



NextHydrogen

Innovation in Water Electrolysis™

Corporate Presentation

November 2021

NXH:TSXV
NXHSF:OTC



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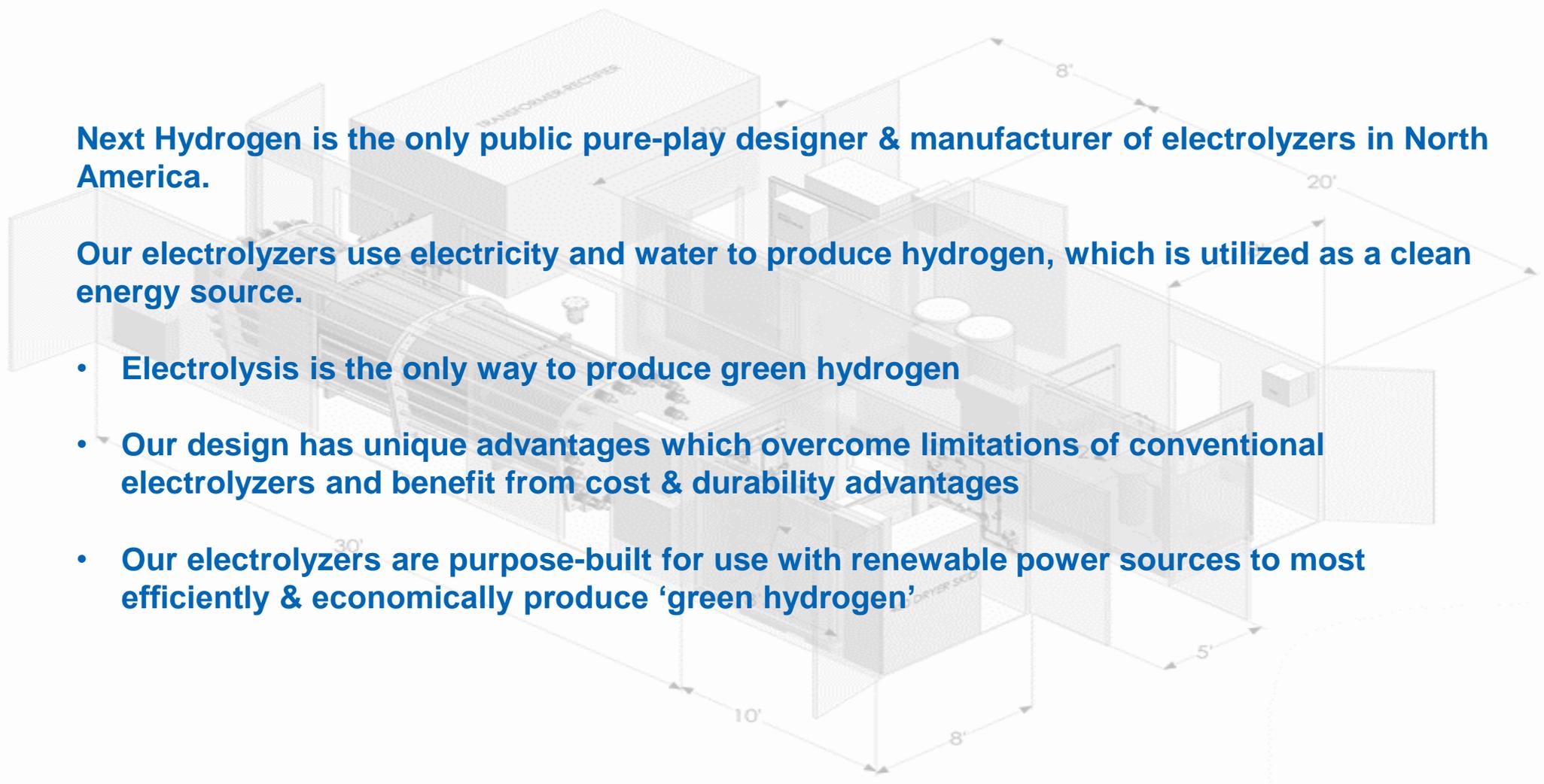
What is Next Hydrogen?



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'**





Hydrogen Economy Tailwind

- **US\$80B Addressable Market and less than 10 notable electrolyzer players** globally
- Applications in materials handling, heavy mobility and industrial processes, which **cannot be electrified**
- **Unprecedented government budgets, grants and subsidies** driving investment

Scarcity Premium

- **Only publicly listed pure play water electrolysis company in North America** and one of few globally
- **Climate change initiatives & investors' push towards ESG** have increased market interest in clean tech companies

Pioneers in Water Electrolysis

- **12+ years of IP development** with proven track record at Stuart Energy and Cummins (Hydrogenics)
- Combined **60+ years** of experience in designing hydrogen generation systems
- **Tremendous bench strength:** Technical, Operational, Manufacturing & Board

Advanced Electrolyzer Design

- **Significant advancement in electrolyzer design architecture** validated by AECL, Canadian Tire and Hyundai
- Combines the attractive features of PEM and alkaline systems to **reduce the levelized cost of green hydrogen**

Extensive IP Portfolio

- 38 patents to cover **multiple alkaline and PEM product roll-outs** to expand value proposition
- **Commercialization** of 1, 2, 3 MW alkaline electrolyzer product line underway
- **Technology development roadmap** includes 3, 6, 9 MW alkaline electrolyzers and PEM product line in the next 3+ years

Hydrogen Economy Tailwind



To stabilize or reduce concentrations of CO₂ 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**

96% of countries are committed to the Paris Agreement

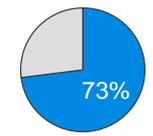
81% of society feel that **companies have a vital role to play in meeting environmental targets**

Global **sustainable funds saw inflows of \$152.3B** in the final quarter of 2020

