Electric Transportation, Far Ranging and Affordable

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Electric Vehicle Transportation Center

- *Consortium, University of Central Florida, Tuskegee University, University of Hawaii*
- *Focus On EV Technology, Transportation Planning, Infrastructure, Social And Environmental impact*
- *U.S. DOT Funded Research Center Co-located With The Florida Solar Energy Center in Cocoa, Florida*
- *http://evtc.fsec.ucf.edu/*

What are EVs?

What are EVs?

What are EVs?


Zero


FedEx
Express
Zero Emission


ECOCAB


Nikola


EDI


PROTERRA CATALYST
BATTERY ELECTRIC

EV Charging

Level 1

110v/55A, Residential AC
Toaster
4 Travel Miles/hour
NEC Article 625/UL

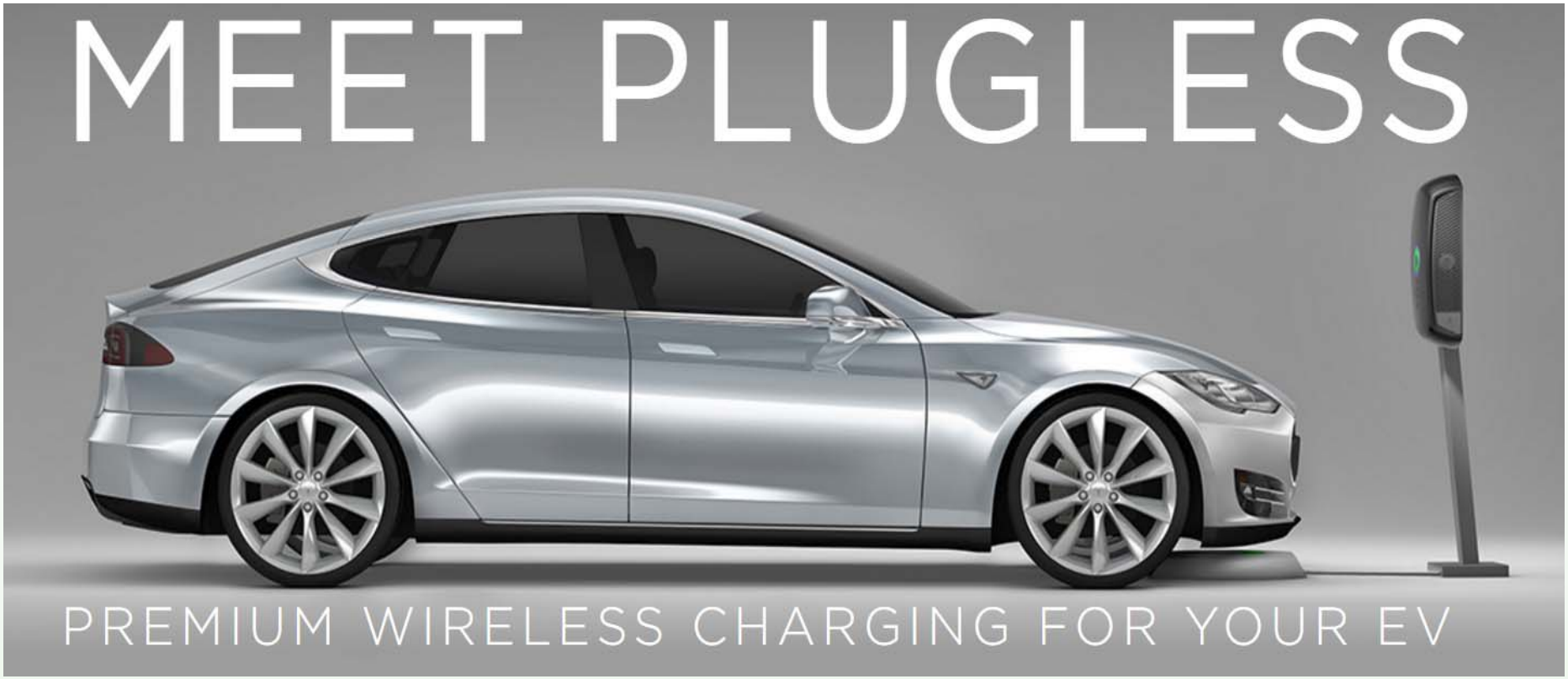
Level 2

220v/35A, Residential AC
208v/35A, Commercial AC
Cloths Dryer
15 Travel Miles/hour

