



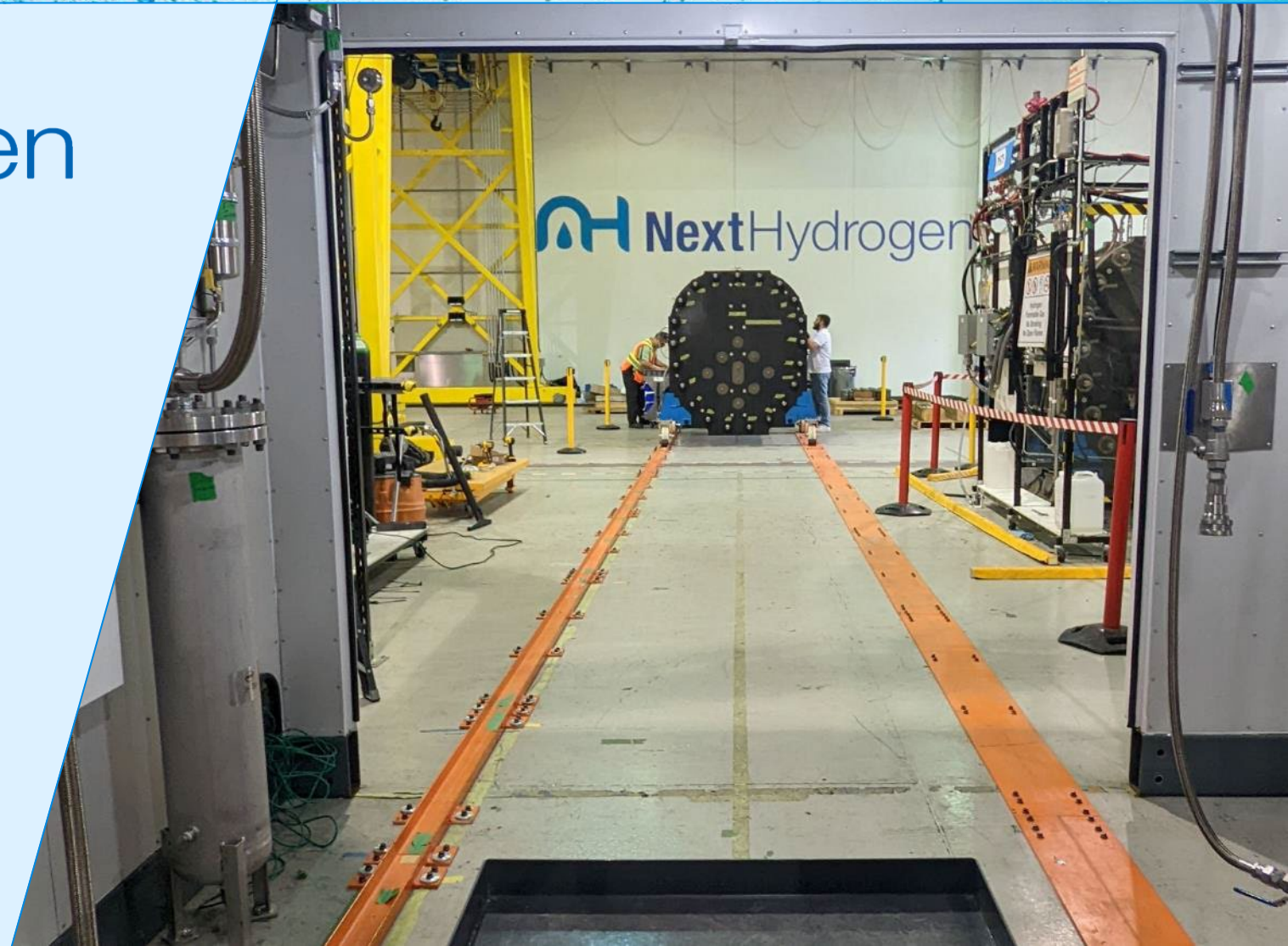
 **NextHydrogen**

*Innovation in Water Electrolysis™*

## Investor Presentation

December 2023

**NXH:TSXV**  
**NXH:OTC**



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The forward-looking statements contained in the Presentation Materials are made as of the date hereof or the dates specifically referenced in the Presentation Materials, where applicable. Except as required by law, Next Hydrogen undertakes no obligation to update publicly or to revise any forward-looking statements that are contained or incorporated in the Presentation Materials. All forward-looking statements contained in the Presentation Materials are expressly qualified by this cautionary statement. No securities commission or similar regulatory authority has passed on the merits of the securities to be offered by Next Hydrogen or reviewed this Presentation and any representation to the contrary is an offence.

# What is Next Hydrogen?

**Next Hydrogen is the only public pure-play designer & manufacturer of electrolyzers in North America.**

**Our electrolyzers use electricity and water to produce hydrogen, which is utilized as a clean energy source.**

- **Electrolysis is the only way to produce green hydrogen**
- **Our design has unique advantages which overcome limitations of conventional electrolyzers and benefit from cost & durability advantages**
- **Our electrolyzers are purpose-built for use with renewable power sources to most efficiently & economically produce 'green hydrogen'**



# Investment Thesis

## Pioneers in Water Electrolysis

- 15 years of IP development with proven track record at Stuart Energy and Cummins (Hydrogenics)
- Combined 140+ years of experience in designing hydrogen generation systems
- 40 patents to cover multiple alkaline and PEM product roll-outs to expand value proposition



**HYDROGENICS**

## Advanced Electrolyser Design

- Significant advancement in electrolyser design architecture
- Utilizes an internal gas-liquid separation system to remove flow restrictions
- Allows 2.5x higher current density, inherently scalable design with superior dynamic response enabling steep reduction in cost of green hydrogen products

Validated by:



## Technology scale up with world class partners

- Consortium approach for our second-generation product launch with SDTC support
- Development of a 20MW multi-electrolyser solution with Black and Veatch
- Technology scale-up roadmap includes 3, 6, 9 MW electrolysers to offer 100MW+ solution

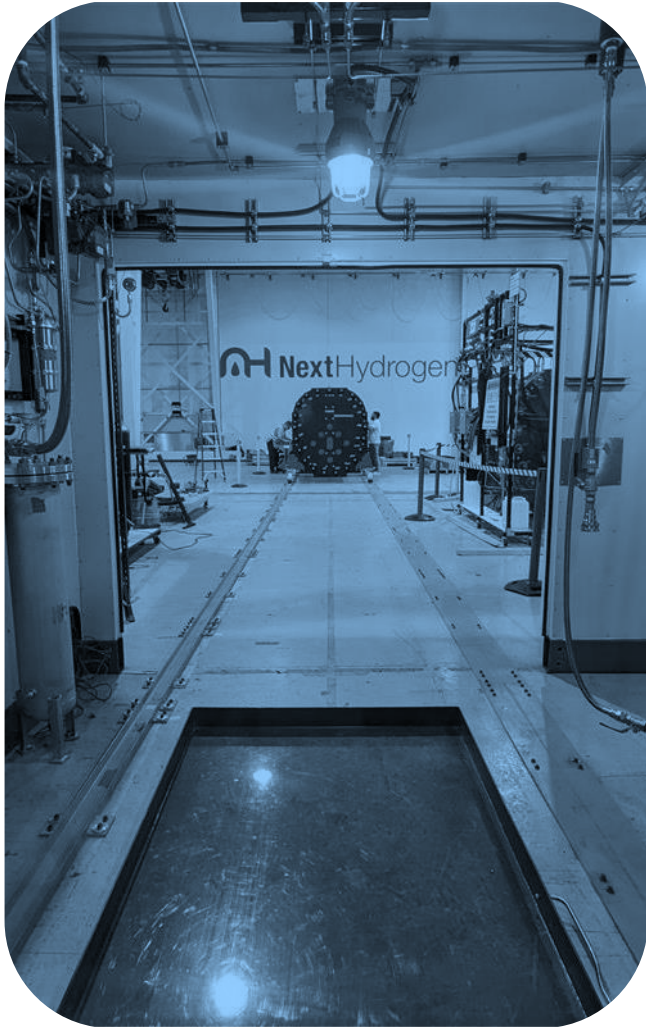


NRC Industrial Research Assistance Program

## Turnkey Solutions Provider

- NHC is an OEM of green hydrogen solutions
- NHC targeting applications in materials handling, heavy mobility and industrial processes, which cannot be electrified
- NHC provides installation and commissioning support
- NHC provides comprehensive service and maintenance for the life of the asset

