



# NextHydrogen

*Innovation in Water Electrolysis™*

## Investor Presentation

NXH:TSXV  
NXHSF:OTC



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# Company Highlights



## Experts in Water Electrolysis

- 16 years of IP development with proven track record
- 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
- 27,000 square foot manufacturing facility in Ontario provides capacity for product assembly, testing, engineering, and development



## Advanced Electrolyzer Design

- Significant advancement in electrolyzer design architecture validated by industry partners
- Allows up to 4x higher current density, superior dynamic response enabling reduction in cost of green hydrogen
- Purpose built for energy fluctuations allowing direct use with wind and solar power projects
- Utilizes an internal gas-liquid separation system to remove flow restrictions, overcoming scalability limitations



## Technology Scale-Up with World-Class Partners

- Partnership approach to build pipeline in key applications and regions
- GEN2 product line demonstrating best commercially available performance
- GEN3 targets best-in-class and scale up to 8 MW single stacks to offer 100MW+ solution
- Received \$11MM of government funding



## Significant Market Opportunities

- \$328B annual global market for hydrogen
- \$17B serviceable addressable market in 2024 with a compounded annual growth rate of 32% reaching \$88B in 2030
- \$10MM backlog in 2024 with expectation to double it in the first half of 2025



## Turnkey Solutions Provider

- Next Hydrogen is an OEM of green hydrogen solutions
- Targets applications in materials handling, heavy mobility and industrial processes, which is difficult to electrify
- Provides installation and commissioning support
- Provides comprehensive service and maintenance for the life of the asset



# 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**



## 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**



## 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**



# Board of Directors



**Allan Mackenzie**  
Chairman

- Owner and prinCIMAL 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



**Walter Howard**  
Director

- 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



**JP Clausen**  
Director

- EVP of Global Manufacturing and Sustainability at General Motors
- Has held executive roles in manufacturing, engineering, and operations at LEGO Group, Tesla, and Zymergen



**Susan Uthayakumar**  
Director

- 25 years experience in finance and executive management
- Chief Energy and Sustainability Officer of Prologis
- Executed global growth strategies and acquisitions across North America, Europe and Asia previously at McCain



**Anthony Guglielmin**  
Director

- 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



# Next Hydrogen Provides a Key System for Green Hydrogen Production Powered by Renewable Energy



Wind Power



Solar Power



Nuclear Power



Hydro Power



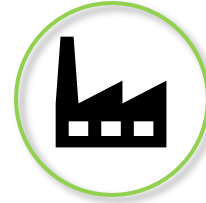
Next Hydrogen is able to harness renewable power sources as inputs to create hydrogen for transportation and industrial use by supplementing fuel sources



Power



Industrial



Transportation



Agriculture



# Hydrogen is a Viable Clean Alternative to Fossil Fuels



## Industrial Applications

- 95% of hydrogen used for industrial purposes is derived from fossil fuels, represents a \$328B<sup>(1)</sup> annual market, 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
- For applications that cannot be electrified – hydrogen is the most viable clean alternative



Fertilizers



Refineries



Steel



Distribution



Trucking



Mining

## Transportation Applications

Fuel Cell EVs ("FCEV") are better suited for heavy mobility than battery EVs

- 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





# Next Hydrogen Achievements



- 1 One of the most tenured teams in water electrolysis globally
- 2 State of the art testing infrastructure and 40 MW manufacturing capabilities developed in our Mississauga facility
- 3 Leading energy efficiency targets for electrolyzers with performance exceeding US Department of Energy targets
- 4 Revolutionary and patented electrolyzer design which overcomes cost and scalability limitations of conventional electrolyzers and purpose-built for renewable power sources
- 5 The company's backlog quadrupled in the last 12 months with partners including GE, Casale, Hyundai, Kia, Canadian Tire, and Atomic Energy of Canada



# 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**

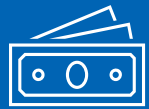


**COP 28** is estimating an infrastructure build out of new clean energy infrastructure with a targeted total **investment of C\$6 trillion by 2030<sup>(1)</sup>**

