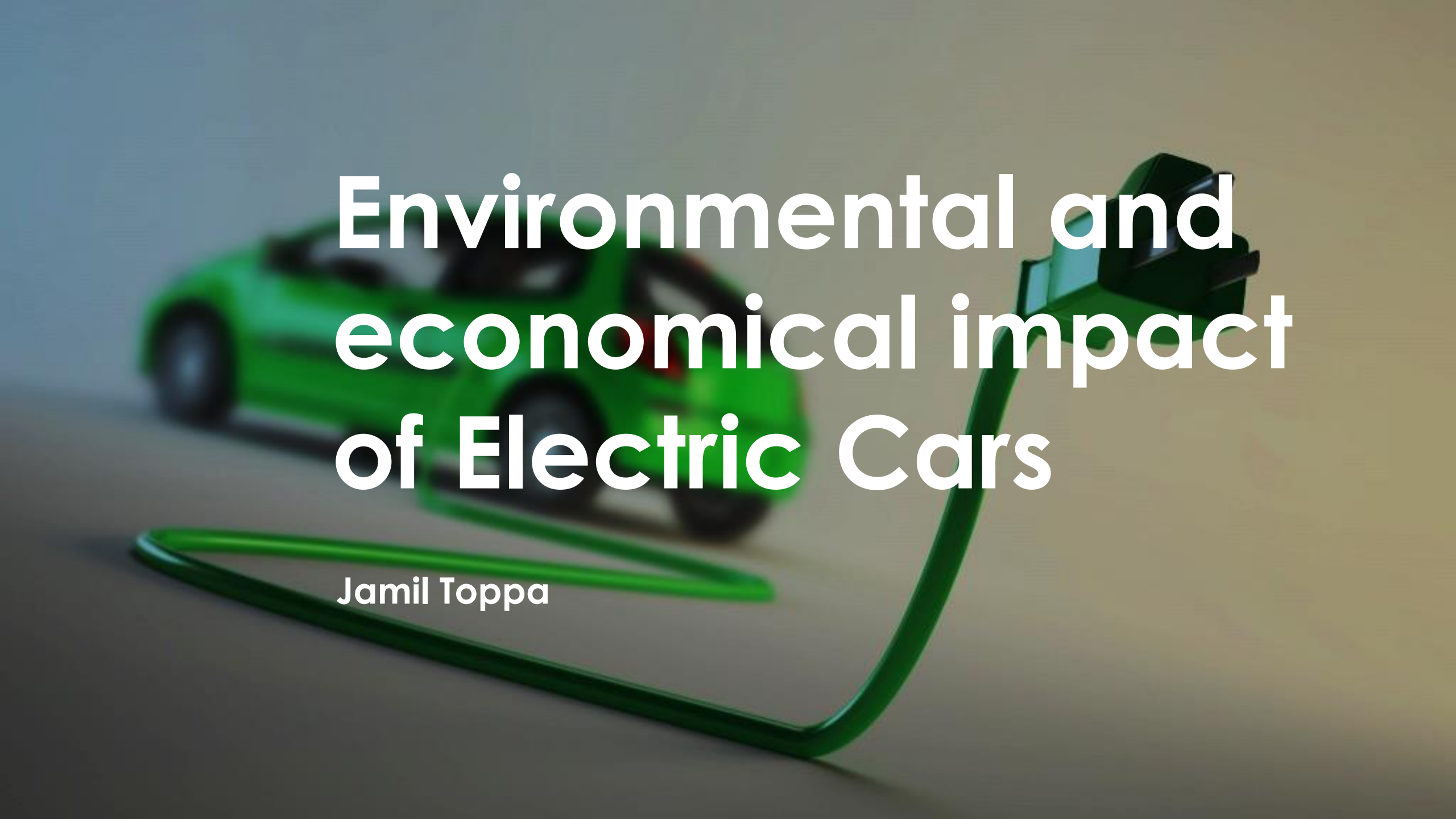

Environmental and economical impact of Electric Cars

Jamil Toppa

What is an Electric Car?