# 2022 Achievements



## Test Capabilities

- ✓ Commissioned three Bench Scale as well as Pilot Scale and Factory Acceptance test stands
- ✓ Commenced producing hydrogen 24/7 using test assets to accelerate product development roadmap

## Product Delivery

- ✓ Delivered proof-of-concept electrolyzer to Hyundai and Kia
- ✓ Demonstrated ability to integrate third-party cells and pathway to lower cost and higher efficiency systems (superior current densities and higher temperatures)

## Accelerated Product Roadmap

- ✓ Secured \$5.1M in SDTC support
- ✓ Achieved full system energy efficiency of 55 kwh/kg at 1 amp/cm<sup>2</sup> with <10% turn-down ratio in bench scale for our second-generation product line
- ✓ Validation of second-generation product line underway at Pilot Scale using full-sized parts

## Partnerships

- ✓ Built on previously announced partnerships with HMC, B&V and NYSERDA
- ✓ Second five blue-chip industry partners to join SDTC funded development for strong product-market fit

# Near-Term Focus



## Demonstrate significant improvement to our product line

- Achieve significant cost reduction and improvements in energy efficiency through our second-generation product line



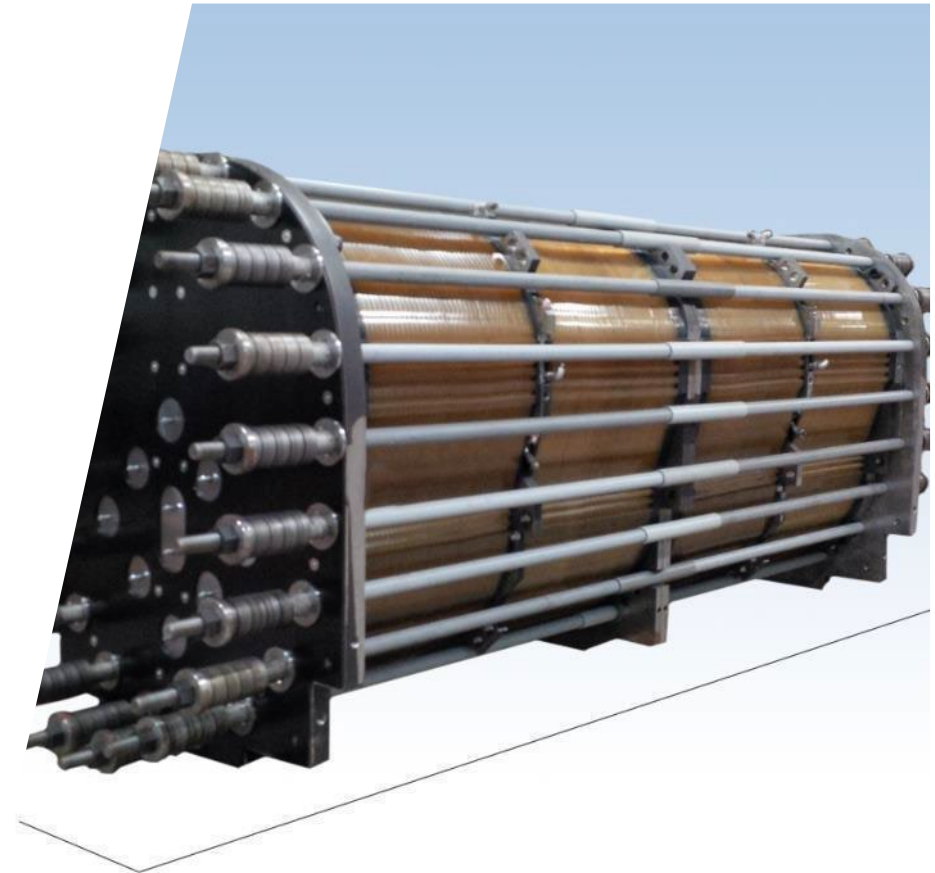
## Demonstrate multi-MW production

- Show-case our second-generation product line in a market application



## Demonstrate market traction

- Secure partnership with high quality customers and channel partners
- Secure market demonstrations for 2024



# Hydrogen Economy Tailwind



To stabilize or reduce concentrations of CO<sub>2</sub> in the atmosphere, the world needs to **reach net-zero emissions as soon as possible**



Governments globally support the growth of **hydrogen as a clean energy source** for the future

Significant push from corporations, investors, and society to **decarbonize the economy**



Hydrogen is a well-established, **\$120B annual global** existing market



The cost of renewable hydrogen production is expected to **fall drastically by up to 60% over the coming decade** driven by **declining costs of renewable electricity generation** and the **scaling up of electrolyzer manufacturing**

USD 320 billion direct investments into hydrogen projects announced through 2030, of which USD 29 billion have passed the final investment decision (FID).

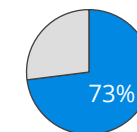
81% of society feel that companies have a vital role to play in meeting environmental targets

With the IRA, up to USD 3/kg H<sub>2</sub> incentives for clean hydrogen production, which could make renewable hydrogen cost competitive sooner.

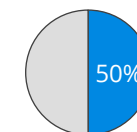
Electrolyzer costs have decreased by 40% during the last 5 years, and costs of solar and wind power have decreased by 89% and 70% during the last 10 years respectively

