



# Plug Power

NASDAQ: PLUG

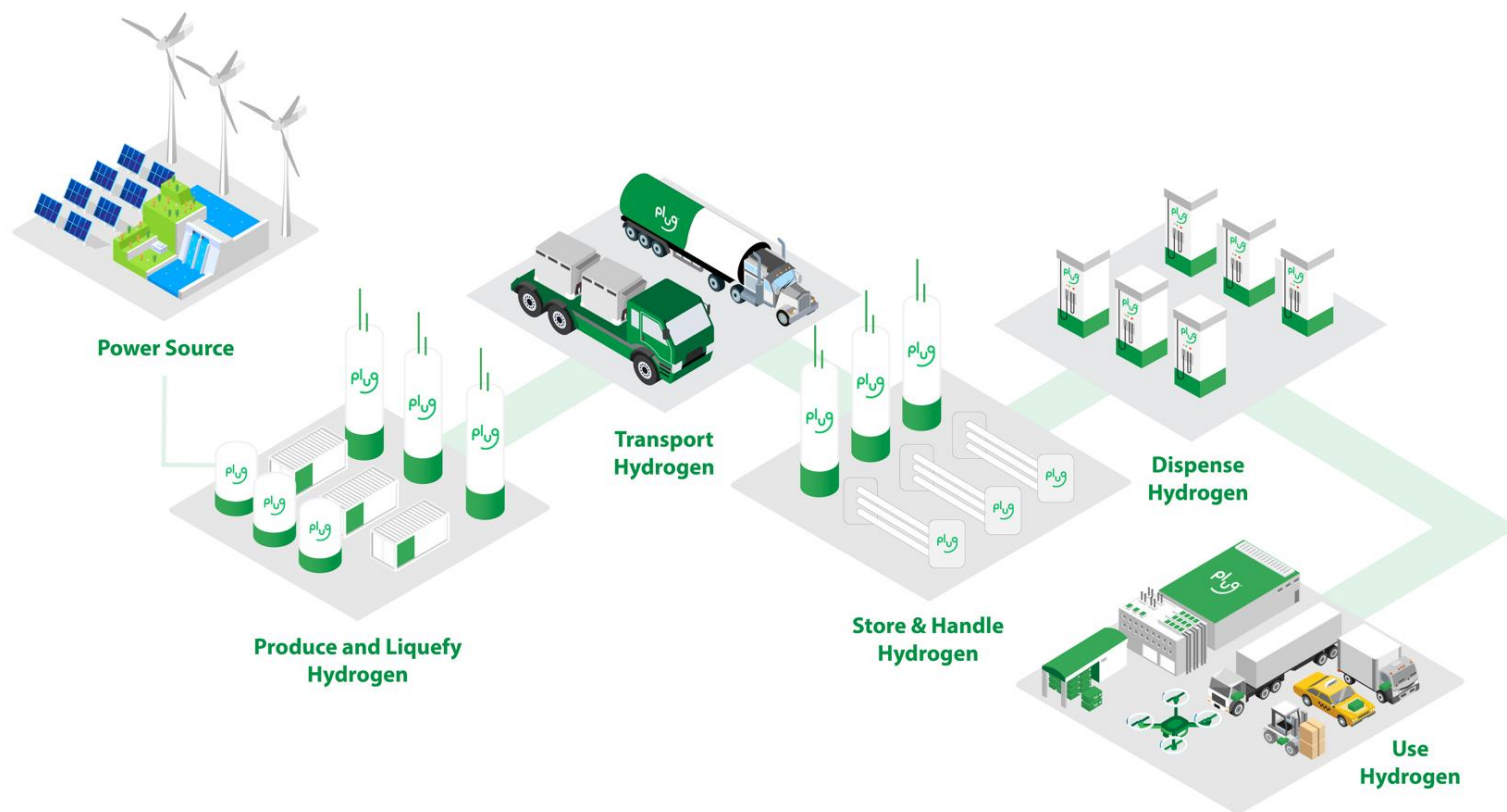
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# Cautionary Note on Forward Looking Statements

This communication contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995 that involve significant risks and uncertainties about Plug Power including but not limited to statements about Plug Power’s expectations regarding the effects of the recent acquisitions; expectations regarding the building of a fuel cell and electrolyzer stack Gigafactory; expectations regarding its position and capabilities in hydrogen generation, liquefaction and distribution of green hydrogen fuel, and expectations regarding its servable addressable market. These forward-looking statements contain projections of our future results of operations or of our financial position or state other forward-looking information. In some cases you can identify these statements by forward-looking words such as “anticipate,” “believe,” “could,” “continue,” “estimate,” “expect,” “intend,” “may,” “should,” “will,” “would,” “plan,” “projected” or the negative of such words or other similar words or phrases. We believe that it is important to communicate our future expectations to our investors. However, there may be events in the future that we are not able to accurately predict or control and that may cause our actual results to differ materially from the expectations we describe in our forward-looking statements. Investors are cautioned not to unduly rely on forward-looking statements because they involve risks and uncertainties, and actual results may differ materially from those discussed as a result of various factors, including, but not limited to: the risk that we continue to incur losses and might never achieve or maintain profitability, the risk that we will need to raise additional capital to fund our operations and such capital may not be available to us, the risk of dilution to our stockholders and/or stock price should we need to raise additional capital, the risk that our lack of extensive experience in manufacturing and marketing products may impact our ability to manufacture and market products on a profitable and large-scale commercial basis, the risk that unit orders may not ship, be installed and/or converted to revenue, in whole or in part, the risk that a loss of one or more of our major customers, or if one of our major customers delays payment of or is unable to pay its receivables, a material adverse effect could result on our financial condition, the risk that a sale of a significant number of shares of stock could depress the market price of our common stock, the risk that our convertible senior notes, if settled in cash, could have a material effect on our financial results, the risk that our convertible note hedges may affect the value of our convertible senior notes and our common stock, the risk that negative publicity related to our business or stock could result in a negative impact on our stock value and profitability, the risk of potential losses related to any product liability claims or contract disputes, the risk of loss related to an inability to maintain an effective system of internal controls, our ability to attract and maintain key personnel, the risks related to the use of flammable fuels in our products, the risk that pending orders may not convert to purchase orders, in whole or in part, the cost and timing of developing, marketing and selling our products, the risks of delays in or not completing our product development goals, our ability to obtain financing arrangements to support the sale or leasing of our products and services to customers, our ability to achieve the forecasted gross margin on the sale of our products, the cost and availability of fuel and fueling infrastructures for our products, the risks, liabilities, and costs related to environmental, health and safety matters, the risk of elimination of government subsidies and economic incentives for alternative energy products, market acceptance of our products and services, including GenDrive, GenSure and GenKey systems, our ability to establish and maintain relationships with third parties with respect to product development, manufacturing, distribution and servicing, and the supply of key product components, the cost and availability of components and parts for our products, the risk that possible new tariffs could have a material adverse effect on our business, our ability to develop commercially viable products, our ability to reduce product and manufacturing costs, our ability to successfully market, distribute and service our products and services internationally, our ability to improve system reliability for our products, competitive factors, such as price competition and competition from other traditional and alternative energy companies, our ability to protect our intellectual property, the risk of dependency on information technology on our operations and the failure of such technology, the cost of complying with current and future federal, state and international governmental regulations, our subjectivity to legal proceedings and legal compliance, the risks associated with past and potential future acquisitions, and the volatility of our stock price. The risks included here are not exhaustive, and additional factors could adversely affect our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for management to predict all such risk factors, nor can we assess the impact of all such risk factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from these contained in any forward-looking statements. While forward-looking statements reflect our good faith beliefs, they are not guarantees of future performance. For additional disclosure regarding these and other risks faced by Plug Power, see disclosures contained in our public filings with the SEC including, the “Risk Factors” section of our Annual Report on Form 10-K for the year ended December 31, 2020 as such risk factors may be updated from time to time in Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and other filings Plug Power makes with the SEC. These forward-looking statements speak only as of the date on which the statements were made. Except as may be required by applicable law, we do not undertake or intend to update any forward-looking statements after the date of this presentation.

