2014 JOHNS HOPKINS MINI CASE COMPETITION

Presented by the Johns Hopkins Business and Consulting Club

November 7, 2014

Case Competition Committee – Basil Hussain, Janna Serbo, Saurabh Khasnavis, Hao Jia, Steven Wang, and Shirley Tan
Co-president – Yuanming Suo

Rules & Regulations

Eligibility

The Mini Case Competition is open to Hopkins undergraduates, graduate students, post-doctoral fellows, medical residents and fellows, and staff. All participants must have a valid JHED ID. The Johns Hopkins Business and Consulting Club (JHBCC) reserves the right to disqualify participants if we determine that rules were violated during the competition. No business experience is necessary. JHBCC board members are not eligible to participate.

Team Composition

Teams must consist of 2-3 members. Teams are encouraged to include participants from diverse backgrounds spanning different schools within Hopkins. Each team must identify a team leader who will serve as the main contact and receive the case via email. Each person should only register with one team.

Case Release

The case competition committee will release the case during the "Case Presentation and Q&A" session from 8:45AM - 9:15AM EST on November 7, 2014 @ Clark 110 Homewood Campus. Team leaders will also receive an email describing case background information and aims at 9:15AM EST. Each team will also be notified of their assigned time slots and locations for the 1st round presentations. After the case presentation, the case competition committee will not be able to answer any questions related to the case.

Case Analysis

Team will be given exactly 3 hours (9:30AM–12:30PM EST) to devise recommendations for the business case. Teams are expected to produce original work and cite all resources used in the presentation. No outside help is allowed; teams found in violation will be disqualified.

First Round Presentation

Teams must submit PowerPoint slides summarizing their recommendations via email to jhbcc.minicc@gmail.com by 12:30PM EST. There is no slide limit on the presentation; however, keep in mind you will only have 10 minutes of presentation time, followed by a 5 minute Q&A.

Only the content of the slides and your presentation itself will be judged. You may prepare appendix slides with detailed notes and analyses to use during Q&A, but it is not guaranteed that the judges will see these.

First round presentations will be judged by JHBCC board members based on the criteria listed in the case packet.

All teams will be given exactly 1 hour following their first round presentation to revise their slides based on feedback from judges. Final slides must be submitted by email to jhbcc.minicc@gmail.com.

Dress Code
Business professional attire is recommended.

Final Round Presentation & Networking Event
Finalists will be announced immediately before the final round presentations. Presentations will follow the same format and criteria as 1st round presentations, but will be judged by a panel of consultants from McKinsey & Co., Boston Consulting Group, and IBM Consulting.

The 1st and 2nd place teams will be announced during the happy hour following the presentations. The happy hour will also provide all participants with an opportunity to obtain feedback and network with our guest judges.

Prize
The awards for 1st and 2nd place teams will be $150 and $75, respectively. These prizes are made possible by generous support from our sponsors: the JHU Graduate Representative Organization and JHMI Graduate Student Association.

Additional information: http://jhbcc.weebly.com/2014-jhbcc-mini-case-competition.html

Questions: email us at jhbcc.minicc@gmail.com

2014 JHBCC Mini Case Competition Score Sheet

Judge:

Team:

Criteria	Points	Max Points
Structure • Well-structured and logical framework for analysis • Comprehensive coverage of key issues		10
Analysis • Rigorous data gathering and interpretation • Use of appropriate theory, principles and models		10
Recommendation • Adequately addresses the problem • Strategies are appropriately supported by data • Demonstrates creative, original thinking		10
Presentation • Well planned, logically organized and presented • Answered questions with thoughtful and well-reasoned responses		10
TOTAL		40

Comments:

Client Profile

Tesla Motors, Inc. is an American car manufacturer, founded in San Carlos, California in 2003. Tesla designs, manufactures, and sells electric vehicles (EV) and EV powertrain components. According to Tesla CEO Elon Musk, Tesla's goal is to accelerate the advent of sustainable transport by bringing compelling mass-market electric cars to the market as soon as possible.