Level 3 DC Fast Charge

480v/60A, Commercial AC
15 Residential Central Air Conditioning
80-100 Travel Miles, 20-30 Minutes

EV Charging



Level 2

220v/35A, Residential AC

208v/35A, Commercial AC

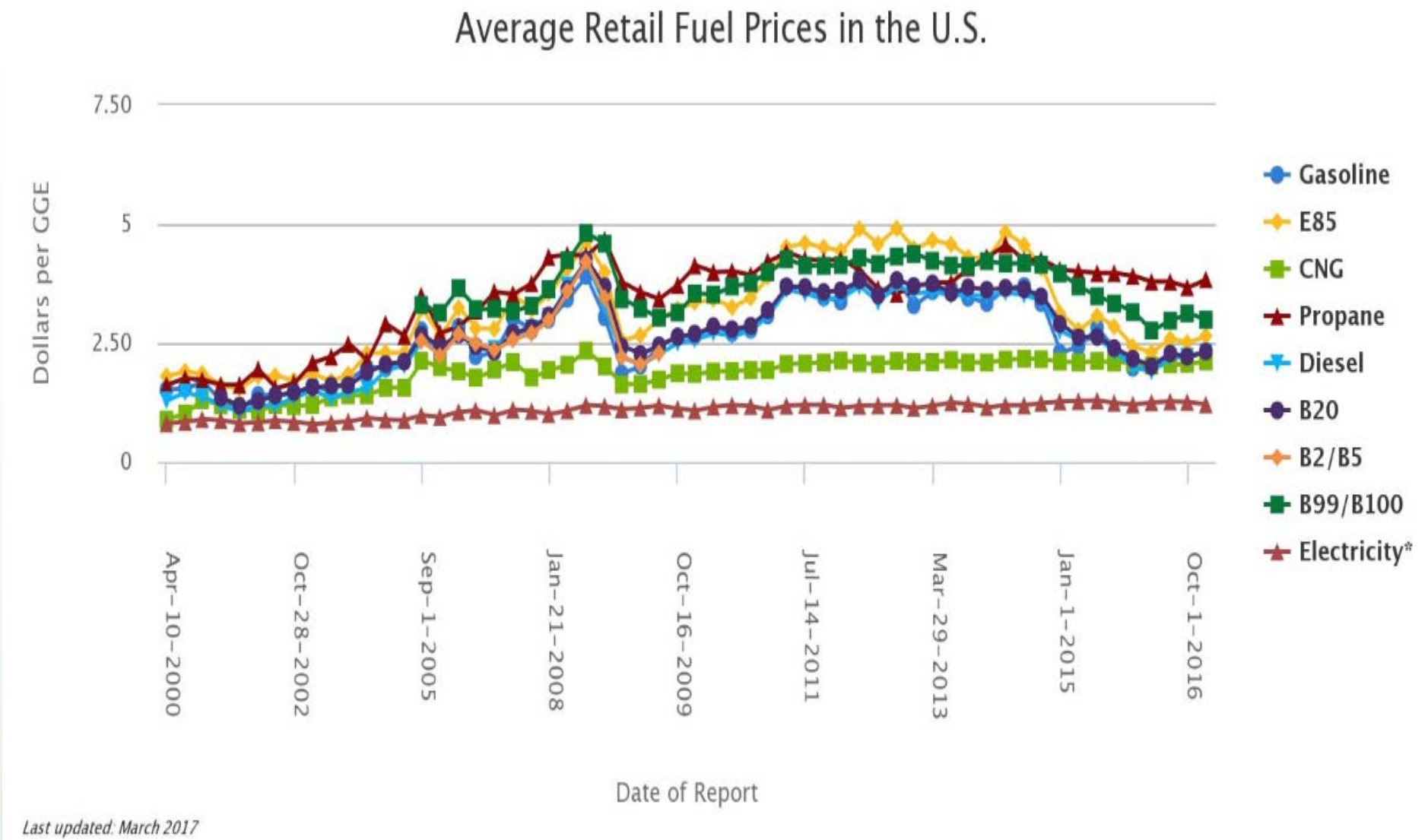
Cloths Dryer

15 Travel Miles/hour

EV Upside

- *Achieving Price Parity With CFVs*
  - *Battery Prices Declined 35% 2014-1015*
- *Much Less Expensive To Operate*
  - *Typically $1.00/gallon*
  - *No Radiator, Transmission, Lubricants*
- *230+ Travel Miles On Single Charge*
- *Quiet And Fun To Drive*
- *Very Environmentally Friendly*

Cost of Fuel


Average Retail Fuel Prices in the U.S.
7.50
5
2.50
0
Dollars per GGE
Apr-10-2000
Oct-28-2002
Sep-1-2005
Jan-21-2008
Oct-16-2009
Jul-14-2011
Mar-29-2013
Jan-1-2015
Oct-1-2016
Date of Report
Gasoline
E85
CNG
Propane
Diesel
B20