**117 countries** agreed to triple global renewable capacity by 2030 to over 11,00 GW<sup>(1)</sup>

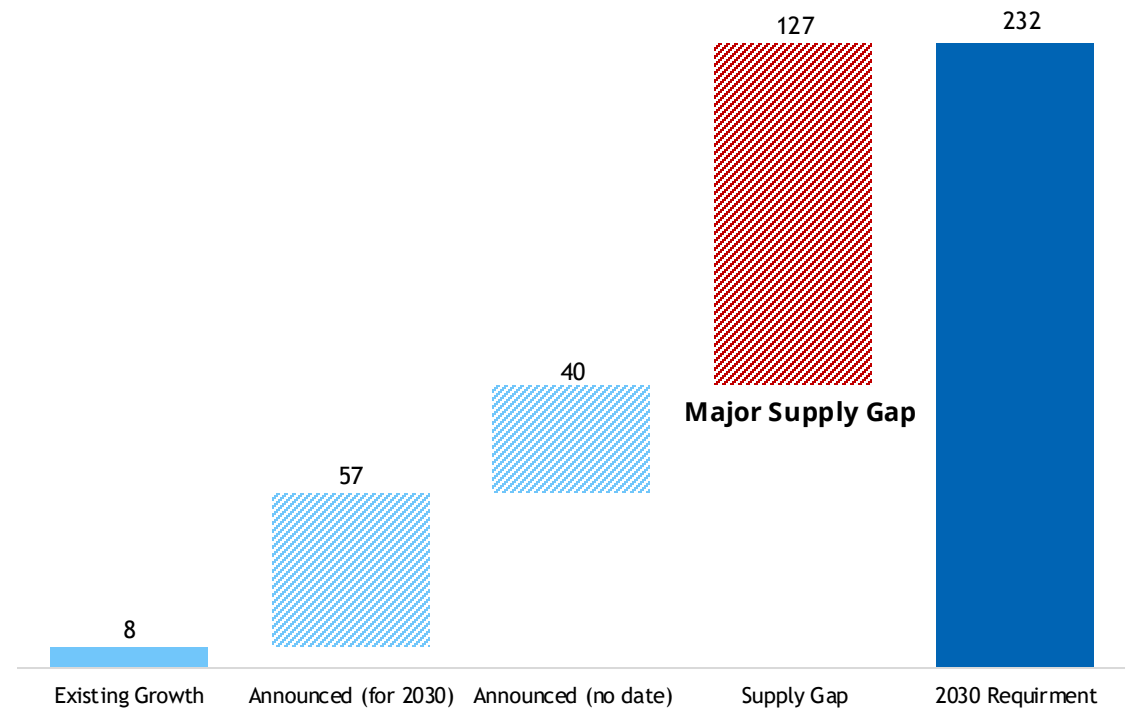


Hydrogen is a well-established, **\$328B<sup>(2)</sup> annual global** existing market



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 **scale up of electrolyzer manufacturing<sup>(4)</sup>**

## Global Electrolyzer Manufacturing Capacity Required by 2030 to Reach Net-Zero by 2050 (GW per year)<sup>(3)</sup>



**More than 230GW electrolysis capacity required to be operational by 2030, implying a more than 30 times the existing growth in deployment is needed over the next six years**

Converted from USD to CAD at FX rate of 1.35 USD/CAD  
 1. World Economic Forum, COP28: What did it accomplish and what's next?  
 2. Markets and Markets: Hydrogen Market  
 3. Deloitte's 2023 Global Green Hydrogen Handbook  
 4. Hydrogen Council report

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



Hydrogen could be used to deliver 30% of **Canada's** end-use energy by 2050

**EU** aims to install 40 GW of renewable hydrogen electrolyzers by 2030

**Germany** targets 10 GW of electrolyzer capacity by 2030

**France** targets H<sub>2</sub> production capacity of 6.5 GW by 2030

**Spain** targets 11 GW of electrolyzer capacity by 2030

**The US** targets hydrogen as a primary fuel source requiring US\$105 - \$235B investment by 2032

**Japan** sets a goal to be using 3 million tons of hydrogen annually by 2030 and 12 million tons by 2040

**South Korea** sets target for fuel cell power generation of 15GW by 2040

**China** targets 80GW of electrolyzer capacity by 2030

**Chile** aims to produce the world's cheapest green hydrogen by 2030

**Australia** aims to be among the top three exporters of hydrogen to Asian markets by 2030

**National hydrogen strategy, more robust plans**

## >1,000

Hydrogen project proposals announced globally, 795 of which plan full or partial deployment by 2030

## 38 Mt p.a

clean hydrogen supply announced globally 2030, less than 1 Mt p.a. deployed today