Since its inception, Tesla has successfully introduced two electric vehicle models: the Tesla Roadster and the Model S luxury sedan. Both use lithium-ion battery cells as their sole source of energy. Currently, Tesla is only selling its Model S Sedan directly to consumers through an international network of company-owned stores and galleries. Meanwhile, Tesla is developing a fully electric SUV, the Model X, which is expected to begin deliveries in fall 2015. It is also working on a more affordable EV, the Model 3, which is not expected until 2017.

To support current vehicles and entice future customers, Tesla has built a robust network of free Superchargers, which serve as quick battery charge stations. To reduce the prices of battery cells, Tesla has initiated a joint venture with Panasonic to build a $5 Billion "Gigafactory" that will produce lithium-ion batteries to power all of their vehicles. Tesla's has enjoyed steadily increasing revenues since its inception, however they have only become profitable in the last quarter. Some shareholders worry that the company's investment strategy will introduce significant costs that jeopardize its bottom line performance.

Question

Despite not being profitable, Tesla has elected to expand its existing Supercharger network, add more vehicle models to its existing model line, and committed to building an enormous Gigafactory to produce lithium-ion batteries. While these large capital expenditures represent significant growth potential, shareholders are wary of the company's ability to maintain profitability. To restore shareholder confidence, your team has been hired by Elon Musk to develop a strategic plan to maximize Tesla's profitability by 2020.

Background Information

A. Tesla's EV models

Car Model	Price/Unit	Unit sold	Extra Information
Roadster	$109K	2.4K	Sold from 2008-2012, no longer selling
Model S (60kWh/85kWh*)	$63K/$73K**	35K (2014)	The only model currently being sold
Model X (same battery options as S)	-	-	An SUV, predicted to release Fall 2015
Model 3 (also called Gen III, expected to release in 2017 with 48kWh battery)	$35,000***	-	Tesla's attempt to make an affordable EV

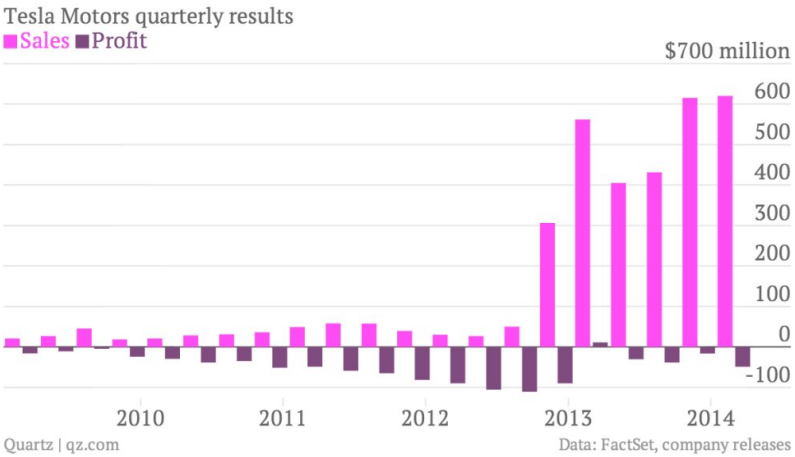
* Estimated lifetime is 100K miles (7 years)
** $63K For 60 kWh battery option, $73K for 85kWh option
*** Target price by Tesla

B. Tesla's investment

Item	Cost/Unit	Unit	Extra Information
Gigafactory	$2B	1	• $5B total cost with Panasonic paying $3B • Maximum battery production goal is to supply 500K EVs/year • Tesla's Cost/kWh in 2017 is estimated to be $170/kWh*
Supercharger	$150K	115 chargers (2014) to 250 total chargers (2015)	By 2015, the supercharger network will reach geographical locations covering 98% of the US population

