

China takes the pole position in the electric-car race

By Justin Worland

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EV – Electric Vehicle

ICE – Internal Combustion Engine(s)

OLLI West Great Decisions; 1/31/2018

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- Time Magazine:
- Link to pdf: [click here](#)



China takes the pole position in the electric-car race

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FROM A CURSORY LOOK AT THE RECENT NEWS FROM Tesla, a casual observer could be forgiven for thinking that the dream of transitioning the world to electric vehicles has stalled. The Tesla brand is more closely associated with electric vehicles than any other, and in the past year the company has struggled to deliver the \$35,000 Model 3. CEO and founder Elon Musk described the internal delays related to producing Tesla's battery and an outside supplier's falling behind as "production hell," while customers vented on social media and the company declared a second third-quarter loss of more than \$600 million.

As Tesla struggles to maintain its position as the world's foremost electric-vehicle brand, traditional automakers in the U.S. and Europe have invested billions of dollars to advance the technology. And a slew of Chinese companies are churning out hundreds of thousands of electric vehicles a year.

"The story is not just about Tesla anymore," says John Gartner, an analyst at Navigant Research. "There's an ecosystem." The battle will determine which country dominates the global market for electric vehicles, which are forecast to be a third of all passenger vehicles on the road by 2040, up from less than 1% today, according to Bloomberg New Energy Finance. Currently, China has the upper hand.

"It's clearly the case that China will lead the world in EV development," William C. Ford Jr., the executive chairman of Ford Motor Co., said in Shanghai in December, according to the New York Times.

Vehicle frames await testing in leading carmaker BYD's lab in Shenzhen, China

5,000
Number of Model 3s Tesla says it will build weekly by midyear; the company had earlier said it would hit that target last year

700K
Number of electric cars sold in China in 2017, according to preliminary figures

54%
Percentage of global car sales expected to be electric by 2040

In some ways, Tesla's "production hell" helps explain why China is better situated to develop the electric vehicle of the future. Despite top design, engineering and marketing talent, Tesla has struggled with basic manufacturing. Automated processes have failed on the factory floor, and the company has struggled to secure the supply chain to operate on the scale it needs to produce a mass-market electric vehicle. Musk has taken responsibility for the delays while also downplaying their significance. "In the grand scheme of things, this is a relatively small shift," he told investors in October.

CHINA HAS INVESTED heavily in policies to develop its electric-vehicle industry. It has offered subsidies to buyers to the tune of \$15,000 per vehicle, threatened to block automakers that don't make electric vehicles from selling traditional cars and funded electric-vehicle infrastructure like charging stations across the country's highway network. Earlier this month, China simply halted production of more than 500 models of heavily polluting cars. China is expected to spend some \$60 billion in electric-vehicle subsidies in the half decade preceding 2020, according to a Financial Times analysis.

That focus has helped foster a slew of Chinese automakers like BYD Auto, Great Wall Motor and Lifan Auto. Chinese automakers are expected to produce more than 4.5 million electric vehicles annually in 2020, compared with about a million from Tesla, according to data from the International Energy Agency.

To date, Chinese electric vehicles have largely remained a product for the developing world, while Tesla has thrived in the European market. But Chinese automakers recently ramped up efforts to expand their global reach, and at least one company—GAC Motor—plans to sell cars in the U.S. as soon as next year.

"Sometimes people are under the impression that China is either dragging their feet or somehow behind the U.S. in terms of sustainable-energy promotion," Musk said at a conference last summer. "But they are by far the most aggressive on earth."

Take away points

- CHINA LEADS
 - 700,000 EVs sold in China 2017
 - Vs. ~25,000 U.S. (<https://www.fleetcarma.com/electric-vehicle-sales-united-states-2017-half-year-update/>)
 - 54% GLOBAL car sales expected by 2040 (likely sooner)
 - Not just Tesla anymore
 - Production issues on factory floor
 - China leads
 - EXPANDING GLOBALLY – EXPORTING!