## >230 GW

Electrolysis demand globally by 2030

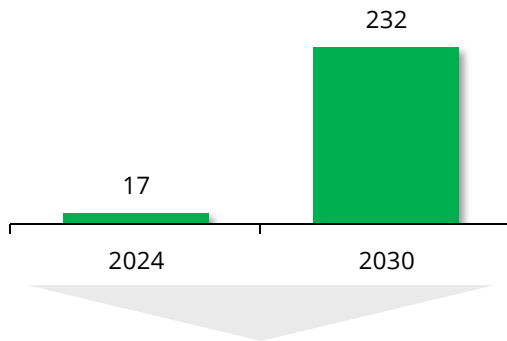
## \$62 B

Investment announced in hydrogen projects by 2030 in North America

# Significant Electrolyzer Market Opportunity

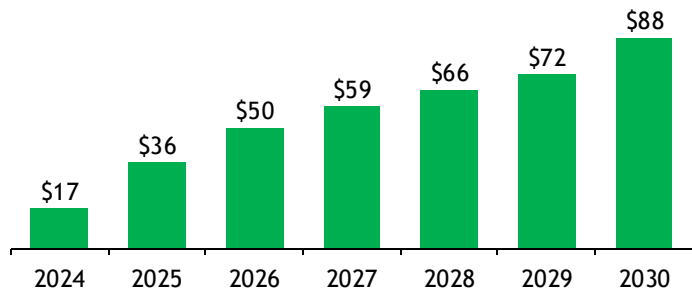
## Global Market Opportunity by 2030

### Forecasted Electrolysis Demand (GW)<sup>(1)</sup>



The growing demand for green hydrogen has resulted in rapid expansion of demand for electrolyzer capacity

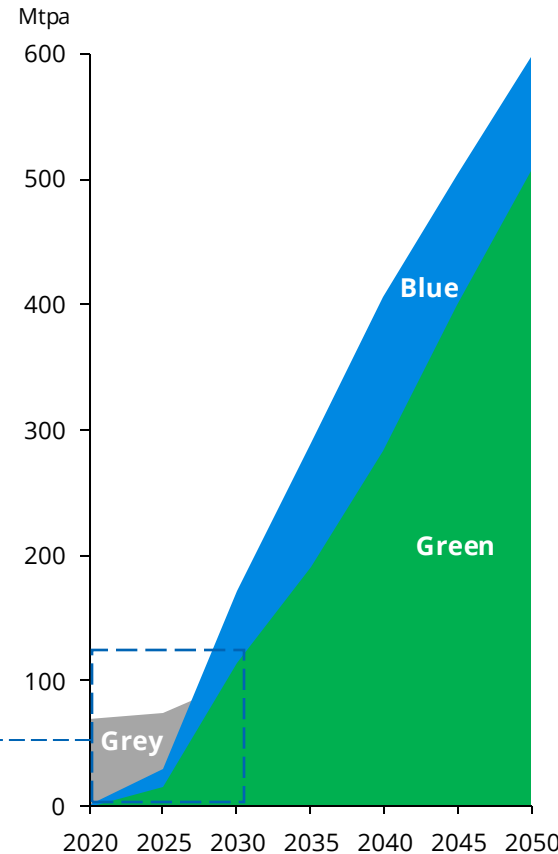
### Serviceable Addressable Market (\$B)<sup>(3)</sup>



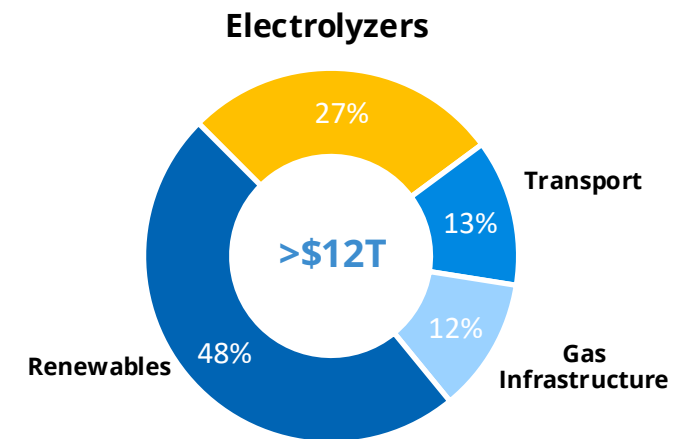
The demand growth will result in a total serviceable market of \$88 billion from 2024 to 2030, growing at a 32% CAGR

## Global Market Opportunity by 2050

### Global Hydrogen Production Scenario<sup>(2)</sup>



**>\$12T**  
Investment required in the hydrogen value chain to 2050<sup>(2)</sup>



Electrolyzers expected to represent ~27% of the Hydrogen Value Chain investment<sup>(2)</sup>

