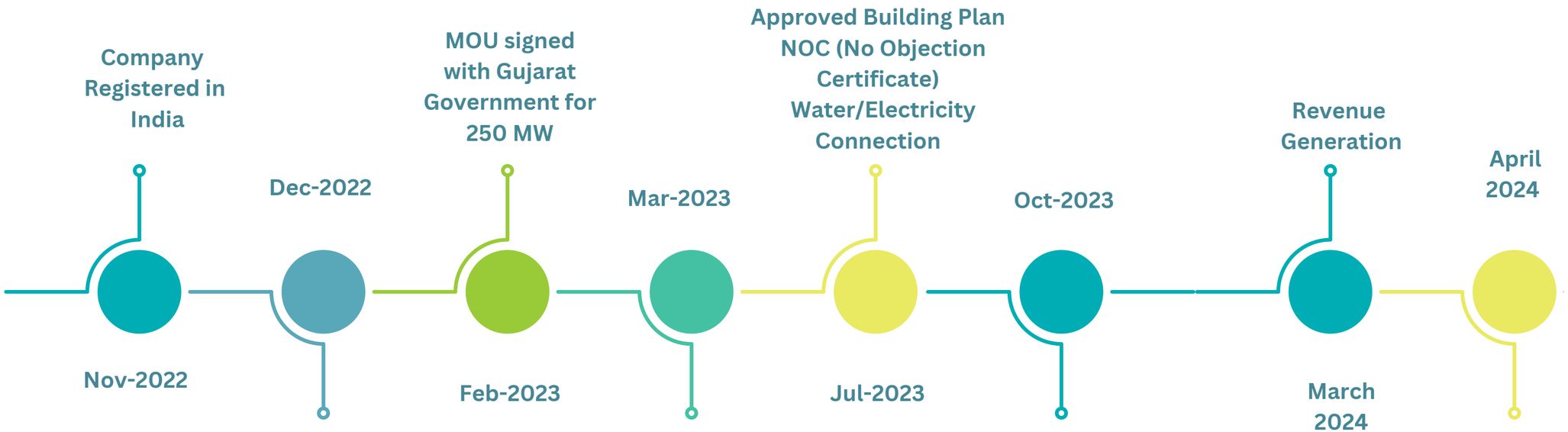
GREENZO ENERGY INDIA LIMITED
ISO 9001-14001

The Green Hydrogen Story

Our Journey



Efficiency: 70% +

Hydrogen Gas Purity: 99.999%

Greenzo Leaders

A team of technocrats with decades of experience in major organizations like NTPC, as well as young professionals from institutes like IIT and NIT.

Mr. Sandeep Agarwal

Founder & Managing Director

Sandeep Agarwal, an IIT Roorkee graduate with B-tech and M-tech degrees, has over 25 years of expertise across renewable energy projects. A member of FICCI, he leads organizations globally, earning recognition for his dedication to advancing renewable energy initiatives.

Types of Electrolyser

Integrator

Buy Stacks from China

Made BOP in India

Importer

Importer stacks and H2 separation & purification

Electrical and other equipment purchase from India

Manufacturer

Making of stacks & BOP on others' technology

Dependency of raw materials from abroad such as membrane, cell. Nickel mesh, etc.

Greenzo Energy is the only indigenous Manufacturer of electrolyser + BOP

Greenzo Energy India Limited has launched India’s first indigenous green hydrogen alkaline electrolyzer equipped with robotic solutions

