



Plug Power, Inc.
NASDAQ: **PLUG**

Can they defy the laws of physics? We seriously doubt it.

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Company Background

Company Overview

Plug Power develops hydrogen fuel cell systems meant to replace or supplement conventional electricity or batteries

Plug's fuel cell applications include as a source of stationary power and as fossil fuel/electric alternatives for fleet and materials handling vehicles

Led by President and CEO Andrew Marsh from 2008-Present

Deployed over 35,000 Proton Exchange Membrane (PEM) fuel cell solutions to date

Main Products

GenSure

ProGen

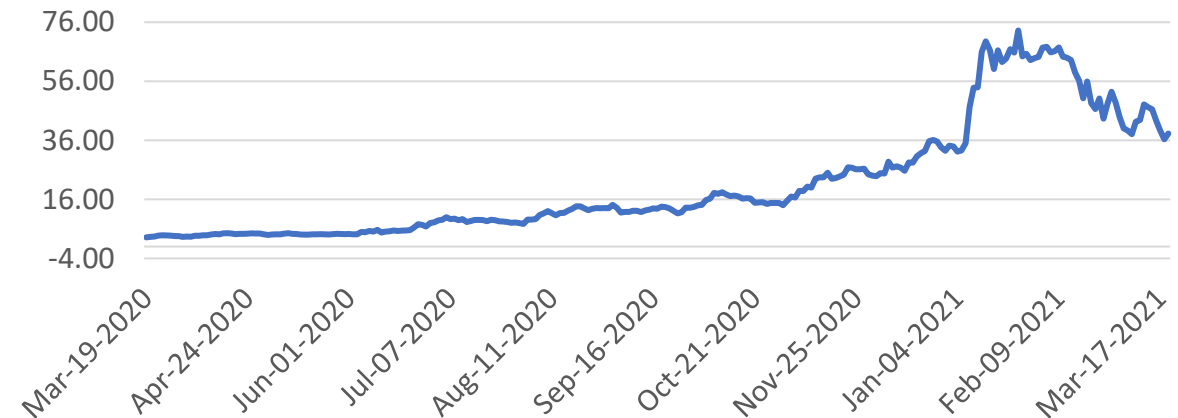
GenDrive



Key Trading Statistics

Ticker	PLUG
Date	3/19/21
Price	\$38.28
Market Cap (Fully Diluted Basis)	25.62B
52 Week High	\$75.49
52 Week Low	\$3.03
EPS	(1.58)
Beta	1.56
Price/Sales	111.26

Plug Power Inc. (NasdaqCM:PLUG) - Share Price 1 Yr



Investment Thesis

Unwarranted Optimism for Impractical Product

The market is anticipating high growth for renewable energy industries in the near future. It is physically impossible for hydrogen power to compete with the efficiency of pure electric due to the inevitable laws of physics. Hydrogen Fuel Cell technology will be left behind for other renewables.

Overlooked Sustainability Issues

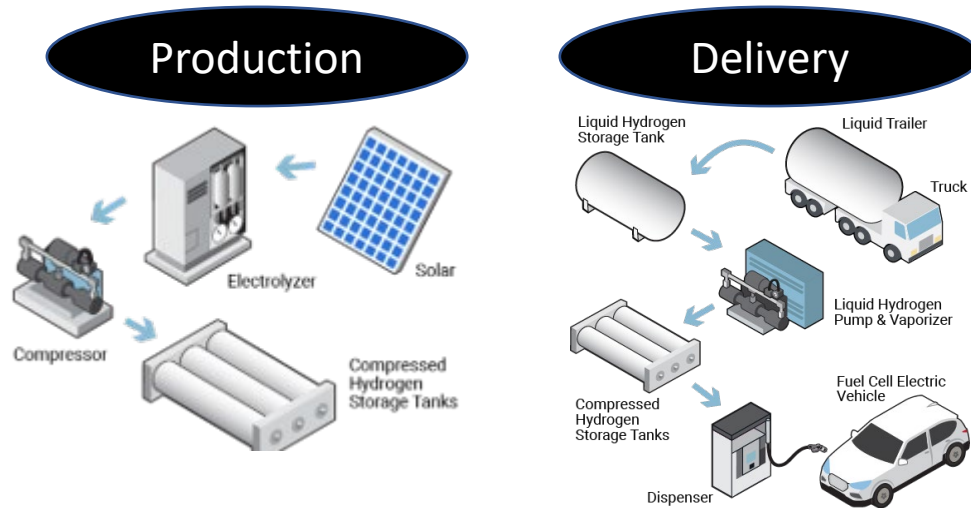
Plug Power has yet to generate any meaningful sales. Their cash burn rate is high and unsustainable.