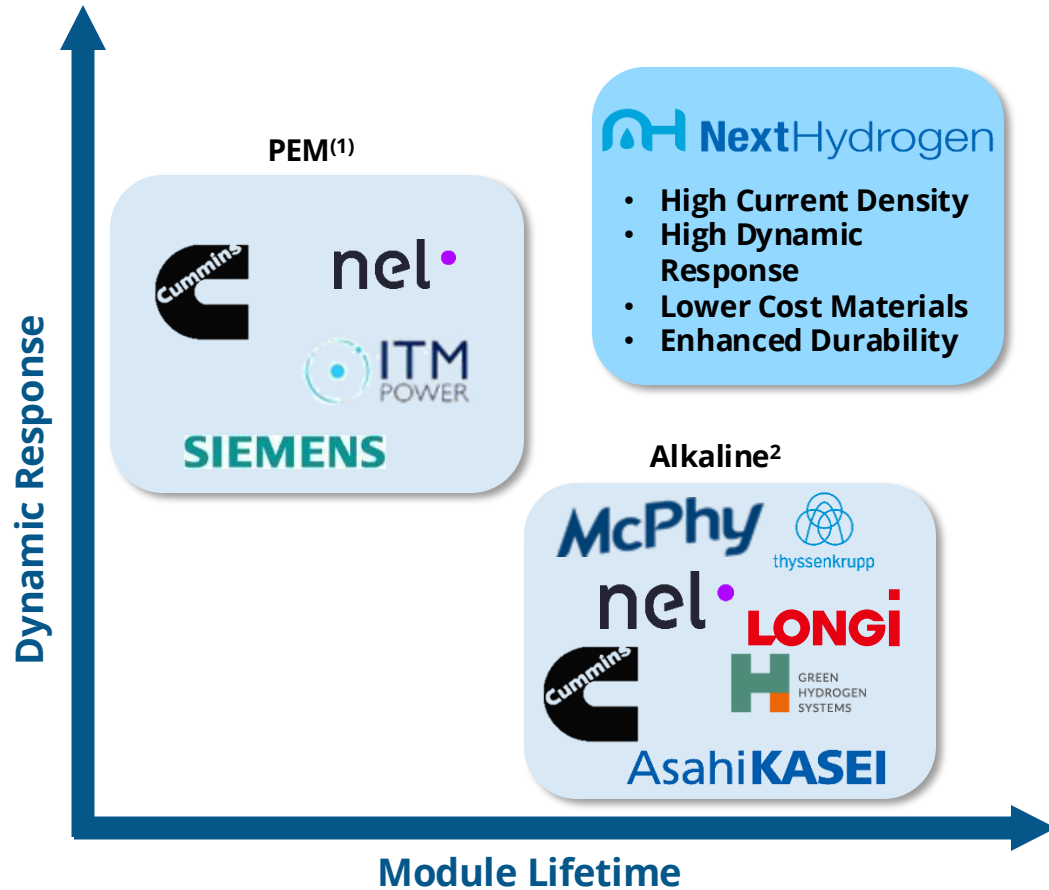
**>\$3.5T**  
Required Electrolyzer Investment

Converted from USD to CAD at FX rate of 1.35 USD/CAD

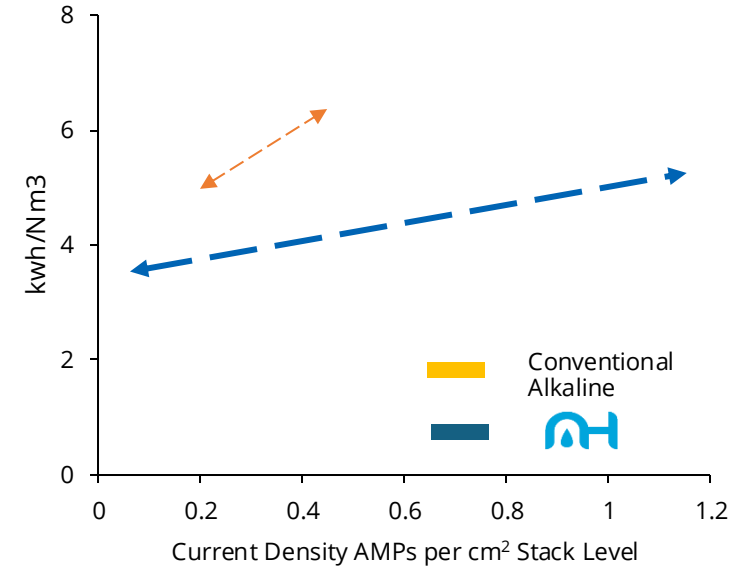
1. McKinsey & Company Global Energy Perspective 2023: Hydrogen Outlook  
 2. Deloitte Green hydrogen: Energizing the path to net zero  
 3. Management estimation based on required GW multiplied by forecasted sales price per GW annual average from 2024 to 2030