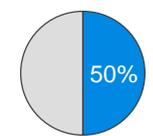
Electrolyzer costs have decreased by 40% during the last 5 years, and **costs of solar and wind power have decreased by 89% and 70%** during the last 10 years

31 Countries have **hydrogen-specific strategies**

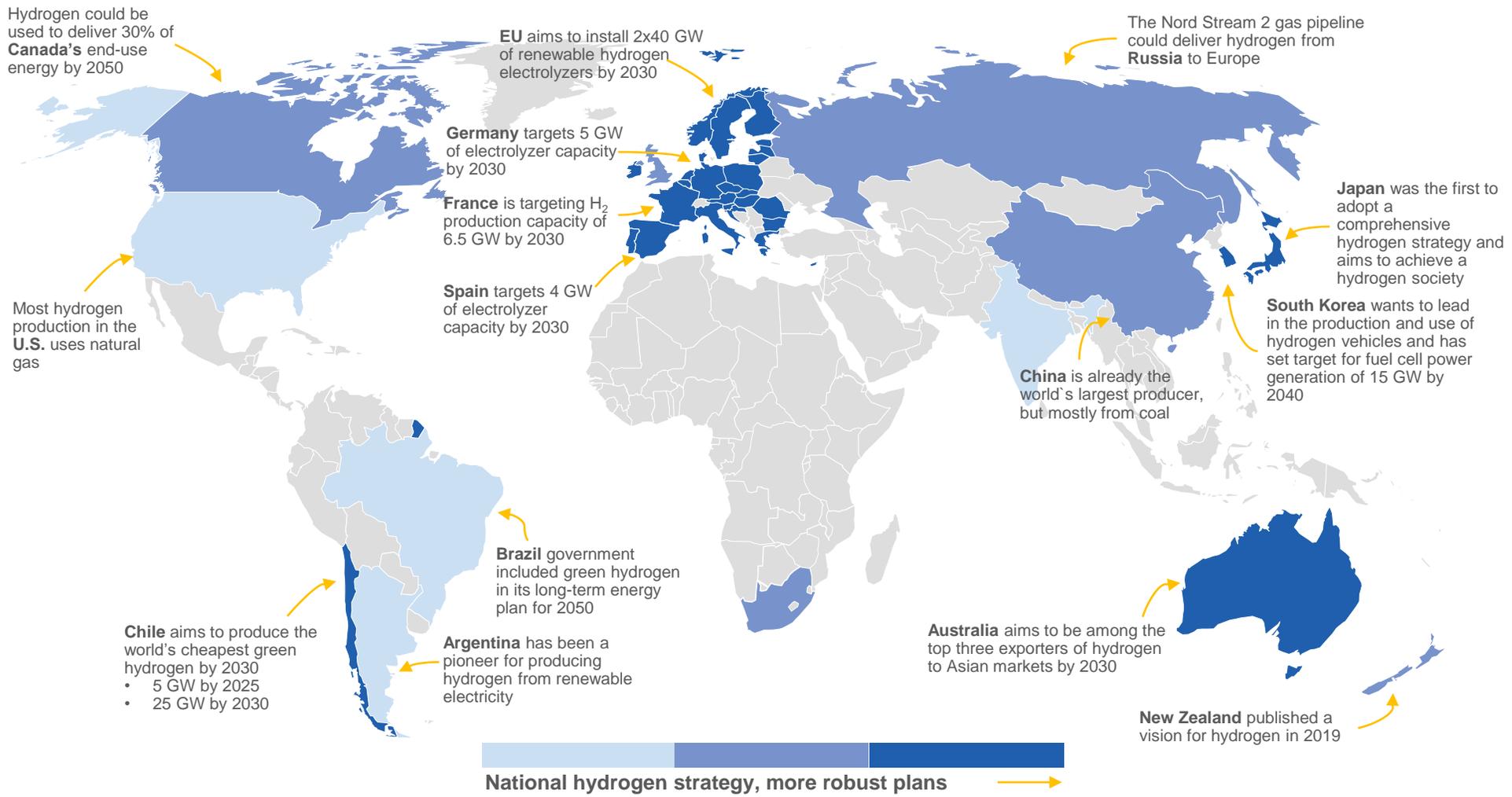
% of Global GDP covered



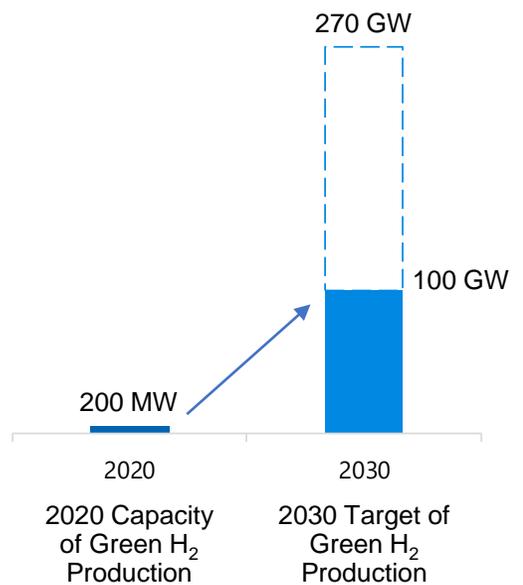
75 Countries have **net zero carbon ambitions**



Unprecedented Commitment on Green H₂ from Countries Globally



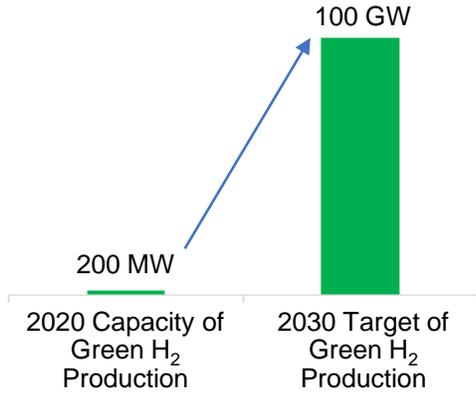
270 GW of electrolyzers will be needed by 2030 to **keep the global temperature increase under 2°C**