31 Countries have hydrogen-specific strategies

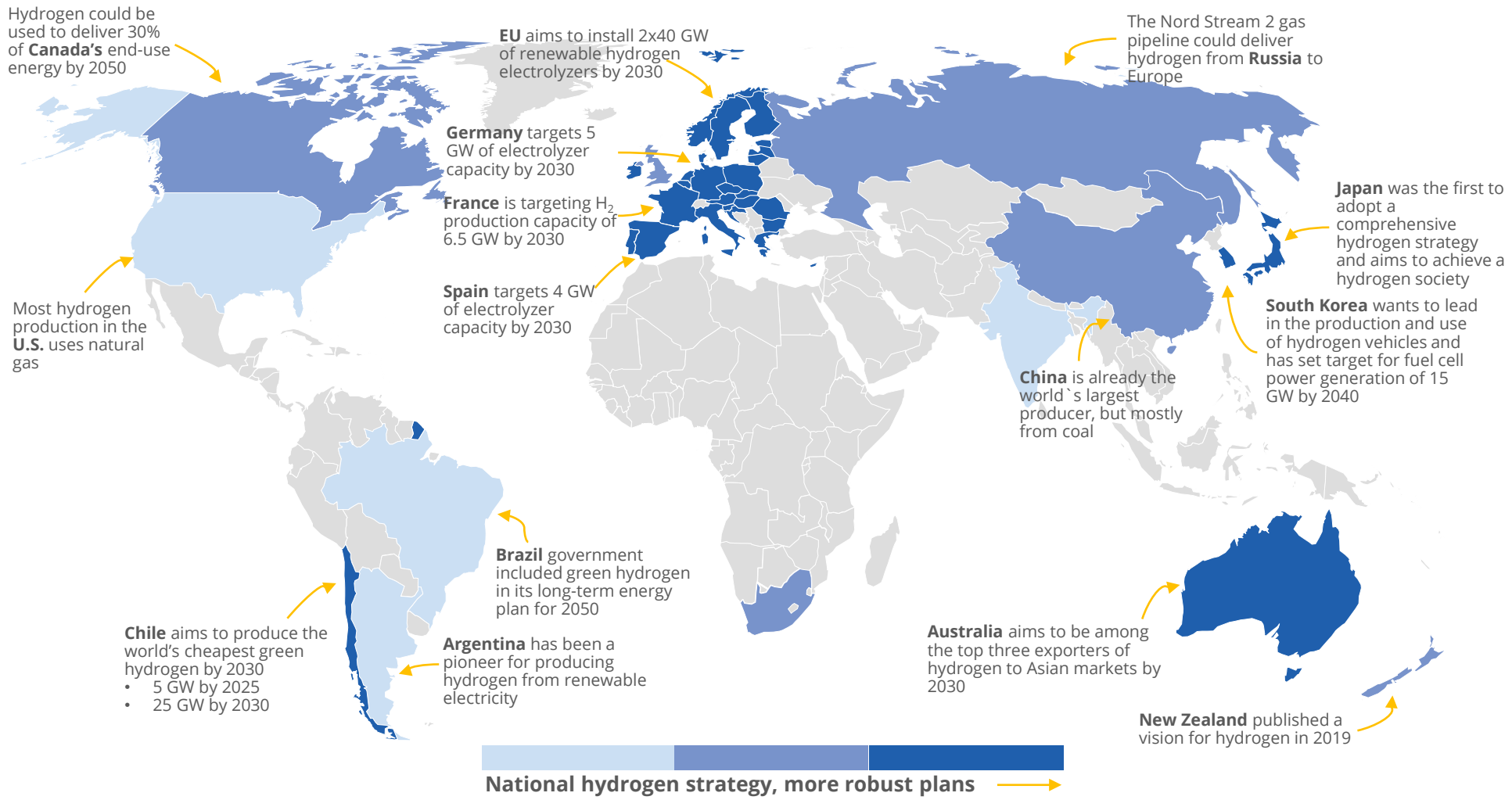
% of Global GDP covered



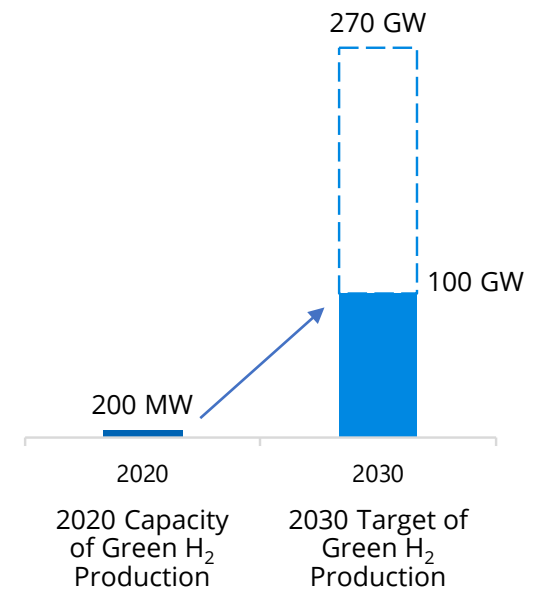
75 Countries have net zero carbon ambitions



# Unprecedented Commitment on Green H<sub>2</sub> from Countries Globally



**270 GW** of electrolyzers will be needed by 2030 to **keep the global temperature increase under 2°C**

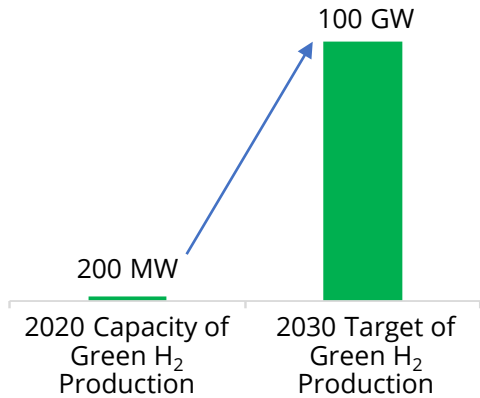


Source: Bloomberg, IRENA, Next Hydrogen, Hydrogen Council, press releases, and publicly available information.

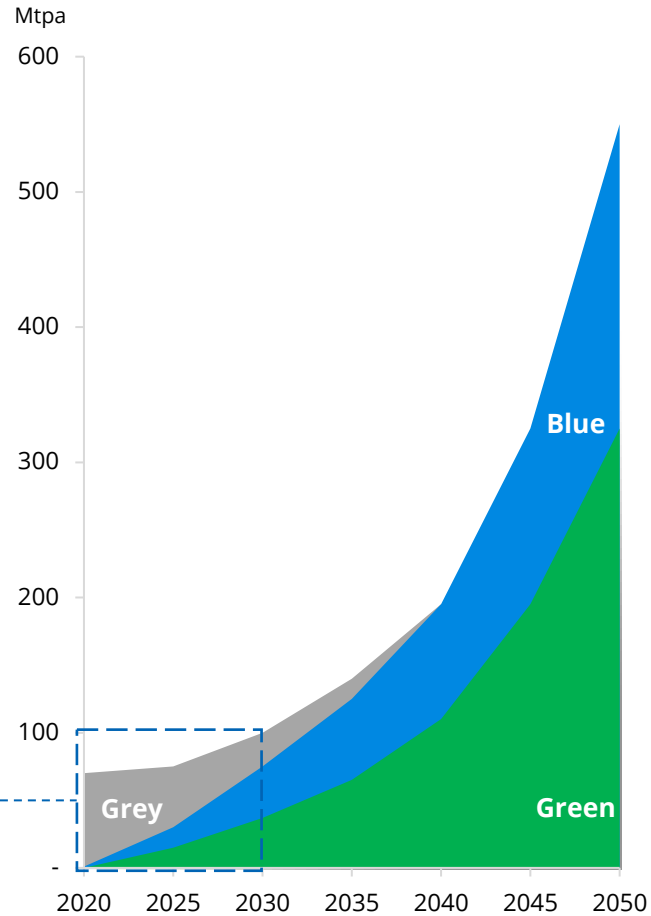


# Significant Electrolyzer Market Opportunity

## Market Opportunity by 2030

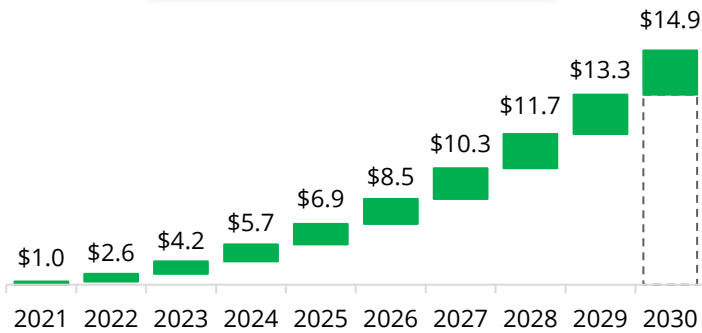


## Global Hydrogen Production Scenario



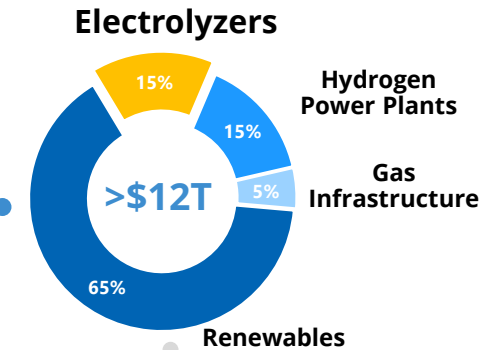
## Serviceable Addressable Market

**US\$80B Opportunity**



## Market Opportunity by 2050

**>\$12T**  
 TOTAL ADDRESSABLE MARKET  
 Hydrogen Opportunity by 2050



Electrolyzers expected to represent ~15% of the Addressable Hydrogen Market<sup>(2)</sup>

**>\$1.8T Serviceable Addressable Market**

Note: All figures in USD. EUR/USD rate of 1.20862.

Source: IRENA, Hydrogen Council, Goldman Sachs, September 2020, "Green Hydrogen: The Next Transformational Driver of the Utilities Industry", and publicly available information.

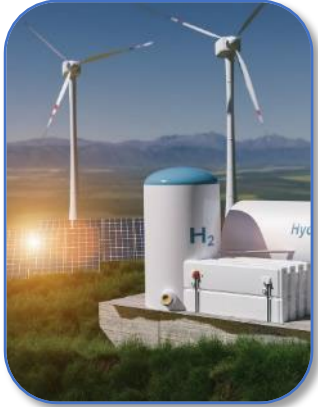
1. Illustrative pricing provided by Next Hydrogen.