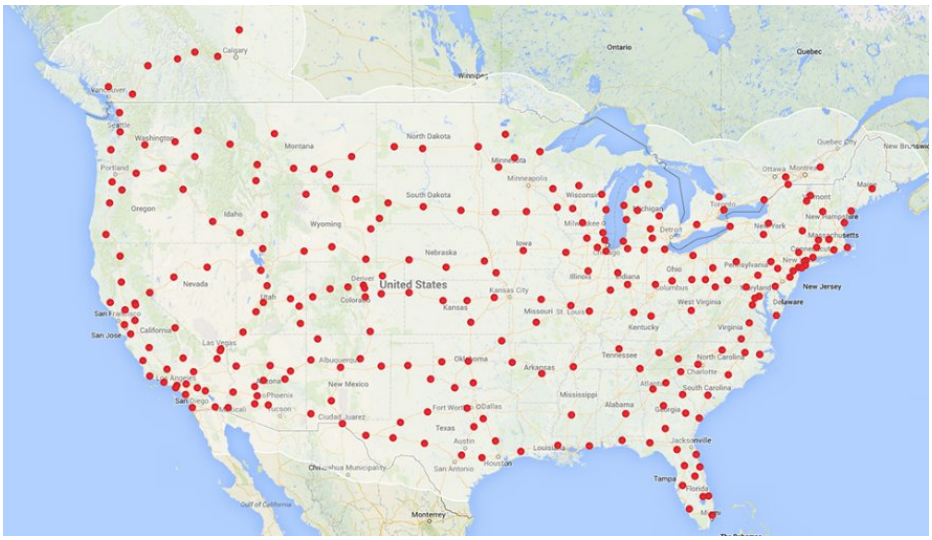
*$170/kWh calculated using information in sources 1 and 2 in the references. Briefly, it is estimated that the current cost/kWh for the Tesla Model S is $238/kWh. Tesla predicts a 30% reduction in battery cost by 2017, resulting in ~$170/kWh estimate.

C. Profitability for Tesla (2010 – 2014)



D. Geographical distribution of Supercharger Network

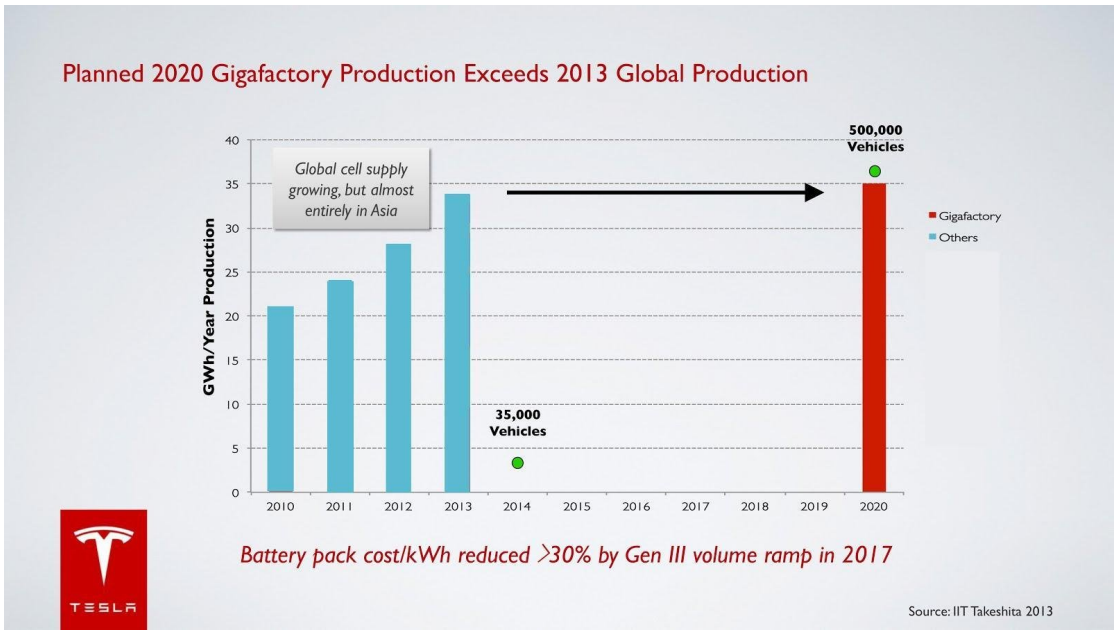
The Tesla Supercharger is an industrial grade, high speed charger designed to replenish 50% of the battery pack in as little as 20 minutes. Supercharger stations are strategically placed along well-travelled highways to allow Model S owners to enjoy long distance travel with convenient, minimal stops. Access to the Supercharger network is currently available free of charge to owners of Model S vehicles with the 85 kWh battery pack options and when purchased as an upfront option for 60 kWh.