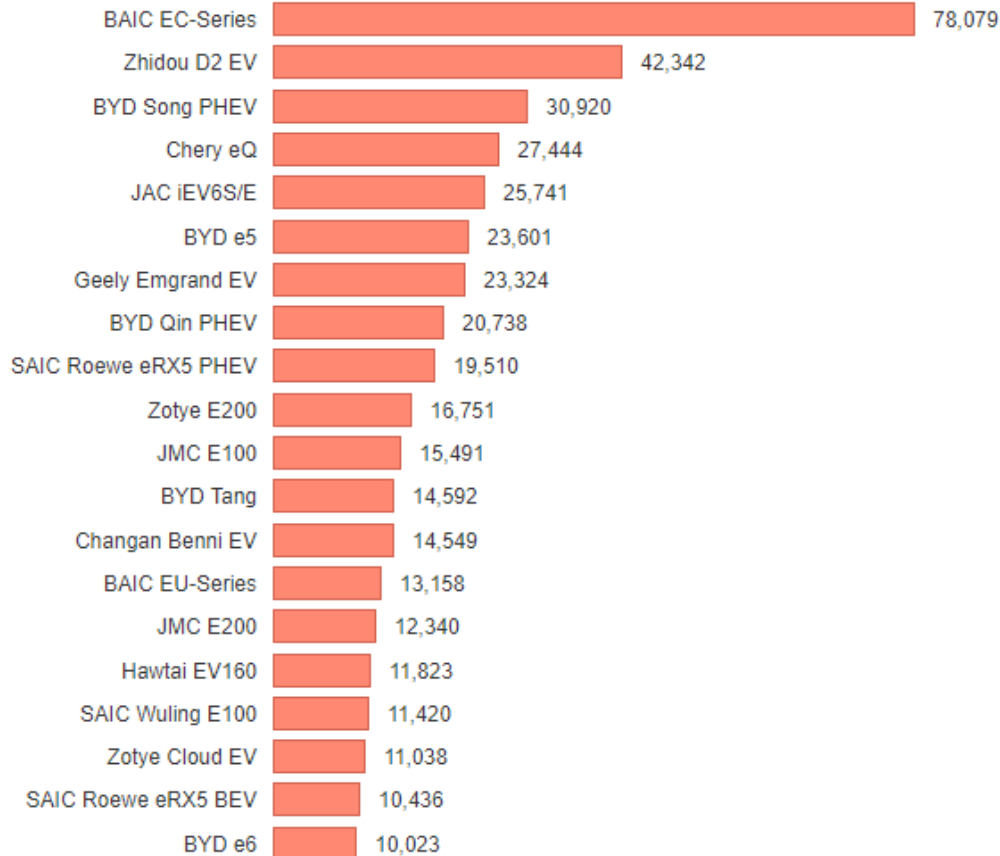
Take away points

- CHINA INVESTS:
 - \$15,000 SUBSIDY vs. U.S. \$7,500 AND uncertain future
 - CHINA: \$60 Billion by 2020 in subsidies
 - China HAS funded EV infrastructure charging stations across the country's highway network
 - WILL block ICE cars (Internal Combustion Engines)

China Electric Car Sales

Sales figures here are not 100% official.