Breach of Fiduciary Duty

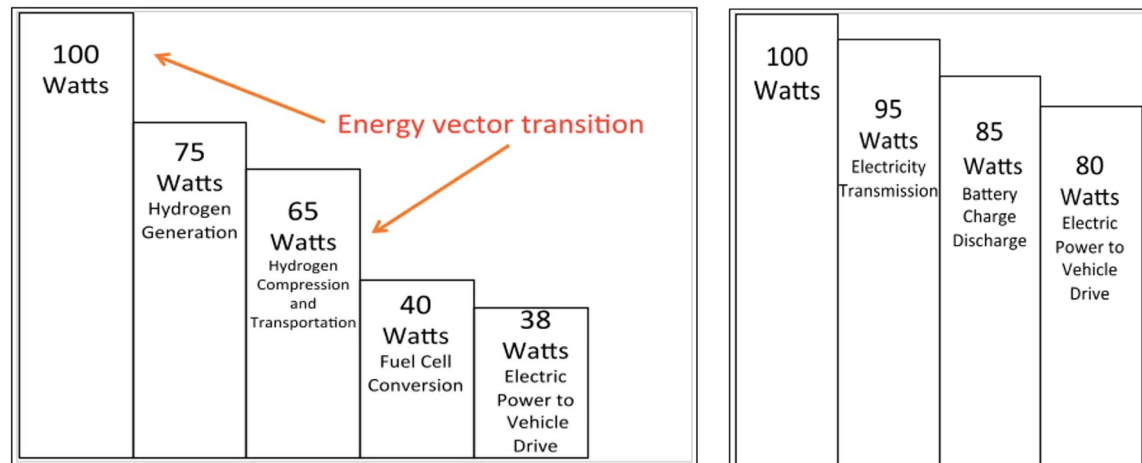
There are large amounts of dilutive securities hidden on the balance sheet that continue to be issued.
Revenues are falsified through the use of accounting tricks and loopholes.

Inefficient Technology

Green Hydrogen Process



2nd Law of Thermodynamics: Entropy



Industry Concerns



"The overall efficiency in the 'power to vehicle drive' energy chain is therefore only half the level of a BEV." –BMW Innovation



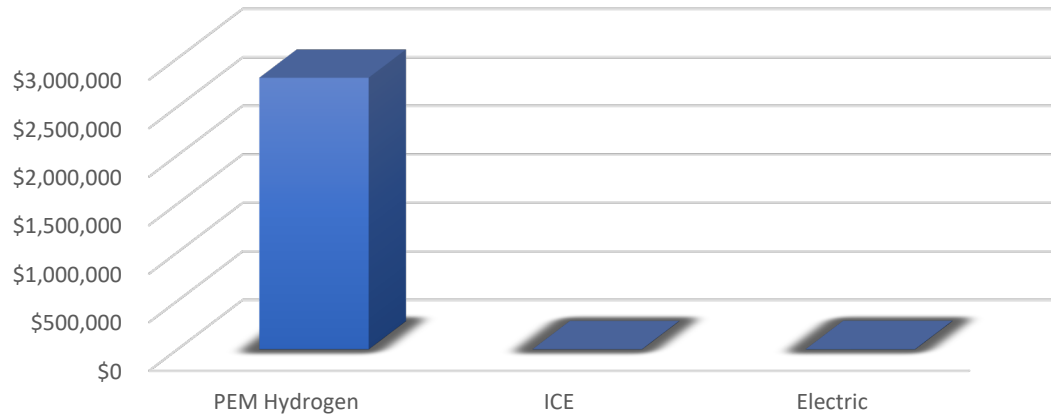
"The hydrogen solution is ultimately also more expensive than the battery version due to the high energy losses."