Projected distribution of Superchargers in 2015 (US)

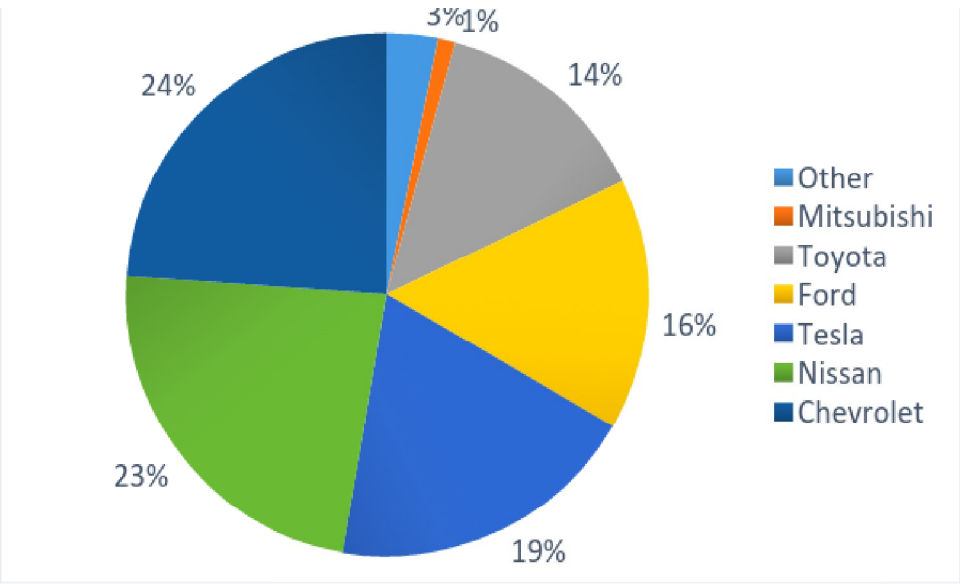
E. Tesla Gigafactory production target

The Tesla Gigafactory is a proposed facility where Tesla will work together with suppliers to integrate battery precursor material, cell, module, and battery pack production in one location. The factory will not produce EVs. At full implementation, the Tesla Gigafactory is expected to have 6,500 dedicated Tesla and production partner employees. They currently plan to commence supplying battery packs, manufactured at the Tesla Gigafactory, in 2017 for vehicles, including the Model 3 vehicle, and stationary storage applications. The factory will also produce lithium batteries for non-EV applications, but the specifics have not been determined. The Tesla Gigafactory is expected to attain full production capacity in 2020, enough to supply 500K vehicles annually and stationary storage applications. Tesla is expected to reduce battery pack costs by greater than 30% on a per kWh basis by the end of 2017, the first year Model 3 production (Gen III).



The green dot in 2014 is the total number of GWh required by vehicles produced by Tesla in 2014. The green dot in 2020 represents Tesla's goal of 500K vehicles/year, which they predict will be achieved in 2020.

