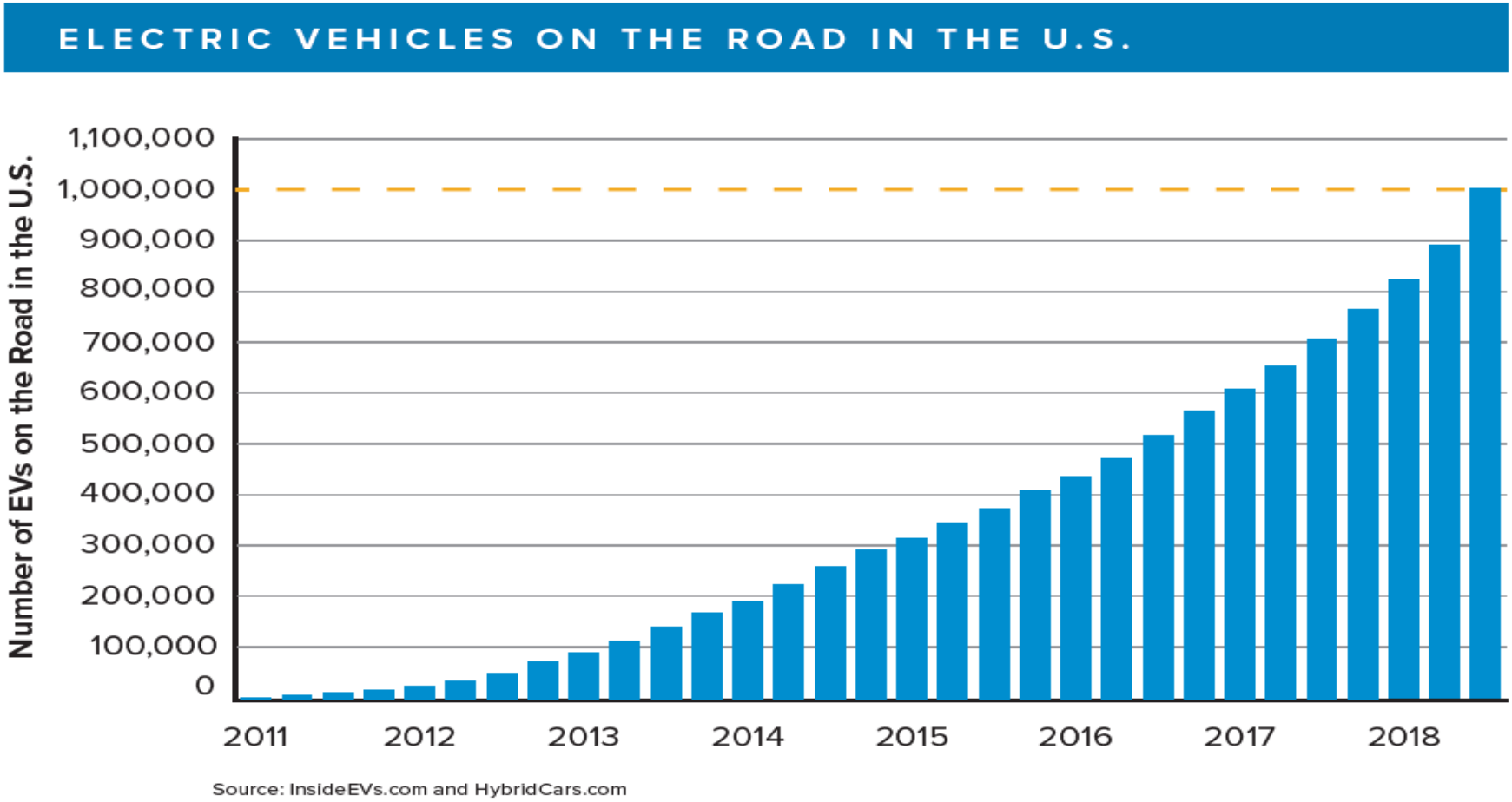
Acceptance

- Years 2010 and 2011, close to 22,000 EV's were sold, 44% Leaf's 36% Volt's
- 2013 over 100,000 EV's on the road
- 2018 over 1 million EV's on the road
- 2030 18.7m EV's projected to be on the road
- 2030 259m vehicles projected to be on the road

Acceptance



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Acceptance

MORE THAN

1 million

EVs

are on the road

in the U.S.