"You will not see widespread use of hydrogen in cars. Not even in 10 years, because the physics behind it is just so unreasonable." -Herbert Diess, CEO of the VW Group

Scaling the PEM Hydrogen Economy

Impractically Expensive

Installation of Charging Equipment/Fuel Storage



Cost of National Hydrogen Infrastructure: \$113 BILLION

That's the equivalent cost of the following historic infrastructure projects:



CANAL DE PANAMÁ

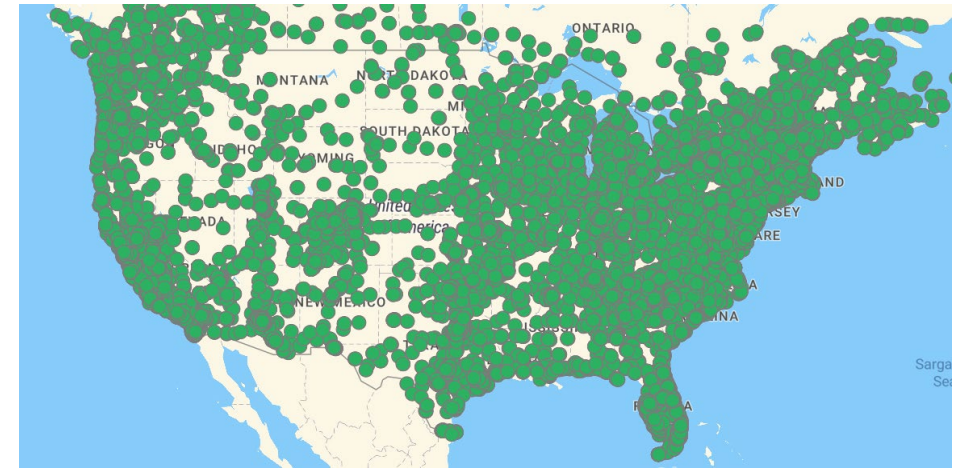
16 Panama Canals



148 Hoover Dams

1.2 Marshall Plans

Lack of Infrastructure



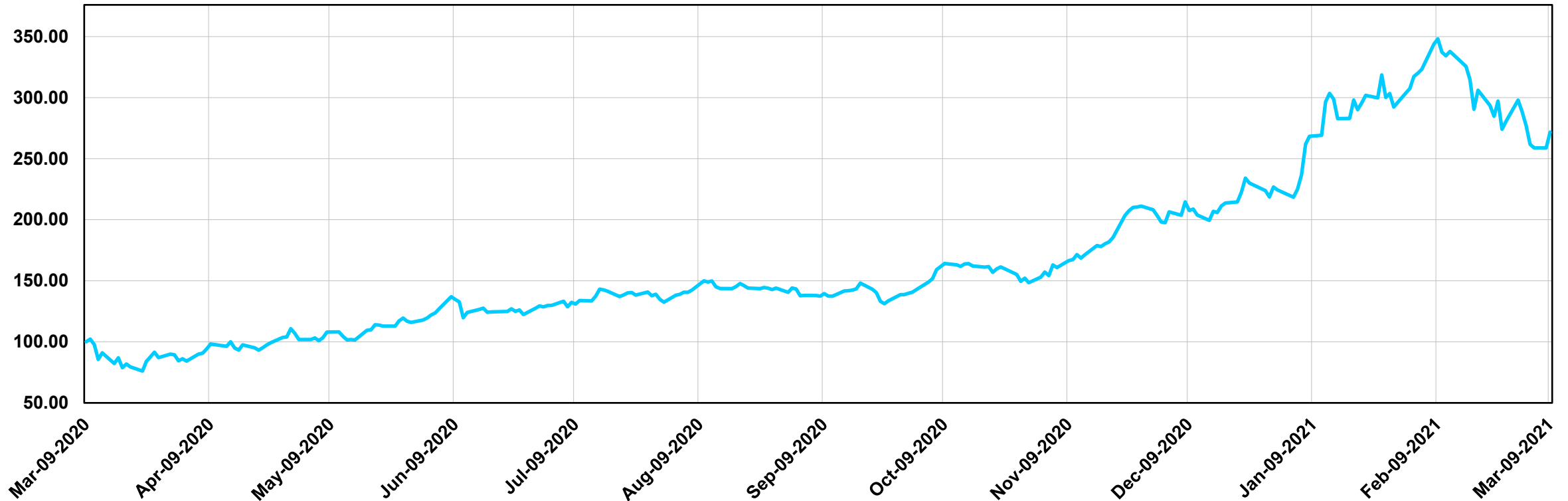
EV Charging Infrastructure



Hydrogen FC Charging Infrastructure

Hydrogen Equities Recent Performance

Keys Hydrogen Fraud Index (#KHFI) - Index Value



The KHFI is an equal-weight composite index of all companies listed on a major U.S. Stock Exchange mentioning “hydrogen” in their business descriptions (29). As seen in the chart above, from March 9, 2020 to March 9, 2021, the index has gained nearly 200%.

Current Market-Implied Performance

Consensus Estimates

Sales Growth Rate	43.00%
Cash Tax Rate	17.50%
Operating Profit Margin	12.00%
WACC	12.00%
Incremental Investment Rate	21.00%