December **2017**

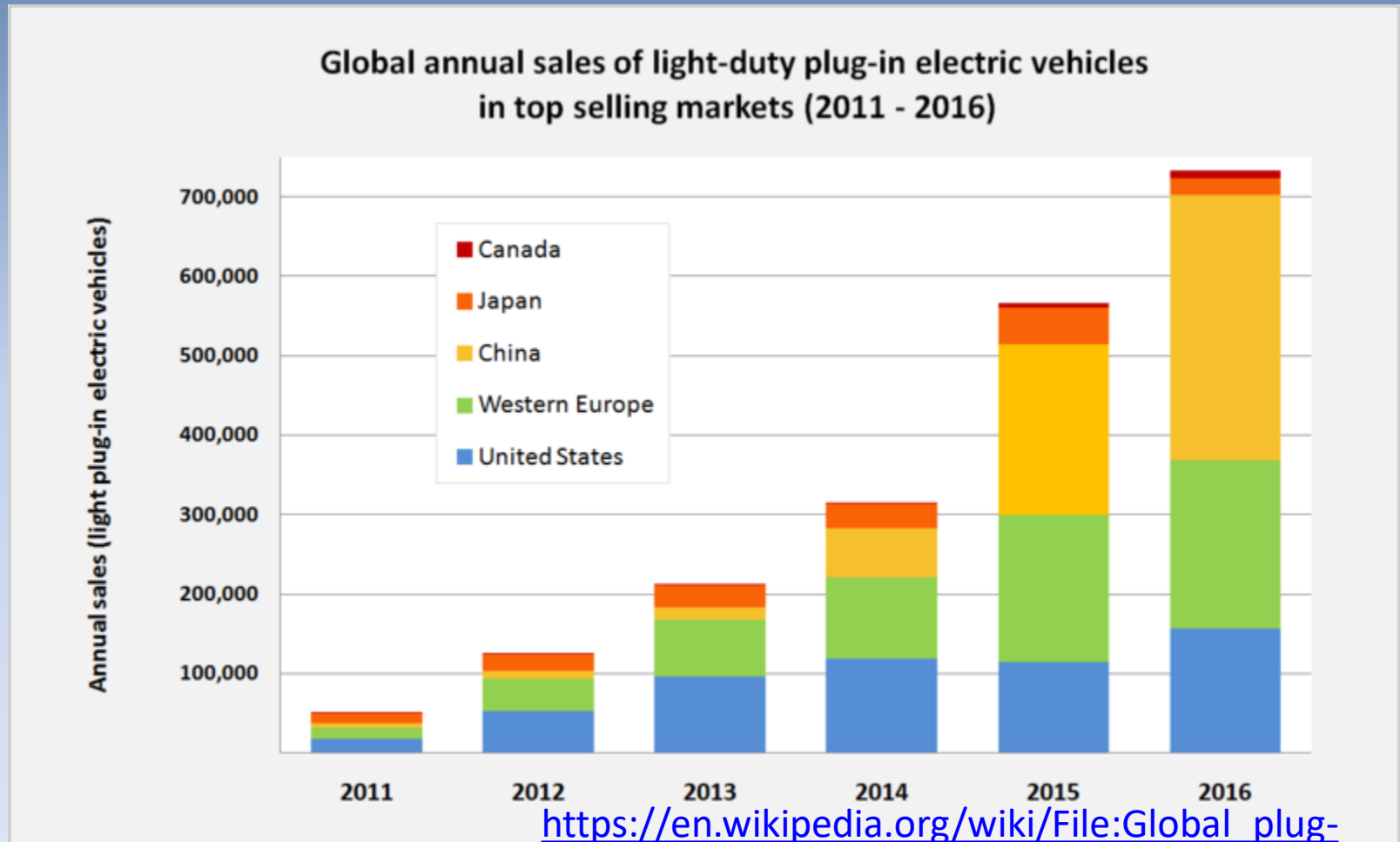


* = estimate

Source: CleanTechnica & EV Obsession • Get the data • Created with Datawrapper

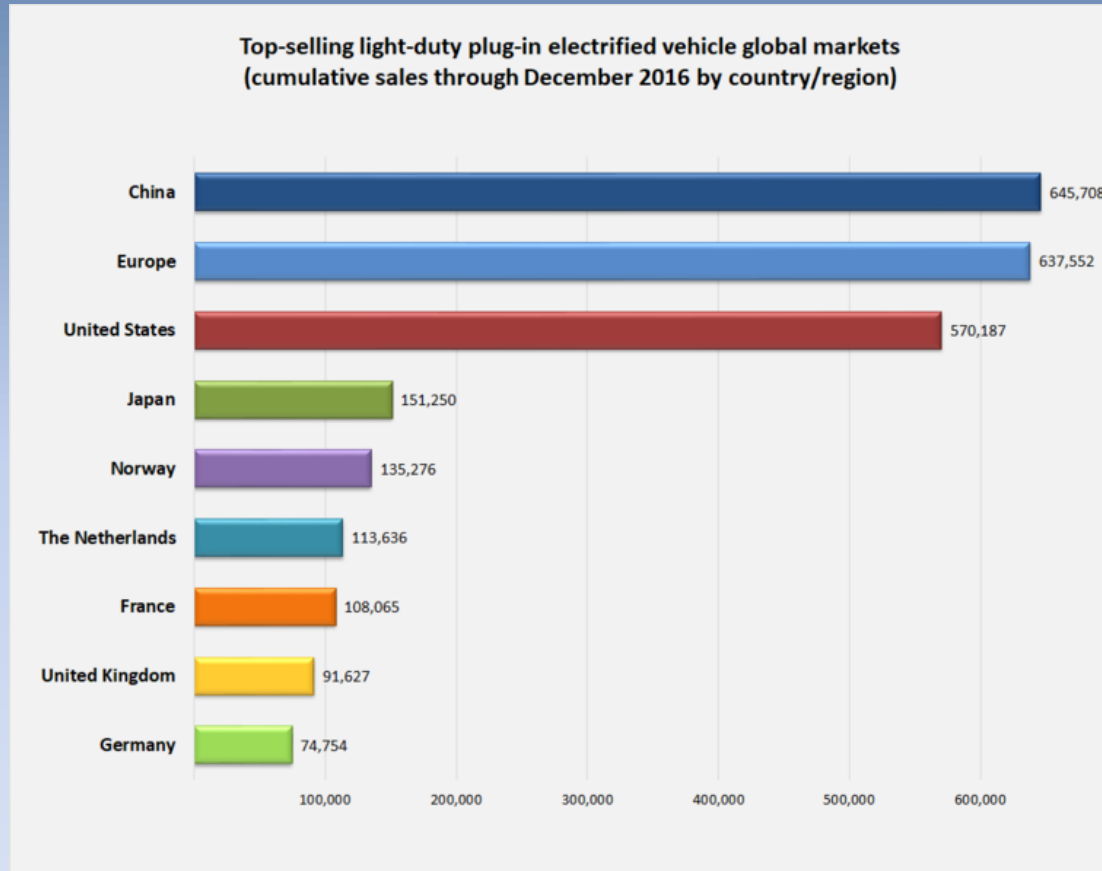
<https://cleantechnica.com/2018/01/29/2017-china-electric-car-sales-blow-world-water-baic-ec-series-superstar/>

