



The European Association
for Electromobility

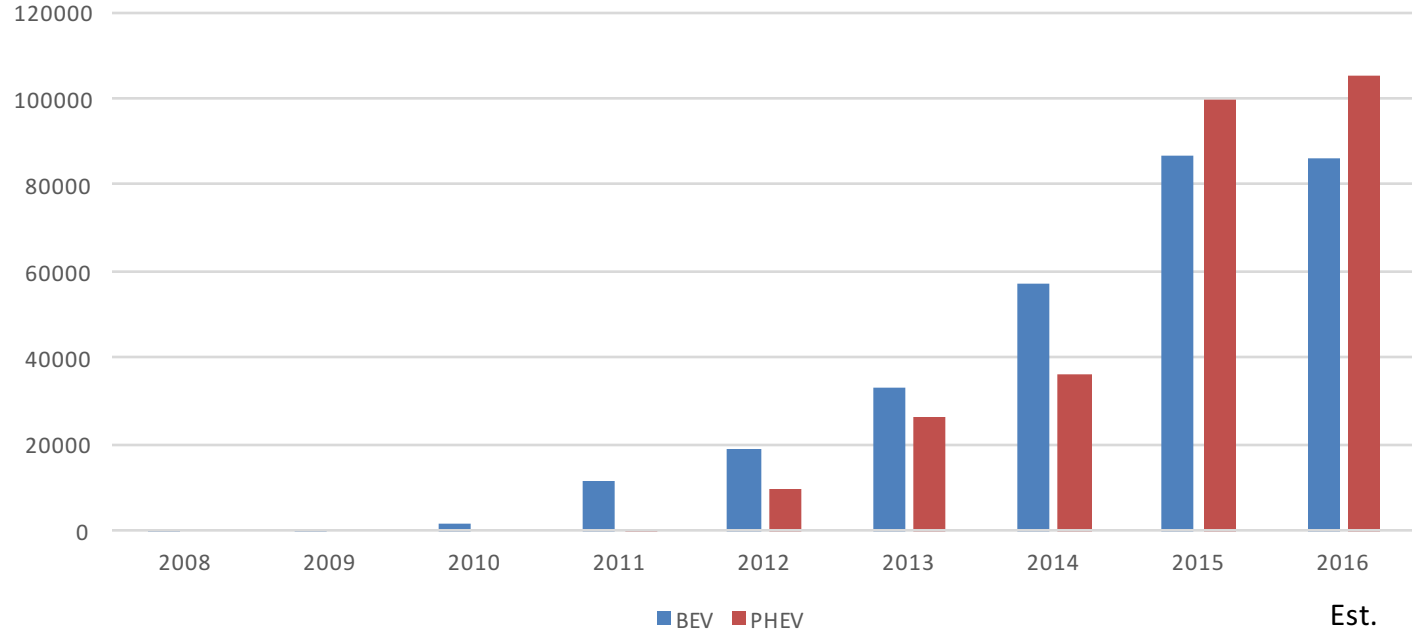
A scenario for the future of electric vehicles