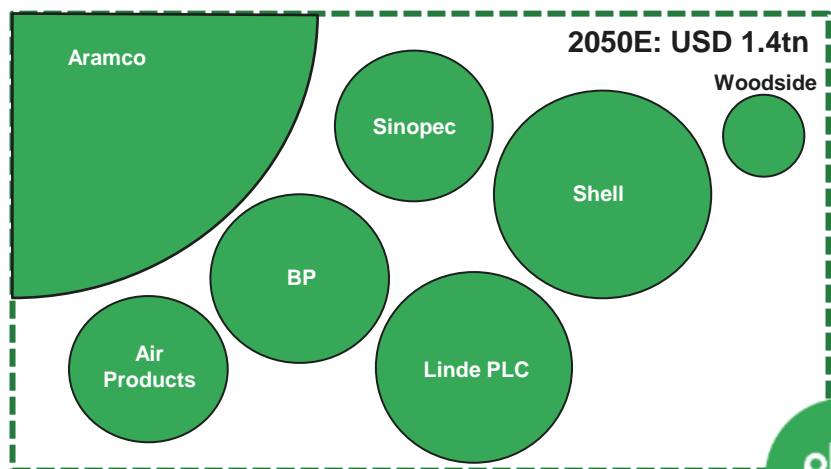




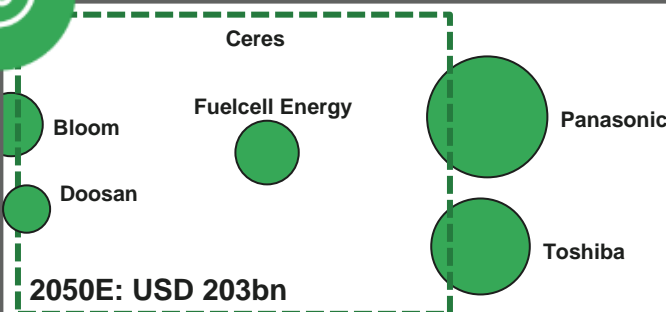
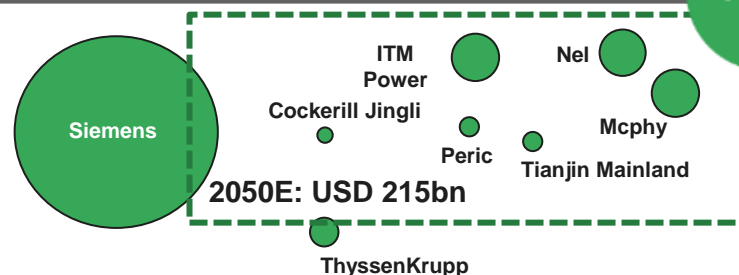
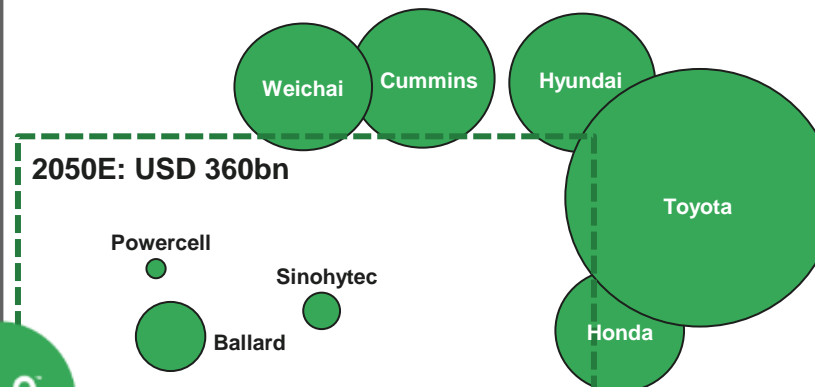
Plug is building an end-to-end green hydrogen ecosystem, from production, storage and delivery to energy generation, to help its customers meet their business goals and decarbonize the economy.

# Plug Power is uniquely positioned at the center of the hydrogen economy

## Hydrogen



## Fuel cells for transport



## Electrolyzers

## Fuel cells for stationary



Market size (2050E)



Company market cap

Source: Bloomberg and Bernstein analysis and estimates

# Market Opportunity

## Material Handling

**\$30Bn**

*Target addressable market*

## Electric Vehicles

**\$300Bn**

*Target addressable market*

## Stationary Power

**\$265Bn**

*Target addressable market  
(US)*

## Hydrogen Economy

**\$10Tn**

*Target addressable market*

### Plug Today

### Long-term Growth Trajectory

#### Forklifts

- More than 6MM forklifts deployed
- 1.5MM forklifts sold annually

#### On-Road Electric Vehicles

- Energy density is ~10x BEVs
- High asset utilization
- Enables sharing economy
- Faster fueling
- Longer range
- Infrastructure expertise
- Less challenging operating conditions than material handling applications
- Constant power

#### Data Centers & Wireless Infrastructure

- Small footprint, high power density
- Lower TCO vs. diesel generators

#### Hydrogen & Equipment

- The Hydrogen Council projects that by 2050, hydrogen could provide up to <sup>(1)</sup>:
  - 18% of final energy demand
  - 6Gt annual CO2 abatement
  - 30MM jobs created