TOTAL EV SALES

for 2018 are up

65%

compared

to 2017

Q3 2018 was the

BEST SALES QUARTER EVER

with more than

110,000

EVs SOLD

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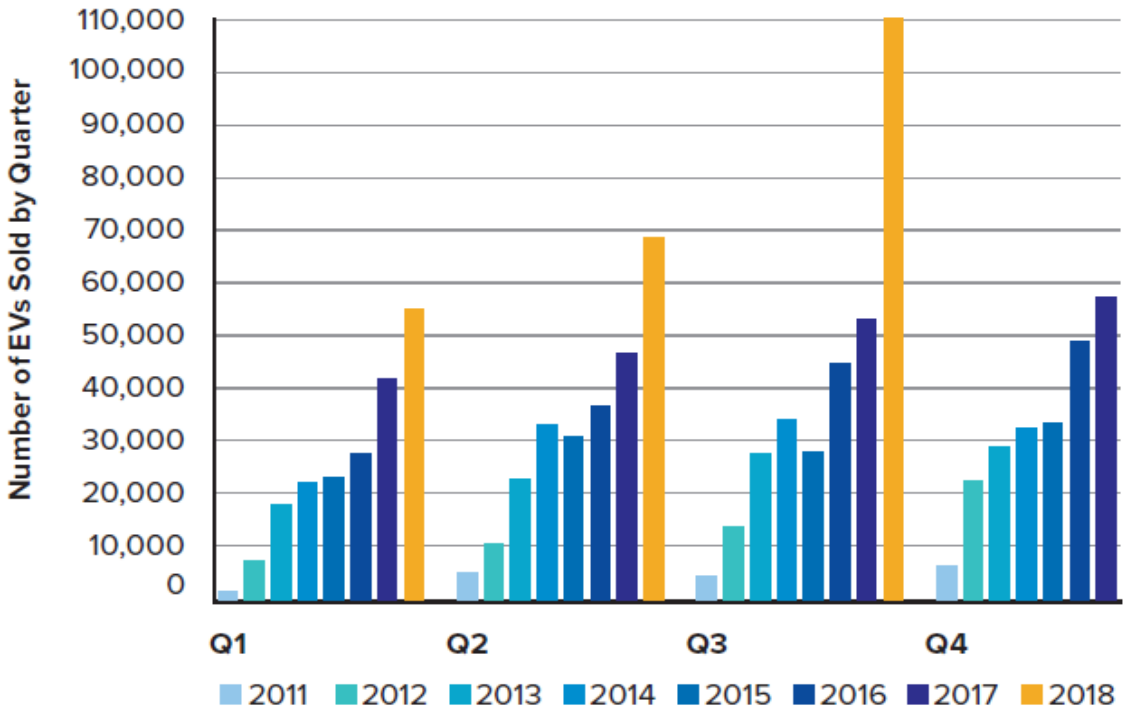
Acceptance

QUARTERLY EV SALES IN THE U.S.



Source: InsideEVs.com and HybridCars.com

KEY FACTS

- Q3 2018 was a breakout quarter, with more than 110,000 EVs sold.
- Q3 2018 sales increased 60% over Q2 and more than doubled the sales of Q3 2017.
- Overall, EV sales are up 65% for the year compared to 2017.