<i>Price-Implied Forecast Period</i>	<u>22 Years</u>

Value Driver Analysis

	Expectation Scenario		Share Price
	Bear Case	Bull Case	
Growth Rate	25%	40%	(\$4.00, \$29.71)
Forecast Period	10	20	(\$3.37, \$28.39)

Based on the above sensitivity/value-driver analysis, we maintain a target fair value price of **\$6.00** per CURRENT share. This represents a suggested downside of **84%**.

Rating & Fair Value Target Price

STRONG SELL 

Fair Value Price

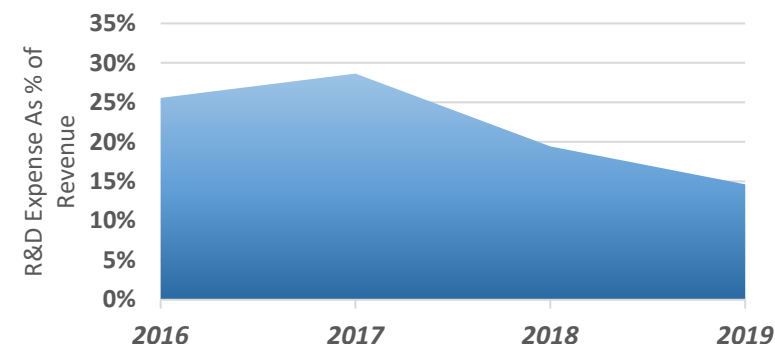
\$6.00

Implied Downside

84%

Not The Profile of a Typical Growth Company

- Founded in 1997, **over 23 years ago**
- There has been no sign of meaningful growth in revenues over this period
- R&D Expenditure is low in proportion to other expenses



State of Revenues and Sales History

Walmart & Amazon Transaction Agreement

- In 2017, Plug Power entered into a transaction agreement with Walmart & Amazon.
- Each were given warrants to purchase 55.29 million shares of Plug Power
- These warrants vest as each pays Plug Power for goods and services rendered
- Total of \$1.2 billion is required to be spent to vest all 110.58 million shares covered by warrants

