Cipher is an Arabic word for zero... Hydrogen is the only element with zero neutrons... Hence the name Cipher Neutron

Management Presentation

Cipher Neutron

September 2024

Strictly Private & Confidential

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SECTION 1. Today's Presenters

Leadership Team

In attendance



Gurjant Randhawa, M.Eng, P.Eng

President & CEO

- Founded Cipher Neutron in 2021
- 10+ years of experience in hydrogen electrolysers and fuel cells; previously served as head of R&D at dynaCERT Inc.



Dr. Pierre Rivard

Director

- Founder and CEO of Hydrogenics (now Cummins).
- Council member of National Research Council, Canada.
- Executive Chairman and Co-Founder of TUGLIQ Energy Corp.



Ranny Dhillon, M.Eng

Chief Scientific Officer

- 10+ years of R&D experience in hydrogen electrolysers, fuel cells, and membrane electrode preparation techniques
- Co-invented 6+ international patents in hydrogen & fuel cell technology



Jean-Pierre Colin

Director & Corporate Secretary

- 10+ years of management experience in Hydrogen Electrolysis companies.
- 40+ years of experience in managing invest banking departments. Financed 200+ public companies.

Additional Members of Leadership Team **Dr. Mayilvelnathan Gurpreet Bhullar, M.Eng Dr. Bruno Pollet** Dr. Amandeep Oberoi Dr. Xiaguo Li Head of Business Development Scientific Advisory Board **Technical Advisor Chief Technical Officer** Head of R&D Valuable Hydrogen Experience 200+ Years Combined experience in hydrogen, clean Hydr_ègène **OTES** Canada HE **O** dynaCERT IAGE **CHFCA** OF HYDROGEN RESEARCH technology, and business development Québec HYDROG(E)NICS

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SECTION 2. Cipher Neutron Introduction

Cipher Neutron At a Glance

Formed to accelerate the global shift towards renewable energy, Cipher Neutron is a pioneering force in the clean energy transition dedicated to innovation and sustainability in green hydrogen production, power generation, and energy storage solutions

- Cipher Neutron leverages advanced technologies to develop Anion Exchange Membrane ("AEM") electrolysers for green hydrogen production and Reversible Fuel Cell ("RFC") technology for power generation and energy storage solutions
- Cipher Neutron's AEM electrolysers are highly efficient, iridiumfree, and PFAS-free, offering a sustainable and cost-effective solution for green hydrogen production, meeting global targets while avoiding critical supply chain constraints
- The company's patent-pending RFCs use graphene slurry for non-compressed hydrogen storage, functioning both as a hydrogen generator and an energy storage solution—offering a sustainable alternative to traditional battery systems
- Cipher Neutron is scaling its production capabilities to meet growing global demand, with plans to increase production capacity from 100 MW to 600 MW of AEM electrolysers by 2025

North America's 1st

AEM Electrolyser Manufacturer

World's 1st Patent Pending

Reversible Fuel System with Graphene



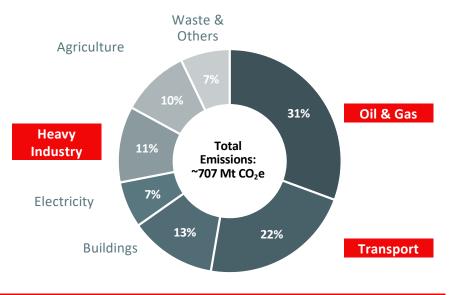
Notes: All figures in C\$ millions, unless otherwise specified.

1. Targeted annual capacity post capital raise.

2. Per 600 MW of AEM electrolyser capacity deployed.

Hydrogen to Play a Key Role in the Energy Transition

Green Hydrogen Leading the Charge Towards a Sustainable Future



CANADA'S GHG EMISSION BREAKDOWN⁽¹⁾

Green Hydrogen to Play a Meaningful Role in Decarbonizing Sectors that Account for 60%+ of GHG emissions

- Currently, over 95% of hydrogen production relies on fossil fuels, primarily for industrial applications such as refining and chemicals, resulting in significant greenhouse gas emissions
 - Relying on grey hydrogen in its current form makes it impossible to reach global decarbonization goals
- Green hydrogen produced from renewable energy sources can help decarbonize hard-to-abate sectors that lack viable alternatives such as electrification, including heavy-duty transportation, heavy industry, and natural gas blending
 - As a molecule, by decarbonizing existing industrial processes where hydrogen is used for refining and biofuel production, chemicals, ammonia, methanation, steel production, etc.
 - As an energy carrier, in applications where it competes with biomass, electricity, batteries, and energy storage (i.e., mobility and transportation, heating and power)