2. Share provided for European market – Assumed that these figures held relatively stable for Rest of the World.

# Next Hydrogen's Focus on Green Hydrogen Applications

## Solutions to Power and Green Industrial Operations

- 95% of hydrogen used for industrial purposes is derived from fossil fuels and is responsible for 830 million tons of CO<sub>2</sub> annually
- Hydrogen produced from green energy can dramatically lower carbon emissions and enhance reliability of supply
- **Solutions that cannot be electrified** – hydrogen is the most viable clean alternative



Agriculture



Cement



Steel

## Solutions for Clean Materials Handling and Heavy-Duty Transport

FCEV are better suited for heavy mobility than battery EV

- FCEV have much greater range and carry more weight than EV since long distances and heavy payloads require larger and heavier batteries which leads to diminishing performance and efficiency
- Much faster refueling time (minutes vs hours)
- H<sub>2</sub> has much higher energy density so fuel tanks are more compact and lighter than an array of fully charged batteries
- Ability to operate in cold climates



Mining



Distribution



Trucking



# World class hydrogen expertise



## Raveel Afzaal

10+ years capital markets experience as an equity research analyst and venture capitalist, former lead of Canadian Sustainability & Special Situations verticals for Canaccord Genuity

**President & CEO,**  
CFA, B.Math, B.Econ.



## Michael Stemp

20+ years of designing and developing hydrogen systems, former Director of Advanced Engineering for Stuart Energy

**Chief Technology Officer, PhD**



## Robert McGillivray

20+ years experience in cleantech commercialization including 10 years in hydrogen product sales, marketing, business and corporate development

**BD Exec Advisor,**  
P.Eng, MBA



## Rohan Advani

10+ years financial leadership experience, has a deep understanding in reporting, budgeting, and forecasting. Responsible for reducing costs and establishing pricing and rebate strategies.

**Chief Financial Officer,**  
CPA, CA



## Jim Hinatsu

25+ years commercial experiences with hydrogen and electrochemical systems, including senior roles at Hydrogenics and Stuart Energy

**Chief Product Officer, PhD**



## Jim Franchville

25 + years experience in manufacturing, operations, supply chain, quality, and process improvement across several industries

**Chief Operating Officer, MS**



## Matthew Fairlie

20+ years in hydrogen industry, former CTO and Executive VP at Stuart Energy, served as Vice Chair of the US National Hydrogen Association and Chair of the Hydrogen Business Council of Canada

**Vice Chairman,**  
MSc, DBA



## Rob Campbell

A clean energy advocate with 20+ years of experience in the cleantech industry with a deep knowledge of high-growth markets and engineering-based capital equipment.

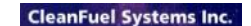
**Chief Commercial Officer, ICD.D, MBA**



## Shane Day

25 + years experience managing the installation and integration of > 60 H2 systems and > 200 fuel cells in multiple applications, first TSSA certified H2 technician in Ontario

**VP Operations**



# Producing Hydrogen: The Electrolyzer Landscape

## Pure Play Electrolyzer Manufacturers



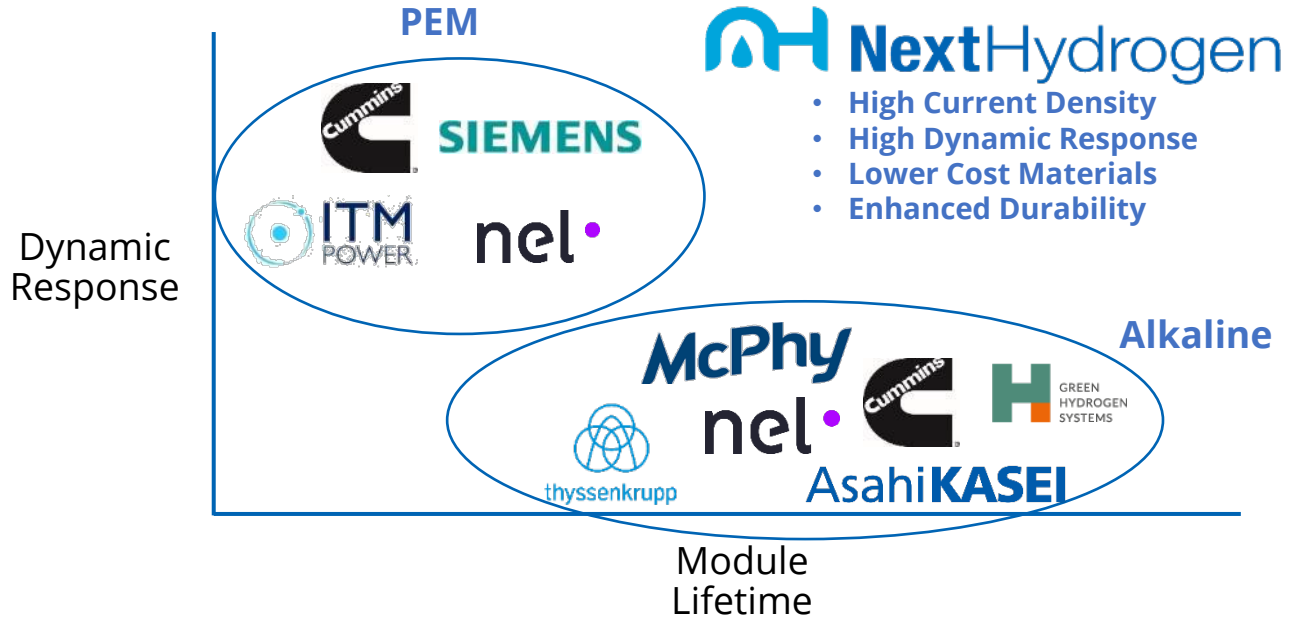
## Electrolyzer Manufacturers



## Fuel Cell Manufacturers



Next Hydrogen captures key benefits of both electrolyzer technologies



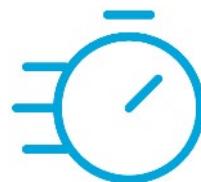


## Higher Current Density



Up to **2.5x current density**, leading to **2.5x more hydrogen produced** while using the same commercially proven raw materials as other commercial systems which drives lower up-front capex

## Superior Dynamic Response



Superior dynamic response enables Next Hydrogen's electrolyzers to **capture fluctuations in energy at 5% per second** compared to conventional alkaline systems with capabilities of up to 5% per minute

## Scalable Design



With approximately the same footprint, Next Hydrogen's electrolyzers are able to **scale up its power by a factor of 300%** which drives significant economies of scale