High Customer Concentration



Key Ideas From Analysis of Revenues

Walmart and Amazon Transaction Agreement is unfavorable to shareholders

Customers are being given unsustainable incentives

Plug Power is having difficulty generating real revenues

Plug Power's recent sales growth is dominated by two customers

Revenues are not what they appear to be

Questionable Revenues

Revenues (in Millions)

FY 2017	FY 2018	FY 2019	FY 2020
100.15	174.63	230.24	-100.47

**Plug Power recorded a negative net revenue for FY 2020 after the value of warrants vested began to outweigh financial benefit from sales*

Financial Sustainability

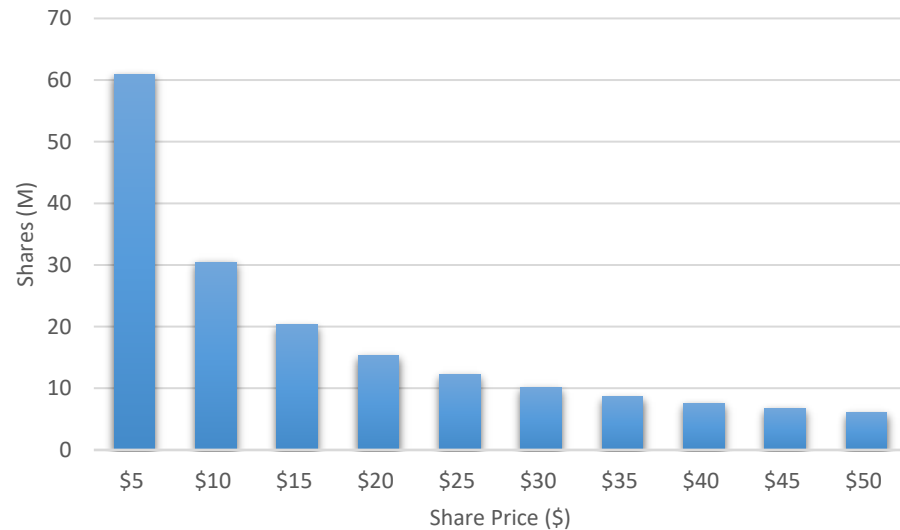
Cash Burn Rate

Cash Used by Operations



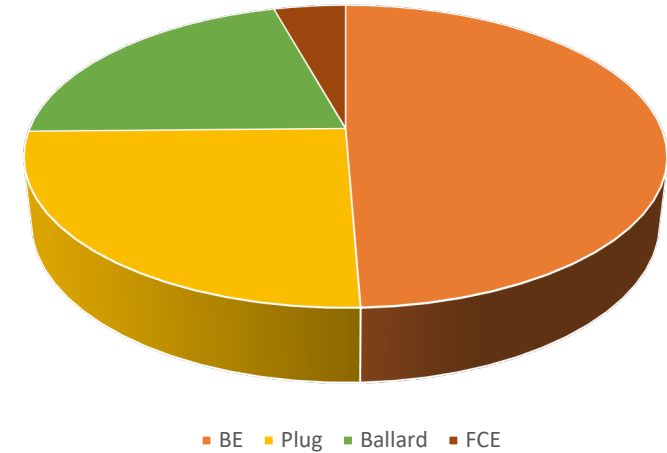
- \$17,434,444/month cash loss from ops in 2020
- Company is sustained solely by capital markets