GREEN HYDROGEN IS A SUPERIOR CHOICE AMONG HYDROGEN PRODUCTION METHODS

	Å		(I)	
	Grey	Blue	Turquoise	Green
GHG Emissions	High	Medium – High	Low	Zero
Production Process	Steam Methane Reforming ("SMR")	SMR + Carbon Capture & Storage ("CCS")	Methane Pyrolysis	Electrolysis
Production Source	Fossil Fuels	Fossil Fuels and Biomass	Natural Gas	Renewable Energy
H ₂ Efficiency	~70 - 80%	~70 - 85%	~75%	~60 - 80%

Note: International Energy Agency ("IEA"), Government of Canada, and publicly available information

1. Data as of 2022 reported by the Government of Canada

Electrolyser Innovations: Understanding AEL, PEM, SOEC, and AEM AEM Offers a Unique Approach Towards Water Electrolysis

	Alkaline Electrolyser ("AEL")	Proton Exchange Membrane ("PEM") Electrolyser	Solid Oxide Electrolyser Cell ("SOEC")	AEM Electrolyser
Concept	Uses a diaphragm to separate the anode and cathode	Deploys a membrane-based technology that allows protons to pass but blocks electrons	The solid electrolyte cell consists of ceramic material that separates anode and cathode	Uses an anion exchange membrane to separate the anode and cathode
Structure	Y2 O2 Anode ↔ Cathode Cat	Anode	Anode $ \begin{array}{c} & Y_2 & Q_2 & H_2 \\ & & & & & & & & & & & & \\ & & & & &$	Anode An
Process	 At the cathode, electrons react with water, producing hydrogen (H₂) and hydroxyl ions (OH⁻) The OH⁻ can pass the diaphragm, while H₂ leaves the cell at the cathode OH⁻ react at the anode and form oxygen (O₂) and water (H₂O), releasing electrons 	 Water is supplied at the anode, where it is split into hydrogen protons (H⁺) and O₂ The H⁺ pass through the membrane to the cathode, and produce H₂ when H⁺ reacts with electrons 	 Water vapor is fed into the cathode and is reduced to form H₂ and oxygen ion (O²⁻) H₂ leaves the cell at the cathode, the electrolyte enables the transport of O²⁻ to the anode At the anode, oxidation takes place and O²⁻ absorb electrons and to form O₂ 	 H₂O soaks the anion exchange membrane and migrates from the anode to the cathode, where it is split into H₂ and OH⁻ H₂ gas leaves the cell at the cathode, while OH⁻ pass through to the anode thereby resulting in water and oxygen when OH⁻ reacts with electrons
Technology Readiness	Matured	Commercialized	Demonstration	Demonstration ⁽²⁾
Global Installed Capacity ⁽¹⁾	~65% (oldest technology to date)	~35%	<1%	<1%

Source: IEA, United States Department of Energy ("DOE"), and publicly available information.

1. Based on estimates from IEA as of 2023.

2. Only two participants, including Cipher Neutron, in the manufacturing of commercial AEM electrolysers.

Breaking Down Key Performance Indicators Across Electrolyser Technologies High Efficiency and Low-Cost: AEM Electrolysers Offer Best of Both Worlds

Cipher Neutron

	Alkaline Electrolyser	PEM Electrolyser	Solid Oxide Electrolyser Cell	AEM Electrolyser
Efficiency (HHV values ⁽¹⁾)	~65%	~80% - ~90%	~85%	90%+ High efficiency, especially at low current densities
Current Density	0.2-0.5 A/cm ²	1.0-2.0 A/cm ²	0.3-1.0 A/cm ²	1.0 – 2.0 A/cm ²
Operating Temperature	60 - 80°C	50 - 80°C	700 - 1,000°C	60 - 80°C
Operating Pressure	30 bar	70 bar	1 - 25 bar	30 bar
Cost	OpEx: High (low pressure H ₂ production) CapEx: Low (mature technology with low- cost materials)	OpEx: High (due to de-pressurization issues) CapEx: High (due to use of PGMs ⁽²⁾)	OpEx: High (due to higher operating temperatures) CapEx: High (due to use of REMs ⁽²⁾)	OpEx: Low (high pressure eliminates the need for secondary compressors) CapEx: Low (compact design requiring small footprint)
Material Usage & Supply Chain	Low supply chain constraints as they utilize abundant materials (nickel, steel, etc.) with some precious metals	Heavily depend on PGMs, thus leading to supply chain constraints as >80% PGMs are in South Africa	Dependent on REMs, leading to supply chain constraints as REMs are concentrated in few select countries	Locally sourced materials, resulting in short lead times
Environmental Impact	Low to moderate impact (use of caustic materials like KOH)	Higher environmental impact (PFAS ⁽³⁾ and precious metal usage)	High environmental impact due to high temperatures & materials used	Lower environmental impact (Iridium free and PFAS-free)
Durability	40,000 – 80,000 hours	30,000 – 60,000 hours	10,000 – 20,000 hours (Limited by high temperature)	30,000 – 50,000 hours
Lifespan	Longer life span with low maintenance	Short lifespan with high maintenance	Short lifespan with high maintenance	Longer life span with low maintenance
Start-up Time	Slow startup (Hours, depending on size)	Quick startup (Minutes)	Very slow startup (Hours to reach operating temp.)	Quick startup (Minutes)
Flexibility & Scalability	Less flexible, better for steady-state operations	Highly flexible, good for dynamic operations	Low flexibility, primarily suited for industrial-scale applications	Highly flexible, ideal for fluctuating renewable energy inputs
System Integration	Limited integration with fluctuating power sources	Excellent integration with renewable energy sources	Best integrated into industrial processes with high waste heat	Excellent integration with renewable energy sources