Note: While U.S. Stays flat, China and Europe forging ahead



https://en.wikipedia.org/wiki/File:Global_plug-in_car_sales_since_2011.png

2016 Data



https://en.wikipedia.org/wiki/File:Top_PEV_global_markets_stock_Dec_2016.png

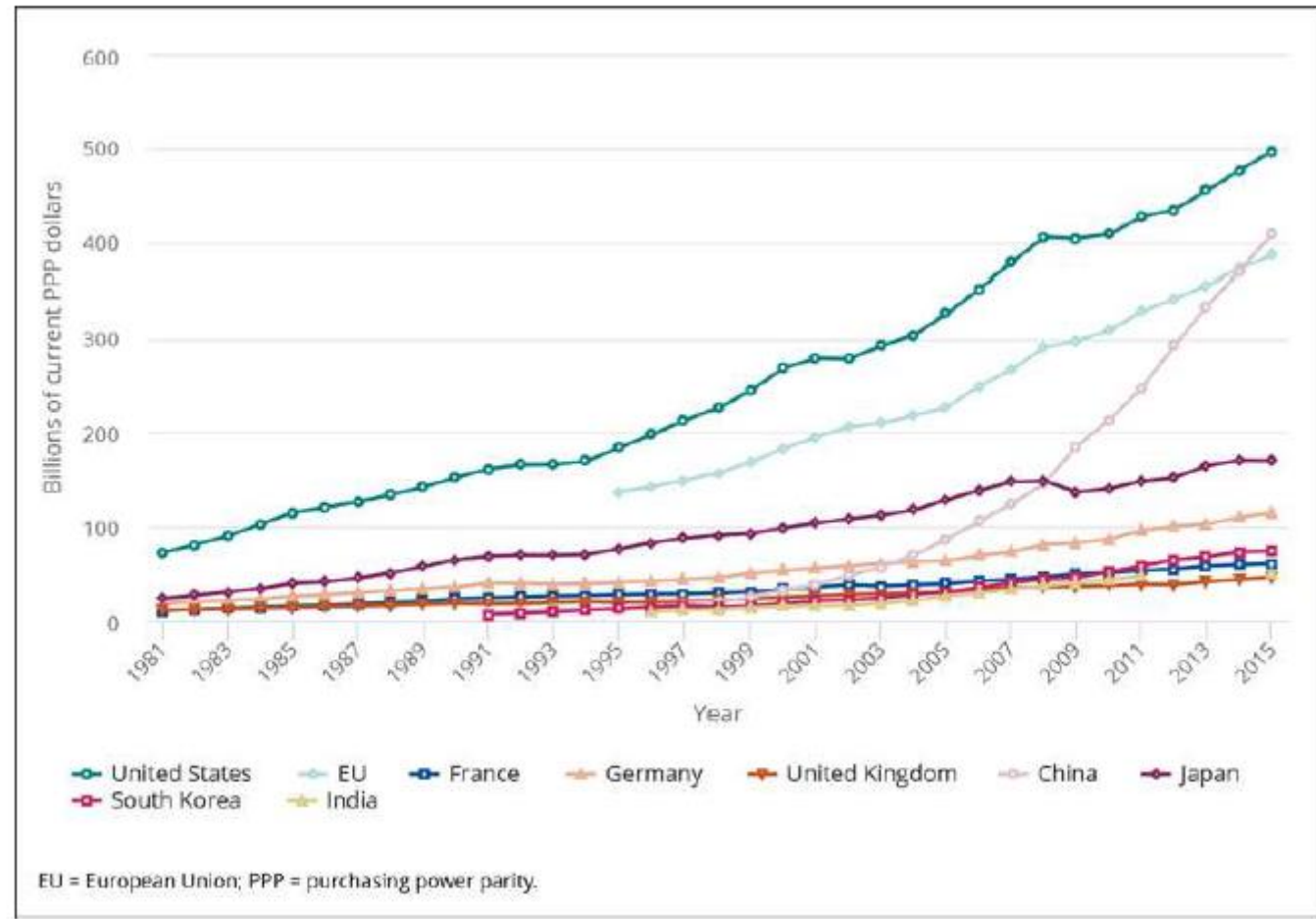
China Catching Up to United States in Research and Development