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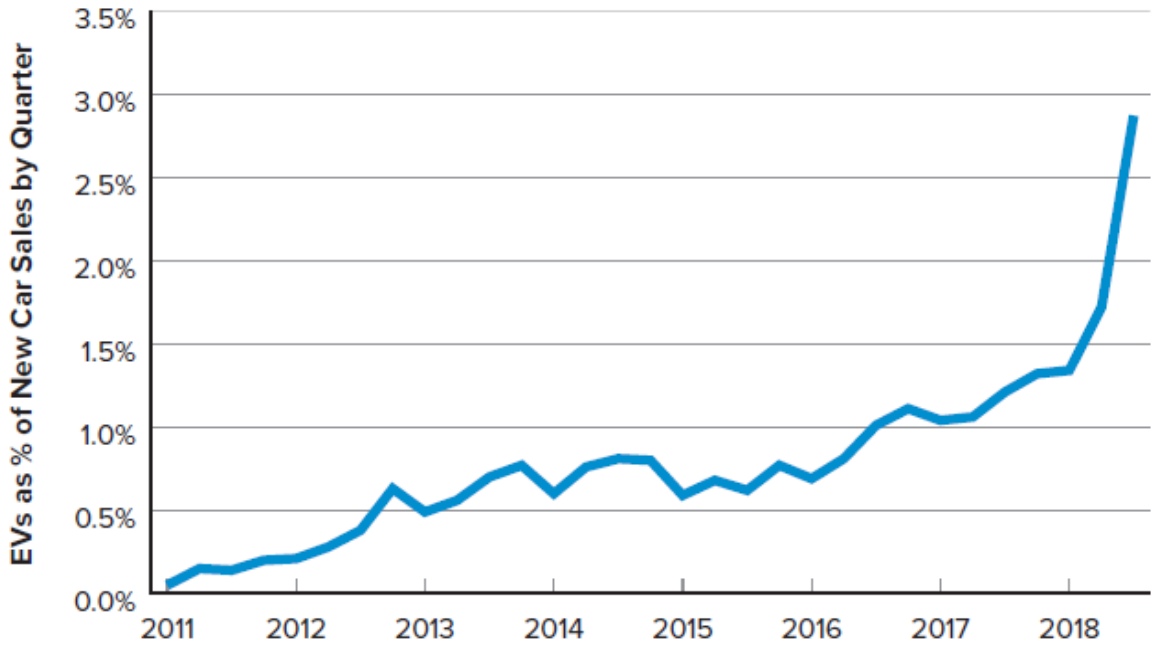
Acceptance

EV SHARE OF NEW CAR SALES IN THE U.S.



Source: InsideEVs.com, HybridCars.com, and GoodCarBadCar.net

KEY FACTS

- EV sales as a fraction of all new car sales reached nearly 3% in Q3 2018, primarily driven by the Tesla Model 3.
- EVs are averaging 2% of new car sales in 2018.
- EV market share is increasing against an overall auto market that is down 7% for the year.

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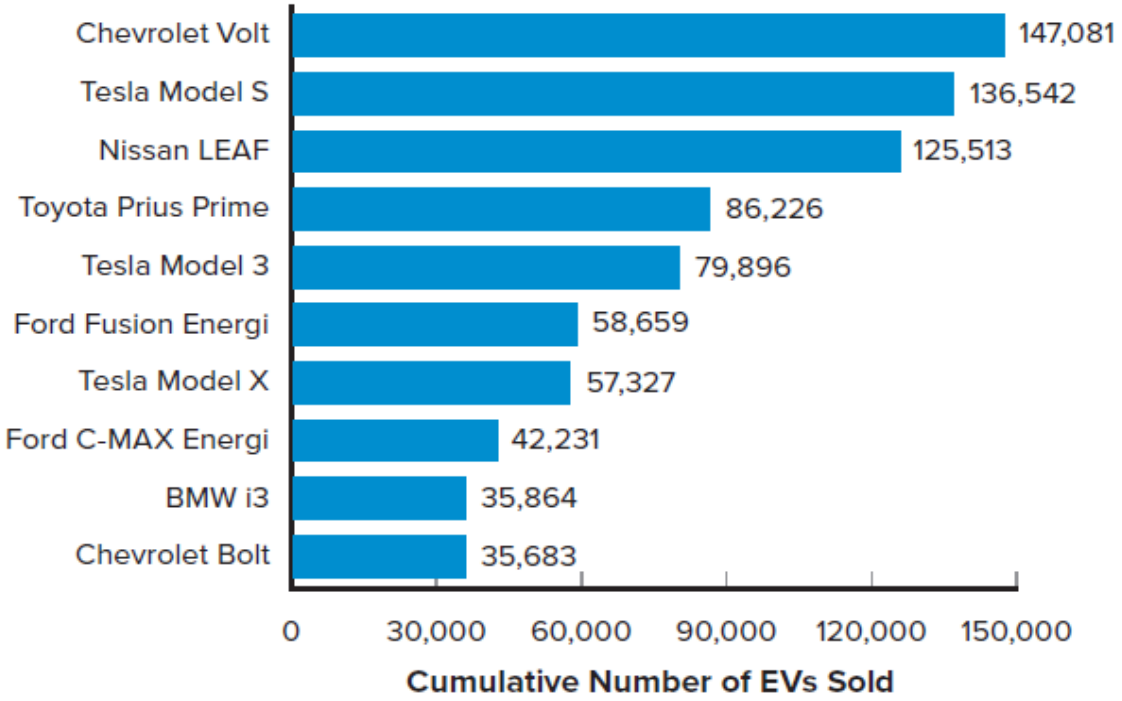
TOTAL EV SALES BY MODEL: TOP 10