Seasoned Offering Size to Maintain Cash



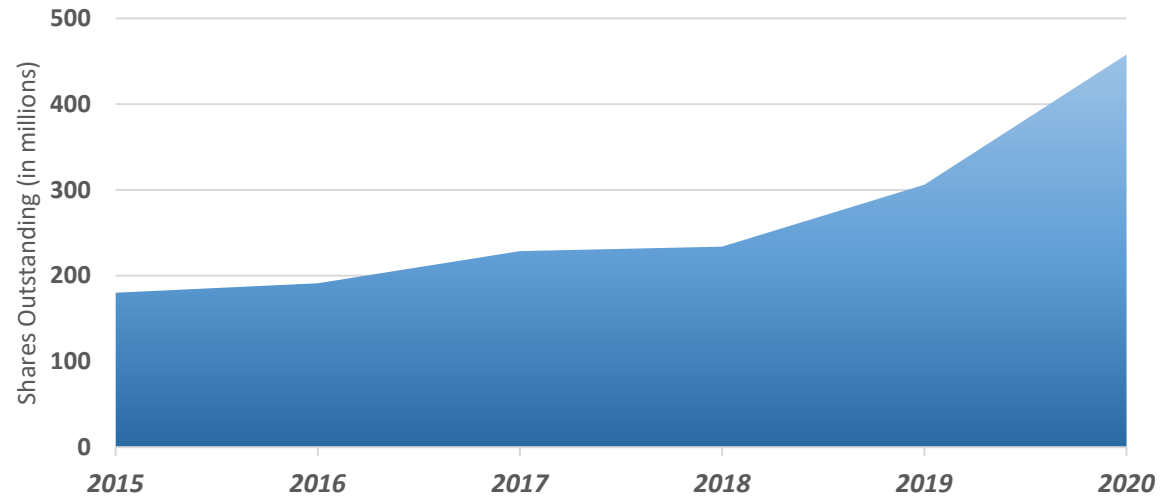
Increased Competition

Direct Competitor R&D 2020

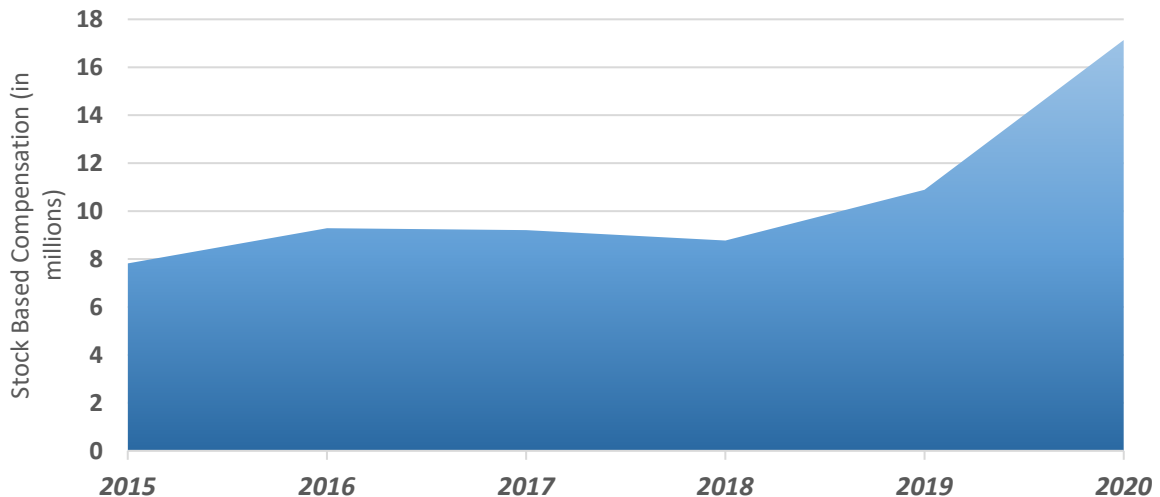


Dilutive Securities Growth

Growth in Shares Outstanding



Growth in Employee Stock-Based Comp.