EOS BUZZ
The latest Earth and space science news



China Catching Up to United States in Research and Development

By Randy Showstack 24 January 2018
China recently overtook the European Union in spending on basic and applied research in science and engineering.



LINK to PDF:

https://eos.org/articles/china-catching-up-to-united-states-in-research-and-development?utm_source=eos&utm_medium=email&utm_campaign=EosBuzz012618

International Energy Agency (IEA) Study:

Global **EV** Outlook 2017

Two million and counting

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA), an autonomous agency, was established in November 1974. Its primary mandate was – and is – two-fold: to promote energy security amongst its member

<https://www.iea.org/publications/freepublications/publication/GlobalEVOutlook2017.pdf>

YouTube Channel of the Colorado Renewable Energy Society (CRES):

<https://www.cres-energy.org/>

- VIDEO: TONY SEBA – JUNE 2018 – A MUST WATCH!:

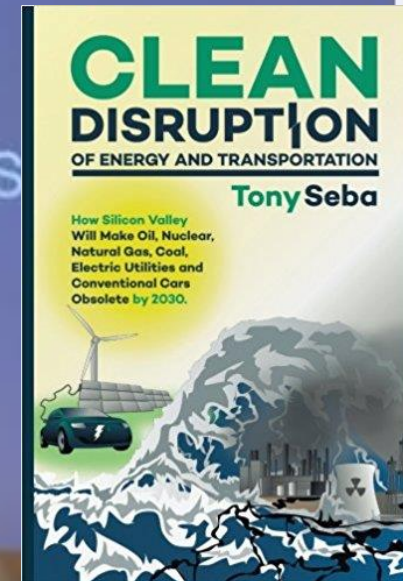
- <https://www.youtube.com/watch?v=...>

The image shows a screenshot of the Colorado Renewable Energy Society (CRES) website. The browser address bar displays <https://www.cres-energy.org>. The website header features a blue navigation bar with social media icons for Facebook, Twitter, Google+, LinkedIn, and YouTube (the YouTube icon is circled in red). Below the navigation bar is a large banner with a stylized illustration of a city and renewable energy sources like wind turbines and solar panels. The text "Energy Society" is prominently displayed in the center of the banner. A video player overlay is positioned in the center of the page, featuring a red border. The video player shows a man, Tony Seba, speaking and gesturing. The video title is "Clean Disruption of Energy & Transportation" and the duration is 1:03:34. The video player also includes the RethinkX logo and the text "Tony Seba.com". The website footer contains a navigation menu with links for EVENTS, JOIN, DONATE, VOLUNTEER, POLICY, RESOURCES, ABOUT CRES, SUBSCRIBE, BLOG, and CONTACT. A blue button labeled "JOIN CRES" is visible at the bottom of the page.