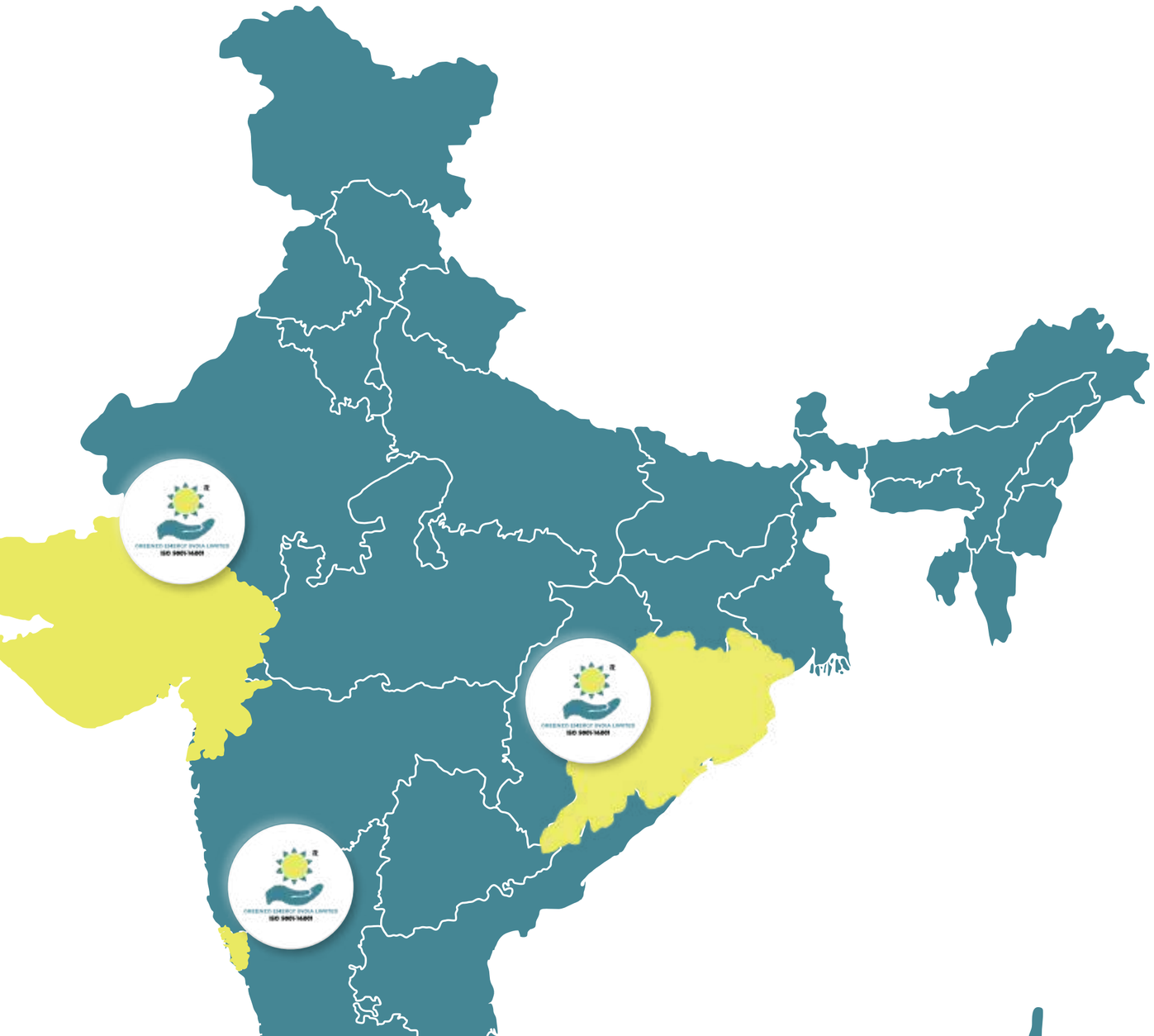
to get error less production, it is supporting India’s broader hydrogen value chain to emerge as a global leader in decarbonizing the economy.

250 MW 01.

Of electrolyzers produced per year in our Ahmedabad facility

2135 kg 02.

Of H2 produced per day using one 5MW electrolyzer system



Made In India.

Made for India.

- No dependency on noble metals making hydrogen cost effective
- Designed to cater to India’s unique environmental needs, unlike foreign manufacturers, whose designs often cater to narrow temperature ranges and limited durability, these can function effectively from -20°C to 60°C and offering a longer lifespan of 20 years
- Only stack manufacturer in India
- Only Indian company with the capability to manufacture 100% Made-In-India electrolyzers at scale
- Recognized as a ‘Make In India’ electrolyzer manufacturer which stands to benefit as a preferred partner for PSUs under directives issued by the Department for Promotion of Industry and Internal Trade.