# Next Hydrogen Offers a Superior Route to Affordable Green Hydrogen

## The Electrolyzer Landscape



## Energy Efficiency and Current Density



- ✓ Next Hydrogen offers lower energy consumption compared against leading alkaline competitors
- ✓ Next Hydrogen offers wide system operating range compared to its alkaline peer group

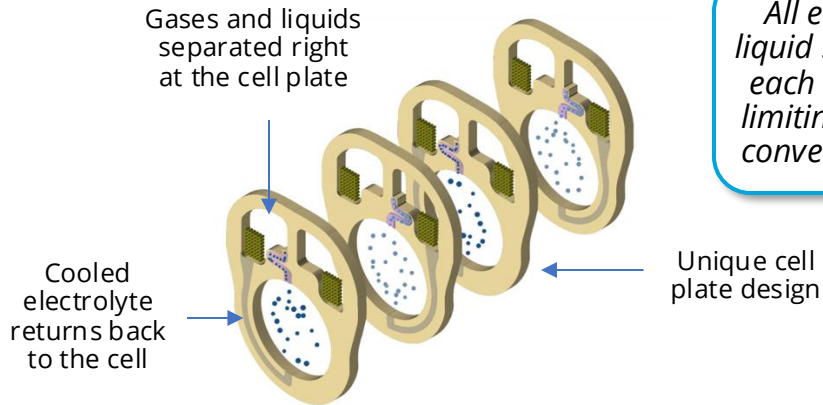
“The most recent iteration of the company's electrolyzer, GEN2, has exceeded the U.S. Department of Energy's technical targets.”



1. PEMWE & AWE Values as per Hydrogen Europe Roadmap; 1.1 USD / Euro  
 2. PEMWE = Proton Exchange Membrane Water Electrolyzer  
 3. AWE = Alkaline Water Electrolyzer  
 4. Based on peak current density at 1.2A/cm<sup>2</sup> and peak energy consumption at 50kWh/kg H<sub>2</sub>