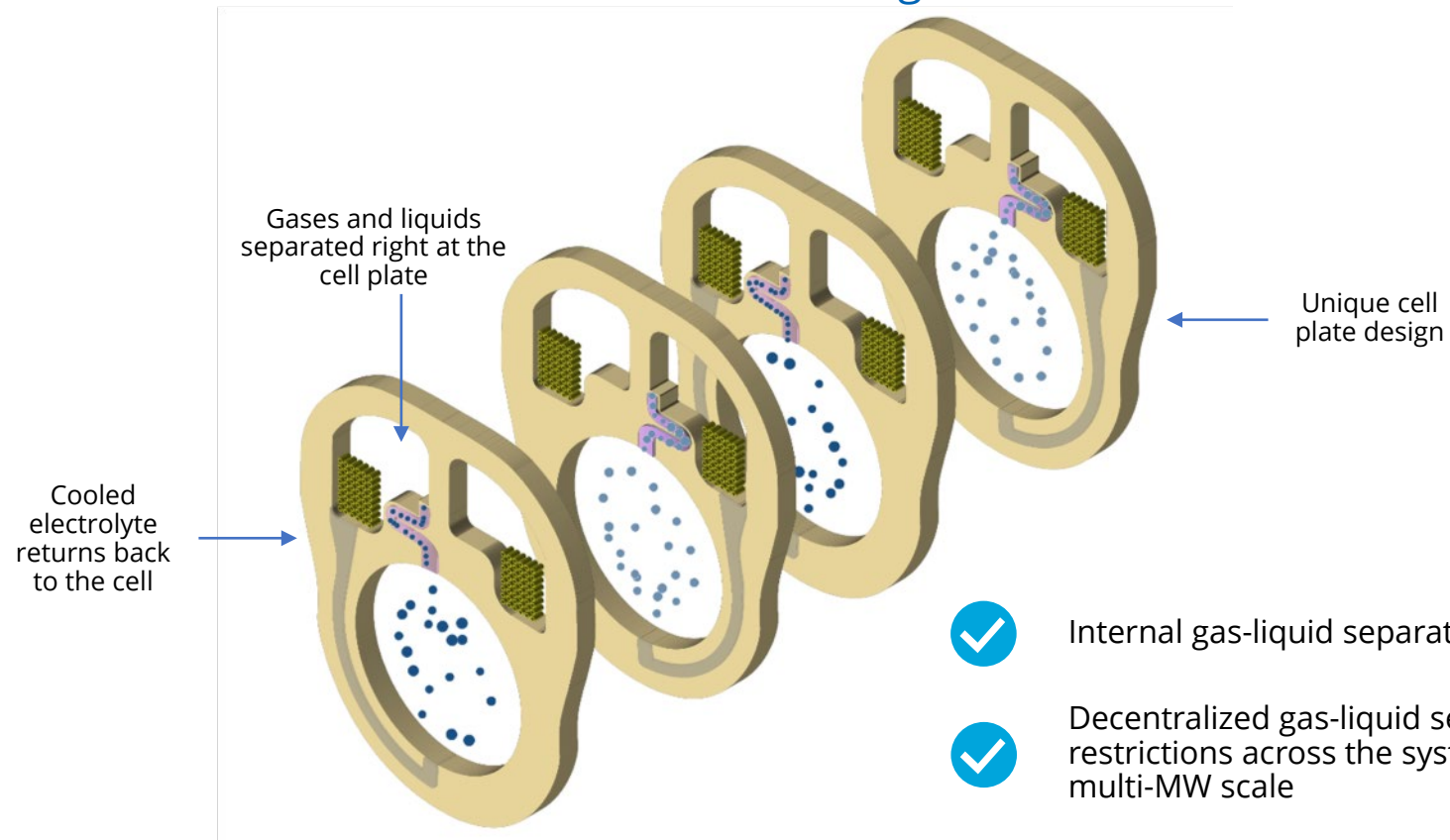
Next Hydrogen's electrolyzers can produce more hydrogen per capex dollar spent when compared to other leading systems<sup>(1)</sup>

1. When compared against competing alkaline electrolyzer technology.

# Significant Advancement in Electrolyser Design

## NextHydrogen Electrolyzer Design

*All electrolyte and gas-liquid separation occurs at each cell plate, removing limiting design features of conventional electrolyzers*




- ✓ Internal gas-liquid separators in each half cell
- ✓ Decentralized gas-liquid separator ensures no fluid and gas flow restrictions across the system for higher current densities and multi-MW scale
- ✓ Superior dynamic response as gases and liquids are separated right above the cell plate

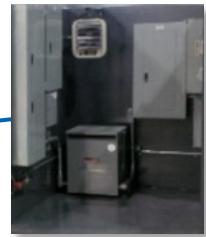
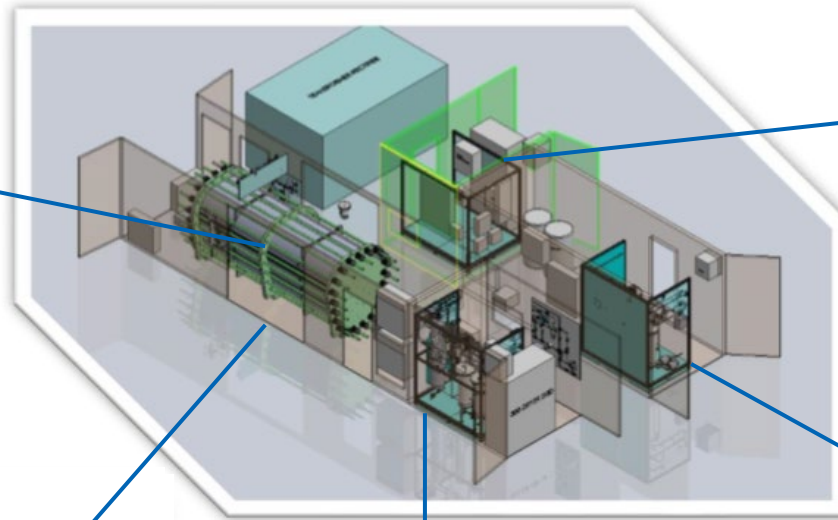
# System Overview



## NH-300 Hydrogen Generation System Schematic



**Electrolyzer Module**  
Patented cellular architecture removes fluid-gas flow restrictions which limit traditional electrolyzer performance



Electrical and Controls Container



Electrolyzer Container



Hydrogen Container



Oxygen and Feedwater Container

- ✓ Open architecture with the best commercially available cell components
- ✓ Compact units, pre-assembled and ready to drop in at sites
- ✓ Current alkaline electrolyzer product line with significant product roll-out planned:

	NH-100	NH-300
Capacity (MW)	0.6	1.8

# Commercial Testing and Validation



## Successful Pilot Project

Significant validation and advancement of electrolyser design architecture in a challenging nuclear application, resulting in a \$7.7MM contract for this application with a blue-chip customer.



## One of the Largest On-site H<sub>2</sub> Generation Projects for Materials Handling Applications

The first “green hydrogen system” – hydrogen powered forklifts and hydrogen fuel production using Next Hydrogen electrolysers. Pilot project success resulted in order of 2 additional electrolysers.



Bolton, Ontario



## Collaboration with Leading OEM for Green Ammonia and Green Methanol Plants

Casale SA and Next Hydrogen Corporation recently entered into a MOU that aims to integrate Next Hydrogen’s electrolysis products into Casale’s green ammonia and green methanol systems. This collaboration provides a compelling pathway to producing clean, zero-emission ammonia and methanol from green renewable energy sources.



## Collaboration with Leading Power Conversion OEM

GE Power Conversion and Next Hydrogen Corporation recently entered into a MOU under which the companies will work together to integrate and deliver hydrogen systems and products including large-scale green hydrogen plants.



## Hyundai and Kia Partnership

Hyundai Motor Company, Kia Corporation and Next Hydrogen Corporation recently signed an MOU to jointly develop an alkaline water electrolysis system and its related stack for economically generating green hydrogen and exploring new business opportunities and technological applications.



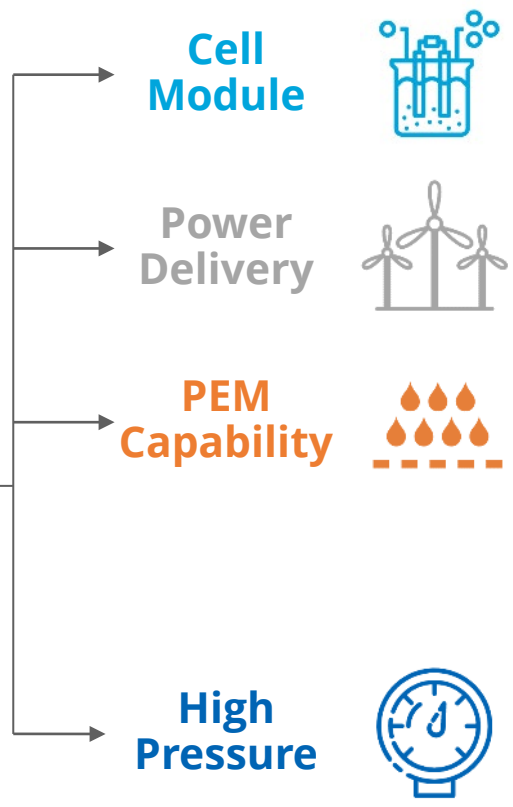


# Patent Portfolio Geared Towards Green Hydrogen from the Beginning



**NextHydrogen**

▪ 40 Patents



	Priority	Filing Location <sup>(1)(2)</sup>
<b>Electrolyzer Module</b> ▪ Core water electrolyzer module design	July 2008	US (3), PCT, CA, EP, CN, IN
<b>Power Dispatch System for Electrolytic Production of Hydrogen from Wind Power</b> ▪ Connection of water electrolyzers to wind farms	October 2008	US (3), PCT, CA (2), EP (2), CN, IN (2)
<b>Polymer Electrolyte Membrane Water Electrolyzer Cell Module</b> ▪ PEM water electrolyzer module design	August 2009	US (2), PCT, CA (2), EP, CN, IN (2)
<b>Externally-Reinforced Electrolyzer Module</b> ▪ High pressure water electrolyzer design	September 2012	US, PCT, CA, EP, CN, IN
<b>Internally-Reinforced Electrolyzer Module</b> ▪ High pressure water electrolyzer design	September 2012	US, PCT, CA, EP, CN, IN
<b>End Pressure Plate for Electrolyzer</b> ▪ End pressure plates for electrolyzer modules and stacks	March 2013	US (2), PCT, CA, EP, CN, IN

1. Inclusive of patents and registrations in different stages (issued and pending).  
 2. US - United States; CA - Canada; EP - Europe; CN - China; IN - India; PCT - Patent Cooperation Treaty.