# Hydrogen Demand

New Apps Create Multiplier Effect for Hydrogen Demand

1kg/day

Forklifts

6kg/day

LCV

40-50kg/day

HDV

1MW 24/7: >1TPD

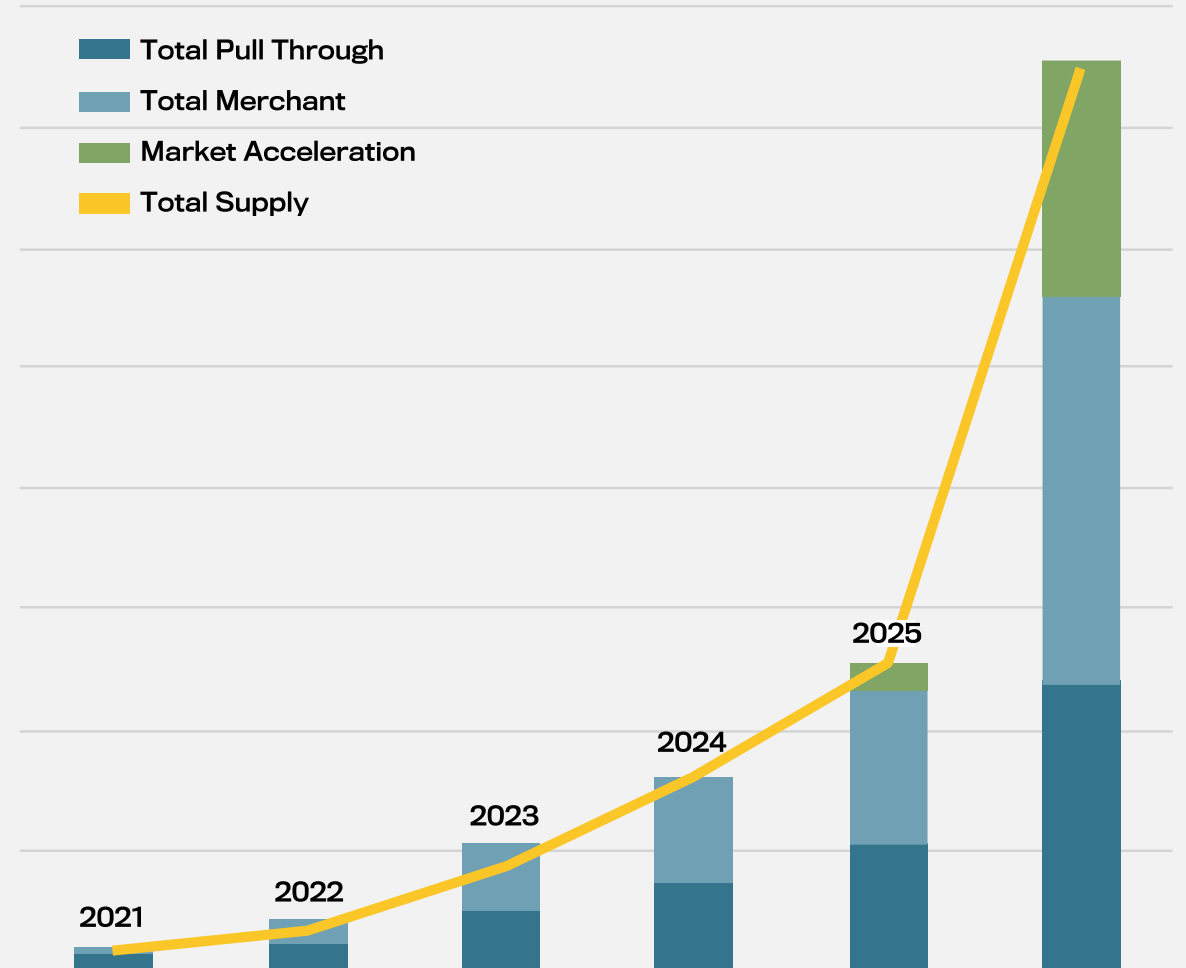
Stationary Power

500TPD of demand represents 5,000 class 7-8 trucks and less than 300MW of stationary power

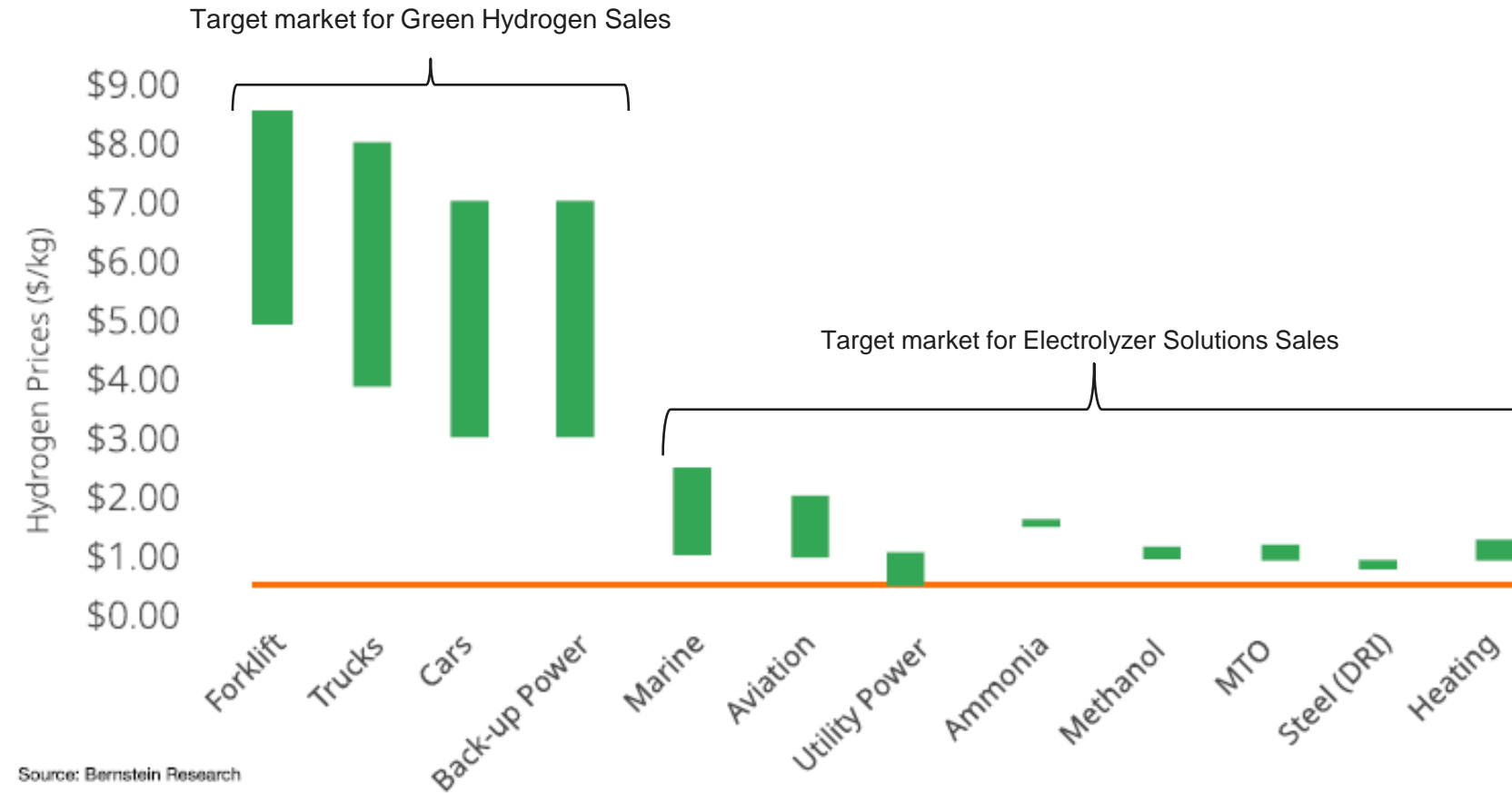
Long haul trucking in NA alone requires 200,000TPD of green hydrogen to displace diesel