Source: IEA, United States Department of Energy ("DOE"), and publicly available information.

1. HHV refers to higher heating value.

2. PGMs refer to platinum group metals such as platinum, palladium, rhodium, ruthenium, iridium, and osmium, REMs refer to rare-earth metals such as zirconium, lanthanum, yttrium, and scandium.

3. PFAS refers to polyfluoroalkyl substances.

Developing North America's First AEM Electrolyser

Unrivaled Efficiency and Performance Across all Electrolyser Technologies



Highly Efficient

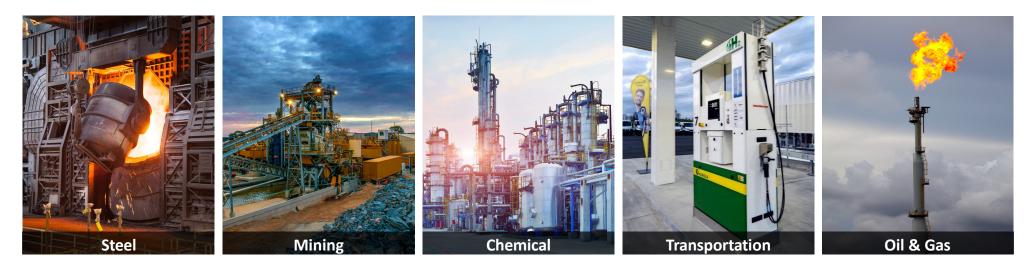
>90% stack efficiency versus industry standard of ~80% (HHV values)

Highly Ampacity

High current density (>1 amps/cm²) enables more H_2 production per unit area

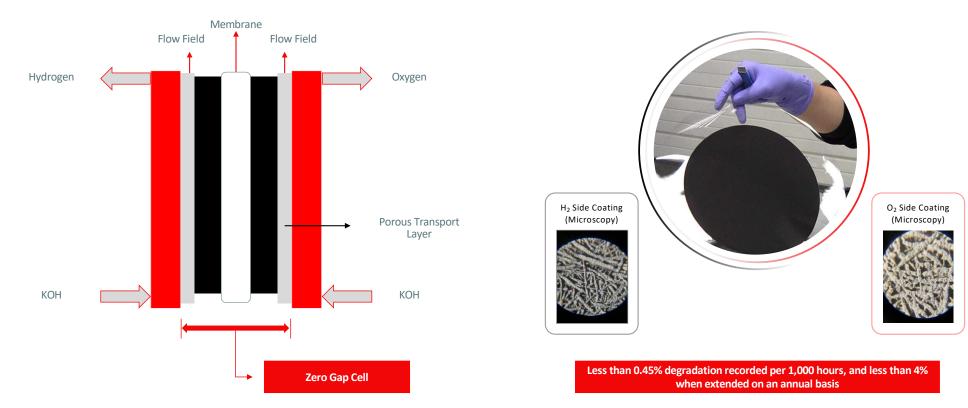
Highly Pressure

Eliminates the need for expensive secondary compressors up to 30 bars



Cipher Neutron's AEM Technology Differentiation

Proprietary Technology and High-Quality Components Deliver Exceptional Performance