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

Significant Electrolyzer Market Opportunity

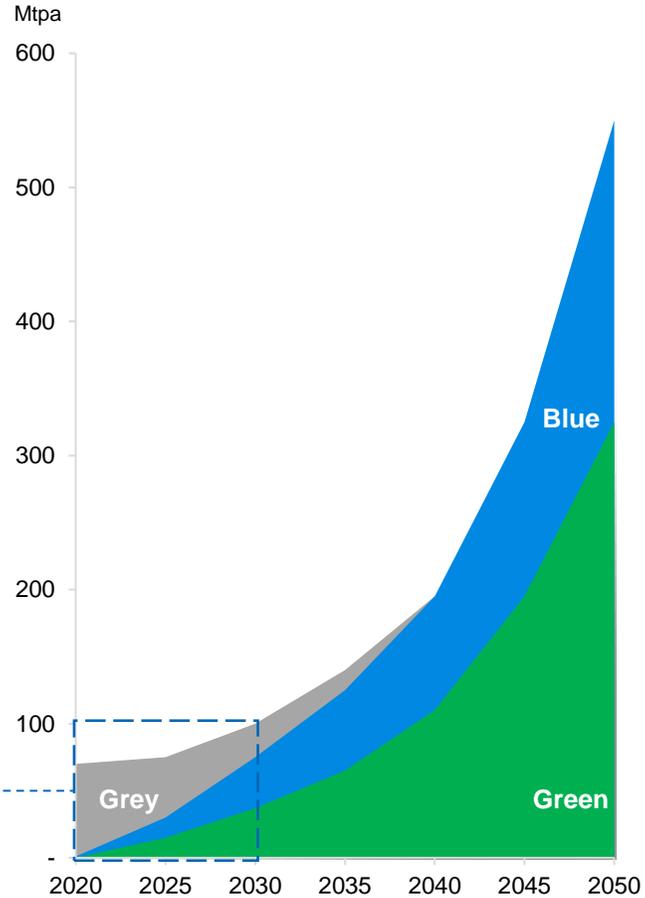
Market Opportunity by 2030



Serviceable Addressable Market

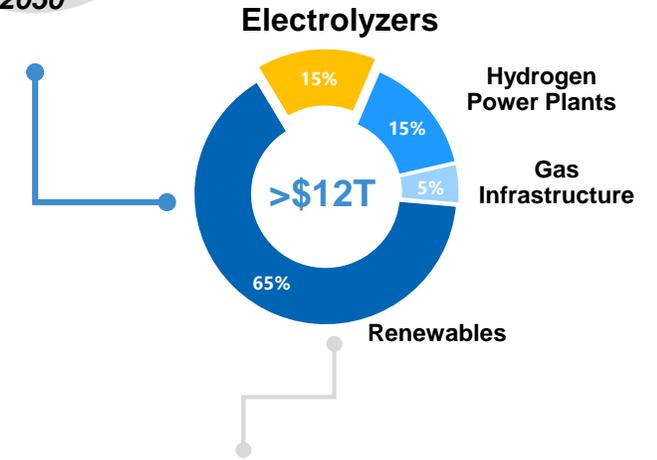


Global Hydrogen Production Scenario



Market Opportunity by 2050

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



Electrolyzers expected to represent ~15% of the Addressable Hydrogen Market⁽²⁾

>\$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 CO₂ 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



Ammonia



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)
- H₂ 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 Experience



Vice Chairman
MSc, DBA

Matthew Fairlie

- 20+ years in hydrogen industry including CTO and Executive VP at Stuart Energy
- Other experiences include Vice Chair of the US National Hydrogen Association and Chair of the Hydrogen Business Council of Canada



Chief Technology Officer
PhD

Michael Stemp

- 20+ years of designing and developing hydrogen systems including Director of Advanced Engineering for Stuart Energy
- Received PhD from the Swiss Federal Institute of Technology



Chief Operating Officer
PhD

Jim Hinatsu

- 25+ years commercial experiences with hydrogen and electrochemical systems including senior roles at Hydrogenics and Stuart Energy
- Received PhD from the University of Toronto



VP Engineering
MS, MBA

Jim Davies

- 19 years experience developing hydrogen generating systems for fuel cell industry
- Engineering experience incl. functional management, technical leadership with emphasis on cost reduction, reliability improvement
- Ops experience incl. supplier development, process development, optimization



VP Manufacturing
BS, MS

Jim Franchville

- 25 + years experience in manufacturing, operations, supply chain, quality, and process improvement in 4 different industries (automotive electronics, medical, aerospace, and oil & gas)
- Extensive experience working with regulating agencies such as ISO, API, FAA, and the FDA



VP Operations

Shane Day

- 25 + years experience managing the installation of > 60 H2 systems and integrated > 200 fuel cells in multiple applications
- The first to be certified by TSSA as an H2 technician in Ontario
- Director Hydrogen Business Council



HYDROGENICS

HYDROGENICS



HYDROGENICS



CleanFuel Systems Inc.