Base Case = 500TPD 2025



# Inflation Reduction Act Implications



Green Hydrogen Price with PTC (Orange Line) vs. cost of alternative in each market



- \$3/kg PTC makes Green Hydrogen competitive in all hydrogen applications and processes immediately
- All new plants before 2032 will receive 10 years of PTC. 5 years direct pay, then 5 years tax credit
- Improves original GH plant paybacks by ~4-5 years
- Lowers the total cost of ownership for hydrogen fuel cell productions, accelerating adaption
- Makes the United States the lowest cost producer of Green Hydrogen in the world



# Energy Solutions



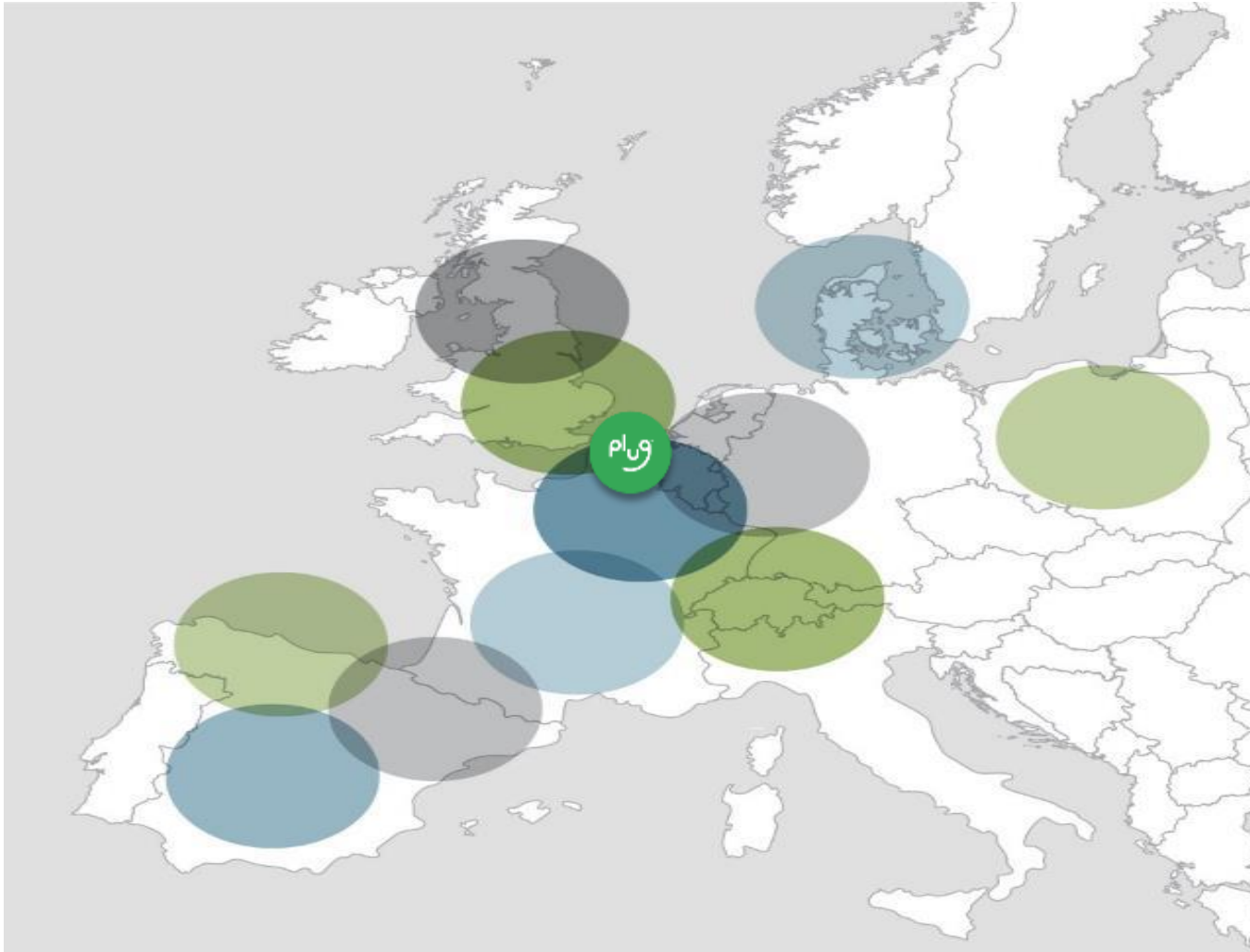


# North America Green Hydrogen Plant Timeline



- Green Hydrogen generation of 500-tons per day by 2025
- Announced Green Hydrogen plant locations at California, Georgia, Louisiana, New York and Texas
  - Broke Ground on three Plants in 2021
  - Six Plants by year-end 2023 with 200TPD
- Energy Solutions Business Revenue projections (Inclusive of Cryo and Liquefaction)
  - 2023: \$285MM
  - 2030: \$3.9B

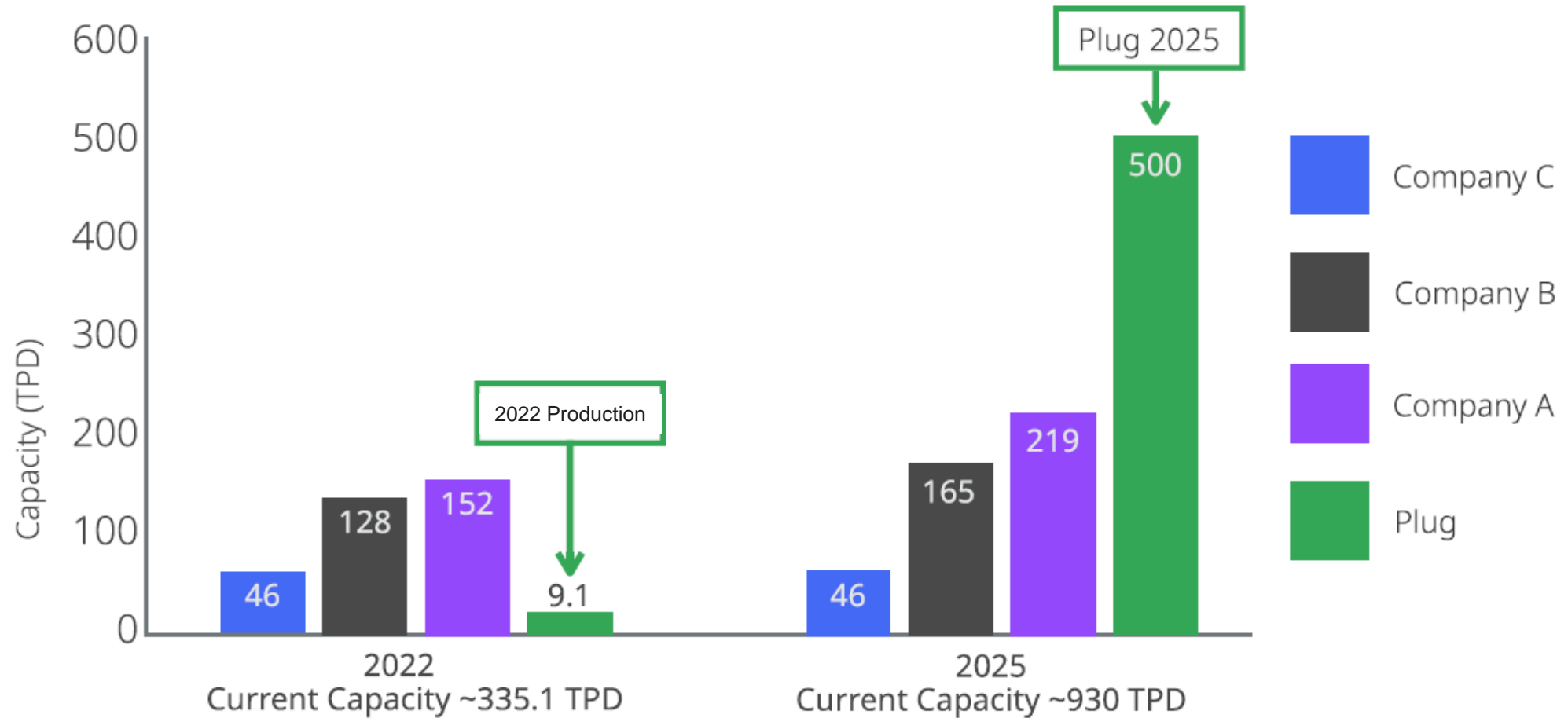
# Building a green hydrogen generation network in Europe to get to 1000TPD Globally by 2028