# Innovative Design Removes Restrictions and Sets the Stage for Scalable Operations



*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

## Higher Current Density

**Up to 4x more current density** ensures cost effective designs without sacrificing efficiency

## Superior Dynamic Response

**Capture fluctuations in energy at 5% per second** vs conventional alkaline systems of up to 5% per minute

## Scalable Design

**Large format modules** (~8MW) enable easy scaling to 100's of MW systems based on 8MW building blocks

## Energy Efficiency

**Exceeds industry targets** and lead in terms of overall competitiveness



**450Nm<sup>3</sup>/h**

Hydrogen Production Capacity

**9m<sup>2</sup>**

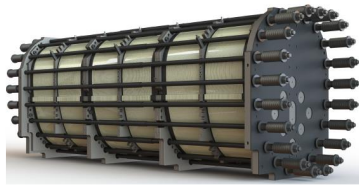
Footprint

**85% less** in footprint when comparing with an industry leading alkaline system

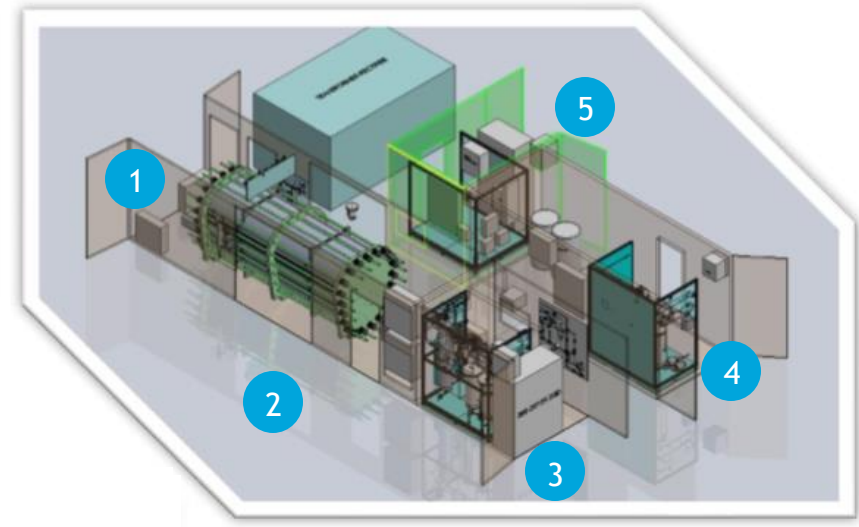
# System Overview



## NH-300 Hydrogen Generation System Schematic



1. Electrolyzer Module



2. Electrolyzer Container



3. Hydrogen Container

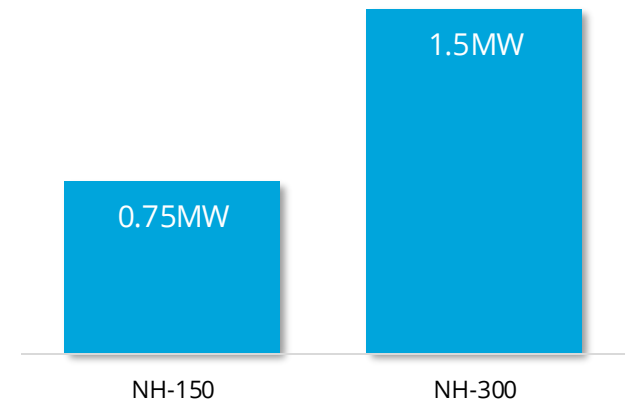


5. Electrical and Controls Container



4. 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:



# Commercial Testing and Validation



## Successful Pilot Project

Significant validation and advancement of electrolyzer 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 electrolyzers. Pilot project success resulted in order of 2 additional electrolyzers

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 electrolyzers for large-scale green hydrogen plants



## Collaboration with Leading Aviation Engine Company

Pratt & Whitney and Next Hydrogen entered into a collaboration agreement for a project funded by Canadian INSAT. In this project, Pratt & Whitney will demonstrate the viability of aircraft engine while Next Hydrogen will demonstrate the viability of electrolyzers for hydrogen as an aviation fuel



## 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

# Next Hydrogen Product Road Map



2022	2023	2024	2025	2026	2027
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**Full system development in real world operations**

- Demonstrated pathway to lower cost and higher efficiency systems in bench scale for our GEN2 product line
- 1.5MW fueling station for fork-lifts and trucks
- Technology Readiness Level 9 of 9

Validation at bench scale and pilot scale

**Secure partnerships with high quality customers and channel partners**

- Secured \$7.7MM nuclear contract with follow-on potential
- Secured \$5.1MM in SDTC support
- Partnerships with GE Vernova, Casale and Canadian Tire; Product delivery to Hyundai and Kia
- Strong backlog growth

Product delivered to partners

Secured funding support

Secure multiple product delivery MOUs

**Large scale product line**

- GEN3 product line with capacity up to 8MW
- Demonstrate multi-module project with 8MW building block solution for up to GW scale projects
- The next generation product under development aiming best-in-class systems with capacity up to 100MW

GEN3 4K

+GEN3 20K (8MW)

Develop large-scale 100's of MW projects

## Product Customers



## Funding and Partnership





# Patent Portfolio Geared Towards Green Hydrogen from the Beginning



**NextHydrogen**

- 40 Patents with a 20-year average life

				Filing Location <sup>(1)(2)</sup>
	<b>Cell Module</b>		<b>Electrolyzer Module</b>	US (3), PCT, CA, EP, CN, IN
			<ul style="list-style-type: none"> <li>Core water electrolyzer module design</li> </ul>	
	<b>Power Delivery</b>		<b>Power Dispatch System for Electrolytic Production of Hydrogen from Wind Power</b>	US (3), PCT, CA (2), EP (2), CN, IN (2)
			<ul style="list-style-type: none"> <li>Connection of water electrolyzers to wind farms</li> </ul>	
	<b>PEM Capability</b>		<b>Polymer Electrolyte Membrane Water Electrolyzer Cell Module</b>	US (2), PCT, CA (2), EP, CN, IN (2)
			<ul style="list-style-type: none"> <li>PEM water electrolyzer module design</li> </ul>	
<b>High Pressure</b>			<b>Externally-Reinforced Electrolyzer Module</b>	US, PCT, CA, EP, CN, IN
			<ul style="list-style-type: none"> <li>High pressure water electrolyzer design</li> </ul>	
			<b>Internally-Reinforced Electrolyzer Module</b>	US, PCT, CA, EP, CN, IN
			<ul style="list-style-type: none"> <li>High pressure water electrolyzer design</li> </ul>	
			<b>End Pressure Plate for Electrolyzer</b>	US (2), PCT, CA, EP, CN, IN
			<ul style="list-style-type: none"> <li>End pressure plates for electrolyzer modules and stacks</li> </ul>	

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

		<u>Management</u>	<u>Management %</u>
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%
<u>Convertible Debentures</u>	<u>2,725,000</u>	<u>550,000</u>	<u>20.2%</u>
Fully diluted shares	29,020,350	7,880,111	27.2%

\* No single shareholder owns more than 20%

\* Convertible Debentures matures Dec. 2026, bears interest of 10% and has a strike price of \$1.00