Producing Hydrogen: The Electrolyzer Landscape

Pure Play Electrolyzer Manufacturers



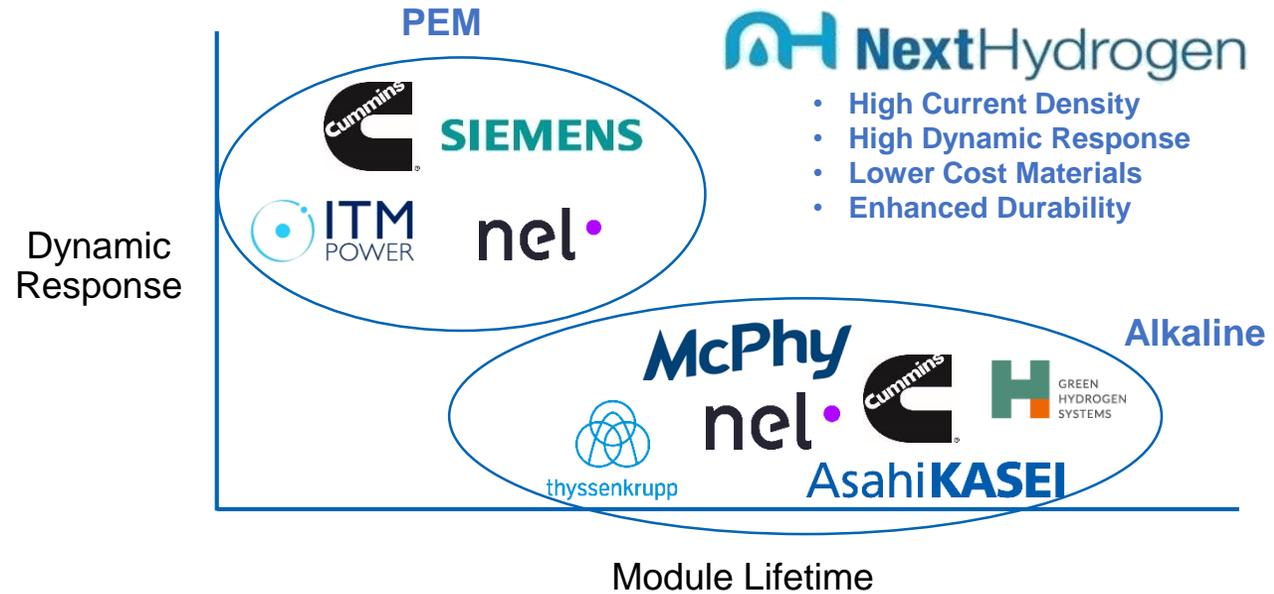
Electrolyzer Manufacturers



Fuel Cell Manufacturers



Next Hydrogen captures key benefits of both electrolyzer technologies



Competitive Differentiators

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

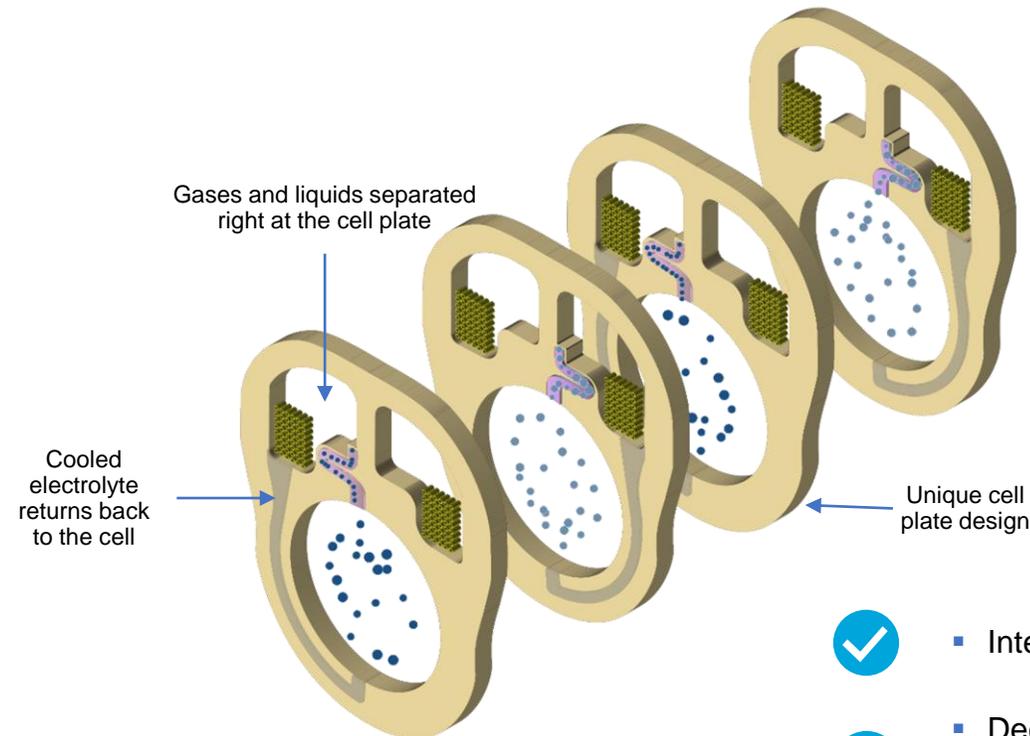
Next Hydrogen's electrolyzers can produce more hydrogen per capex dollar spent when compared to other leading systems⁽¹⁾

1. When compared against competing alkaline electrolyzer technology.

Significant Advancement in Electrolyzer 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