Bert Witkamp, AVERE

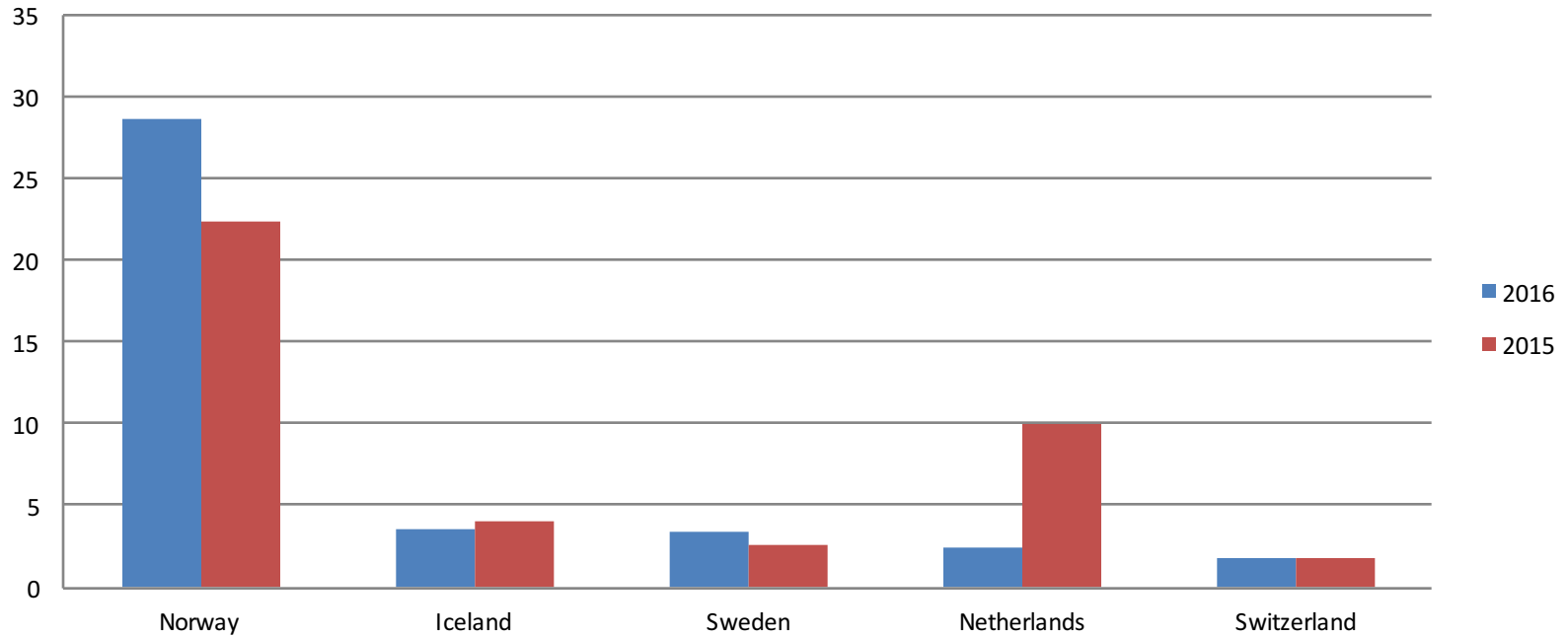
7th IRU International Taxi Forum, 5th November 2016,

Cologne, Germany 2016

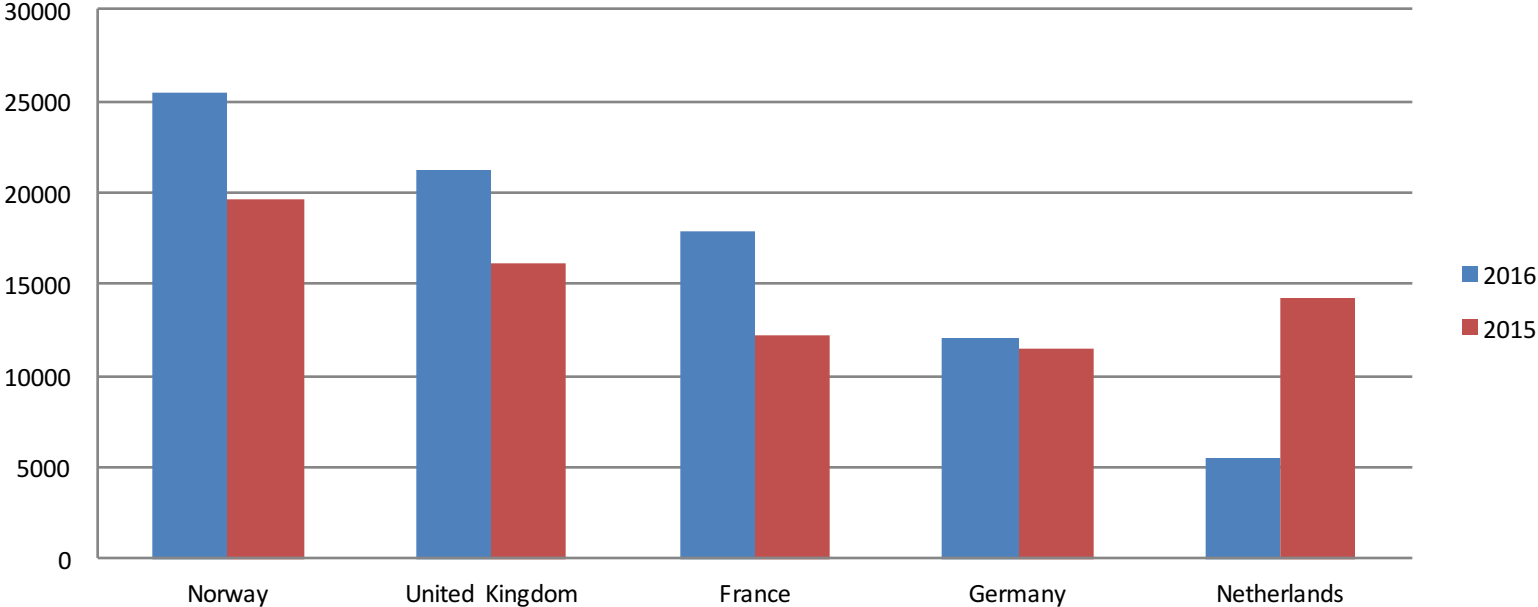
PEV Registrations Europe



Highest PEV Market Share (% new registrations)