## Balance Sheet at Sept 30, 2024

<b>Assets</b>	
<b>Current</b>	
Cash and cash equivalents	\$3,208,852
Trade and other receivables	\$109,003
Prepaid expenses and deposits	\$712,603
Inventory	\$2,994,039
<b>Total Current Assets</b>	<b>\$7,024,497</b>
Trade and other receivables	\$42,454
Prepaid expenses and deposits	\$8,138
Equipment	\$6,819,776
Right of use asset	\$1,361,798
Patents	\$510,391
Intangible assets and goodwill	\$139,268
<b>Total Assets</b>	<b>\$15,906,322</b>
<b>Liabilities</b>	
<b>Current</b>	
Trade and other payables	\$1,990,627
Deferred revenue	\$2,106,521
Deferred government grants	\$592,412
Provisions	-
Finance lease liability	\$78,807
Current portion of long-term debt	\$38,493
<b>Total Current Liabilities</b>	<b>\$4,806,860</b>
Deferred revenue	\$3,215,798
Deferred government grants	\$359,926
Provisions	\$3,850,000
Finance lease liability	\$1,582,285
Long-term debt	322,371
<b>Total Liabilities</b>	<b>\$14,137,240</b>
<b>Shareholders Equity</b>	
Share capital	\$76,418,695
Contributed surplus	\$6,358,759
Retained deficit	<u>\$(81,008,372)</u>
	<u>\$1,769,082</u>
	<u>\$15,906,322</u>

# Conclusions



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



The Company's electrolyzer design is covered by 40 patents, validated by corporate partnerships and industry leaders



The Company has a 40MW, 27,000 square foot proof-of-concept manufacturing facility commissioned with an ERP system and well positioned for rapid scale-up



The Company plans to demonstrate multi-MW production of our third-generation product line with the support of SDTC and six industry leading partners



Backlog was \$10MM in 2024 with expectation to double it in the first half of 2025.