Tony Seba: Clean Disruption - Energy & Transportation

CLEAN DISRUPTION OF ENERGY & TRANSPORTATION

- 1 Batteries
- 2 Electric Vehicles
- 3 Autonomous Vehicles
- 4 Ride-Hailing
- 5 Solar



Other CRES YouTube Videos:

https://www.youtube.com/channel/UCr81EUb2qVJVfmmlJMxEHVw/videos?disable_polymer=1

- Driverless Cars and the Environment - Rutt Bridges, Futurist <https://youtu.be/0BWJcpesr6A>
- Ramping Up Solar to Power the World - Greg Wilson, NREL <https://youtu.be/7CDPHxcnq4c>
- Bill Ritter - Powering Forward. The Clean Energy Revolution can't be stopped <https://youtu.be/agowW1Qkwms>
- Can Hydrogen Save our Energy System? Mark Ruth, NREL <https://youtu.be/4u93y-l0cwM>
- Where Are Hydrogen Fuel Cell Vehicles today? (Oct-2016) <https://youtu.be/WpqaVATWgnA>

Wirth Chair Talk by Amory Lovins:

PDF Link: [click here](#)



Disruptive energy futures

Amory B. Lovins

Cofounder and Chief Scientist

Wirth Chair Luncheon, U of Colorado Denver
Four Seasons, Denver, 06 Oct 2017



The Gasoline-Powered Automobile Is Obsolete

*Electric Drivetrains Simply Make the
Most Sense and Are Now More Practical
and Affordable for Cars & Trucks*

Jim Smith, January 26, 2018

- [For a full set of Jim Smith's slides click here](#)

Incentives

***Electric Cars Are Already Affordable
Because of Federal/State Tax Credits***

\$7,500 Federal tax credit

\$5,000 Colorado rebate at purchase

And if you're against Incentives UNDERSTAND that there are Oil and Gas incentives

- Incentives exist temporarily to support new technologies.
- Have a look here to see those Billions of incentives for Oil and Gas – not exactly NEW technology:
 - CO bill 18-002: <https://leg.colorado.gov/bills/sjm18-002>
 - Worth the read to see how many billions of subsidies exists
https://leg.colorado.gov/sites/default/files/documents/2018A/bills/2018a_sjm002_01.pdf
 - Current status 1/25: postponed indefinitely

Other Countries Are Further Along
in the Manufacture and Adoption of
Electric Vehicles

Unsubsidized EV costs

ALL ELECTRIC:

- 2018 [Nissan Leaf](#) - \$30,877
- 2017 [Chevrolet Bolt](#) - \$36,620
- 2018 [Tesla Model S 75D](#) - \$74,500
- 2018 [Tesla Model X 75D](#) - \$79,500
- 2018 [Tesla Model 3](#) - \$35,000
- 2018 [Ford Focus Electric](#) - \$31,075
- 2018 [Kia Soul EV Wagon](#) - \$33,145
- 2017 [Fiat 500e](#) - \$34,085
- 2017 [Mercedes-Benz B250e](#) - \$46,075
- 2018 [BMW i3](#) - \$48,645
- 2017 [Mitsubishi i-MiEV](#) - \$24,390
- 2017 [Smart car-EV](#) - \$14,000

SERIAL HYBRID: Electric runs first with backup ICE (Internal Combustion Engine)

2018 [Chevrolet Volt](#) - \$33,220

Possibly some above too

Modified from Courtesy Jim Smith

REMEMBER

CURRENT FED SUBSIDY = \$7,500

CURRENT COLORADO = \$5000

= \$12,500 IF YOU LIVE IN COLORADO

The New 2018 Leaf – 150 mile range

[NISSAN INTELLIGENT MOBILITY](#) | [EXPLORE LEAF](#) | [LOCATE DEALER](#)



Innovation
that excites

**BUILD &
PRICE**

NISSAN INTELLIGENT MOBILITY

AMAZING IS HERE



Starting MSRP \$29,990*
2018 Nissan LEAF® S*
(AS SHOWN MSRP \$32,490)*

**DRIVE HOME THE WORLD'S
BEST-SELLING ELECTRIC CAR** AND
ENJOY THESE GREAT OFFERS**

**DRIVE HOME THE WORLD'S
BEST-SELLING ELECTRIC CAR** AND
ENJOY THESE GREAT OFFERS**

0% APR for
72 Months¹
for well-qualified buyers

OR

\$229/ Month
Lease²

2018 Nissan LEAF® S*
Lease 36 Months - \$229/Month - \$3,070 initial payment
As Shown: 2018 Nissan LEAF® SV*
Lease 36 Months - \$356/Month - \$3,970 initial payment²
Excludes tax, title and license. For well-qualified lessees.