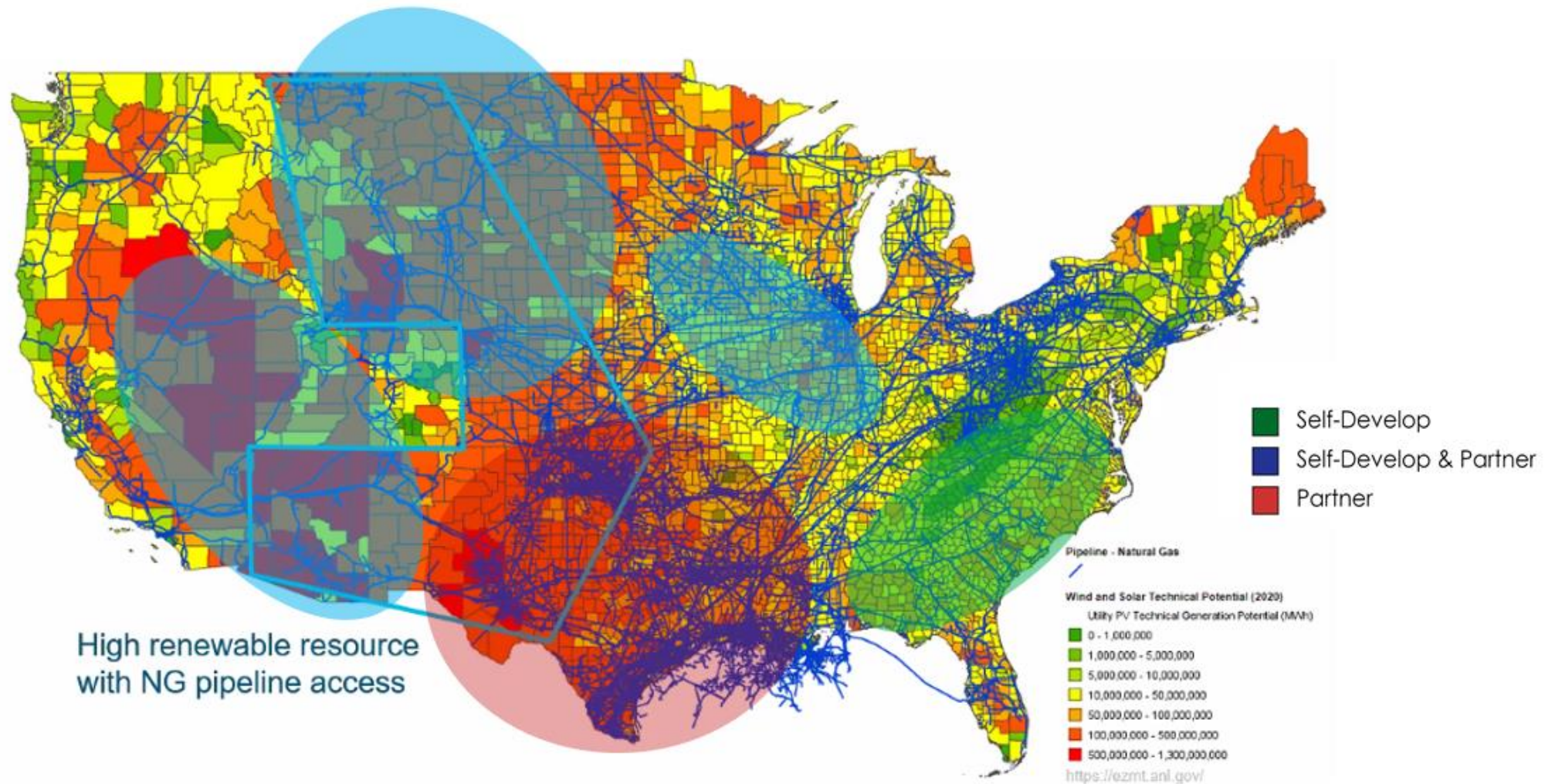
- 100+ TPD in Europe by 2028
- Port of Antwerp-Bruges 35TPD
- Lhyfe (300MW+)
- H2 Energy (1GW)
- Acciona (50/50 JV) to build green hydrogen plants in Iberia
- Renault / Hyvia (50/50 JV) to target 30% market share of the fuel cell LCV segment in Europe by 2030
- Identifying locations in places such as Denmark and Sweden with low-cost renewable electricity to produce low-cost green hydrogen and transport to demand centers

# Plug's Transition from Nascent Player to Industry Leader

## Making Green Hydrogen Economical, Easy, and Ubiquitous



# Energy Landscape Transformation – High Potential Area





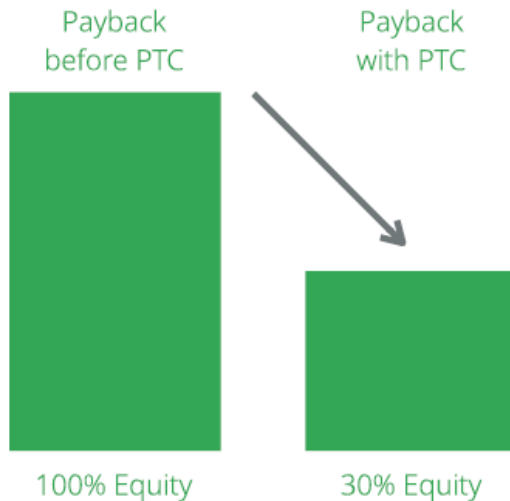
# Energy Solutions Business Outlook

## Sustainable Competitive Advantage

1. Scale
2. Sourcing clean energy and water
3. Optimizing plant design

## PTC

Accelerates Return and Capital Formation



- Green Hydrogen Production
  - First Generation of plants ~\$4/kg production cost (Pre-PTC). Eligible for \$3/kg PTC in US
  - Transportation currently ~\$0.25 per 100 miles over the road
- Significant margin expansion as Plug Green Hydrogen plants come online
  - Fuel Margin Breakeven exiting 2023, and >30% in 2025
- Energy Solutions Business Revenue projections (Inclusive of Cryo and Liquefaction)
  - 2023: \$285MM
  - 2030: \$3.9B