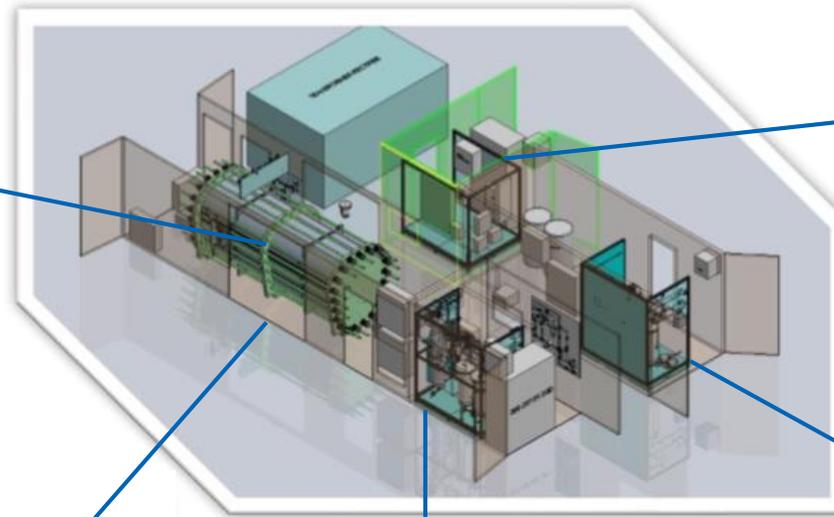
System Overview

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



Successful Pilot Project

"The team successfully demonstrated the continuous operation of the cell with the required quality of hydrogen stream from the electrolyser in a liquid phase catalytic exchange system." - AECL MD&A



One of the Largest On-site H₂ Generation Project for Materials Handling Applications Globally

The first "green hydrogen system" – hydrogen powered fork lifts and electrolysis fuel production using Next Hydrogen electrolyzers

- Canadian Tire commissioned an NH60 (0.4 MW) unit for a pilot project at their Brampton, Ontario distribution centre
- Subsequently ordered 2 NH300 (1.8 MW) units since the first demonstration unit for their Bolton, Ontario facility. Total hydrogen production capacity of 1.5 tonnes/day



Bolton, Ontario

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.

"We are pleased to partner with Next Hydrogen specializing in state-of-the-art water electrolysis technology. This partnership is another leap forward for our hydrogen business and will be our first step into the alkaline water electrolysis market," said Jae-Hyuk Oh, Vice President and Head of Energy Business Development Group at Hyundai Motor Group. "We believe our technology will be an excellent match for Next Hydrogen's technology, and this synergy will help achieve our goal to provide our customers with cost-effective green hydrogen."

Patent Portfolio Geared Towards Green Hydrogen from the Beginning



NextHydrogen

- 38 Patents
- 21 European Registrations
- 2 Pending Applications

			Priority	Filing Location ⁽¹⁾⁽²⁾
	Cell Module 	Electrolyzer Module <ul style="list-style-type: none"> ▪ Core water electrolyzer module design 	July 2008	US (3), PCT, CA, EP, CN, IN
	Power Delivery 	Power Dispatch System for Electrolytic Production of Hydrogen from Wind Power <ul style="list-style-type: none"> ▪ Connection of water electrolyzers to wind farms 	October 2008	US (3), PCT, CA (2), EP (2), CN, IN (2)
	PEM Capability 	Polymer Electrolyte Membrane Water Electrolyzer Cell Module <ul style="list-style-type: none"> ▪ PEM water electrolyzer module design 	August 2009	US (2), PCT, CA (2), EP, CN, IN (2)
	High Pressure 	Externally-Reinforced Electrolyzer Module <ul style="list-style-type: none"> ▪ High pressure water electrolyzer design 	September 2012	US, PCT, CA, EP, CN, IN
		Internally-Reinforced Electrolyzer Module <ul style="list-style-type: none"> ▪ High pressure water electrolyzer design 	September 2012	US, PCT, CA, EP, CN, IN
		End Pressure Plate for Electrolyzer <ul style="list-style-type: none"> ▪ 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.

Near-Term Commercial and Operational Focus

Product Development	Strategic Partnerships	Deployment of Systems	Assembly Capabilities	People
<p>Incorporate upgrades to existing design</p> <p>Freeze design of 1, 2, 3 MW systems</p> <p>Develop 3, 6, 9 MW systems</p> <p>Focus on improvements to:</p> <ul style="list-style-type: none"> • Current density • Energy efficiency • Cost reduction 	<p>Expand strategic partnerships that can scale operations, bring large end-markets and serve as go-to market partners:</p> <ul style="list-style-type: none"> • Transportation • Industrial (Ammonia, Steel, Refining) • Power infrastructure • New applications 	<p>Add two more demonstration systems to existing backlog of three for 2022</p> <p>Target large volume commercial sales for 2023</p> <p>Build out scope of services and integration business line</p>	<p>Expand upon low capex assembly capabilities (20-40+ MW/year) in existing facility</p> <p>Explore low cost country location strategy</p> <p>Exploit ERP system functionality</p>	<p>Continue to build out depth of high quality operational, engineering and management talent</p> <p>Targeting 60 employees by end 2022 from 38 in Q3/21</p>

Financial Highlights

Share Capitalization

Issued & Outstanding	22,883,432
Board & Management	4,654,297
Percent Board & Management	20%
Options	3,106,626
Fully Diluted Shares	25,990,058
Percent Board & Management	26%

No single shareholder owns more than 15%

Balance Sheet at September 30, 2021

Assets	
Cash	\$ 44,509,542
Trade and other receivables	591,121
Prepaid expenses and deposits	843,563
Current income tax recoverable	119,763
Inventory	2,017,300
Total Current Assets	48,081,289
Prepaid expenses and deposits	150,701
Equipment	778,343
Right of use asset (facility lease)	1,952,457
Patents	777,302
Intangible assets and goodwill	390,167
Total Assets	\$ 52,130,259
Liabilities	
Bank indebtedness	\$ 60,000
Trade and other payables	2,593,756
Contingent liability	14,968
Deferred Revenue	1,866,551
Provisions	1,447,645
Finance lease liability	50,755
Long-term debt	136,156
Loan payable	-
Deferred share unit liability	-
Total Current Liabilities	6,169,831
Contingent liability	48,216
Deferred Revenue	1,161,390
Provisions	1,278,011
Finance lease liability	1,841,931
Long-term debt	198,348
Total Liabilities	10,697,727
Total Shareholders Equity	41,432,532
Total Liabilities and Shareholders Equity	\$ 52,130,259