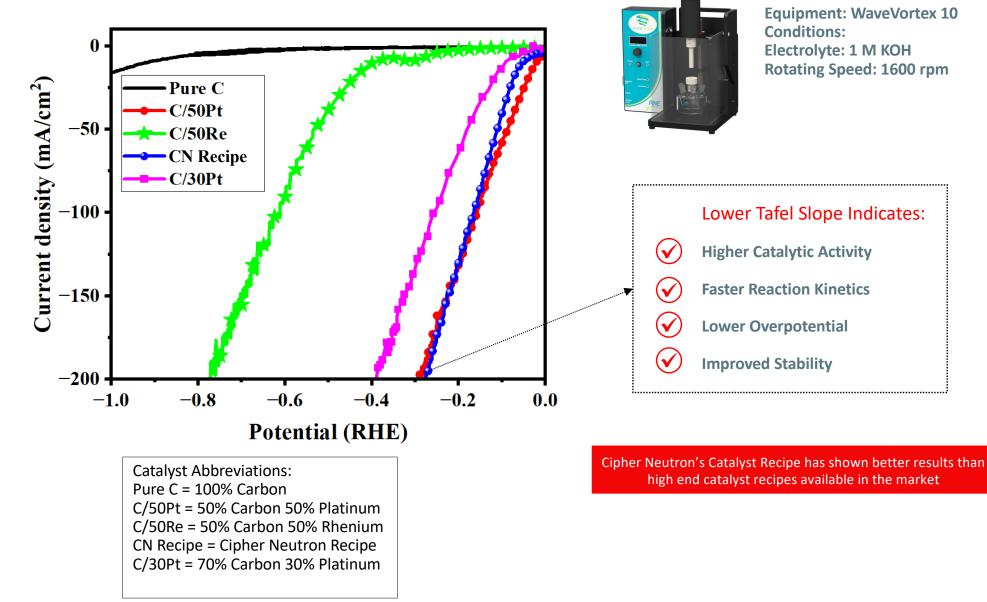


ZERO GAP CELL TECHNOLOGY

PROPRIETARY INK RECIPE AND COATING MECHANISM

Enhanced Efficiency: Reduced ion transfer resistance allows for more efficient ion conduction
 Lower Ohmic Losses: Shorter ion travel distance between anode and cathode improves cell performance
 Enhanced Gas Separation: Prevents gas mixing, improving safety and purity
 Improved Durability: Consistency in performance with minimized degradation

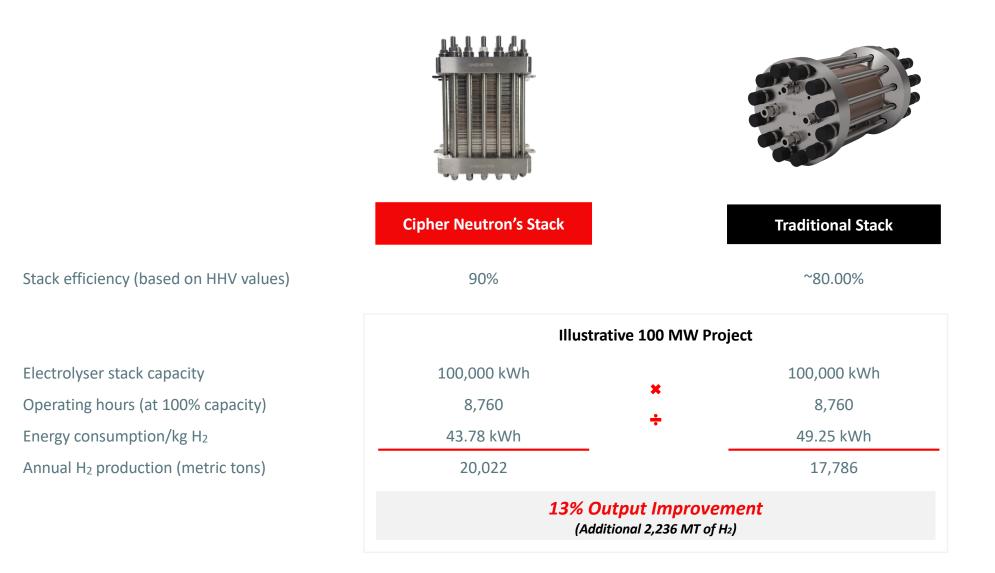
Cipher Neutron's AEM Technology Differentiation Proprietary Catalyst Recipe and Coating Method Delivers Exceptional Performance



ELECTROCHEMICAL DATA (ROTATING DISC ELECTRODE)

Why Electrolyser Efficiency Maters

Maximizing Output, Minimizing Costs: The Game-changing Impact of Superior Electrolyser Efficiency



Cipher Neutron's AEM Technology Delivers Consistent Performance and Reliability, from Pilot Projects to Large Industrial Applications, Making it Ideal for Scaling Hydrogen Production

Levelized Cost of Hydrogen (LCOH)

Cipher Neutron provides one of the most cost-effective solutions for hydrogen production.

LCOH provides a **standardized measure** of how much it costs to produce one unit (usually 1 kg) of hydrogen over the lifetime of an electrolyser project.