Highest PEV Volume Markets



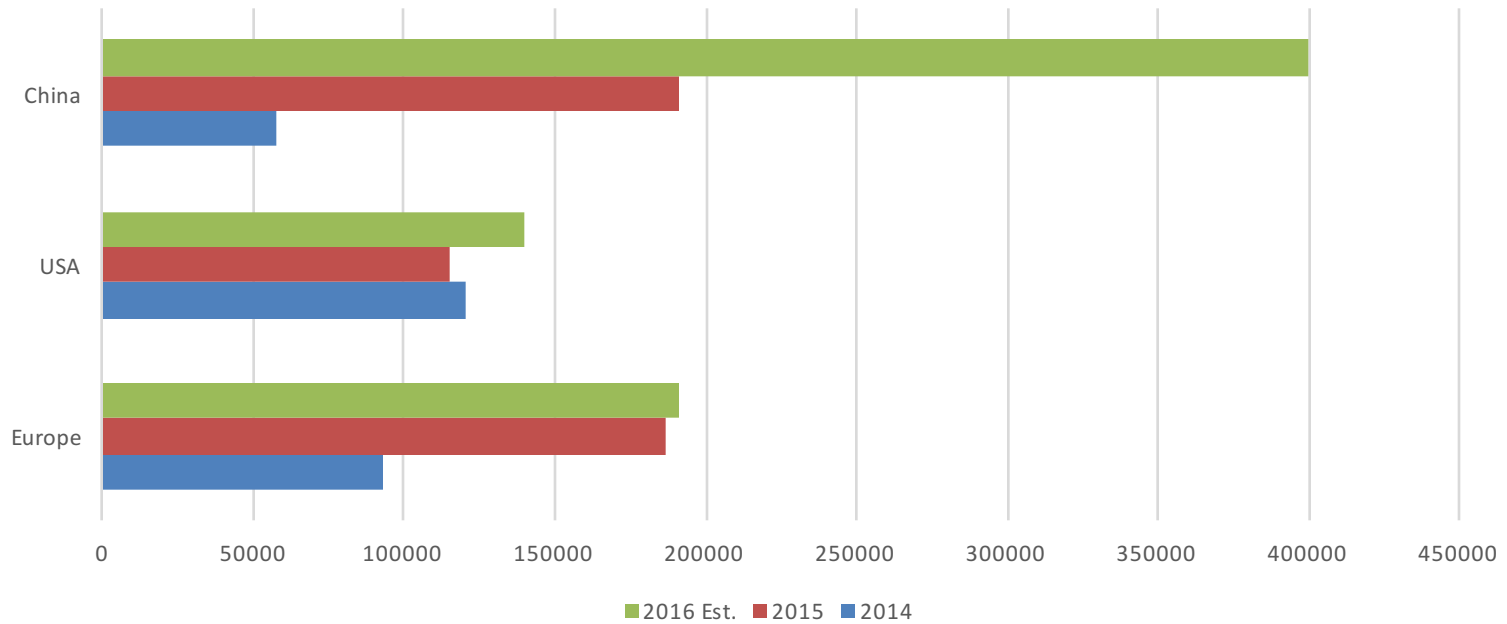
Jan. - July

Best Selling PEV Models in 2016

Model	Registrations
Renault Zoe (BEV)	12.907
Mitsubishi Outlander (PHEV)	12.538
Nissan Leaf (BEV)	11.851

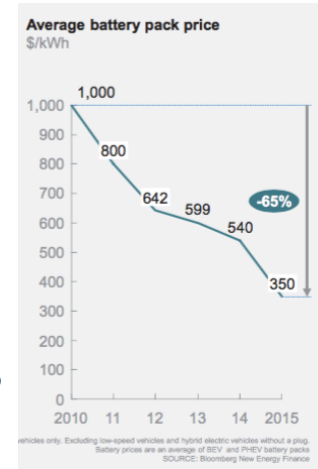
Jan. – July

Registrations by Major Selling Market



2016: The outlook for EV's has never been so good

- ✓ **People love there EV's !**
- ✓ EV sales close to 1 million in 2016
- ✓ Norway EV > 30% new car sales in 2016 = mass market
- ✓ Electric city buses competitive 2015 - 2020
- ✓ 300+ km e-range mid sized models in 2016-2017 = **NOW (= taxis?!)**
- ✓ 400-600 km e-range vehicles in 2016-2019
- ✓ Battery prices falling much more rapidly than predicted ! **AND THIS CONTINUES**



The coming years:

- **2018 Ultra Fast Charging: 350 kW = 300 km in 20 minutes**
- **EV cost parity within a decade and much sooner (taxis!)**

New 'ultra-fast 350 kW charging stations' for EVs to be deployed in Europe in partnership with Audi, BMW and others

Fred Lambert - 6 days ago @FredericLambert

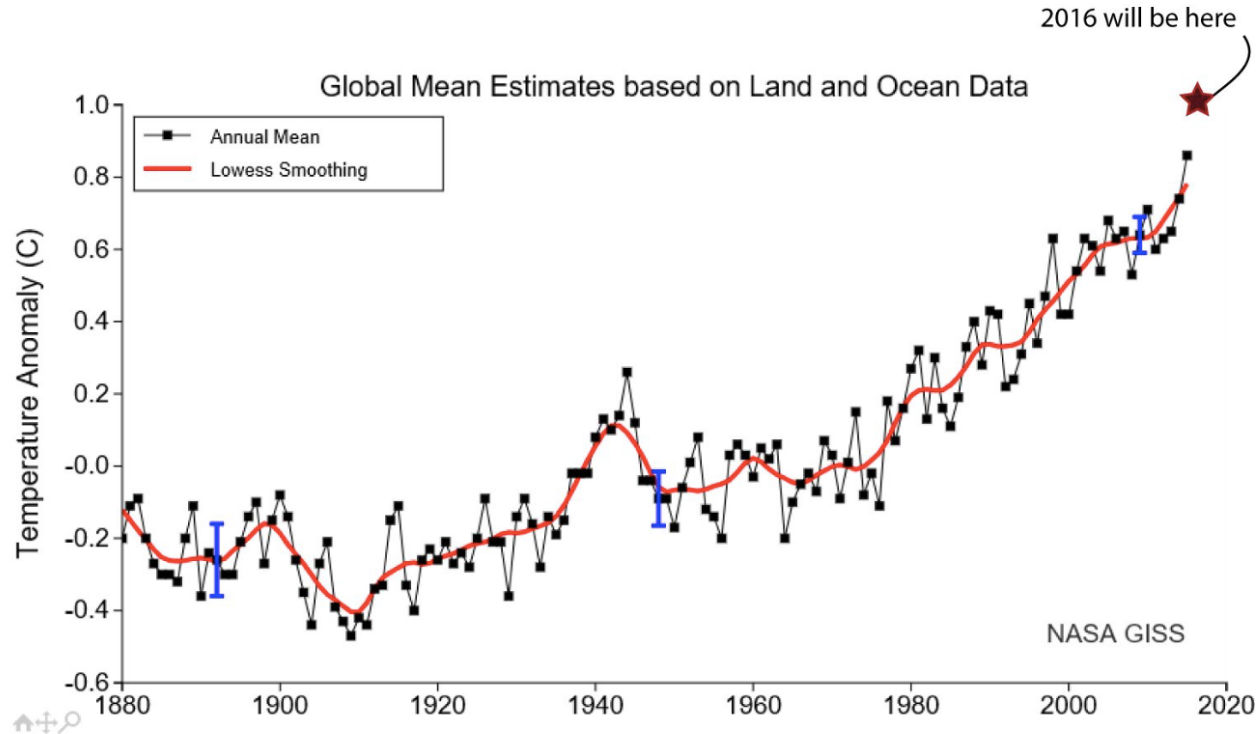
ULTRA-E ULTRA FAST-CHARG

400k Reservations



Tesla Model 3

2016: third times « hottest year ever » in a row



Estimate made on October 6, 2016 (J.P. Abraham)

An \$18 billion 'automotive crime'

That's what Volkswagen's 'dieselgate' could cost — at a minimum.

By **LEO LEVINE** | 9/28/15, 10:30 AM CET | Updated 9/28/15, 1:39 PM CET

Is It the End of the Road for the Diesel Auto Industry?

By **Shobhit Seth** | August 30, 2016 — 11:44 AM EDT

THE END OF DIESEL Will diesel cars disappear? Renault predicts the end of old school fuel

French car manufacturer expects diesel engines to disappear from most of its European cars

BY **LAURENCE FROST AND GILLES GUILLAUME** | 6th September 2016



France will end diesel-gasoline tax gap for companies' car fleets

Print Reprints Respond

Michel Rose Reuters
October 13, 2016 11:56 CET
PARIS -- France will offer companies the same tax credit for gasoline cars as for diesel cars, removing a key incentive that has boosted sales of diesel models.



"We will to give gasoline the same tax benefit that diesel currently has," Segolene Royal told France 2 television today.