# Plug Cryo

## ACT Cryo and Joule Acquisitions



- Cryogenic liquid hydrogen tanker manufacturing, with the highest payloads in the industry
- Roadmap to double tanker manufacturing capacity and reduce costs per unit by 50%
- Storage tanks introduced Q1 2023
- Mobile refuelers ordered in 2022 for 2023 delivery
- Energy efficient liquefiers, that can lower energy needs for liquefaction by 20%+
  - Sold three 30 ton per day hydrogen liquefaction systems in 2022
- Large TAM for third-party sales as Hydrogen Economy accelerates





# Electrolyzer Solutions



# We are making Green Hydrogen the Molecule of Choice by offering Best-in-Class Electrolyzer Solutions

Our Electrolyzer Solutions are growing through sales to customers and solutions provided for our own Green hydrogen needs. We offer World-Class Electrolyzer Solutions of varying size

Stacks from  
1kg Per Day  
to  
425kg Per Day

Systems & Plants from  
125 Kg/day  
to  
300+ TPD



## Competitive Landscape

	Alkaline Electrolyzer Competitors	PEM Electrolyzer Competitors	plug™
High Current Density Operation	X	X	✓
Small Footprint	X	✓	✓
High Efficiency	✓	✓	✓
High Gas Purity	X	✓	✓
Operating Pressure	X	✓	✓
Differential Operating Pressure	X	X	✓
System Response/Ramp Time	X	✓	✓
Cold Start	X	✓	✓
Stand By	X	✓	✓
High Temperature Pressure	✓	X	✓

### Competing technologies but one winner at scale

Our PEM technology advantages allow us to stand alone



# **FRAMES** now Plug System Solutions



- Engineering / EPC Capabilities, with ~300 employees in EMEA
- Offering Turnkey solutions to end customers in multiple different end markets including Green Ammonia, Methanol, Power-to-Gas, and mega green hydrogen projects
  - Plug's "green book" provides a framework for design, project management, and optimization of electrolyzer solutions for our customers

# Electrolyzer Solutions Business Outlook



425 kg per day Container	2 Ton per Day System	4 Ton per Day Array
Up to <b>1 MW</b> input	Up to <b>5 MW</b> input	Up to <b>10 MW</b> input
Fully containerized solution (standard 40 ft. / 12.2 m ISO container)	Includes full BoP for turnkey simplicity	BoP custom-engineered to meet customer requirements
Scalable drop-and-play convenience	Containerized solution for high demand applications	Efficient, scalable solution for high volume H <sub>2</sub> plants

- Electrolyzer backlog exceeding 2 GW
- Sales funnel of \$30B+
  - 50% Green Ammonia / Fertilizer projects
  - Significant demand acceleration following the passage of the Inflation Reduction Act
- 1.5GW+ of annual electrolyzer capacity
  - Evaluating manufacturing expansion opportunities globally
- Electrolyzer Business Unit Projections
  - 2026: \$1.45B revenue
  - 2030: \$7.3B Revenue





# World's first PEM Technology Gigafactory

Driving Scale in Fuel Cell Technology

## Annual Capacity

2.5+  
Gigawatts  
output

7M+  
MEAs

2M+  
Bi-Polar  
Plates

2+GW  
Of Electrolyzers

Green H2  
Onsite generation

60,000+  
Fuel Cell Stacks

100+MW  
Manufacturing strategy to build  
over 100 large electrolyzer  
stacks per month

Gigafactory Virtual Tour: <https://3d.zuant.com/experience/plugin/KJ66EE8SEe2i3O%2BCc7Lqpg/>





# Applications



# Material Handling - GenDrive

4M

Operating forklifts, U.S. and Europe, 2021

5M

Operating forklifts, U.S. and Europe, 2030

Large

Medium

Small

15%

200+ unit fleet

25%

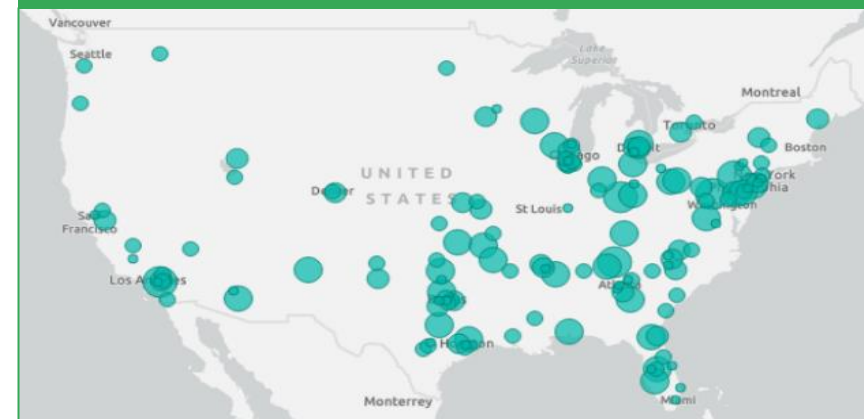
60-200 unit fleets

60%

>60 unit fleets



- Plug’s “GenDrive” fuel cell creates significant productivity gains in high volume warehouses and distribution centers vs. battery alternatives
- 60,000+ Plug Fuel Cells installed
- Installed and operating the largest network of H2 refueling stations in the world
  - Over 200 locations dispensing 45tpd+



# Material Handling Expansion for 2023

**50**  
New pedestal sites planned and targeting 3 new pedestal accounts in North America

**8**  
New sites in Europe planned and targeting 1 new pedestal account

**25%**  
Targeting mid-size offerings which increases the TAM by 25% or 1 million more forklifts

**Cost Focus**  
Plan for continued product cost down and reliability improvements



Channels Globally						
European Expansion						
New Multisite Deals New Customers						
						
Continued Expansion						
						
						

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# Mobility & Stationary Power Solutions

## Targeting Three Primary New Market Applications

With a robust technology platform established, trucks, planes, and data centers are our logical progression.