$LCOH = \sum (I+M+E+O) / \sum H$

- Where:
- I = Initial capital cost (CapEx)
- M = Annual maintenance and operation costs (OpEx)
- **E** = Electricity costs for hydrogen production
- **O** = Other operational expenses
- **H** = Annual hydrogen production (kg/year)

	Cipher Neutron's Electrolyser	Traditional Electrolyser	
Initial capital cost (CapEx) for 1 MW	1,000,000	1,350,000 ⁽¹⁾	
Average Annual maintenance/operation costs (OpEx)	3% of CAPEX	3% of CAPEX	
Assumed Electricity costs for H ₂ production	\$ 0.05	\$ 0.05	
Annual hydrogen production (kg)	~160,000 ⁽²⁾	~145,500 ⁽³⁾	
Average Electrolyser Lifetime	5 years	5 years	
Levelized Cost of Hydrogen	\$ 3.94 /kg	\$ 4.81 /kg	
	Over 18% Improvement in ICOH		

Over 18% Improvement in LCOH

Note: All prices in CAD, unless mentioned otherwise.

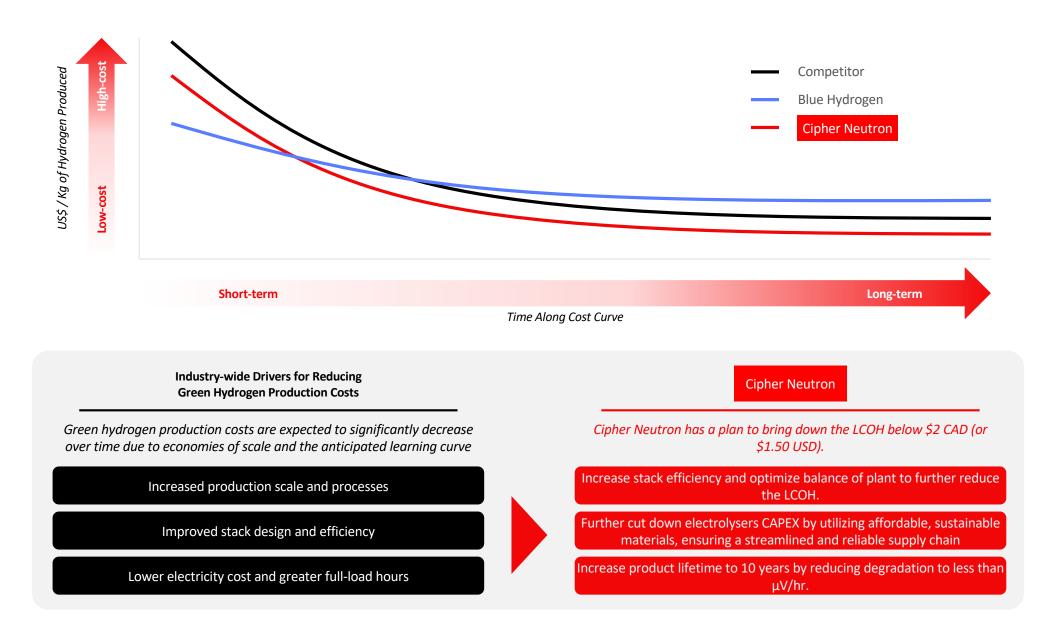
1. Average 1 MW PEM Electrolyser Cost.

2. Annual H2 production based on 50 kwh to produce 1 kg of H2 and 8000 hours of yearly operation. This is the stack consumption plus all other auxiliaries in the Balance of Plant.

3. Annual H2 Production based on 55 kwh to produce 1 kg of H2 and 8000 hours of yearly operation. This is the stack consumption plus all other auxiliaries in the Balance of Plant.

Unlocking Value Through Superior Cost Reduction

The Cipher Neutron Path to Affordable Green Hydrogen Through Efficiency, Scale, and Innovation



Introducing the World's First Patent-pending Reversible Fuel System Innovative Solution with Graphene, Expected to Revolutionize Hydrogen Storage and Usage



Dual-function system, produces green hydrogen (electrolyser) and generates clean electricity (fuel cell)

Graphene slurry enables safe and efficient hydrogen storage, reducing risks associated with highpressure systems

Seamless integration into both large-scale industrial applications and smaller residential energy setups

Superior energy density compared to conventional hydrogen storage, making it suitable for longer-term energy storage

Non-compressed hydrogen storage enhances safety, addressing key concerns in hydrogen infrastructure development

Targeted for Launch in Q4 2026



Cipher Neutron is Production Ready

With Plans in Place to Increase Capacity 6x to Capture Future Demand





100 MW annual AEM electrolyser production capacity



Semi-automated production line



Scalable manufacturing facility in Toronto, Ontario



Dedicated R&D facility driving innovation



Production ready and operational today!