- A car powered by an electric motor instead of a internal combustion engine.
- The electric motor gets energy from a controller, which regulates the amount of power
- The electric car (also known as electric vehicle or EV) uses energy stored in its rechargeable batteries, which are recharged by common household electricity.

4 Types of Electric Cars

- Standard Hybrid
- The rechargeable hybrid (“Plug-In”)
- All Electric
- The Range Extender

Standard Hybrid

- Been around for 20 years
- It has 2 engines, 1 electric and 1 gas engine
- The electric engine is used to start up the car
- The car continues using electric engine at low speeds
- Once you start travelling at high speeds, the gas engine is used to power the vehicle

- Main disadvantage: 2 engines mean twice the manufacturing cost and energy
- Emissions savings are only between 10%-40% (depending on the use of the car)

Rechargeable Hybrid

- First came available in 2012
- Similar to the standard hybrid except it can be recharged quickly and directly
- Drive range is about 50 miles (enough to cover a small town without emissions)

All Electric Vehicles

- Runs on only electricity
- Produces zero emissions
- Disadvantage: battery has to be constantly be recharged and takes several hours
- Limited range: average 80 miles
- Only suitable for drivers who drive local in small towns

Electric Cars vs Gas Cars

- On representative of those sold today produce less than half the global carbon emissions compared to gasoline-powered vehicles
- Driving an average electric car results in lowering carbon emissions than driving a gasoline car that gets 50 miles per gallon
- Electric vehicles will become even cleaner as more electricity is generated by renewable sources of energy
- 25 percent reduction in emissions from the manufacturing of electric cars


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electric drive

Major Electric Motor Companies

- Tesla
- Faraday
- Lucid
- BMW i series

Tesla

- Co founded by Martin Eberhard and Marc Tarpenning in 2003
- Based out in California
- Known for their Model S

Tesla Model S P100D

- EPA: 89/98 MPGe
- 0-60 2.3 sec (equivalent to Bugatti Veyron)
- Energy impact: 0.2 barrels of oil/year
- Energy impact for average midsize sedan (12 barrels of oil/year)
- CO2 Emissions: 0