# Financial Highlights

## Share Capitalization

		Management	
Issued and outstanding	22,888,436	4,873,197	21.3%
Options	3,271,626	2,321,626	71.0%
DSUs	135,288	135,288	100.0%
<b>Fully diluted shares</b>	<b>26,295,350</b>	<b>7,330,111</b>	<b>27.9%</b>

No single shareholder owns more than 20%

## Balance Sheet at September 30, 2023

### Assets

#### Current

Cash and cash equivalents	\$11,891,569
Trade and other receivables	\$2,221,984
Prepaid expenses and deposits	\$363,276
Inventory	\$5,072,737

**Total Current Assets** **\$19,549,566**

Trade and other receivables	\$55,738
Prepaid expenses and deposits	\$229,776
Equipment	\$4,998,317
Right of use asset	\$1,558,684
Patents	\$591,859
Intangible assets and goodwill	\$240,042

**Total Assets** **\$27,223,982**

### Liabilities

#### Current

Bank indebtedness	\$60,000
Trade and other payables	\$1,654,327
Contingent liability	\$14,968
Deferred revenue	\$1,000,000
Deferred government grants	\$600,216
Provisions	\$110,000
Finance lease liability	\$85,345
Current portion of long-term debt	\$62,272

**Total Current Liabilities** **\$3,587,128**

Contingent liability	\$48,216
Deferred revenue	\$2,771,641
Provisions	\$3,740,000
Finance lease liability	\$1,661,859
Long-term debt	\$38,492

**Total Liabilities** **\$11,847,336**

### Shareholders Equity

Share capital	\$76,393,695
Contributed surplus	\$5,412,048
Retained deficit	(\$66,429,097)
	<u>\$15,376,646</u>
	<u>\$27,223,982</u>

# Conclusions



Next Hydrogen has developed the world's **first** Alkaline electrolyser that is designed to:

- Integrate with intermittent renewable power
- Operate at up to 2.5X the current density of competitors
- Produce the lowest levelized cost of green hydrogen



Next Hydrogen's team has a combined 140+ years of experience in designing hydrogen generation systems



Next Hydrogen's electrolyser design is covered by 40 patents



Next Hydrogen plans to demonstrate multi-MW production of our second-generation product line with the support of SDTC and six industry leading partners



Next Hydrogen has a 40MW proof-of-concept manufacturing facility commissioned with an ERP system and well positioned for rapid scale-up





# Appendix



# Senior Leadership



**President & CEO**  
CFA, B.Math, B.Econ

## Raveel Afzaal

- 10+ years capital markets experience as an equity research analyst and venture capitalist
- Most recently led Canadian Sustainability & Special Situations verticals for Canaccord Genuity



**Chief Financial Officer**  
CPA, CA

## Rohan Advani

- 10+ years diverse financial leadership experience
- Has a deep understanding in reporting, budgeting, and forecasting. Responsible for reducing costs and establishing pricing and rebate strategies.



**Chair of the Board**  
BSc, BA, MBA

## Allan Mackenzie

- Owner and principal of Disruptive Ventures
- 15+ years of total investing experience, previously, a partner of Octane Venture Partners
- Has served as Chairman of two software technology companies, Tynt and Optessa



**Board Director**  
M.Eng, MBA

## Walter Howard

- Extensive career spanning operations, business development, finance, and M&A in the utility industry
- 35+ years in senior executive positions in related syngas, wind energy, and cogeneration firms

cg/Canaccord  
Genuity

xpV

Optessa  
Intelligent Planning & Scheduling

OCTANE  
VENTURE PARTNERS

Westinghouse

ZeGen  
Accelerating The Transition

Noble  
ENVIRONMENTAL POWER

GE Capital

# Board Contributes Invaluable Leadership Experience



**Board Director**  
BSc, MSc

## JP Clausen

- VP of Engineering - Data Center Advanced Technology Innovation at Google
- Has held executive roles in manufacturing, engineering, and operations at LEGO Group, Tesla, and Zymergen



**Board Director**  
CPA, CA, MAcc, EMBA

## Susan Uthayakumar

- 25 years experience in finance and executive management
- President of Schneider Electric Canada since 2018
- Executed global growth strategies and acquisitions across North America, Europe and Asia previously at McCain



**Board Director**  
BA, MBA

## Anthony Guglielmin

- Previously SVP and Chief Financial Officer of Ballard Power Systems
- Also board member of Westport Fuel Systems, Information Services Corporation, and other private and not-for-profit organizations



# Alkaline and PEM Industry KPIs

Parameter	PEM			Alkaline			
	Unit	State of the art	FCH-JU Target		State of the art	FCH-JU Target	
		2020	2024	2030	2020	2024	2030
<b>Electricity Consumption at Nominal Capacity</b>	kWh/kg	55	52	50	50	49	48
<b>Capital Cost</b>	US\$/(kg/d)	2,500	1,800	1,200	1,500	1,200	940
	US\$/kW	1,100	820	590	700	560	470
<b>Current Density</b>	A/cm <sup>2</sup>	2.2	2.4	3	0.6	0.7	1
<b>Hot Idle Ramp Time</b>	sec	2	1	1	60	30	10
<b>Cold Start Ramp Time</b>	sec	30	10	10	3,600	900	300

Based on a 100MW system

Sources: EERA & Hydrogen Europe Research Multi-Annual Work Program, 06/08/2020, Key Performance Indicators (KPIs) for FCH Research and Innovation, 2020-2030, Version: 5.0.

Hydrogen Europe & Hydrogen Europe Research Strategic Research and Innovation Agenda Clean Hydrogen for Europe, Final Draft, October 2020

Clean Hydrogen Joint Undertaking Multi-Annual Work Plan 2021-2027, Working Draft Version 3, 29/07/2021

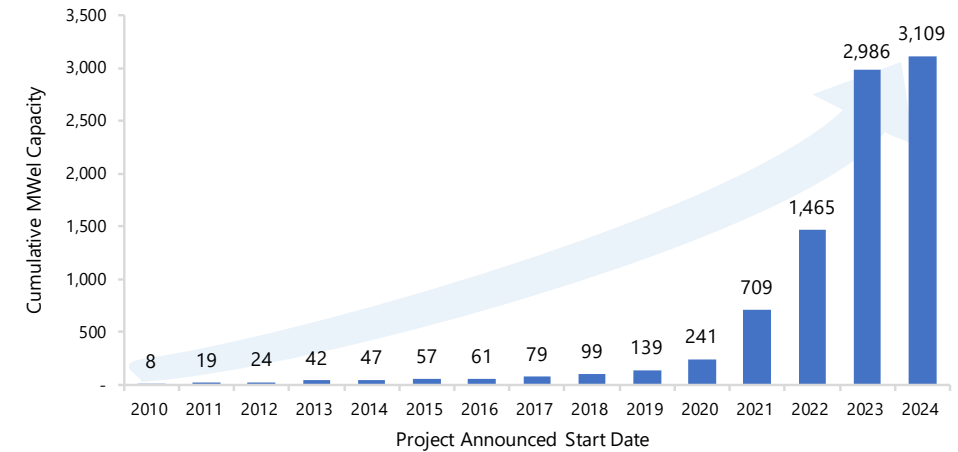
Exchange: 1 USD= 0.86 Euro

# Corporate Led Hydrogen Projects Increasing Globally



Many large corporations have announced plans to operate green hydrogen production plants globally