Capacity increase of 6x to 600 MW annually



State-of-the-art tools and machinery



Highly scalable facility designed for flexibility across project sizes



Easy access to logistics and distribution infrastructure and proximity to global supply chain infrastructure



Capable to produce non-standard, custom-designed items essential for AEM electrolyser production

Established Competitive Moat

Cipher Neutron Holds a Significant Advantage in the Electrolyser Market



Intellectual Property

Patent portfolio creates a significant competitive advantage



Proprietary Expertise Technical knowledge from significant investment in R&D



Partnerships

Exclusive partnerships and collaborations with leading industry players and universities



First Mover Advantage

First Company to commercialize AEM electrolysers in North America

6 Patents Granted and Pending

5+ Years of R&D Advantage

10+ Partnerships and Collaborations

> **1**st AEM Electrolyser in North America

PATENT PORTFOLIO



Graphene based hydrogen storage and delivery system

 Storage of H₂ in a slurry that results in enhanced safety in H₂ storage and transportation



Polymer acid electrolyte-based RFC with serpentine micro flow channels

Advancements in energy storage and electricity generation

HT-PEM fuel cell with heat pipe-based cooling

Enhanced thermal management in fuel cells

Anion exchange membrane electrolyser

 Unique AEM electrolyser and balance of plant design, enhancing the efficiency and CAPEX reduction

Highly efficient anion exchange membrane electrolyser with circular end plates and flow channels

Optimized flow rates to enhance the electrolyser efficiency

A hybrid solar chimney with wind turbine for enhanced efficiency

Integration of renewable sources

Vast Market Opportunity Key Regions with Supportive Regulatory Environments

- Demand for green hydrogen is projected to grow substantially as nations strive to achieve net-zero emissions by 2050
 - Electrolysers play a pivotal role in producing low-emission hydrogen using renewable or nuclear energy sources
- Global electrolysis capacity currently stands at ~1 GW with ~12 GW of capacity having reached final investment decision
 - However, to align with the net-zero emissions by 2050 goal, over 550 GW of electrolysis capacity will be required by 2030
- Governments are expanding supportive regulatory frameworks and finalizing their hydrogen strategies to scale hydrogen production and distribution globally

REGULATORY SUPPORT FOR HYDROGEN GROWTH

* 2023-2024 Budget

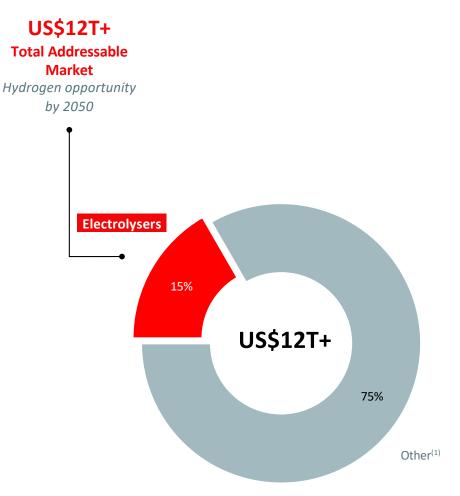
- The Government of Canada announced:
 - A Clean Hydrogen Investment Tax Credit program, available across a range of clean hydrogen pathways
 - A contract for difference program to help de-risk major hydrogen supply projects

Federal Funding

- Inflation Reduction Act ("IRA") and U.S. Department of Energy funding
- Provides major funding across the hydrogen value chain that state governments are building upon via direct funding, low carbon fuel regulation support, and 45V hydrogen production tax credit

Source: Hydrogen Council, Equity Research, IEA, Government of Canada, and publicly available information. Note: All figures are C\$ millions, unless otherwise specified.