Compared to your average mid size sedan

Tesla Model 3

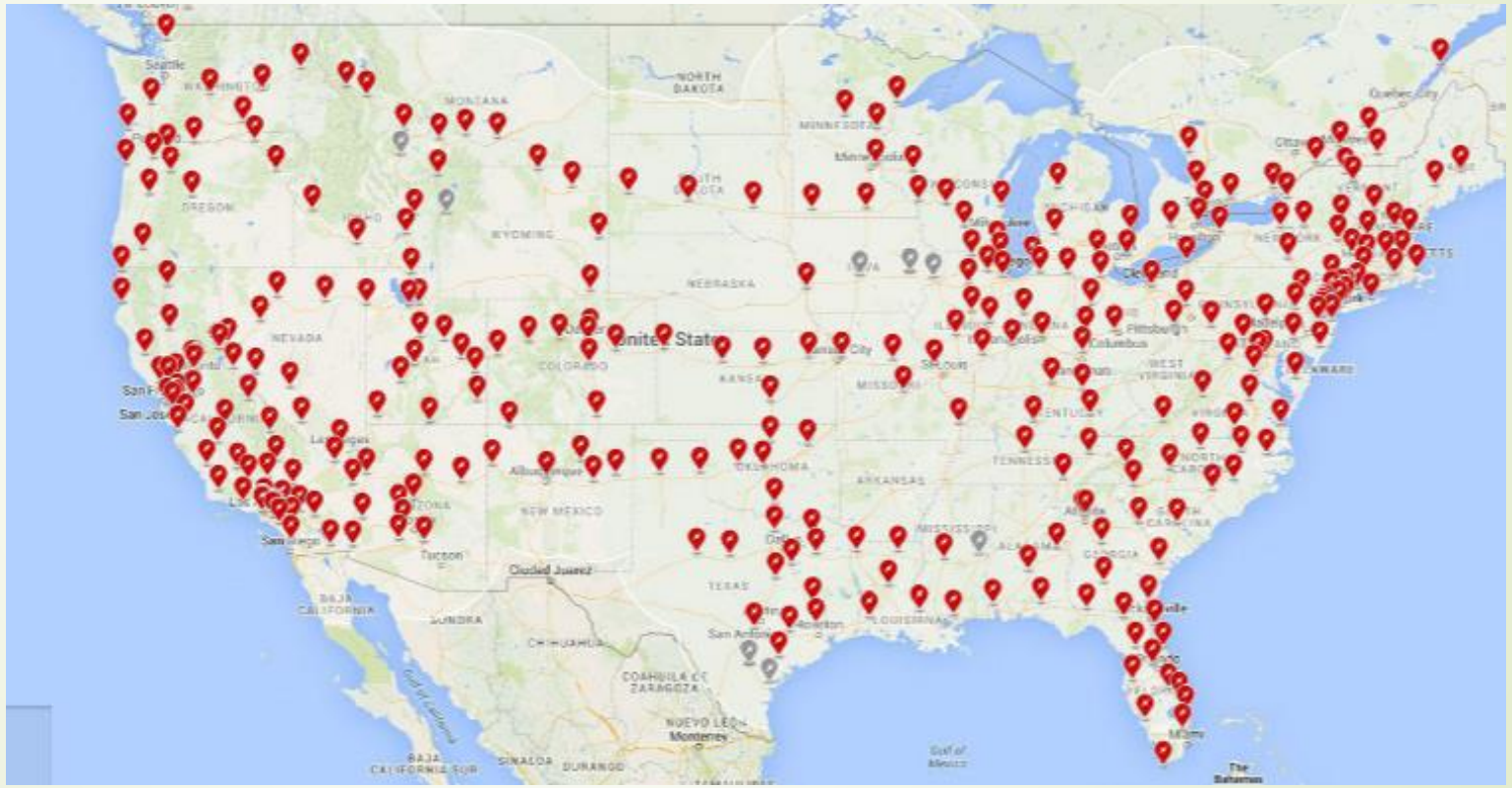
- The Tesla Model 3 is an upcoming all electric four-door compact luxury sedan produced by Tesla Inc. It was unveiled on March 31, 2016
- Electric range of 215 miles
- Base model MSRP to start at $35,000
- 373,000 reservations have been made for the Tesla model 3, (325,000 within the first week)
- Production began in July, 2017. Tesla expects to start first customer deliveries in late 2017.