US\$80B Addressable Market with Next Hydrogen being **one of 10 notable electrolyzer players globally**



Next Generation Alkaline electrolyzer that creates a pathway to the **LCOH**. **Validated & differentiated design** offers higher current density, inherently scalable design with superior dynamic response



Commissioning one of the **largest onsite green hydrogen fueling stations for materials handling in North America**



Scaling our electrolyzer module to **10 MW for large scale green hydrogen applications** for initial deployment in 2021-24



Continue to achieve **significant milestones in 2021 and 2022**



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, CPA(IL), MAcc

Kasia Malz

- 10+ years financial leadership experience
- 5+ years public company CFO and start-up experience, most recently with Titanium Transportation Group where she took the company public and grew the business from \$40M to \$200M in revenue



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

TITANIUM
Transportation Group Inc.

EY

Optessa
Intelligent Planning & Scheduling

OCTANE
VENTURE PARTNERS

Westinghouse

ZeGen
Accelerating The Transition

Noble
ENVIRONMENTAL POWER

GE Capital

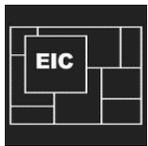
Board Contributes Invaluable Leadership Experience



Board Director
BA, MBA

Michael Pyle

- CEO of Exchange Income Corporation and previously President of The Arctic Glacier Income Fund
- Director of CentrePort Canada Inc. and of the Winnipeg Blue Bombers Football Club



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
Electricity Consumption at Nominal Capacity	kWh/kg	55	52	50	50	49	48
Capital Cost	US\$/(kg/d)	2,500	1,800	1,200	1,500	1,200	940
	US\$/kW	1,100	820	590	700	560	470
Current Density	A/cm ²	2.2	2.4	3	0.6	0.7	1
Hot Idle Ramp Time	sec	2	1	1	60	30	10
Cold Start Ramp Time	sec	30	10	10	3,600	900	300

Based on a 100MW system

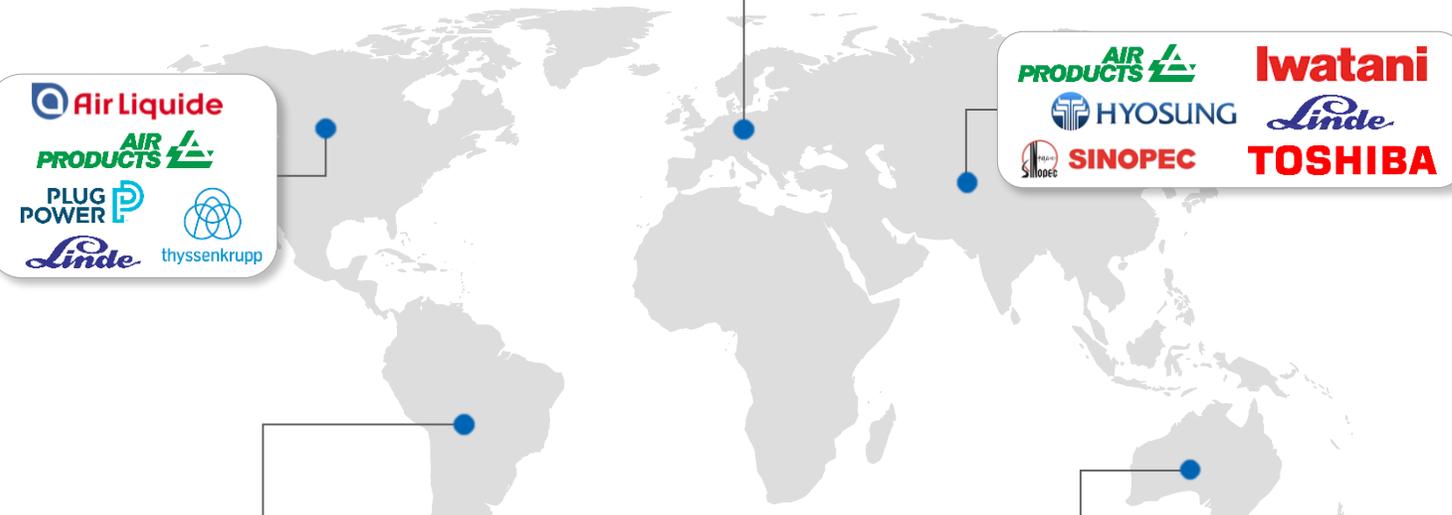
Sources: EERA & Hydrogen Europe Research Multi-Annual Work Program, 06/08/2020, Key Performance Indicators (KPIs) for FCH Research and Innovation, 2020-2030, Version: 5.0.