Four more carmakers join diesel emissions row

Mercedes-Benz, Honda, Mazda and Mitsubishi's cars are shown to emit significantly more NOx pollution on the road than in regulatory tests
VW scandal: 3.6m European vehicles need major changes



Business Analysis & Features

Volkswagen emissions scandal: Forty years of greenwashing - the well-travelled road taken by VW

The German car giant may have used highly sophisticated software to cheat in emissions tests, but other car and truck makers have been prosecuted for their 'defeat devices' ever since traffic pollution first became an issue

BRUSSELS SKETCH

Beware Europe's automotive-political complex

The VW emissions scandal dredges up uncomfortable questions about German influence in Brussels.

By **TIM KING** | 9/24/15, 11:50 AM CET | Updated 9/30/15, 3:23 PM CET

France Moves to End Diesel's Tax Break Amid Emissions Scandal

by **Mathieu Rosemain**
@mrosemain

October 7, 2015 — 6:15 PM CEST



- ▶ Environment minister vows to make gasoline, diesel taxes even
- ▶ Decline in diesel's share of Europe car market may accelerate



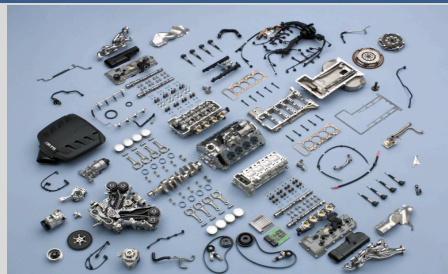
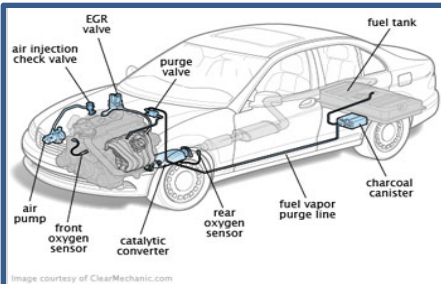
Road transport: diesel has been « sold » as climate saver (in Europe)

- Lobbying over decades comparing diesel to gasoline:
 - Higher fuel efficiency: « climate friendly »
 - Higher technology cost: compensation needed and obtained through fuel subsidies and tax breaks
 - Environmental friendly: diesel = air pollution disaster for cities
- **End of diesel is a consequence of its high cost and it worse than gasoline environmental performance (air quality!)**
- Recent scandals have exposed that the « engine downsizing » does not work and leads to excessive emissions, proof of the pudding:
 - Fiat discontinues its Twin Air engine
 - GM discontinues CDTi 1.3 liter engine
 - VW replaces 1.4 Tdi by 1.5 liter engine
 - Renault 1.6 cDI engine replaced by 1.8 liter engine
 - Renault 0.9 Tci engine replaced by larger one

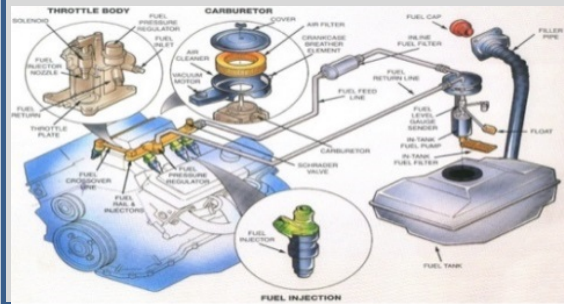
The transition to 21st century technology

A new manufacturing paradigm: EV's are easy to produce and the technology is widely available

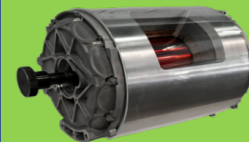
20th century best in class technology: NOT fit for 21st!



Precision mechanical engineered parts and very complex emission control system



21st century best in class technology



3x more kW/kg
40x more kW/liter
4x more efficient

ZERO emission
LOW noise
VERY low maintenance

*Off-the-shelf electronics
and electrical parts*



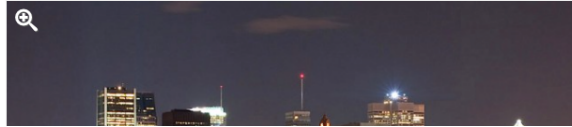
Transition to electric drive: not foreseen by industry insiders and experts *but also not wanted?!*

- Around or before 2025: EV's likely to be the lowest cost vehicles
- Decarbonisation of transport is not a choice, it has to happen and fast
- EV dominant passenger car technology within a decade?
- In 2030 or before all cars sold are electric?, last ICE in 2035?!

At a certain moment, people will not buy old technology anymore , **especially young people ! People love EV's** 😊

Montreal Plan: 2,000 Electric Taxis By 2019 To Compete With Uber, Lyft

Stephen Edelstein 8 Comments 2,496 views Aug 12, 2015



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Menu

TAXI ELECTRIC



More environmentally friendly, more customer-friendly.