Source: InsideEVs.com and HybridCars.com

KEY FACTS

- Ten EV models have surpassed 30,000 in total cumulative sales.
- These 10 EV models account for 80% of all EV sales in the U.S. More than 40 other EV models that have been sold in the U.S. since 2010 account for the remaining sales.

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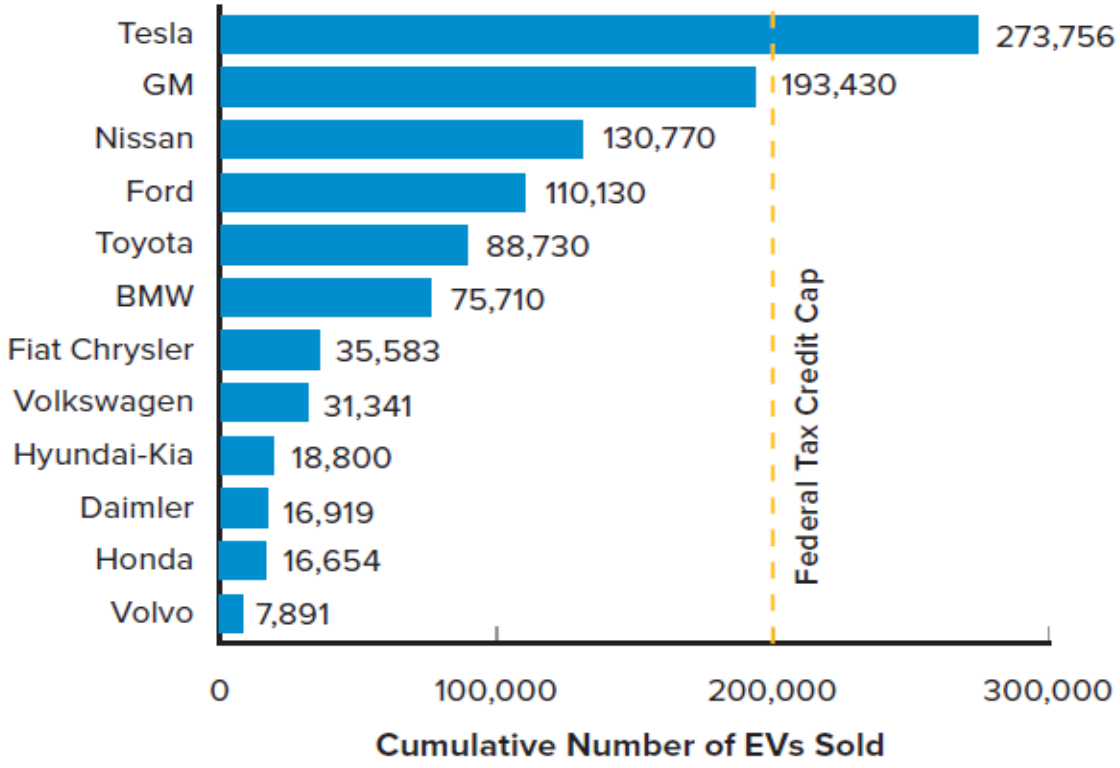
TOTAL EV SALES BY AUTOMAKER



Source: InsideEVs.com and HybridCars.com

KEY FACTS

- Tesla sales have surpassed the 200,000 cap for the federal tax credit, triggering a phase-out of the credit for Tesla vehicles over the course of 2019. General Motors is nearly at the cap.
- The top 6 automakers account for 87% of total EV sales, while the bottom 6 account for the remaining 13%.