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

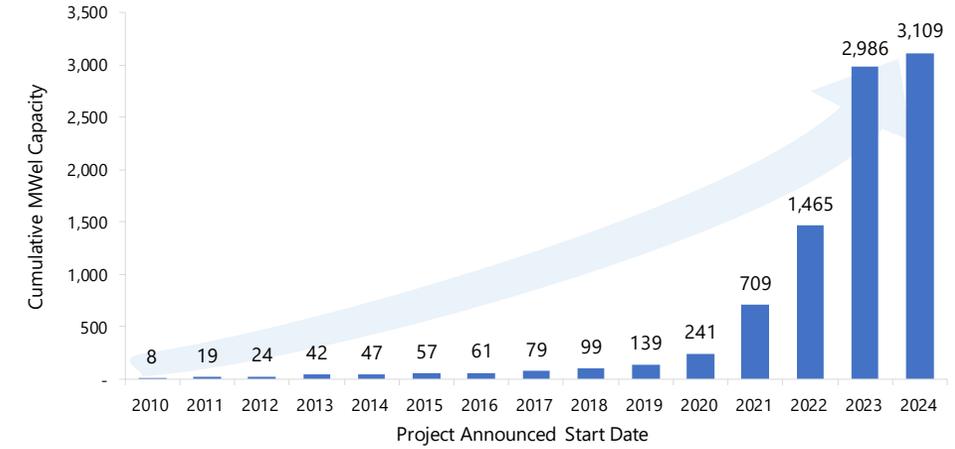
Exchange: 1 USD= 0.86 Euro

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

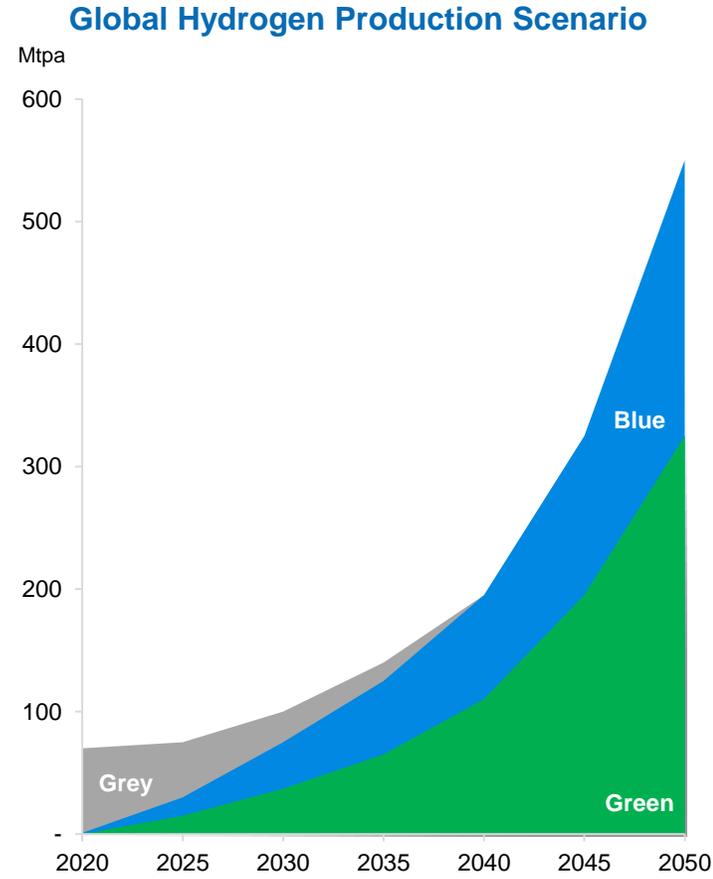
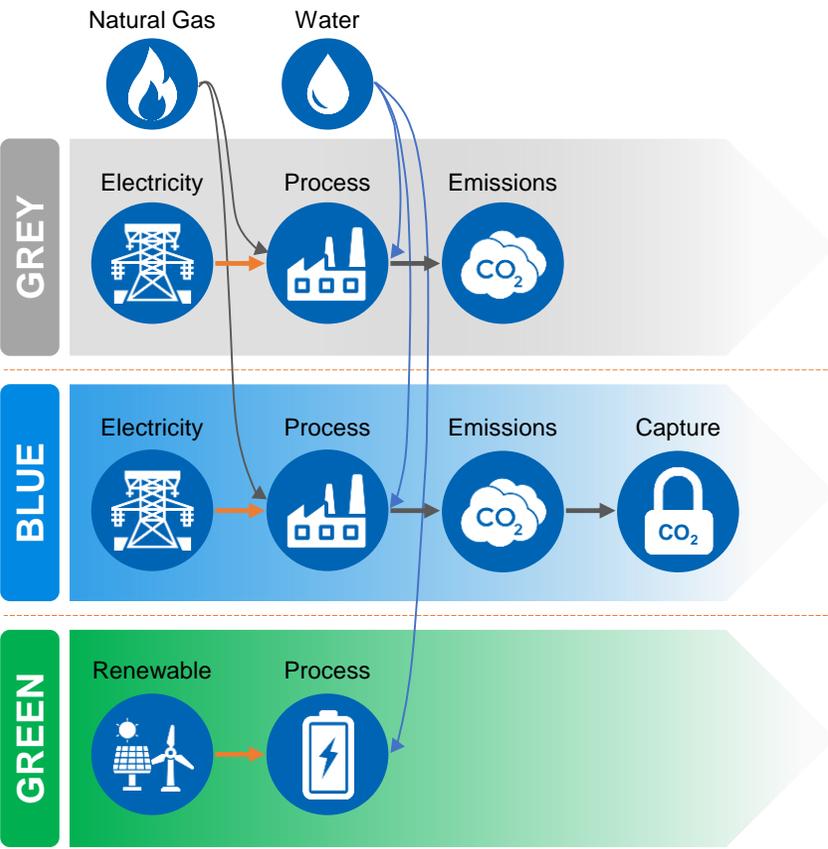


Select Projects Expected to Come Online

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



Illustrative scenario that could achieve a completely decarbonized hydrogen supply from 2040 where the global production portfolio contains a mix of green and blue hydrogen