MARKET OPPORTUNITY FOR ELECTROLYSERS

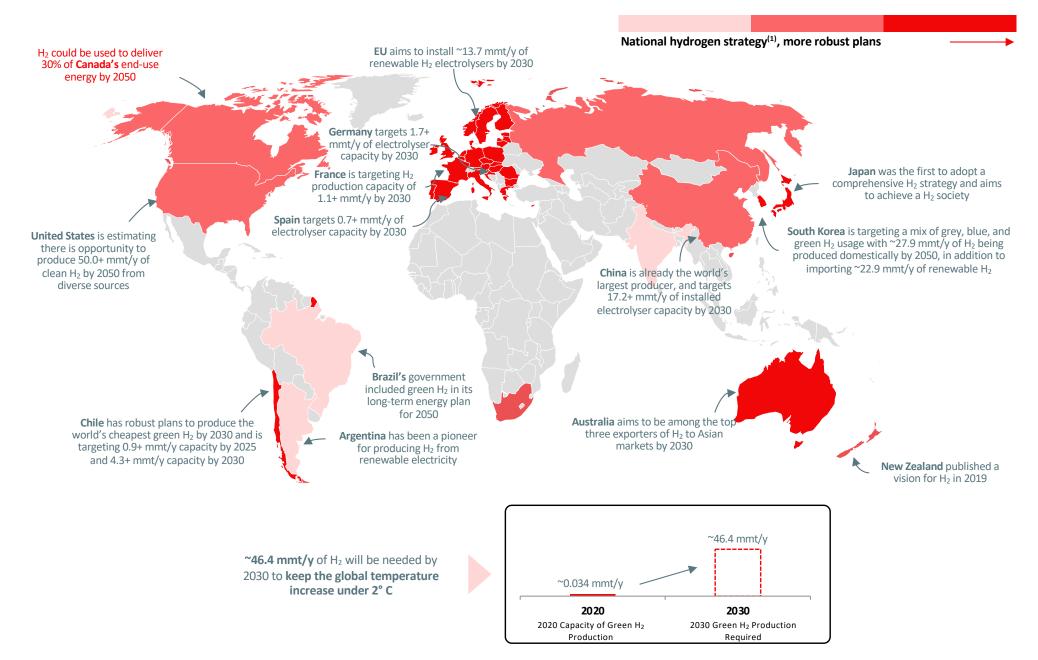


Electrolysers expected to represent ~15% of the addressable hydrogen market

US\$1.8T+ Serviceable Addressable Market

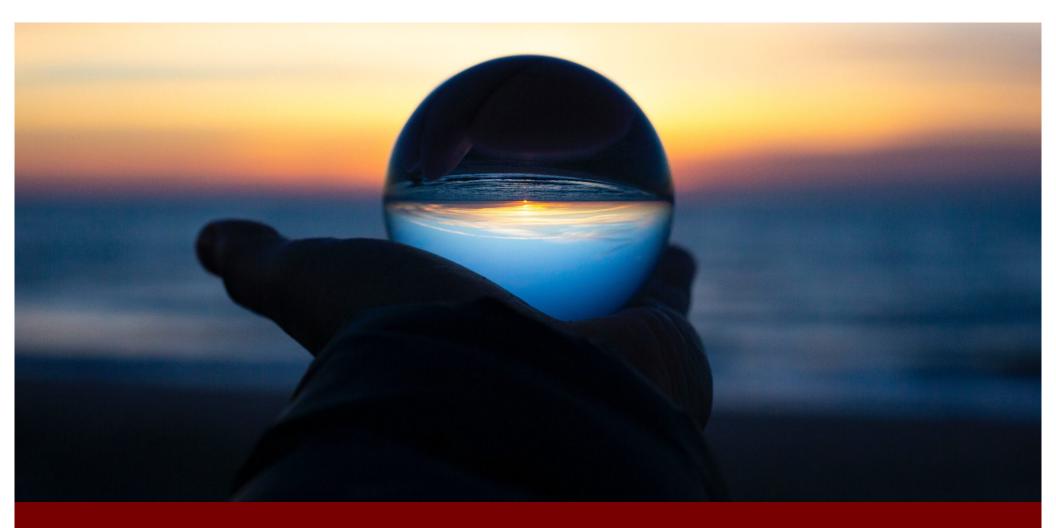
Significant Commitment to Green Hydrogen Globally

Support for Hydrogen on a Global Scale Increases Adoption Rate and Integration



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

1. Where applicable, GW to mmt/y conversion calculated using the low heating value of hydrogen (33.33 kWh per kg H₂) adjusted with a conversion efficiency of ~68% and ~98% uptime.



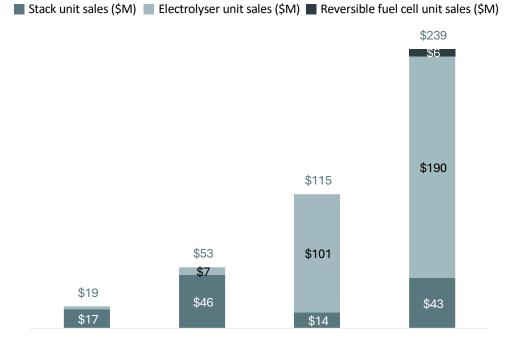
SECTION 3. Financial Overview

Strong Global Pipeline

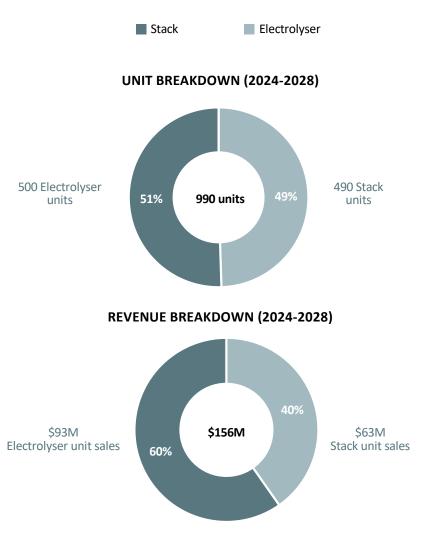
Current Pipeline Supported by Ongoing Discussions for a Low-Cost Technology Solution