Presence in States that are Key Enablers in India’s Green Hydrogen Production

Existing 250 MW Electrolyzer Production Facility at Gujarat

Two plants in Goa and Odisha by 2030

Leading the Energy Transition

1250 Crore Order Book in FY24

1 established subsidiary in London

250+ committed talent

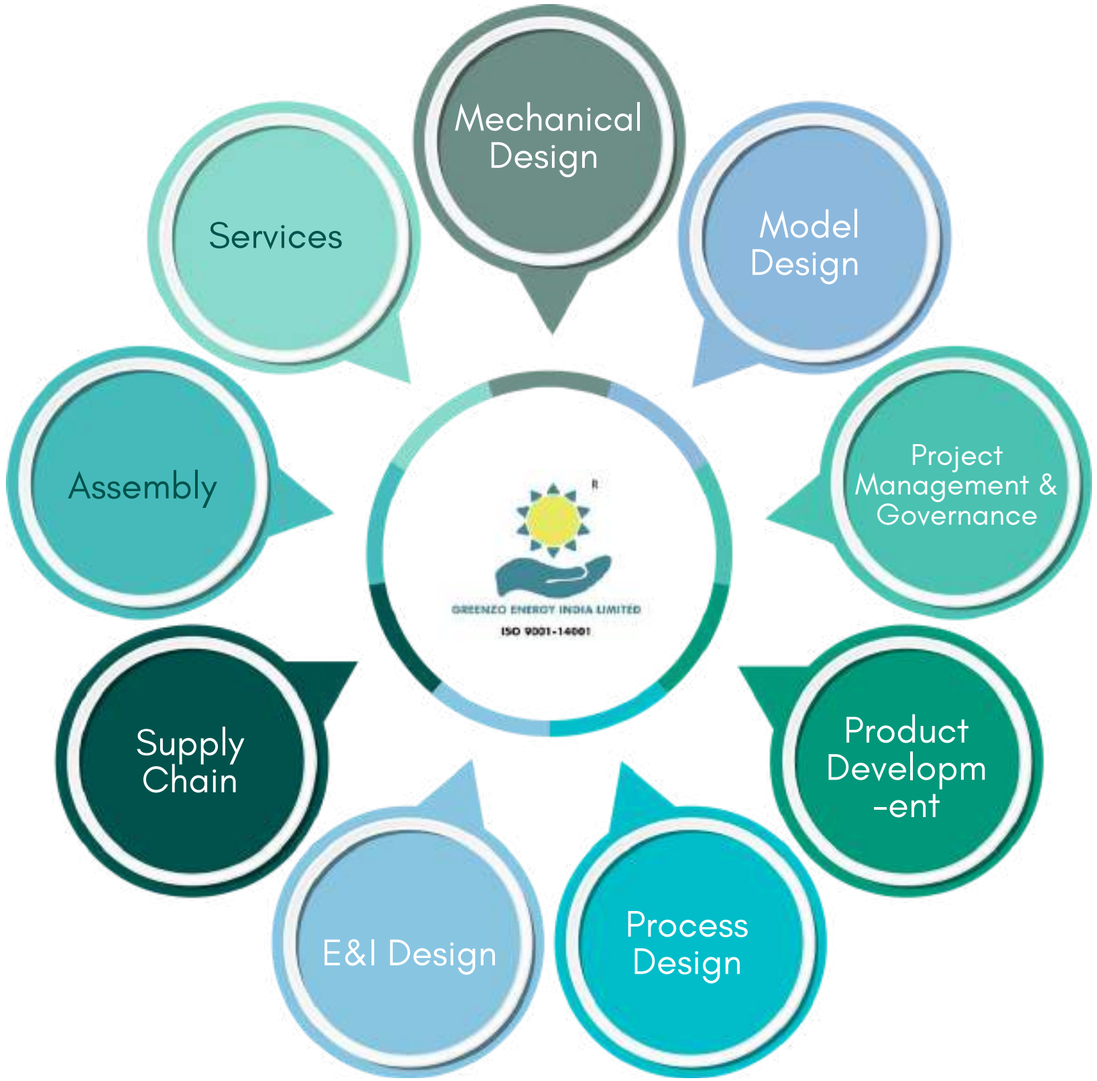
25 + years of experience at Group level

Long term services agreements with locally present teams in India