Enter your starting location and destination. Click "Calculate fare" and then complete your booking.

1. CALCULATE TAXI FARE

From: Address City
Street address No.

To: Address City
Street address No.


1 passenger Economy (Nissan Leaf)

Calculate fare

Powered by taxiD

+31 (0) 88 100 4444


- Taiyuan replaces 8,000 taxis with BYD's E6 electric vehicles
- A new car-charging station opens every other day in the city



wij zijn social enterprise

Economy €
Nissan LEAF
Friendly and affordable
100% electric

Business € €
Tesla Model S
Punctual and stylish
100% electric



Singapore tests out petrol-free future with new, all-electric taxi company

1.3k SHARES

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Table 2: Annual Operating Cost for Taxis in Shenzhen, China⁸

	IC Taxi	BYD e6
Average Daily Range	500 km	
Life Cycle	5 years	
Energy Consumption/100 km	10L	22kWh
Energy Price (US\$)	1.33/L	0.19/kWh
Cost (\$)/100 km	13.30	4.18
Annual Cost (\$)	23,474	7,377
Total Cost (\$)	117,372	36,888

Table from: <http://cleanenergyinstitute.net/mod/page/view.php?id=4102>

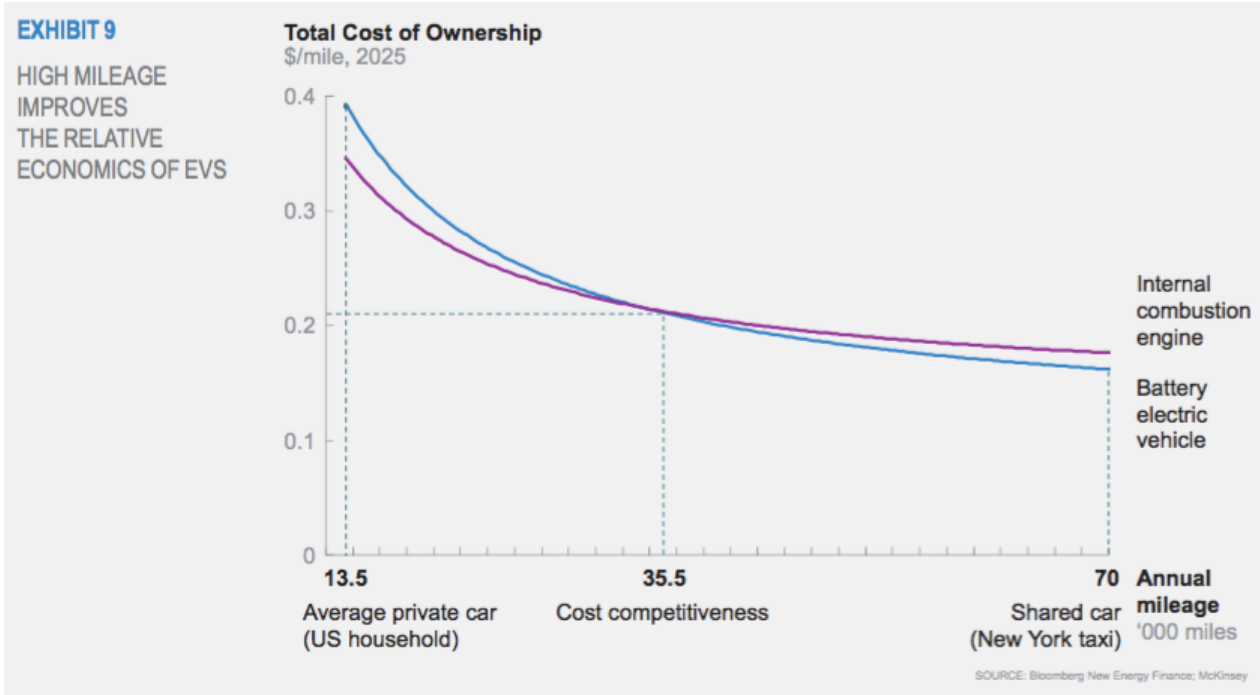
BUSINESS | AUTOS & TRANSPORTATION | AUTOS

GM, Lyft to Test Self-Driving Electric Taxis

Move aimed at fighting off Silicon Valley giants amid a reshaping auto industry



Taxis: already cost competitive today?!