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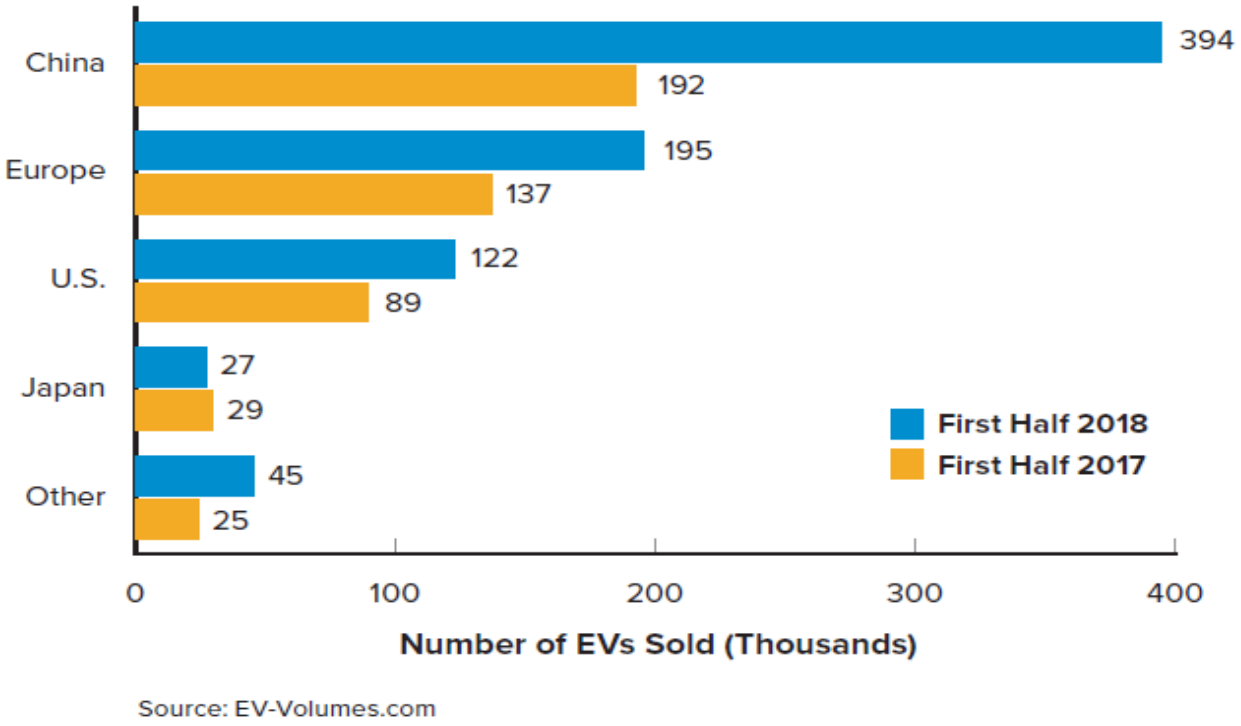
GLOBAL EV SALES JANUARY TO JUNE 2018 VS. JANUARY TO JUNE 2017



Source: EV-Volumes.com

KEY FACTS

- Global EV sales totaled about 783,000 in the first half of 2018, an increase of 66% compared to the first half of 2017.
- China and Europe are the leaders in EV Sales. U.S. EV sales made up about 16% of global EV sales in the first half of 2018.
- U.S. EV sales grew by about 37% in the first half of 2018 compared to the first half of 2017, lagging behind growth in Europe of 42% and growth in China of 105%.