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

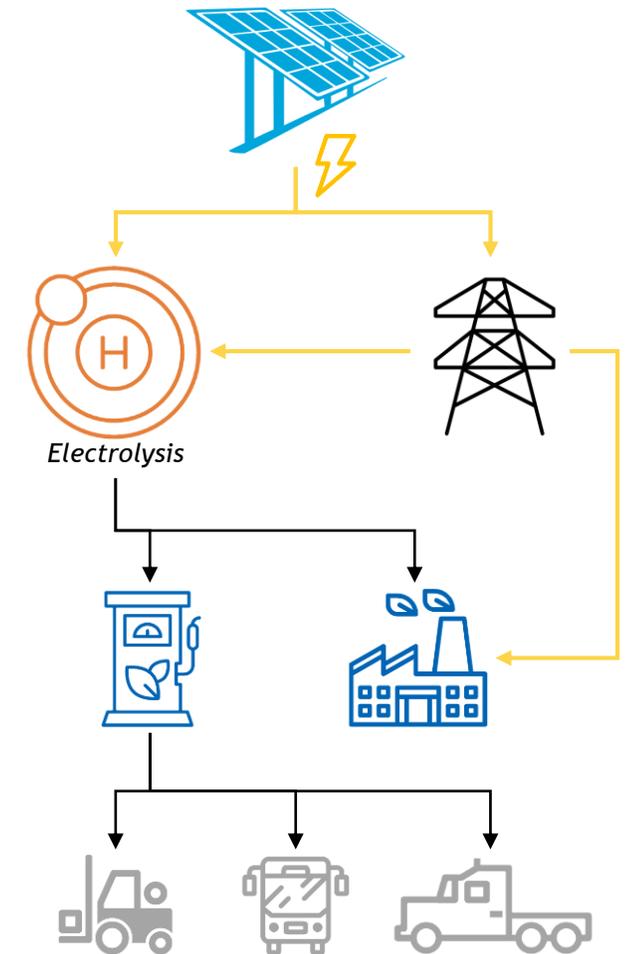
To take a central role in the energy transition, existing and new uses of hydrogen need to be met with decarbonized or clean hydrogen production sources

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

Illustrative Excess Solar Energy Capture for H₂ 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

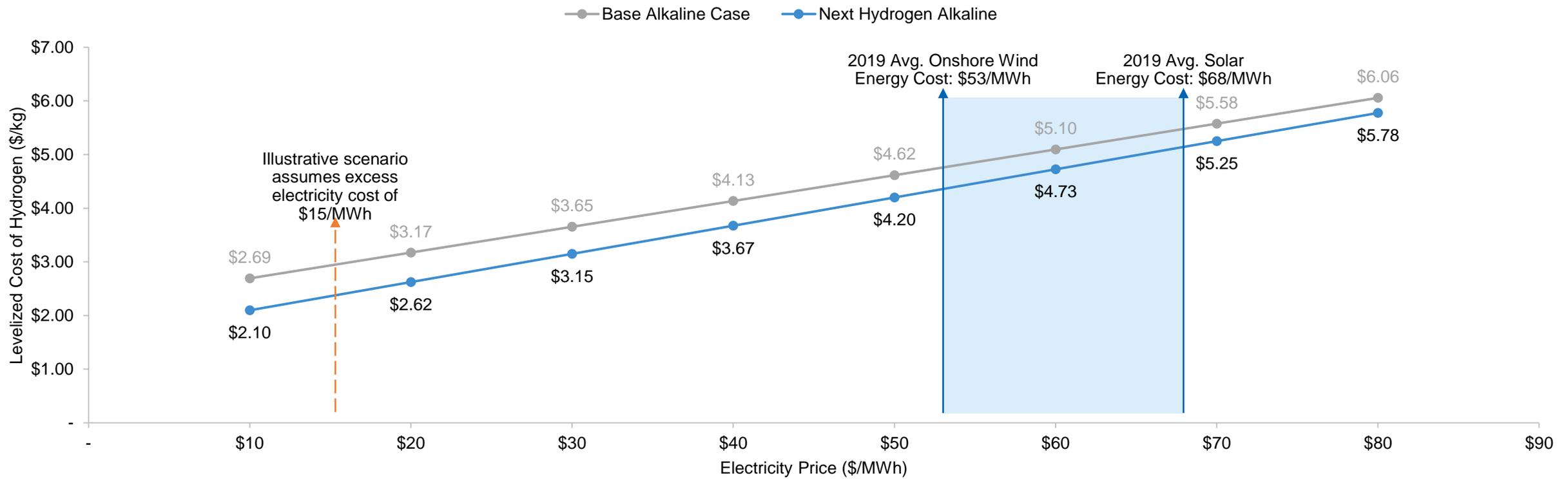


Illustrative Excess Solar Energy Capture for H₂ Production Scenario Sensitivity

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 H₂ Production - Electricity Price Sensitivity



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



The Green Hydrogen Opportunity

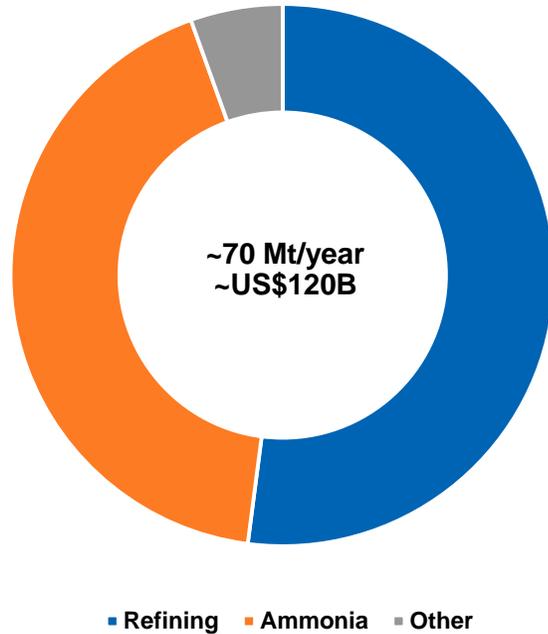


Large Existing Market for Hydrogen – Green To Replace Grey

- 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 CO₂ emissions

Hydrogen Market Set To Grow 8x

Global hydrogen market by end use
Mt H₂ per year



Global energy demand supplied by hydrogen, Mt