### Commercial Fleet Vehicles

Class 3 – 8 Middle Mile  
Last Mile Transit Bus Fleet

HYVIA



EDISON MOTORS

BAE SYSTEMS



### Stationary Power

Megawatt Scale Backup Applications  
Continuous Power Generation

amazon

Walmart



Southern Company



### Aerospace

UAV/Drones Decarbonize Airports  
Regional Passenger  
Cargo/Commuter

AIRBUS

HEVEN  
DRONES

Airflow

Universal  
Hydrogen





# ProGen Engines: Zero-Emission Transportation Solutions

## Modular Power Enables Tailored Power Density

- Pre-engineered OEM platform
- “Plug and Play” system solution
- Includes all balance of plant
- Models can be used in series and parallel combinations
- Building block of Hyvia Master van



## Modular Engines Provide Leverage and Enable Multiple Applications



15kW



30kW



85kW



125kW

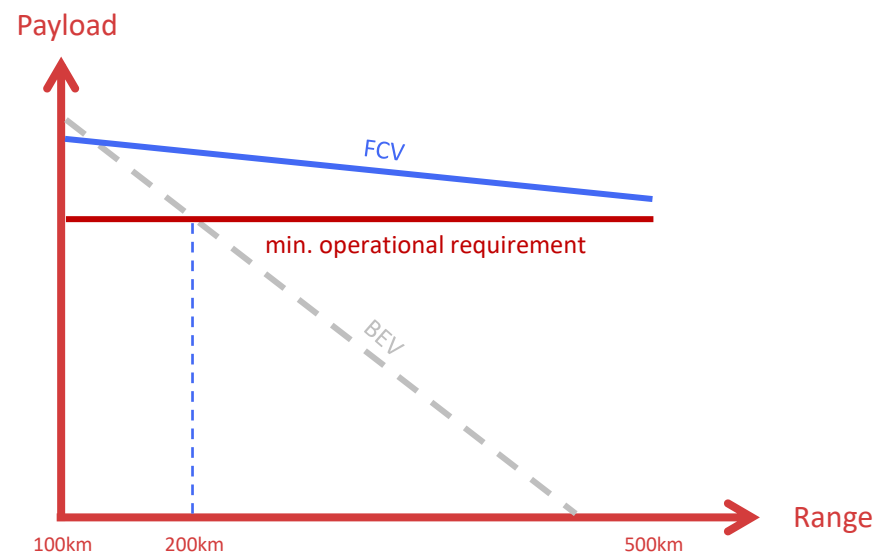


>1mW

# Fuel cell trucks increase range and payload

From 2019 DHL’s Symposium Presentation

## Operational Perspective



For ranges > 200km BEVs do not fulfill the minimum user requirements (“the asset can’t do the job”)

Source: Corporate Incubations, Deutsche Post DHL Group

<u>Vehicle Type</u>	<u>Distance</u>	<u>Weight</u>	<u>Charge/Refuel Time</u>
<b>Diesel</b>	500 mile	45,000lb Payload 35,000lb Unloaded	5 Minutes
	125 mile	44,000lb Payload 36,000lb Unloaded	3 Hours
<b>Battery</b>	500 mile	34,600lb Payload 45,400lb Unloaded	11 Hours
	150 mile	45,000lb Payload 35,000lb Unloaded	5 Minutes
<b>Fuel Cell</b>	500 mile	42,600lb Payload 37,400lb Unloaded	15 Minutes



# Stationary Power - GenSure

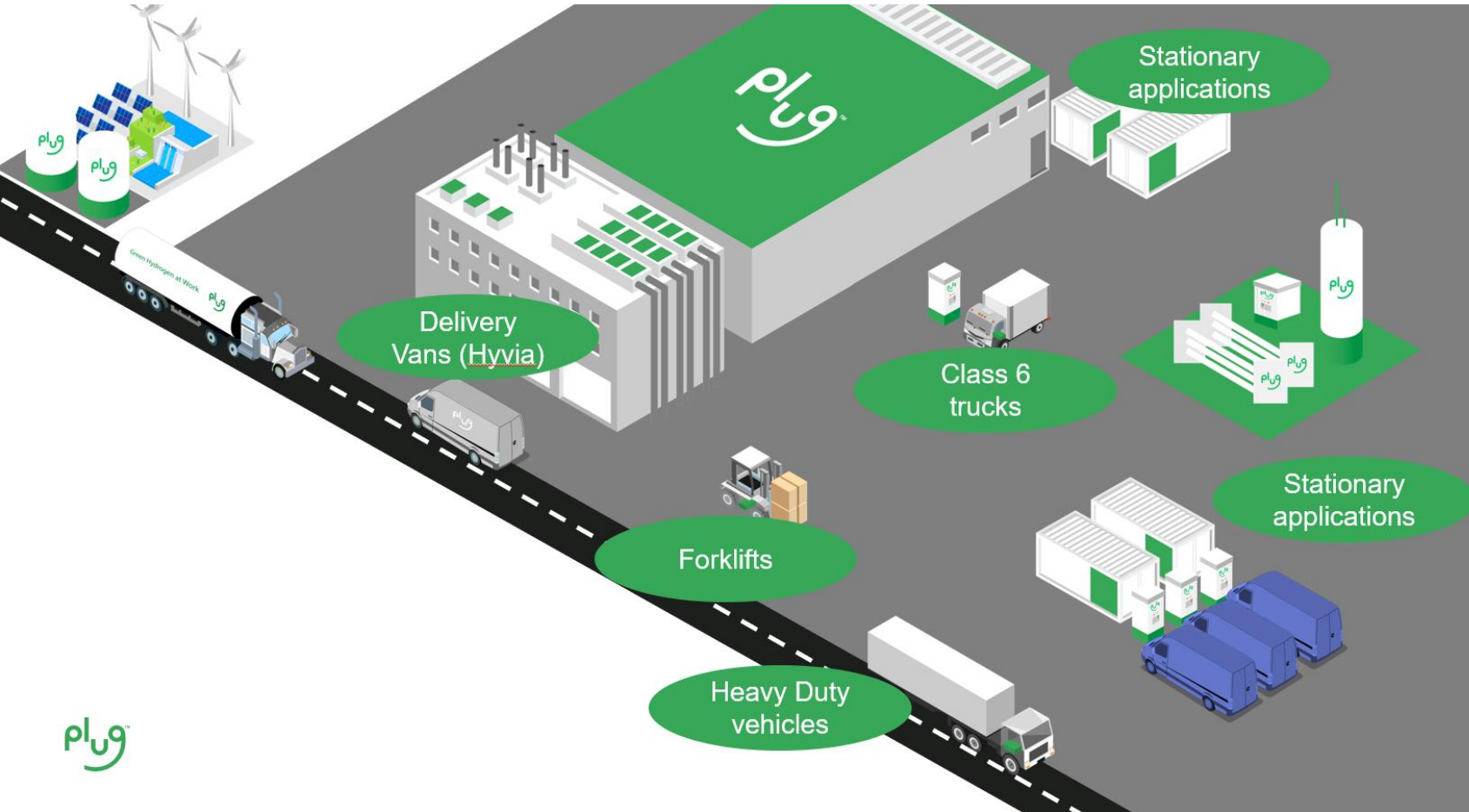


Microsoft Alpha Test Unit at Latham, NY HQ



- Successfully Tested 3MW stationary power unit for Data Centers Back Up with Microsoft
- One of the biggest near-term applications is materializing in battery electric vehicle charging stations
  - Available in 1-3 MW for Back Up Power - Prime Power - Peak Power - EV Charging
- 1MW unit uses 65kg of H<sub>2</sub> per hour

# Applications Business Outlook



- \$1.6B+ of revenue in 2025
- ~\$9B of Revenue in 2030
- Material Handling
  - \$1B of revenue in 2025
  - Growing sites at 30% CAGR
- Stationary Power
  - 2023: 20-30MW Shipped
  - 2024: 200MW+ Shipped
- Mobility
  - HYVIA targeting 20,000 vehicles sold in 2025, and 100,000 in 2030