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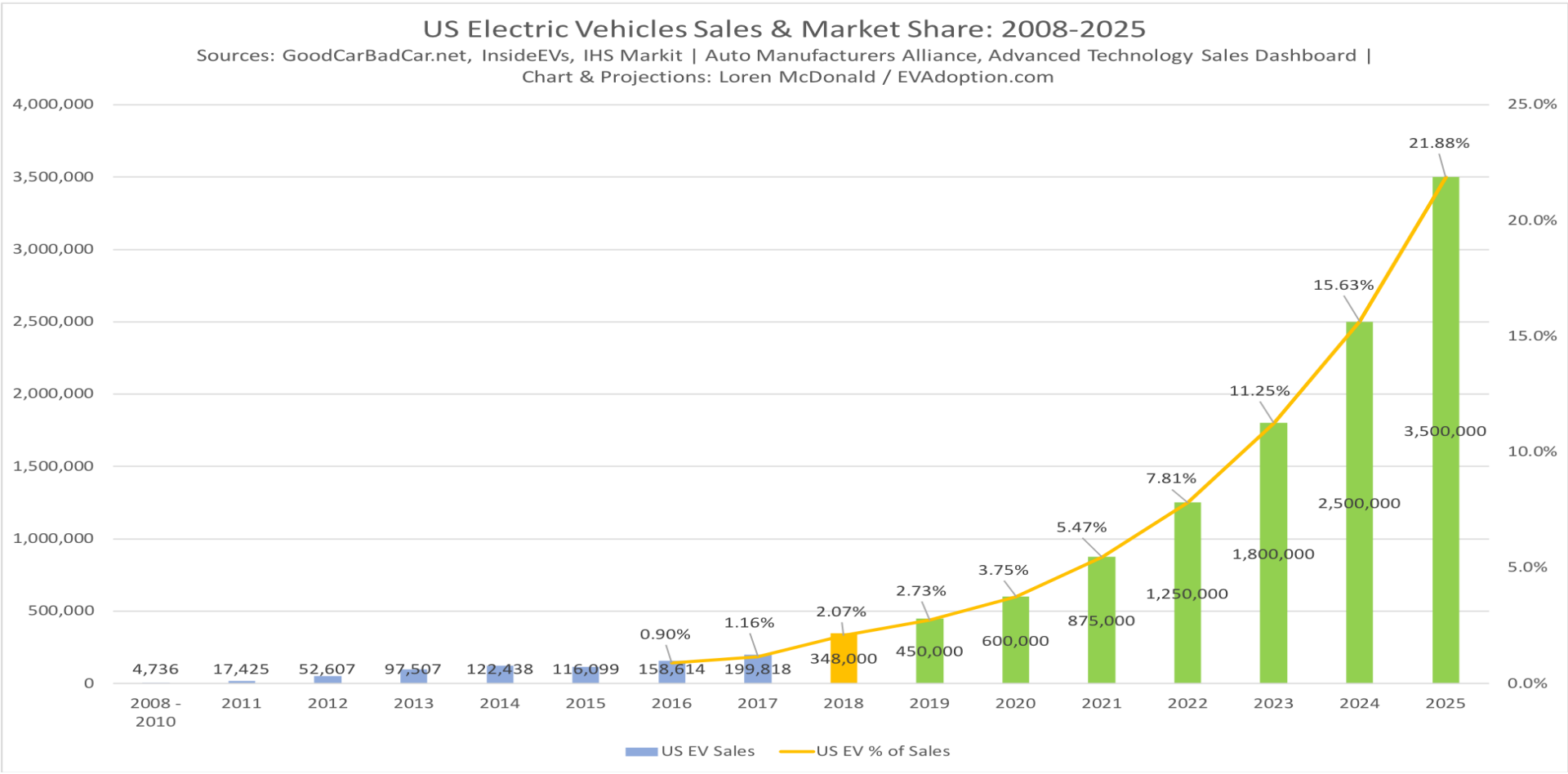

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Expect 125 million EVs on the road world wide by 2030, says IEA

An International Energy Agency report anticipates 24 percent annual growth and triple the total in just two years.