## Electrolysis Produced Hydrogen Capacity Increasing Exponentially



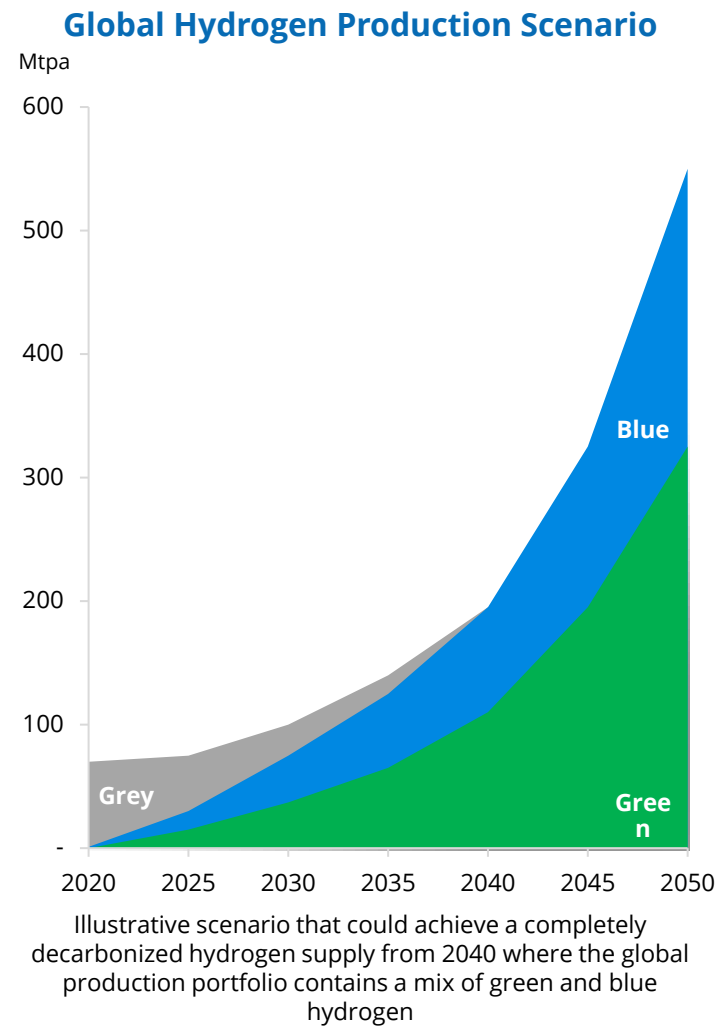
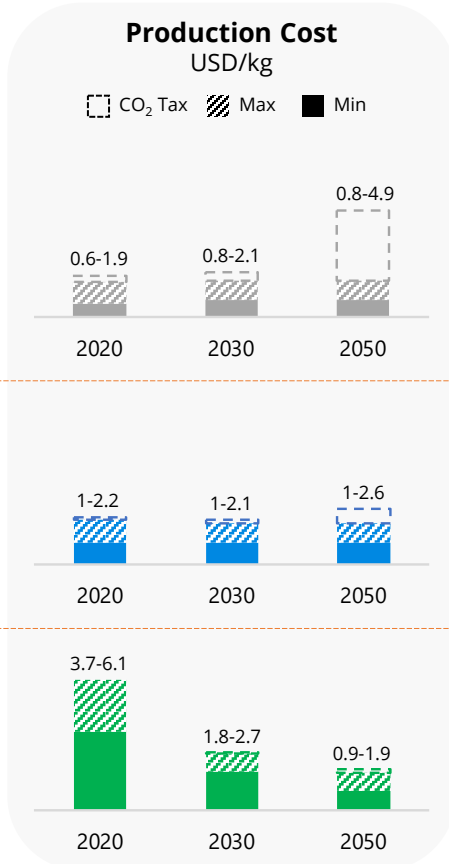
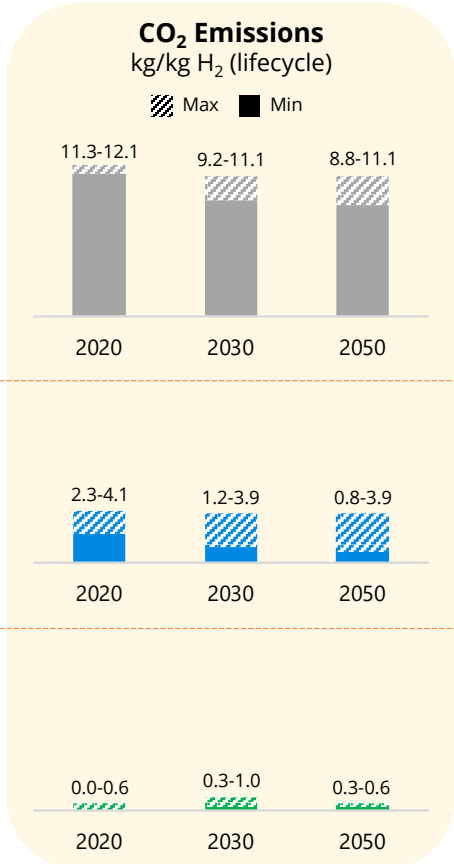
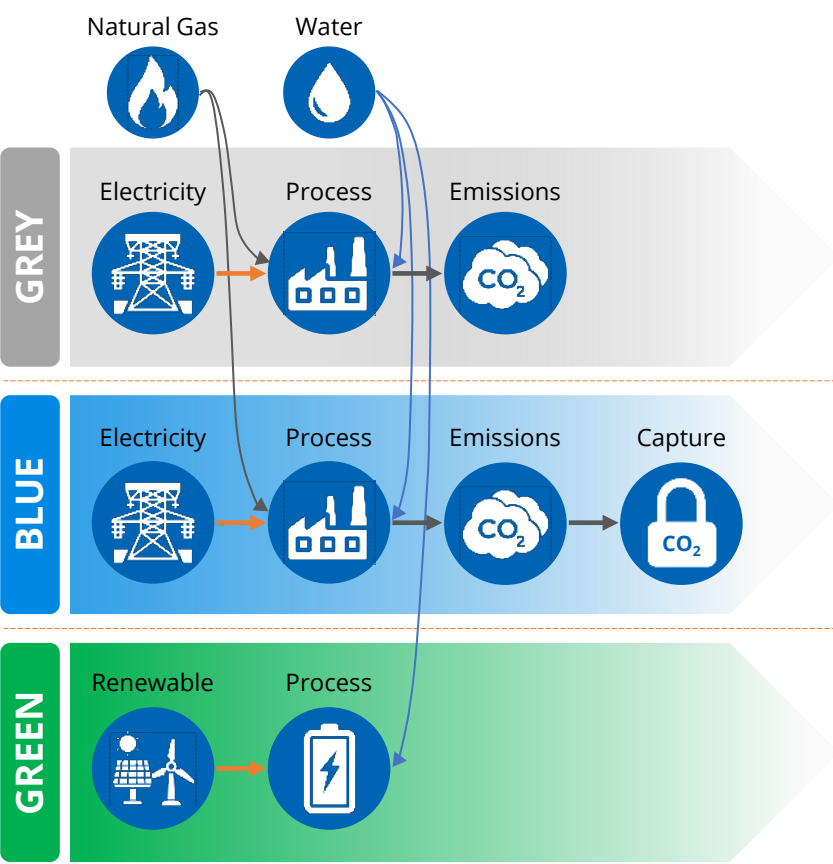
### Select Projects Expected to Come Online

Start Date	Project Name	Companies	Capacity
2020	Air Liquide Bécancour	Air Liquide, HYDROGENICS	20 MW
2021	Port Lincoln, Eyre Peninsula	H2U, thyssenkrupp	30 MW
2022	ECB Paraguay	thyssenkrupp	310 MW
2022	H2V France Phase 1	H2V, Air Liquide	100 MW
2023	H2V France Phase 2	H2V, Air Liquide	100 MW
2023	Hybridge Germany	amprion, OGE	100 MW
2023	Shell - Port of Rotterdam	Shell, Eneco	200 MW
2023	Hydro-Québec	Hydro Québec, thyssenkrupp	88 MW
2024	GreenHydroChem Central	SIEMENS, Linde	120 MW

Source: IEA Hydrogen Project Database, press releases, and publicly available information.