# Partnerships





# Partnerships Enable Green Hydrogen Leadership



- ✓ On October 6<sup>th</sup>, 2021 Plug Power and SK E&S, part of South Korea's SK Group, formed a joint venture designed to accelerate the use of hydrogen as an alternative energy source in Asian markets
- ✓ This collaboration will provide hydrogen fuel cell systems, hydrogen fueling stations, electrolyzers and green hydrogen to the Korean and other Asian markets
- ✓ The partnership included a \$1.6B strategic investment from SK Group into Plug Power
- ✓ The partnership will leverage SK's leadership in chemicals, petroleum and energy as well as Plug's leading hydrogen platform



- ✓ On June 3<sup>rd</sup>, 2021 Plug Power and Renault Group launched the HYVIA JV
- ✓ Plug Power and Renault Group's 50/50 JV Leading the Way to a Complete Ecosystem of Fuel Cell Powered LCVs, Green Hydrogen and Refueling Stations Across Europe
- ✓ 2021: beginning of commercialisation with pilot fleet deployments
- ✓ 30%: Targeting market share of fuel cell LCV market in Europe by 2030



- ✓ On February 16<sup>th</sup>, 2021, Plug Power and Acciona announced plans to form a strategic partnership and joint venture
- ✓ The partnership aims for 20% market share of green hydrogen in Iberia by 2030, with total investment over €2 billion
- ✓ With a 10GW+ renewable power portfolio, Acciona is also Spain's largest 100% renewable power retailer
- ✓ The partnership looks to leverage Acciona's strong relationships in Iberia and Plug's leading hydrogen technology
- ✓ The partnership looks to accelerate the growth of the hydrogen economy in the industrial, mobility and pipeline gas sectors



- ✓ On January 31, 2023 Plug Power and JM announced long-term strategic partnership to strengthen Plug's supply chain and help meet growing demand for fuel cells and electrolyzers
- ✓ JM will become an important strategic supplier of MEA components, providing a substantial portion of Plug's demand for catalysts, membranes, and catalyst coated membranes (CCM)
- ✓ JM brings security of supply of precious metals, and unique recycling capabilities
- ✓ Plug and JM will co-invest in a 5GW (scaling to 10GW over time) CCM manufacturing facility in the United States with production targeted to begin in 2025



- ✓ On October 19, 2022 Plug Power and Olin launched a joint venture to begin with the construction of a 15-ton-per-day hydrogen plant in St. Gabriel, Louisiana
- ✓ The JV, named Hidrogenii, will support reliability of supply and speed to market for green hydrogen throughout North America, setting the foundation for broader collaboration Plug and Olin
- ✓ Plug will be the exclusive marketer of the JV's hydrogen and provide logistical support for delivery, while Olin will provide reliable hydrogen supply and operational expertise



# Strategic Acquisitions Have Vertically Integrated Plug's Green Hydrogen Systems and Product Offerings

Increasing Efficiency, Lowering Costs, Increasing Revenue



- Provider of highly engineered EPC solutions, and best-in-class capabilities to build electrolyzer systems.
- Strong supply chain capabilities in Southeast Asia (Vietnam / India) allowing for cost components advantage



- Cryogenic manufacturing capabilities facilitating growth of tanker capacity & reducing tanker costs by 50%
- \$500MM annual revenue opportunity by 2025



- Reduces Plug's hydrogen plant OpEx and CapEx by leveraging best-in-class liquification technology
- Large TAM in global hydrogen economy build-out, with \$500M-\$1B revenue opportunity by 2025



# Financials

# 2023 Goals

\$1.4B

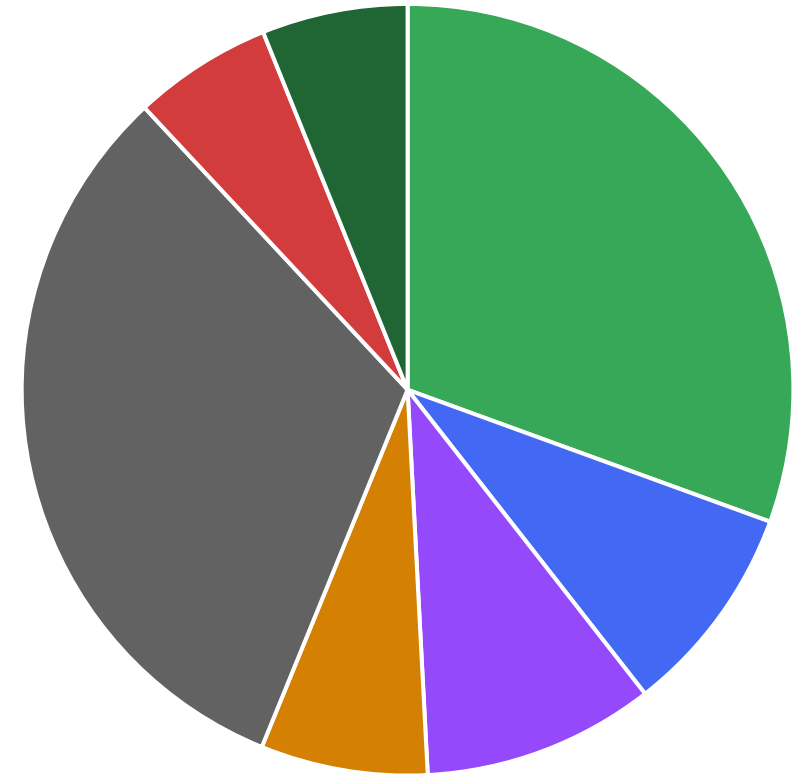
revenue

10%

gross margin



Planned 2023 Sales Mix



- Electrolyzers
- Tanks and Trailers
- MH Equipment
- Fuel
- Liquefiers
- Stationary and Mobility
- Service and PPA



# What will Plug financials look like in 2026 and 2030?

## 2026 Targets

**\$5B<sup>1</sup>**  
in Annual Sales

**30%**  
Gross Margin

**17%**  
Operating Income Margin

## 2030 Targets

**\$20B<sup>1</sup>**  
in Annual Sales

**35%**  
Gross Margin

**20%**  
Operating Income Margin

A Global Hydrogen Ecosystem Market Maker Poised for Continued Substantial Growth

Diversified  
Technology  
Company

Global  
Hydrogen  
Solution  
Platform

Generating  
Significant  
Earnings & Cash  
Flows

Differentiated  
Market Position in  
Large Global  
Markets



<sup>1</sup>: Not including Non-Consolidated JV revenue of  
2026: \$1.5B  
2030: \$5B

# What will Plug financials look like in 2026 and 2030?

## Product Gross Margin Forecast

Margin %	2022	2023	2026	2030
Equipment	20%	20%	30%	35%
Service and PPA	(98%)	(50%)	20%	25%
Fuel	(195%)	(35%)	35%	37%
Total	(8%)	10%	30%	35%





Green Hydrogen at Work™

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