B2/B5
B99/B100
Electricity*
Last updated: March 2017

What's Coming?

- *Florida, 19,000+ Passenger EVs And Growing*
- *Tesla has 373,000+ Reservations For Model 3*
- *Chevy Now Selling The 230 Mile Bolt*
- *300+ Mile Travel Range Beginning 2018*
- *Ford Adding 13 New Models by 2020*
- *BMW Has EV Versions Of All Models By 2019*
- *Autonomous/Wireless Technologies Advancing*

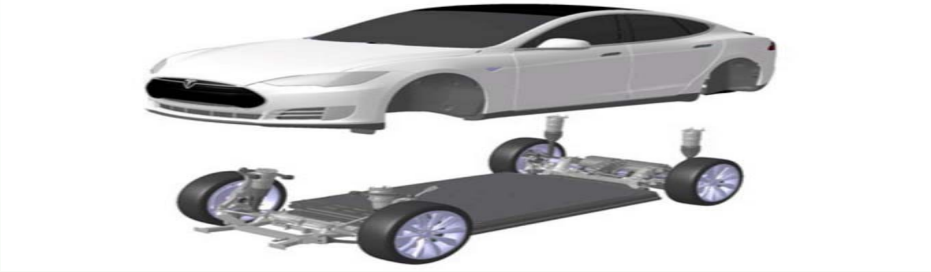
What Are The Challenges?

- *EV Stakeholders Need To Do A Better Job:*
  - *Consumer, Dealer And Policy Maker Education*
  - *Engagement With MPO, TPOs, DOTs*
  - *Engage Planning & Design Consulting Firms*
- *Charging Infrastructure Is/Will Be A Problem*
- *OEMs, Parts Manufacturers, Oil Companies*

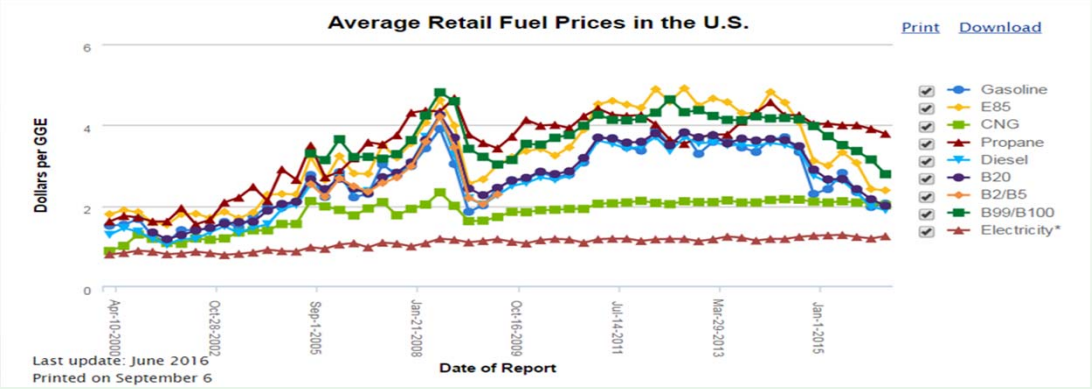
Conclusions

EV Transportation At The Tipping Point!