# Hydrogen's Supply Needs to be Decarbonized



Currently, green hydrogen makes up less than 0.1% of the world's hydrogen supply

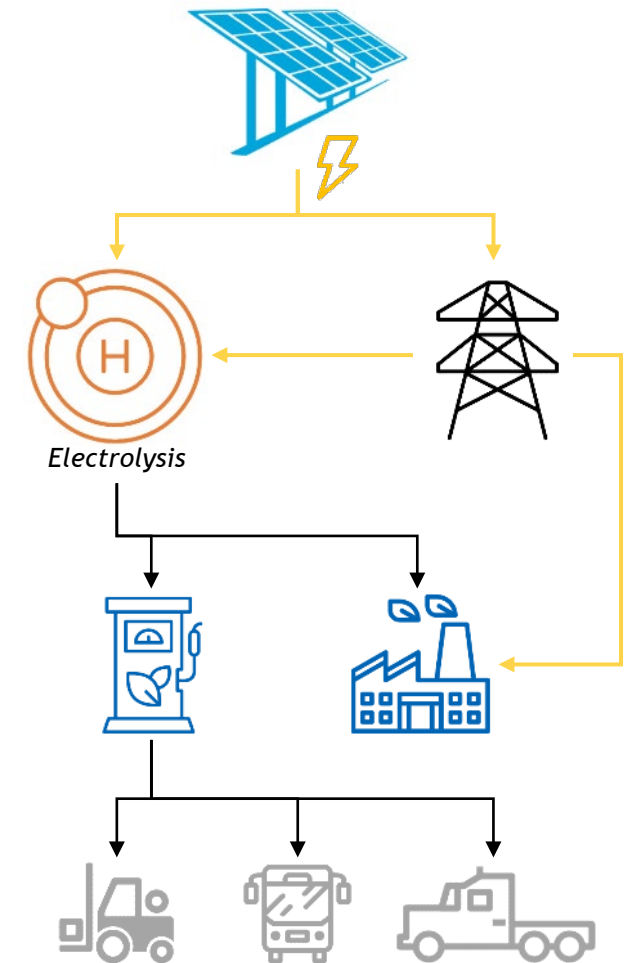
To take a central role in the energy transition, existing and new uses of hydrogen need to be met with decarbonized or clean hydrogen production sources

Source: Hydrogen Council reports, Green Hydrogen Coalition, Pembina Institute, press releases, and publicly available information.

# Illustrative Excess Solar Energy Capture for H<sub>2</sub> Production Scenario Assumptions

## Key Assumptions

- Solar Energy
  - Large solar installation that sells the first 50% of its name plate capacity through a Power Purchase Agreement
  - Electrolysis capacity to capture the remaining 50% of solar generation for hydrogen production
  - Excess power would often be wasted, therefore Next Hydrogen expects to be able to capture that energy at a cheaper rate of \$15/MWh
  - Overall solar plant capacity factor of 26%
- Electrolysis
  - Base case electrolysis is based on future electrolysis KPI targets published in the European FCH2JC 2020 Report
  - Next Hydrogen's electrolysis unit is based off being able to achieve the base case targets while running at 50% of our rated capacity due to the 2x higher current density
  - The cost reduction for a Next Hydrogen electrolyzer only applies to the cell stack cost, with external balance of plant costs being held constant
- Economics
  - Project is projected to be built in 2024
  - Discount rate and cost of acquiring capital at 8%
  - Project lifespan estimated to be 25 years

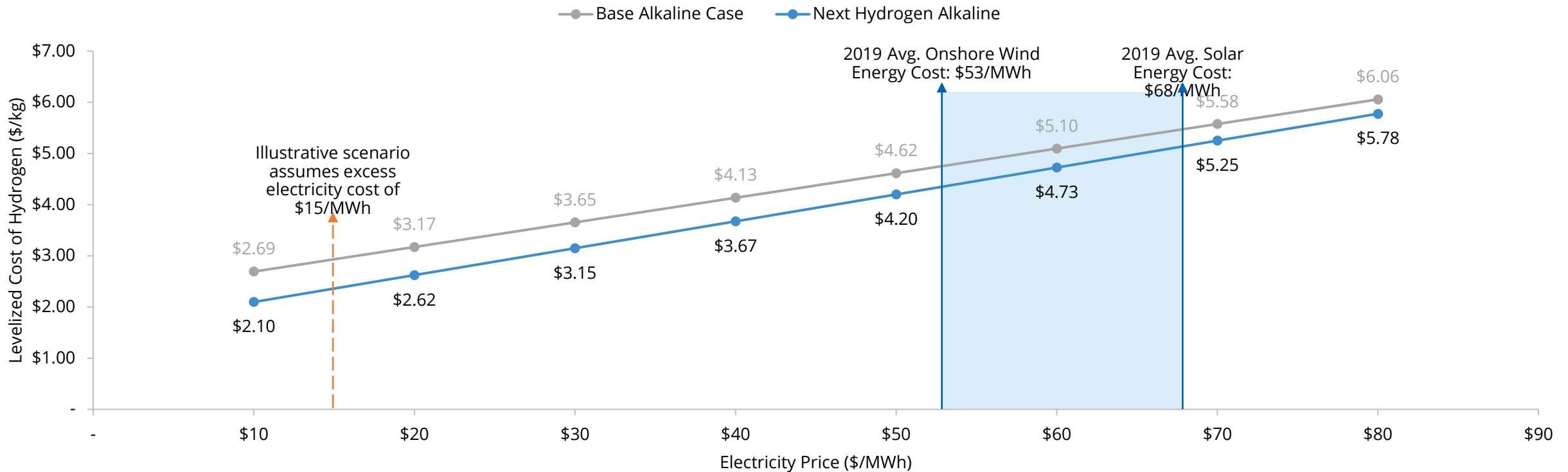


# Illustrative Excess Solar Energy Capture for H<sub>2</sub> Production Scenario Sensitivity

## Sensitivity Analysis – Impact of Electricity Pricing

- The lower the electricity price, the better Next Hydrogen's capital cost advantage becomes
- The low-capacity factor for capturing excess solar energy results in Next Hydrogen's capital cost advantage making it more economical for most electricity prices

### 2024 Excess Solar Energy Green H<sub>2</sub> Production - Electricity Price Sensitivity



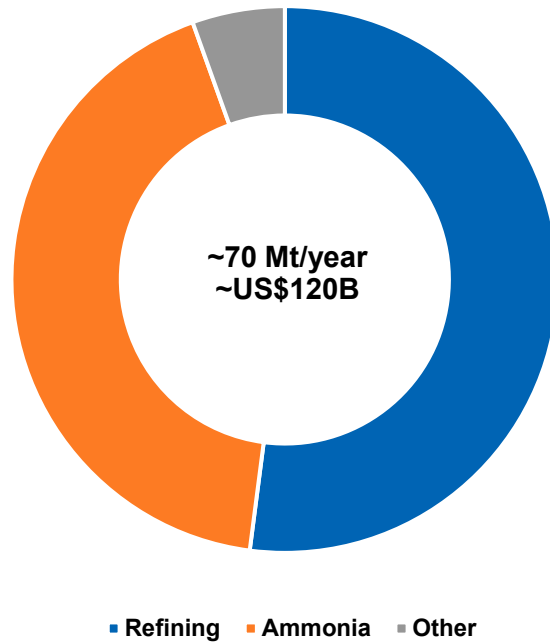
Source: Next Hydrogen, IRENA Renewable Power Generation Cost 2020, and publicly available information.

# The Green Hydrogen Opportunity

## Large Existing Market for Hydrogen – Green To Replace Grey

- 70 million tons per year = US\$120 billion annually
- 95% of hydrogen used for industrial purposes is derived from fossil fuels
- 830 million tons per year CO<sub>2</sub> emissions

Global hydrogen market by end use  
Mt H<sub>2</sub> per year



## Hydrogen Market Set To Grow 8x

Global energy demand supplied by hydrogen, Mt