•By Emme Hall

May 30, 2018 12:10 PM PDT

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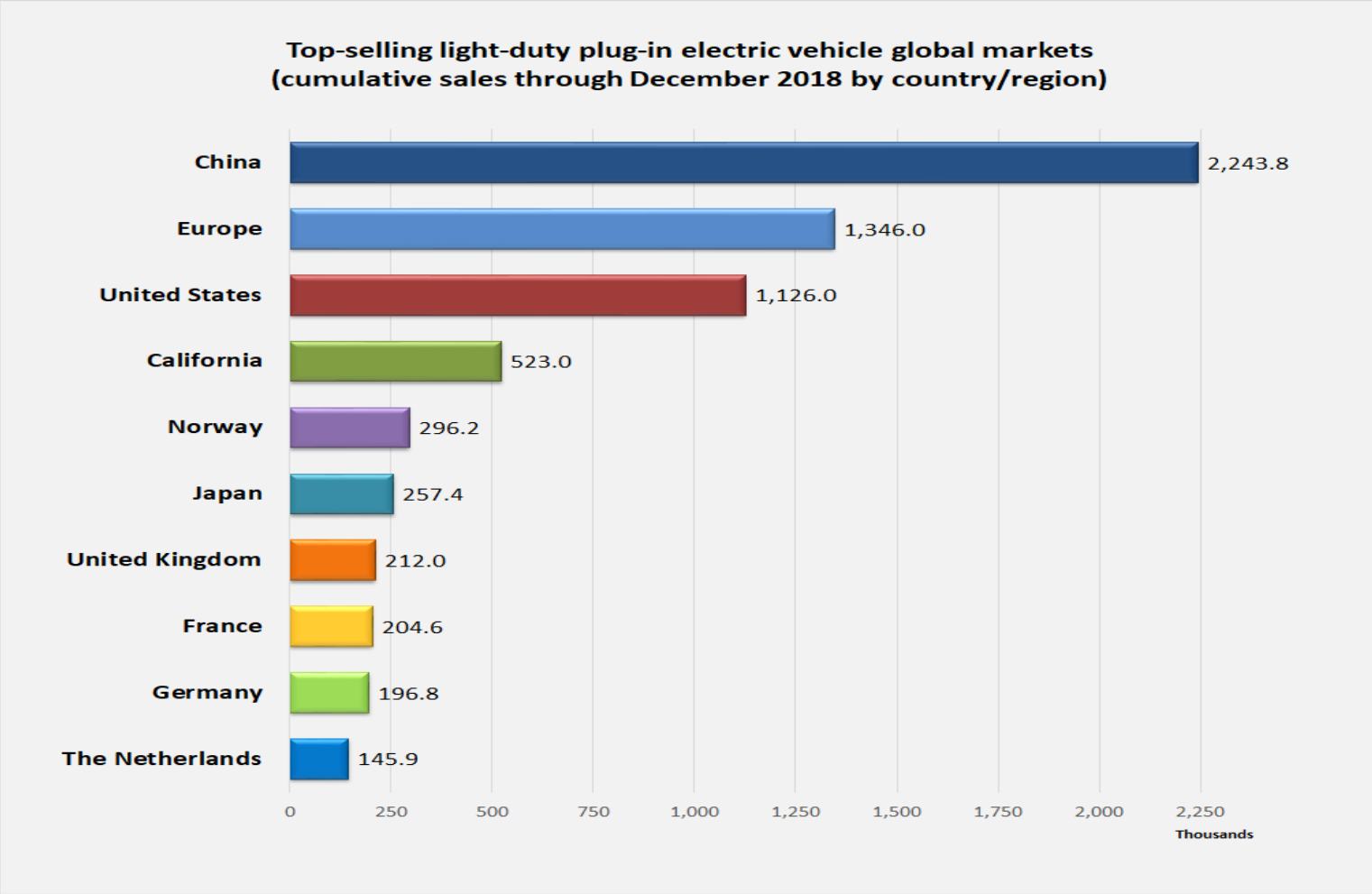
Acceptance



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Utility and Community Perspective

- Utilities and Communities are interested in reducing emissions/carbon footprint
- Communities and Utilities want cleaner healthier communities to work and live in
- Utilities and Community Leaders are responsive to those they serve
- Community and Utility Leaders are responsive to those who regulate them

Community Perspective

- Community Leaders respond to citizens
- Grassroot movements within communities to be Greener and sustainable, is growing
- Greener, sustainable communities is something we have been teaching our children for nearly 50 years
- April 22, 1970
- First Earth Day

Community Perspective

- Since April 22, 1970 federal, state and local government policies have progressively required and or incentivized environmentally friendly behavior
- Communities are doing many different things to be greener and more sustainable
- For some communities that includes being EV friendly
- Someday all communities will be EV friendly