Fully Diluted Shares Outstanding

Description	Amount (in millions)
Shares Outstanding	501.5
Convertible Notes	42.2
Outstanding Warrants	110.5
Outstanding Options & RSUs	15.0
Total	669.2

Dilutive Basis: 25.06%

Key Ideas From Analysis of Revenues

Investors are not accounting for the hidden dilution outstanding

Employee stock options are growing considerably YoY

Shares Outstanding are growing at CAGR of 16.83%

Management is being rewarded for a surge in optimism, not results

Current financing decisions are not in the best interest of shareholders

Potential Catalysts for Decline in Share Price

10-K Release

- March 2nd Plug announced a delayed 10k & May 17th date not expected to be met
- Plan to restate and correct prior period financial statements
- Poor internal accounting controls
- Financial results beginning FY 2018 are going to be affected

Class Action Settlement

March 16th, Block and Leviton, LLP. announces class action lawsuit

Beverly vs. Plug Power Inc., et al. SDNY

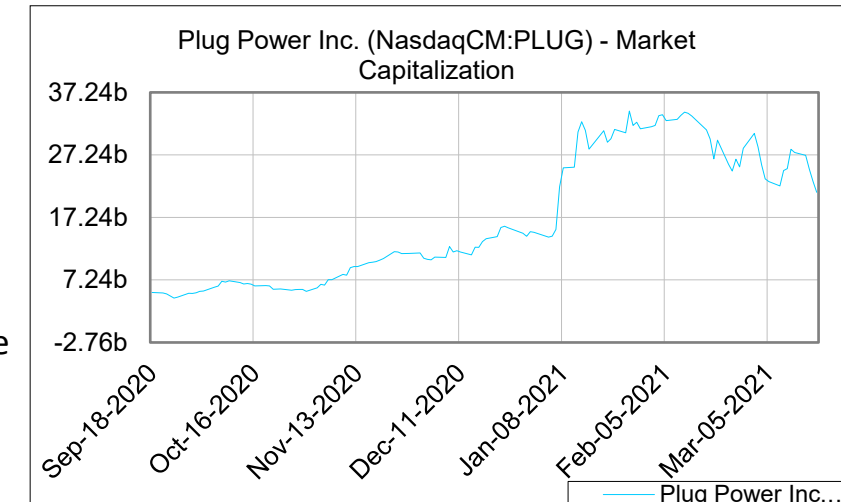
In regards to a violation of Federal Securities Law

While it may not cause much financial distress, it will draw attention

Firm has settled with Snap, Inc., Walmart, American Airlines, etc.

Failure to Pass Hydrogen-Friendly Legislation

- Current valuations are due to political developments
- Without swift government action, valuation will deflate inevitably



Reluctant to Change

- Andrew Marsh CEO since 2008
- Paul Middleton CFO since 2014
- Keith Schmid COO since 2013
- Combined 25 years of disappointing operating results



- ⚡ We have assigned a **Strong Sell** rating to PLUG stock with a price target of **\$6**
- ⚡ On the surface, hydrogen fuel cells are an exciting technology. However, examining the industry as a whole reveals the technology is inefficient and costly
- ⚡ Plug Power has not once turned a profit, and without significant developments we do not believe there is reason to be optimistic for change
- ⚡ Shares have been issued at alarming rates, and without a clear future of profitability we see this as being very detrimental to shareholders
- ⚡ Accounting tricks and loopholes have provided optimism in revenues up to this point, but now management and shareholders are beginning to see the fallout

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Final Points

- Potential Catalysts for Decline in Share Price
- Conclusion

Assorted Calculations

	Charge Stations	\$/Station		
FC	43	2800000		410.3419943
EV	40582	28312	\$1,148,957,584.00	
			Total Cost to Scale	\$113,629,600,000.00
			Investment in EV thus far	\$1,159,485,714.29

Fuel Type	Price	Capacity	KWh /dollar
PEM Hydrogen	\$9.5/kg	33.3 kwh/KG	3.505263158
Diesel	\$3.08/Gal	40.7	13.21428571
Electric	\$.1319/KWH		7.581501137

R&D Expenditure	
BE	83577000
Plug	42844000
Ballard	35519000
FCE	7292000

Install of fuel storage	
PEM Hydrogen	\$2,800,000
ICE	\$3,500
Electric	\$5,000

Share Price	M of shares needed
\$0	
\$5	61
\$10	30
\$15	20
\$20	15
\$25	12
\$30	10
\$35	9
\$40	8
\$45	7
\$50	6