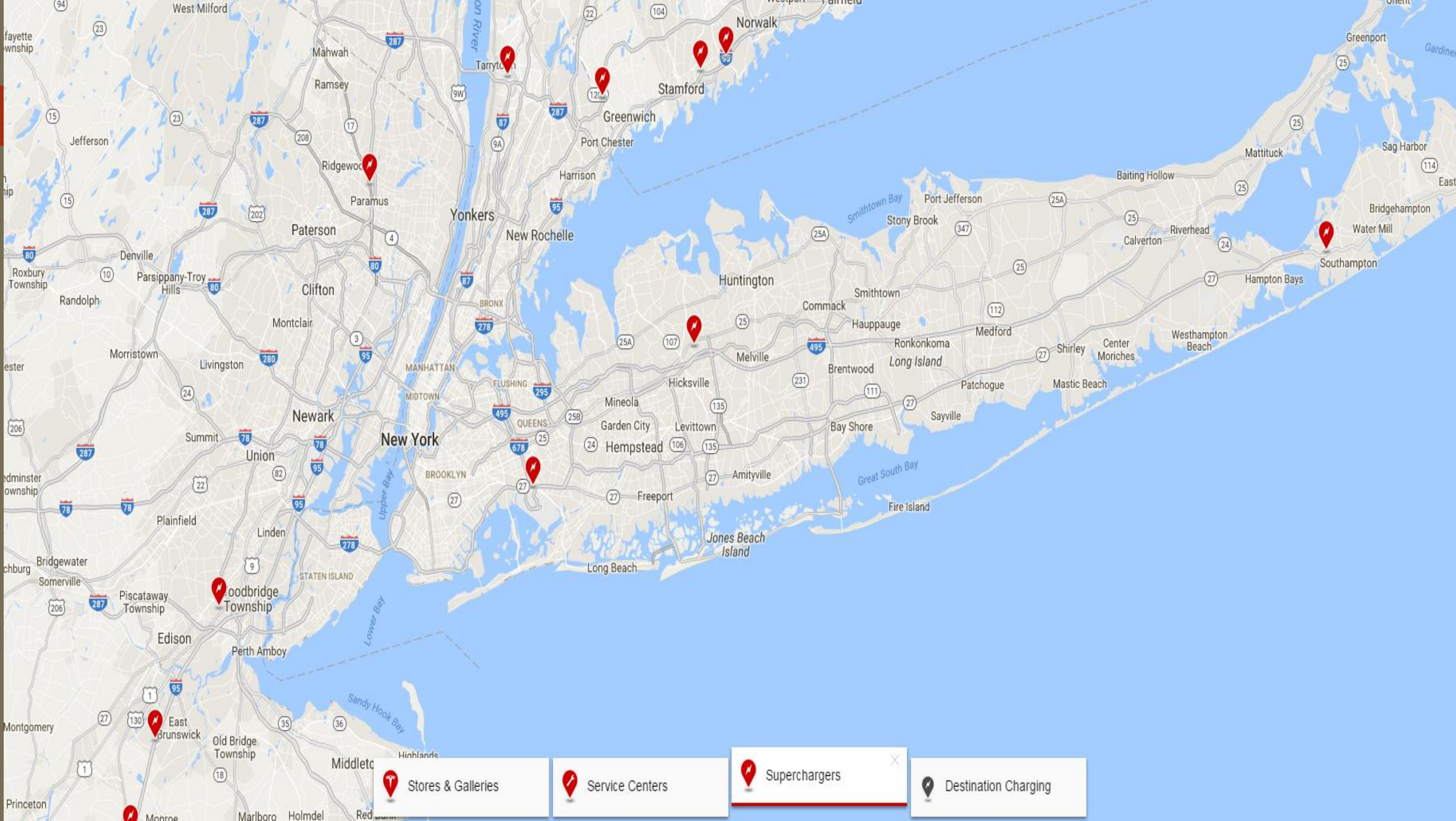
What are Super Chargers

Super Chargers

- Superchargers are free connectors that charge Model S and Model X in minutes instead of hours.
- Stations are strategically placed to minimize stops during long distance travel and are conveniently located near restaurants, shopping centers, and WiFi hot spots.
- Each station contains multiple Superchargers to help you get back on the road quickly.

Super Charging stations across America

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Jefferson
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New Rochelle
Paterson
Denville
Roxbury Township
Parsippany-Troy Hills
Clifton
Randolph
Montclair
BRONX
Morristown
Livingston
MANHATTAN
FLUSHING
MIDTOWN
QUEENS
Newark
New York
Summit
Union
BROOKLYN
Plainfield
Linden
Bridgewater
Somerville
STATEN ISLAND
Piscataway Township
Edison
Perth Amboy
Upper Bay
Lower Bay
Sandy Hook Bay
Montgomery
East Brunswick
Old Bridge Township
Highlands
Princeton
Monroe
Marlboro
Holmdel
Greenport
Mattituck
Sag Harbor
Baiting Hollow
Bridgehampton
Water Mill
Port Jefferson
Smithtown Bay
Stony Brook
Calverton
Riverhead
Southampton
Hampton Bays
Huntington
Smithtown
Commack
Hauppauge
Ronkonkoma
Long Island
Medford
Shirley
Center Moriches
Westhampton Beach
Melville
Brentwood
Hicksville
Patchogue
Mastic Beach
Mineola
Sayville
Garden City
Levittown
Bay Shore
Hempstead
Amityville
Great South Bay
Freeport
Fire Island
Jones Beach Island
Long Beach
Stores & Galleries
Service Centers
Superchargers
Destination Charging