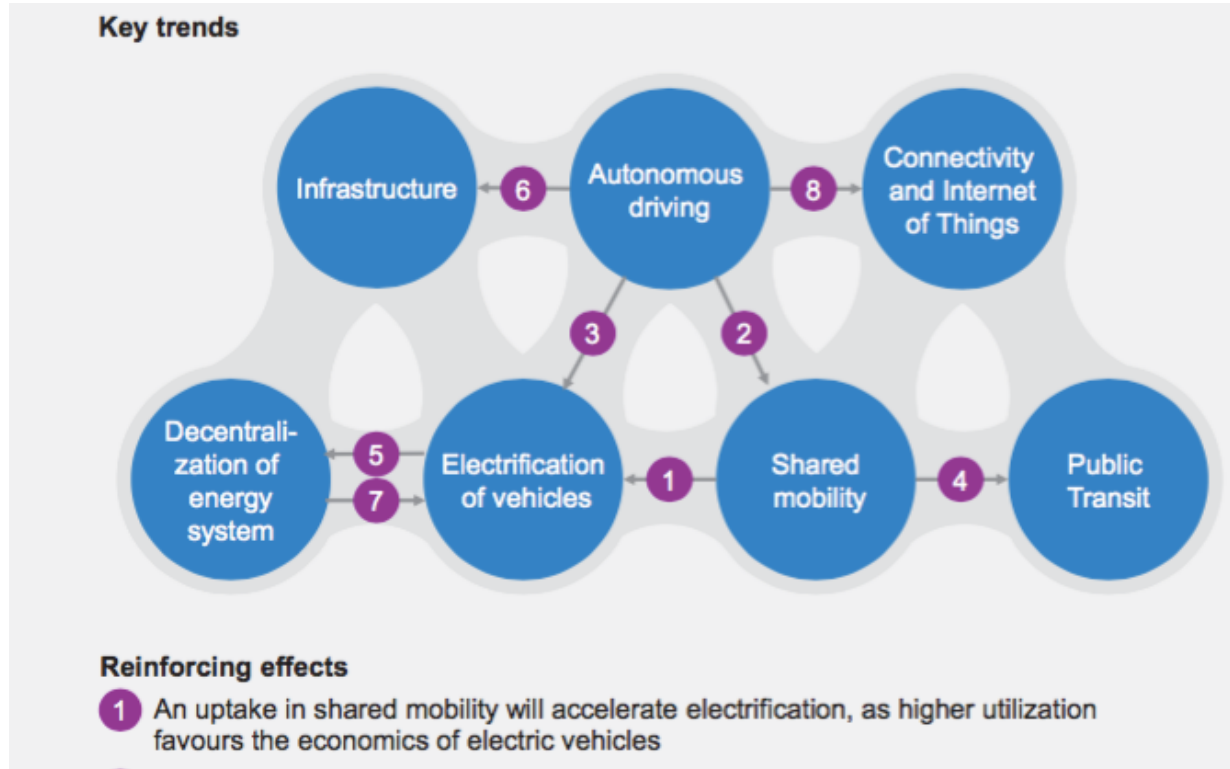


Cost competitive:

USA: at 60.000 km

Europe: ?

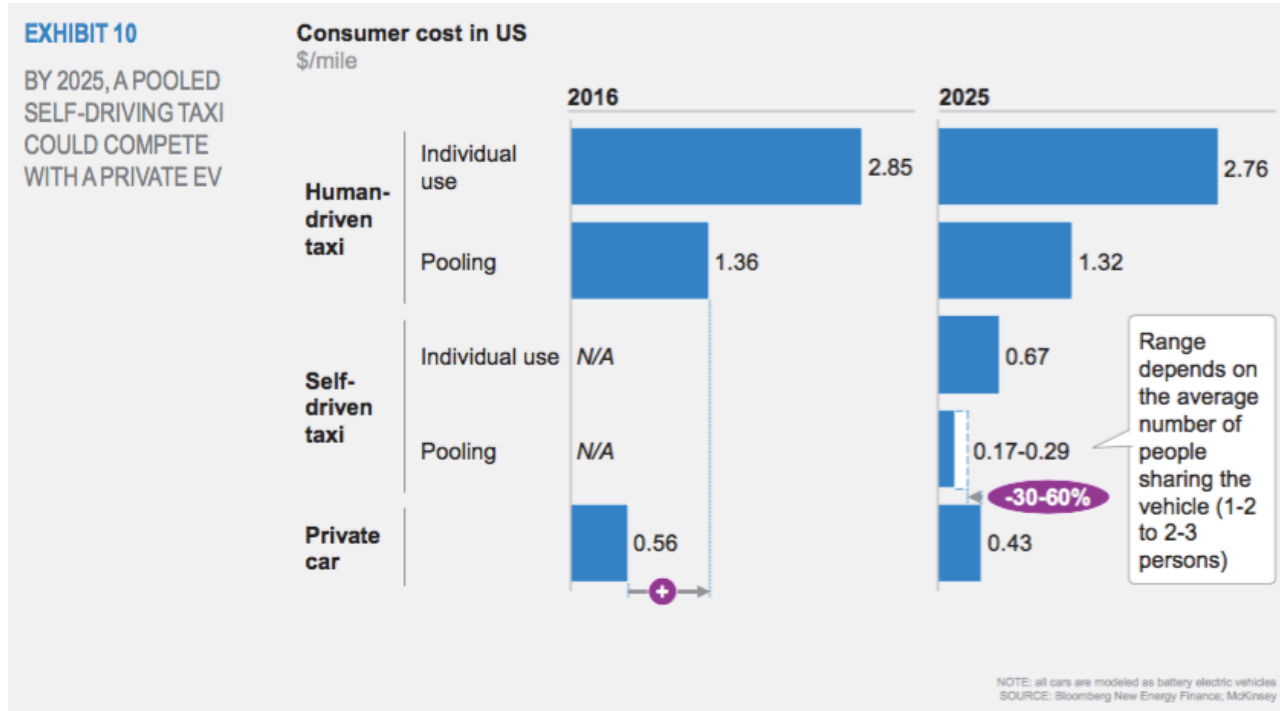
Autonomous driving & electric drive = reinforcing transition