Present in 10+ countries

A full suite of after sale services and technical support

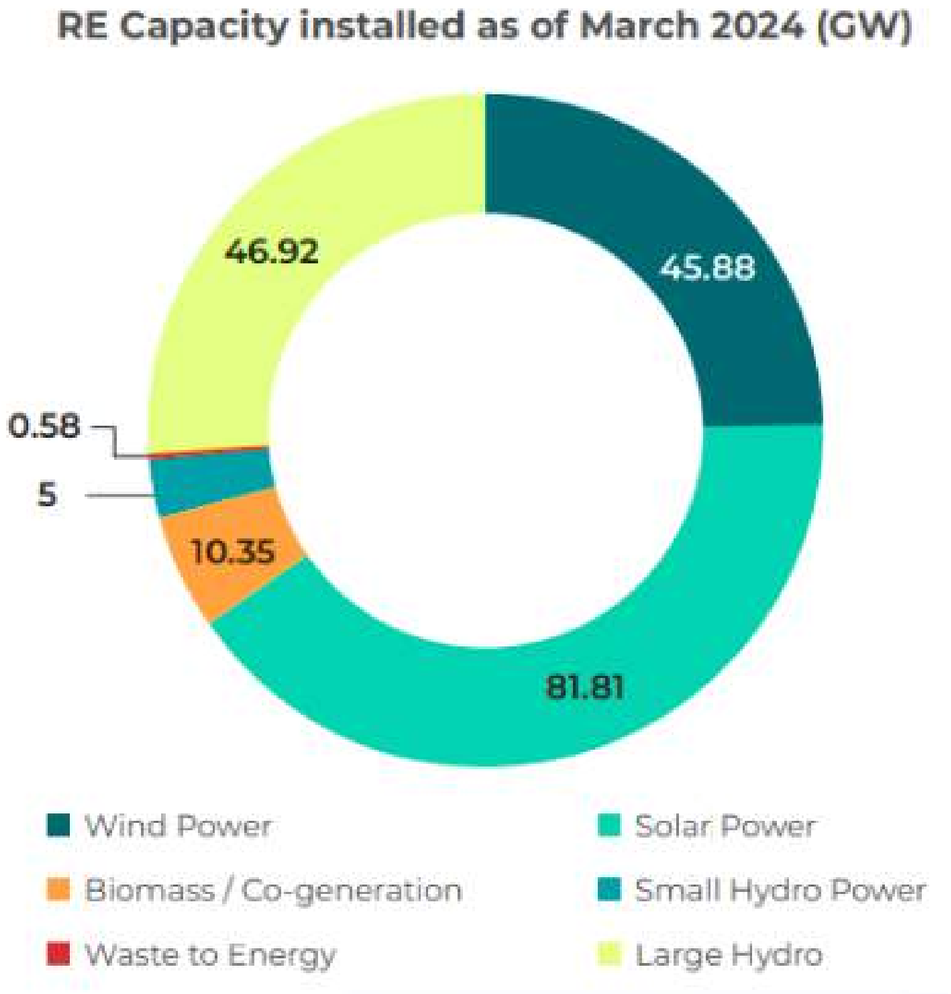
Fully Repairable within India



Greenzo Energy's Turnkey Solutions

Greenzo operates across the renewable energy value chain offering engineering, procurement and construction (EPC) services in solar and hydrogen projects along with electrolyzer production and developing scalable green hydrogen solutions.