MUST TAKE DELIVERY BY MARCH 31, 2018

Other EVs



Bolt - EV



Kia Soul Wagon - EV



Kia Soul Wagon – EV



Tesla Model 3

National Renewable Energy Lab (NREL)

- <https://www.nrel.gov/>
- Hydrogen fuel cell impacts:
<https://www.nrel.gov/hydrogen/impacts.html>
- Are fuel cell (hydrogen) cars the future?:
<https://www.nrel.gov/workingwithus/avf-fuel-cells.html>

Links

- Local Denver EV newsletter/meetings: <http://devc.info/>
- <https://www.greencarreports.com/>
- https://en.wikipedia.org/wiki/Electric_car_use_by_country
- Colorado Renewable Energy Society (CRES): <https://www.cres-energy.org/>
- CRES YouTube Channel: <https://www.youtube.com/channel/UCr81EUb2qVJVfmmIJMxEHVw>
- .

For tips on sustainable building and home upgrades and retrofitting:

- <https://www.solardecathlon.gov/>
- <http://www.avenson.net/>

- Ethics and Ecologic Forum meetings and past meeting notes:
http://denverclimatestudygroup.com/?page_id=683
- next meeting 2/26
- Toward a Sustainable well-being: <http://denverclimatestudygroup.com/wp-content/uploads/2014/10/Toward-a-Sustainable-Wellbeing-Economy-v4.pdf>

- Feel free to contact me regarding other thoughts/info/links on sustainability:
PEBelanger@glassdesignresources.com 303-249-7966
- Lots of info at <http://denverclimatestudygroup.com/> and
<https://www.facebook.com/denverclimatestudygroup/>

My Advice to Americans:

Don't buy a new gas-powered car. If the type of vehicle you want is not available today, it will be within 5-10 years at most.

Can't Afford a New EV?

Used EVs are a super deal & a smart buy!

2015 Nissan Leaf - \$11,569 (Boulder Nissan)

2015 Chevy Volt - \$15,061 (Emich Chevrolet)

2017 Chevy Bolt - \$27,727 (Cargurus.com)

2013 Tesla Model S - \$39,494 (Trucar.com)

OTHERS AT Green-eyed Motors: <https://www.greeneyedmotors.com/>

What Are You Waiting For?

Electric Cars Are:

- * Powerful & Safe
- * Cheap to Operate
- * Even Cheaper to Maintain
- * Drive Train Warranted for up to 8 Years
- * Can Be Fueled for Free at Home or Work and on Long Trips
- * Will Have Great Resale Value

We can Invest in Solar Panels or Community Solar

- AN INVESTMENT - Here's why:
 - A personal story
 - SPENT:
 - \$30,000 (minus 30% fed credit) for 30 panels (rounding out cost)
 - RETURN:
 - Saved **\$1000** in electricity for 1 year
 - With my Leaf – powered by solar panels I drove 14,000 miles replacing a car 25mpg say \$2.50 / gallon = i.e. I did NOT spend **\$1,400 on gasoline**
 - RETURN \$2,400 in ONE year on \$30,000 investment! = **8%**
 - RETURN WITH 30% FED TAX CREDIT = **11.4%**

Buy and Electric Vehicle (EV)

- 100 mpg equivalent
- Batteries > 100,000 miles
- Motor 1,000,000 miles
- No oil change EVER
- No maintenance
- Why Gasoline Powered Cars Are Obsolete - Jim Smith

<https://www.youtube.com/watch?v=d7tRlsoZgdl>

EVs no Emissions



**Steve Stevens with Tesla X
90 kWh = 300 mile range**



**Paul Belanger & Phil Nelson with
their Nissan Leafs
30 kWh = 107 mile range**

**Ron Larson with Tesla S
75 kWh = 250 mile range**



BREATHE EASY: COAL is not coming back Renewables win!

- **RENEWABLES are cheaper!**
 - Wind especially
 - PV next – but will become even cheaper
 - Battery backup
 - Concentrated Solar Power for Thermal backup



Imagining a World After Fossil Fuels



OLLI WEST – POSSIBLE COURSE I AM DEVELOPING

- Entitled: **Understanding Man-Made Climate Change; How and Why We Need to Decarbonize Our Energy Sources, Sequester Carbon and How it is Being Done.**
- ...now how to make the title shorter?

My contact info

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