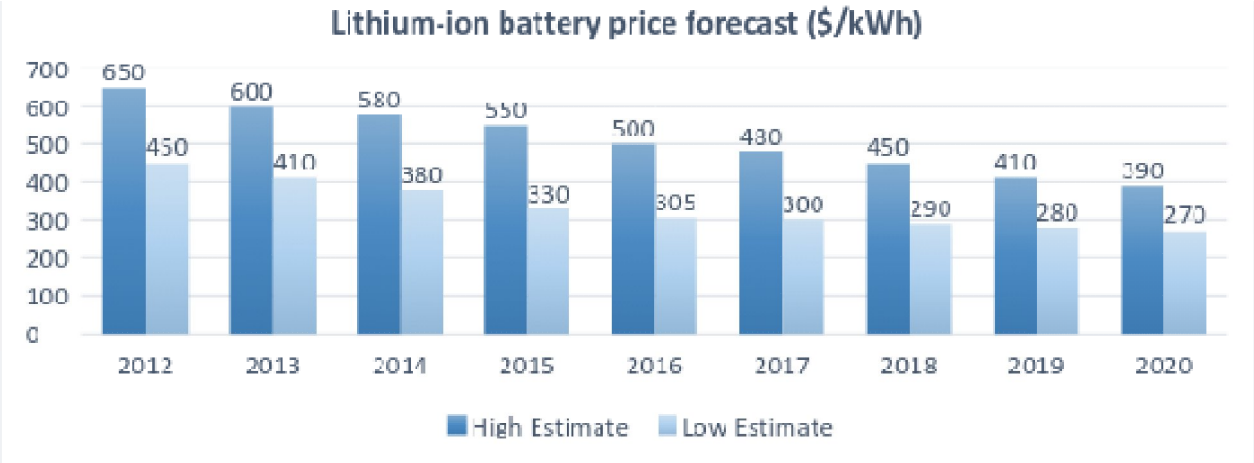
F. EV new car sales share for US market (2013)



Source: hybridcars.com

G. Battery Price

Electric vehicles require batteries with both high endurance and power, and there is often a tradeoff between these capacities. Lithium-ion batteries are commonly used for vehicle applications. Higher production volumes in recent years have pushed down prices.

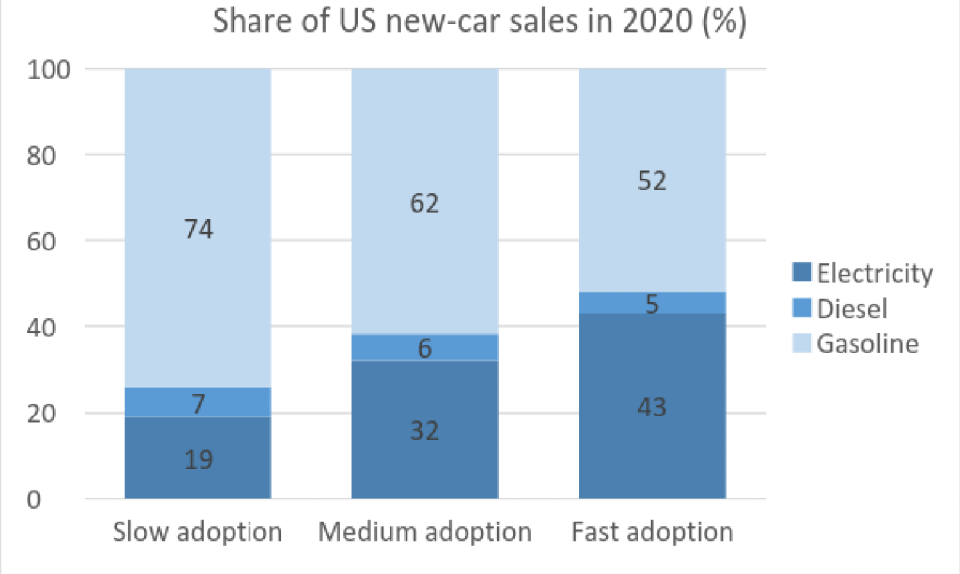


H. Manufacturing EVs

With the price to build a North American auto plant averaging $1 billion, Tesla has spent less than a third of that to buy, renovate, and equip its current EV manufacturing factory[3]. Separate from the Gigafactory, Tesla bought the idled NUMMI plant[4] from Toyota for $42 million, and the plant is estimated to be able to produce 100,000 cars per year at its current equipment capacity[5,6].