Transition in cities: societal business case « no-brainer » = it will happen sooner than we think



Autonomous Electric Vehicles (AEV's): *lower cost – better safety – clean air*

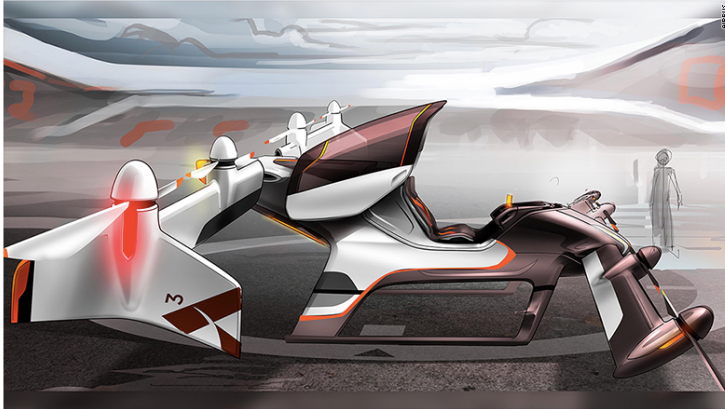


Autonomous Electric Vehicles (AEV's): *what will this change?*

- Nearly the same mobility can be delivered with 10% of the cars
- A shared AEV system with high-capacity public transport will result in 6% more car-kilometres travelled than today
 - But taxis and buses will no longer be needed
- Reduced parking needs will free up significant public and private space
 - 20% of the kerb-to-kerb street space and 80% off-street parking could be removed

City mobility in 3 dimensions?

Airbus offers a peek at its flying taxi

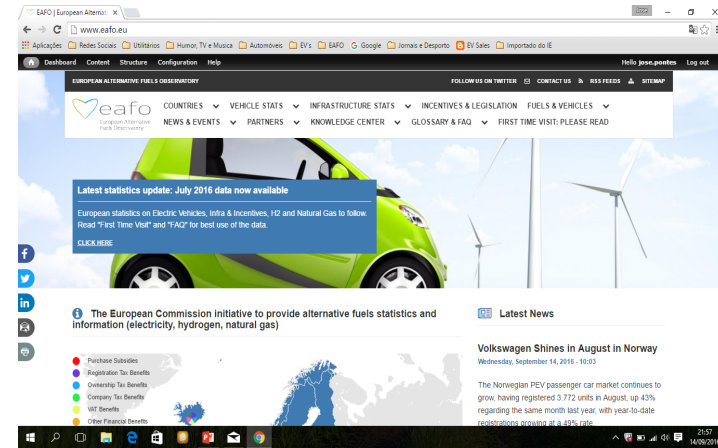


The project hopes to fly a full-size prototype by the end of 2017 and eventually have something it can sell by 2020, Lyasoff wrote.

European Alternative Fuels Observatory

www.eafo.eu

- Data on **vehicles, infrastructure, incentives** at **European, EU, Country level**
- Update every month (cars), every quarter (other vehicles); electric vehicles at model level
- Vehicles: cars, buses, light commercial vehicles, L-category
- Vehicle catalogues
- News items, monthly newsletter, events
- Knowledge center with EU information, projects
- For Cities: City template (pilot), e-buses at city & project level, hydrogen filling stations



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- *eafo#EAFO_news*



- *Register for monthly newsletter!*

Thank You

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