Less Expensive To Manufacture



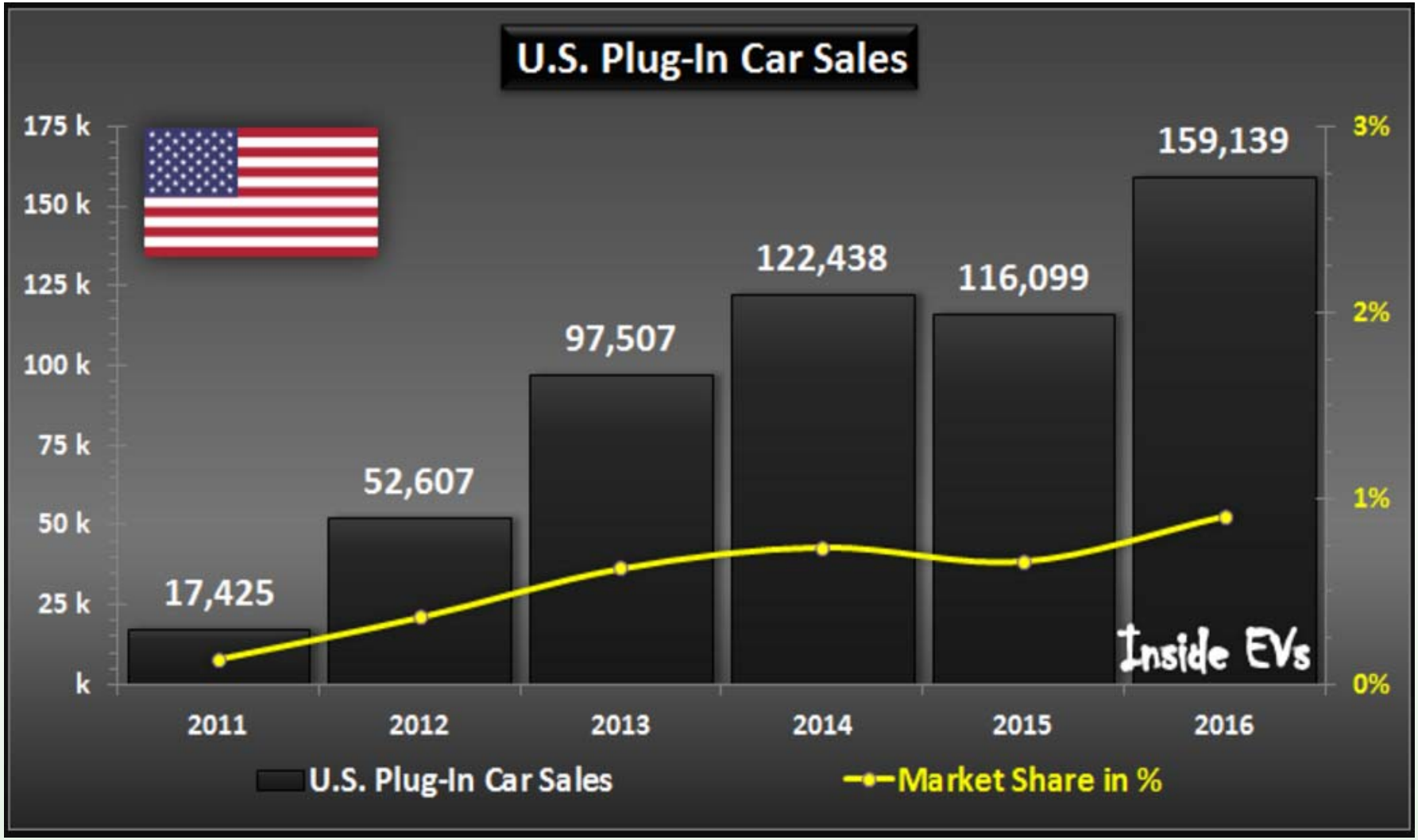
Less Expensive To Fuel And Maintain



The Rest Of The World Doesn't Subsidize Fuel

EVTC

Tesla Model 3
373,000



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http://fsec.ucf.edu/en/publications/pdf/FSEC-CR-1996-15.pdf