I. EV Adoption[9]

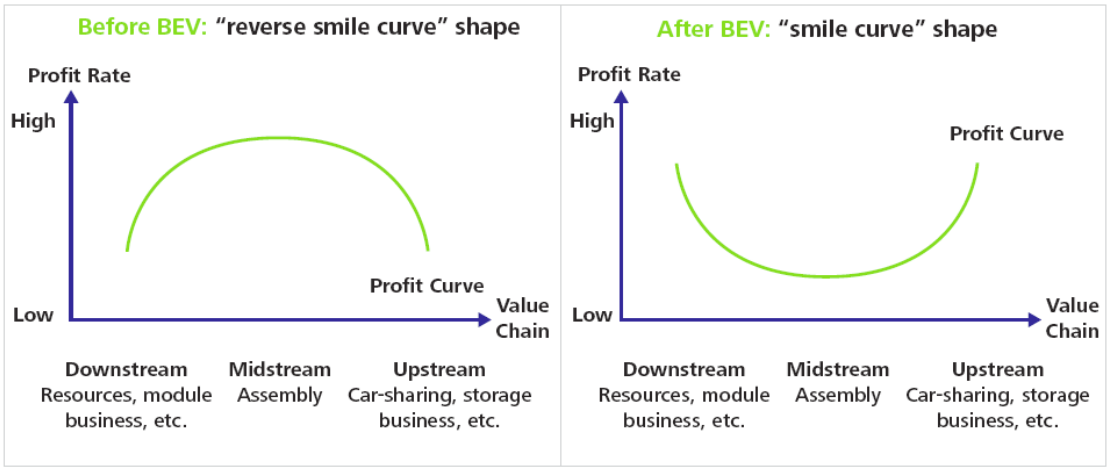
The adoption of EVs depend on factors such as oil price, public concerns about climate change, government regulations, tax incentives, and private sector investment. Estimates vary, but Tesla projects 20 million new EV sales in the US in 2020. Below is a projection of new car sales in the US in 2020, by fuel type, under 3 different EV adoption scenarios.



J. Change in the Value Chain[10]

For decades, the automotive industry has followed a "reverse smile curve" in which the profitability of the processes in the middle of the value chain (e.g., assembly) has increased, while profitability of processes at the ends of the value chain has decreased. It's projected that after battery EV (BEV) expansion, the profit structure will evolve to a "smile curve" structure, with a profit shift from the middle of the value chain to the upstream and downstream processes.

Figure 4. A change in profit structure by BEV expansion



References:

1. http://insideevs.com/tesla-battery-in-the-model-s-costs-less-than-a-quarter-of-the-car-in-most-cases/
2. http://www.teslamotors.com/sites/default/files/blog_attachments/gigafactory.pdf
3. http://toyotanews.pressroom.toyota.com/releases/toyota+begins+corolla+production+mississippi.htm
4. http://blog.caranddriver.com/tesla-partners-with-toyota-will-build-electric-vehicles-at-nummi-plant-in-california/
5. http://www.motortrend.com/features/consumer/1206_temple_of_tesla_touring_elons_factory/
6. http://www.bloomberg.com/news/2012-04-12/tesla-motors-cuts-factory-cost-to-try-to-generate-profit.html
7. Kanellos, M. (2010, August 31). EV Batteries Plummet in Price: Down to $400 a kWh. Greentech Media. Retrieved from http://www.greentechmedia.com/articles/read/ev-batteries-dropping-rapidly-in-Price
8. The Deutsche Bank - The End of the Oil Age 2011 and beyond: a reality check
9. BCG report - The comeback of Electric Car?
10. Deloitte Review - Charging Ahead: Battery Electric Vehicles and the Transformation of an Industry

Useful Resources

Many resources are freely available, while others are subject to more restricted use. Here is a list of potentially useful resources, some of which may be accessed via the JHU library (see below):

- IBIS Reports
- MarketResearch.com Academic
- Mintel
- Datamonitor 360
- PassportGMID
- Wharton Research Data Center
- Bloomberg

From the JHU Business Library on ethical use of online resources (http://databases.library.jhu.edu/databases/subject/business):

The library's database subscriptions are licensed for academic research of the university, with the understanding that use is for courses, academic programs, or internal research that supports the mission of the university. The terms of the data providers can vary. Where we know that particular providers are more specific and restrictive in stating their terms of use to the users, either at the point of entry or through legal notices within them, librarians have been more careful when promoting them. Some state course-related use only. Others specify exclusions for jobs or internships, commercial gain, or for profit purposes. All exclude distribution of content to external entities. Users who are prompted by the database provider to accept specific terms of use will be responsible for adhering to them. The library does not monitor use, but the data providers might.