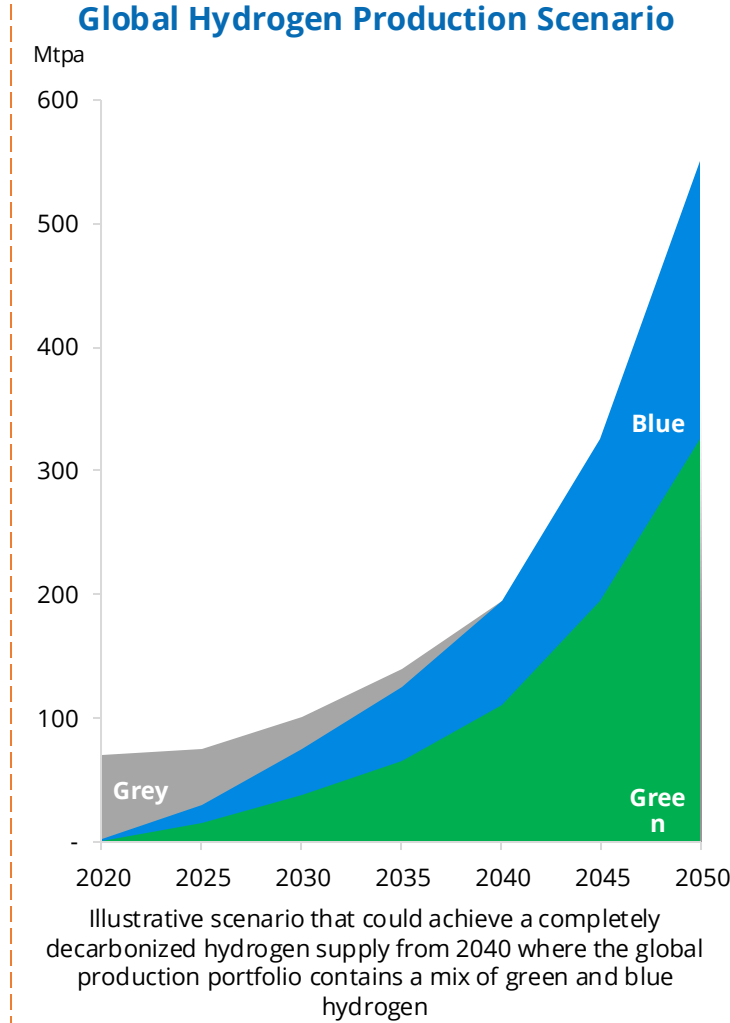
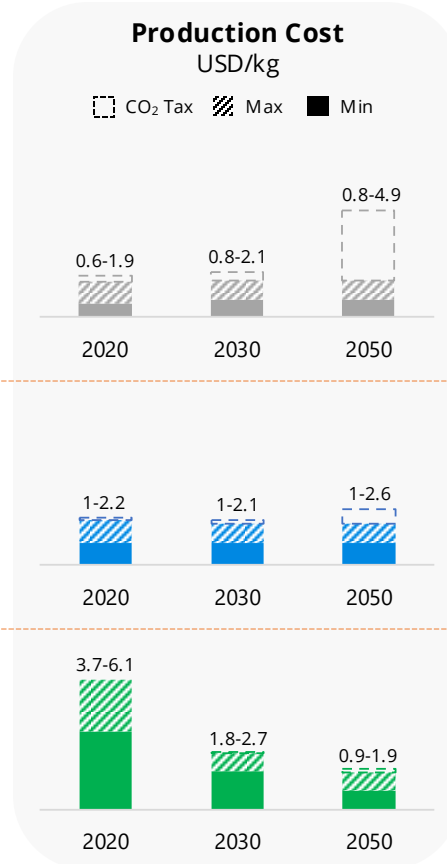
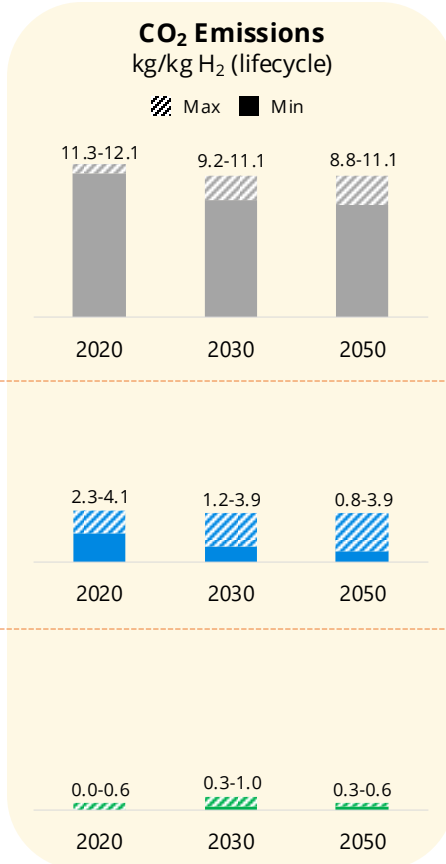
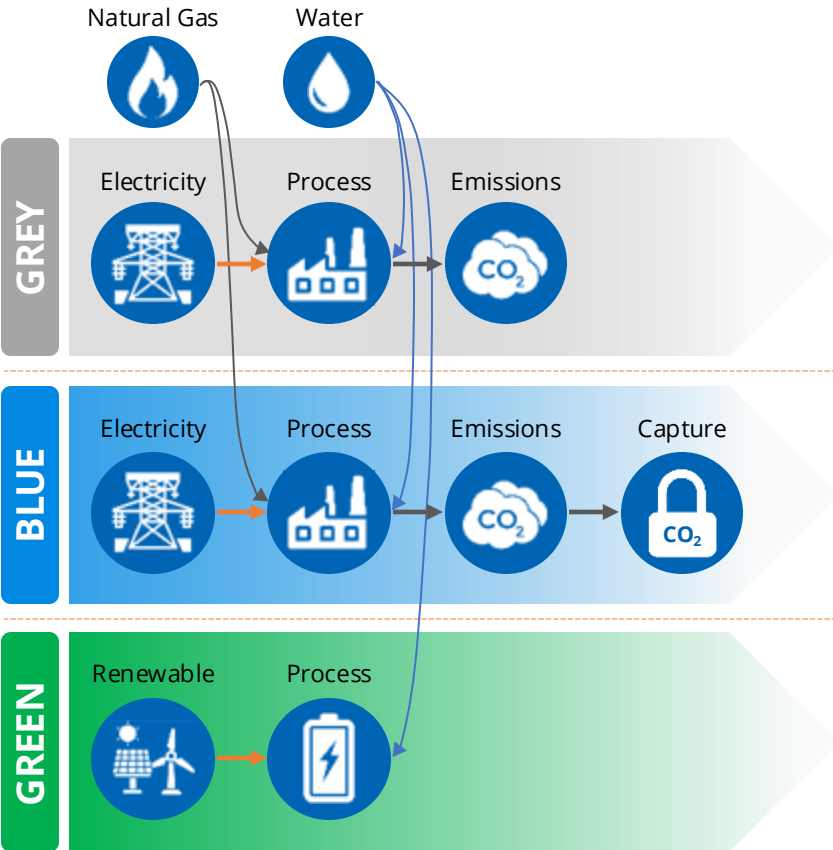




# Appendix



# 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.