Issues

- Charge time range from 8 to 12 hours for a full charge if connected to a 220V
- Takes approximately 75 minutes to fully charge Tesla Model S at a supercharging station
- 810 Super Charging stations in the U.S, total of 3000 world wide.
- Compared to approximately 168000 Gas Station in the US
- If Tesla wants to compete with modern day cars, there going to need a lot more charging stations

Faraday Future

- American start up technology company
- Founded in April 2014
- Based in Los Angeles, CA
- Main focus is the development of intelligent electric vehicles
- FF91

Faraday FF91

- Concept phases
- 130 kWh battery with an estimated range of 378 miles
- 0-60 2.3 seconds
- 1050 horsepower
- The production of FF 91 is planned to start in 2018

LUCID Motor Company

- Electric car company founded in 2007
- Based out in Menlo Park, California
- Co-Founded by Derek Jenkins
- Recently released its car “LUCID AIR”

LUCID

The “LUCID AIR”

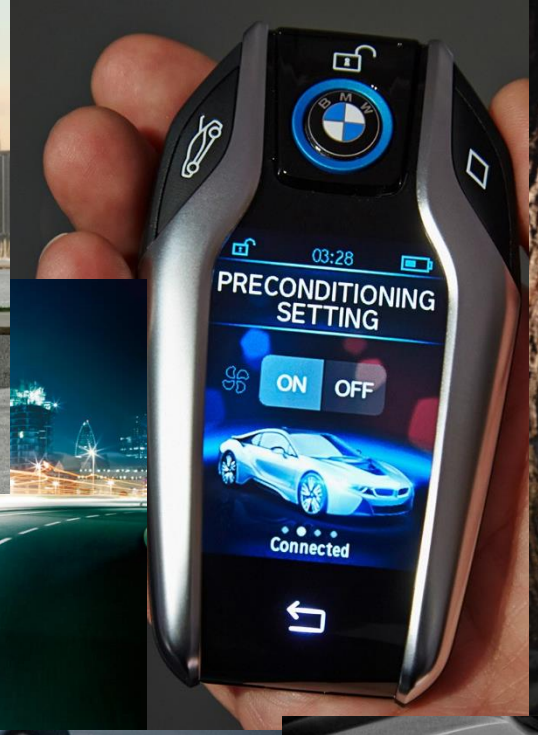
- High end luxury vehicle
- 100 kilowatt hour pack
- Range of 300 miles standard
- 1000 horsepower (400hp in front motor & 600 in rear motor)
- 0-60 in 2.5 seconds
- Lithium-ion batteries manufactured by Samsung
- Not Aimed to compete with Tesla
- Aimed to compete with other luxury brands (BMW, Mercedes, Audi)
- Production will start in late 2018


LUCID

BMW i Series

- The “i” stands for innovation, inspiration, and a holistic concept of sustainable and future-orientated mobility
- 2 models: all-electric BMW i3 and the plug-in hybrid BMW i8
- BMW i manufacturing facility in Leipzig, Germany is BMW’s most sustainable automotive plant
- Relies mostly on renewable energy sources


BMW i8 Concept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PRECONDITIONING
SETTING
ON
OFF
Connected


98%


eDrive

Tax reductions on owning an electric cars

- Internal Revenue Code Section 30D provides a credit for Qualified Plug-in Electric Drive Motor Vehicles.
- The tax credits range from $2,500-$7,500 depending on the size of the battery in the car.
- Several major insurance companies, such as Farmers, offer discounts of 5 percent or more for owners of electric and hybrid cars.
- Many electric utilities around the country offer special rates, including time-of-use (TOU) rates, to reduce the cost of powering an electric car or plug-in hybrid.

Conclusion

- The electric vehicle is one of the most promising sustainable methods of transportation.
- If the other major forms of transportation in NYC (bus, taxi) are converted to electric powered engine, we'll see a major reduction in CO2 emissions
- As technology advances, electric cars will become as prominent as internal combustion engine vehicles, as well as more affordable.
- Discounts in insurance and electric utility costs and tax reduction helps persuade people to use electric cars in the future.

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