Community Perspective

- I live, in Kaukauna, WI. Pop. 16,000
- Kaukauna is an EV friendly Community
- Kaukauna owns and operates the electric utility
- Kaukauna calls themselves the Electric City

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Kaukauna - Electric City

Has anyone ever wondered where the moon gets its glow…

Here is something to ponder ☺

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KU Level 2 EV Charger & KU Solar

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Hydro Park Level 2 EV Charger

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City Hall Level 2 EV Charger

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Fire Station Level 2 EV Charger

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Kwik Trip Level 1 EV Charger

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ATC Level 2 EV Charger

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Community Perspective

- All charging for chargers owned by the city and the gas station are free at this time
- ChargePoint allows for establishing a fee for charging at any time
- When EV's become more widespread most likely a fee will be implemented

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Utility Perspective

- Customers, policy makers and regulators are making environmentally friendly decisions
- Utilities are responding to those decisions
- The accommodation and use of EV's is one of the many environmentally friendly initiatives utilities are doing.
- Shifting Perspective: Fleets No Longer a Cost Center, but a Strategic Investment*

*Edison Electric Institute – *Transportation Electrification, June 2014*

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Utility Perspective

Situation

- *Stagnant growth, rising costs, and a need for even greater infrastructure investment represent major challenges to the electric utility industry.**
- *To maintain our critical energy infrastructure while investing for the future, today's electric utilities need a new source of load growth – one that fits within the political, economic and social environment.**

*Edison Electric Institute – *Transportation Electrification, June 2014*

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Utility Perspective

What does ATC say…

- We are accustomed to leading the way.
- We are committed to being an industry innovator.
- We are looking for new ways to grow the company while keeping employees and stakeholders engaged in our efforts to move energy into the future.
- We are committed to environmental leadership throughout our business.
- As a home-grown company, we are looking for ways to help our communities and neighbors.

Public Utility Perspective

Overall Benefits

- Reduced operating costs.
- Reduced carbon footprint.
- Improved sustainability.
- Enhanced “brand image.”
- Increased employee satisfaction.

- Added tool for employee recruitment & retention.
- Strengthens reputation as one of the “Best Places to Work.”

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Utility Perspective

Other Benefits

- Supports corporate environmental goals
- ChargePoint stations generate environmental reports for carbon offset and oil reduction.
- Cost savings from reductions in employee mileage expenses.
- Federal tax incentives.

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Rev it up

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How to Transition to EV's

- Create an Ad-Hoc EV research group
- Determine if there is a Need and Benefit
  - What are industry leaders doing
  - Does it align with company values
  - Does it support the company's business model
  - Respond to customer needs

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How to Transition to EV's

- Develop summary of findings
- Develop a recommendation
  - Install Chargers?
  - Acquire EV's?
  - Customer incentives?
- Give presentation to decision makers
- Get permission to proceed

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Public and Workplace Policy

- Workplace Policy
  - Permission to proceed is the Segway to develop company practices, guidelines and policy for everything EV's
- Public Policy

  Local

  State

  Federal

Public Policy

- Local
  - Mayor or equivalent.
  - City Council or equivalent.
- Elected Officials are responsive to their constituents.
  - Contact the Mayor or your local representative.
  - This can be a citizen, special interest, business community or a joint effort.

Public Policy

- You don’t need to have all the details before contacting a local official.
- All you need is a concept.
- Most communities also have key staff, like planners, finance directors, public works directors etc. that can be very helpful in helping navigate this process.

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Public Policy

- Goal is to have your City become EV friendly.
  - By virtue of policy, ordinance or resolution.
  - Install EV charging stations at public facilities.
  - Requires EV Chargers for new public construction projects.
  - Require all new construction to accommodate EV charging
- This same concept can be used at both the state and federal levels.

Public Policy

"The government started pushing development of electric cars to help eliminate air pollution, reduce oil imports and develop high-technology manufacturing"

*Bloomberg News 4/14/19

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Opinion:

Opinion: China, not Tesla, is driving the electric-car revolution

2018 sales; China 1.1 million, U.S. 358k

MarketWatch

By **Jack Barkenbus 3/15/19**

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why
when
who
where
what
why
QUESTIONS
who
how
where
what
how
who
when

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