- Cipher Neutron has a strong pipeline that is underpinned by more than 100 discussions with current customers, select partners, and potential clients globally
- Pipeline reflects announced purchase orders, quotes, MOUs, LOIs and collaboration agreements with hydrogen industry participants

TOTAL REVENUE AND UNIT BREAKDOWN



Unit Sales by Type	2025	2026	2027	2028
Stack	134	347	260	700
Electrolyser	41	122	569	1,169
Reversible Fuel Cell	-	-	-	150
Total	174	469	829	2,019



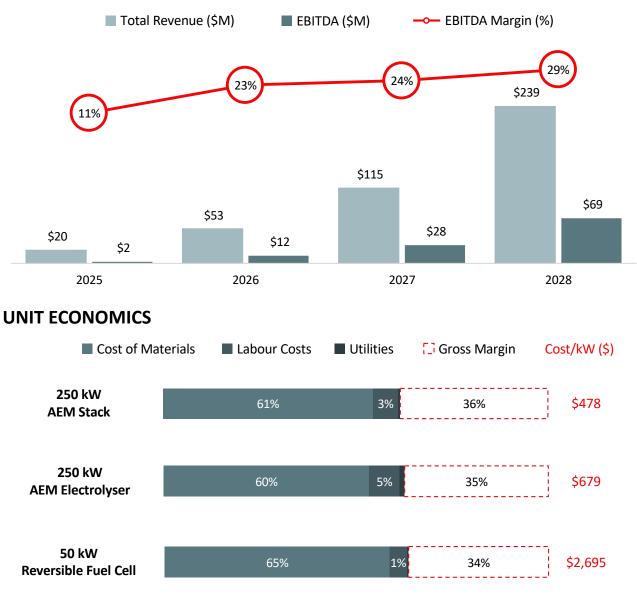
CURRENT SALES PIPELINE BREAKDOWN

Robust Financial Profile

Cipher Neutron is Already a Revenue Generating Company

- Forecast is based on the Company's sales pipeline, assessing client requirements on a case-by-case basis
- Accelerating sales growth largely driven by discussions with over 100 Multi-megawatt and Gigawatt green hydrogen project developers, each indicating their plans to accelerate the ramp up of electrolyser installations in the near term
 - Favourable pricing, ~30% discount to competitive PEM electrolyser units, supporting product demand
- Margin expansion largely driven by superior product gross margin (30+%) resulting form:
 - Innovative Precious Metal-Free Technology: Eliminates reliance on costly platinum and iridium
 - Efficient and Compact Design: Streamlined system minimizes complexity and materials required for manufacture
- General cost inflation of 3% is applied throughout the forecast with 4% applied to salaries

TOTAL REVENUE AND EBITDA MARGIN



Attractive Financial Profile Supported by an Innovative Product Offering that's Simple, Sustainable, and Precious Metal-Free Resulting in Significant Cost Savings for the End User



SECTION 4. Appendix

Recent Partnership Building Out SFU's Clean Hydrogen Hub

- In July 2024, Cipher Neutron was awarded an advanced contract award notification to design and construct 2 electrolyser stacks with a capacity of 250 kW for Simon Fraser University ("SFU")
- The project is expected to begin in Q4 2024
- The project will investigate and validate the AEM technology at the 250 kW - 1 MW scale
- As part of the partnership, Cipher Neutron and SFU intend to explore advanced AEM electrolyser technologies to enable scaling of low-cost green hydrogen production



"As a leading research university and trusted innovation partner, Simon Fraser University is excited to collaborate with Cipher Neutron to advance the scalability of AEM electrolysers with this innovative 250 kW single-stack project. This initiative will help us advance the Canadian innovation ecosystem while developing the capacity needed to reach net-zero target"

- Laura Sloboda, Operations Director, Clean Hydrogen Hub of SFU

Status of Current Funding Applications

Cipher Neutron Secures Government Non-Dilutive Funding to Maximize Strategic Opportunities with Government Support

Funding Program	Partner	Funding Amount (\$M)	Status
	UNIVERSITY OF ALBERTA	\$0.5	Approved
Hydrogen Innovation Fund	Western	\$0.5	Approved
Total Approved		~\$1.0	
👾 FedDev Ontario	n.a	\$2.0	In Progress
New York Congress Direct Funding	Ally Power	\$13.5	In Progress (Approved by the Senator of New York, currently moved to the next stage)
	UNIVERSITY OF ALBERTA	\$0.1	In Progress
	OF ALBERTA	\$2.0	Application Pending
Total Pending		~\$17.6	

Disclaimer

Forward-Looking Statements:

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