- *Highlights for FY 2023-24*
- *Electrolyzer Production: Installed to 250 MW by January 2025*
- *Green Hydrogen Projects: Multiple projects with a capacity of 125 MW*
- *Committed 250 MW of solar projects across India*



Realities of Renewable Energy Systems'

Globally, India stands 4th in Renewable Energy Installed capacity (including Large Hydro), 4th in Wind Power capacity & 5th in Solar Power capacity (as per REN21 Renewables 2022 Global Status Report). The country has set an enhanced target of 500 GW of non-fossil fuel-based energy by 2030, at the COP26. This has been a key pledge under the Panchamrit and is the world’s largest expansion plan in Renewable Energy. India’s installed non-fossil fuel capacity has increased to 396% in the last 9 years.

The Hydrogen Opportunity

Large-scale potential markets for hydrogen

Accelerated focus on industrial hydrogen applications:

Identified markets with a high electrolysis potential exceeding 2,000 GW include:

Strong momentum within mobility, especially within Heavy-Duty Vehicles (HDV):

The electrolysis potential in this area also exceeds 2,000 GW, with notable examples such as:

- Ammonia production
- Refineries
- Steel manufacturing

Time for scaling up is now

Market Opportunity

Hydrogen

- 340 Bn green hydrogen market in India by 2050
- 5 Mn Tons per year planned manufacturing of green hydrogen by 2030 in India
- 10% of global demand by 2050 will be from India

Solar

- India targeting 280 GW of solar installations by 2030
- CAGR of over 52% from 2023 to 2028,
- Up to $792.5 billion in investments during 2023-28

Greenzo Today: Hydrogen

- Electrolyzer Production: Installed 250 MW by January 2025 which will expand to 2 GW by 2030
- Green Hydrogen Projects: Multiple projects with a capacity of 125 MW
- Secured order of 58 MW of of electrolyzers at over INR 1250 crore
- Developed and built a prototype

Greenzo Today: Solar

- Committed 250 MW of solar projects

“India is likely to stick to alkaline electrolysers because they have lower capital costs compared to PEM electrolysis and require fewer rare raw materials, despite a few drawbacks like limited operational flexibility (although this is improving), a larger area footprint, and low output pressure. Moreover, it is the most mature technology, being used in the fertiliser and chlorine industries for decades.”
— UKIBC analysis

Greenzo provides you with the heart of the electrolysis process with our modular alkaline electrolyzer system.


No use of precious metals


Less corrosion

AI and IoT based Systems


Waste Heat recovery


Enhanced safety features


Bi-polar design for enhanced adaptability


Water Management Systems

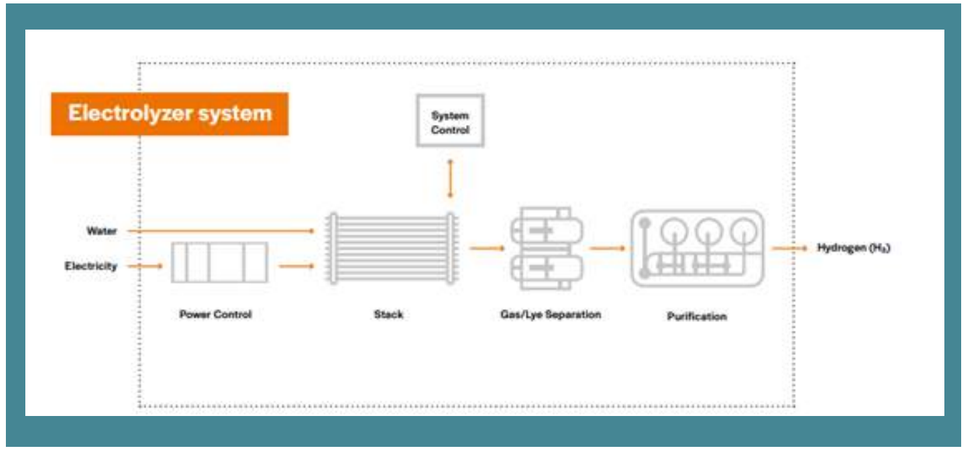

Integrated with renewable energy sources (solar, wind)


Wide Temperature range


Longer lifespan

Pressurized alkaline technology (32 bar) with compact footprint

The Hydrogen Generation Plant



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

Electrolyzers Operating at

0.5 MW, 1 MW, 2MW and 5MW

Stacks from

100 Nm3/hr

to

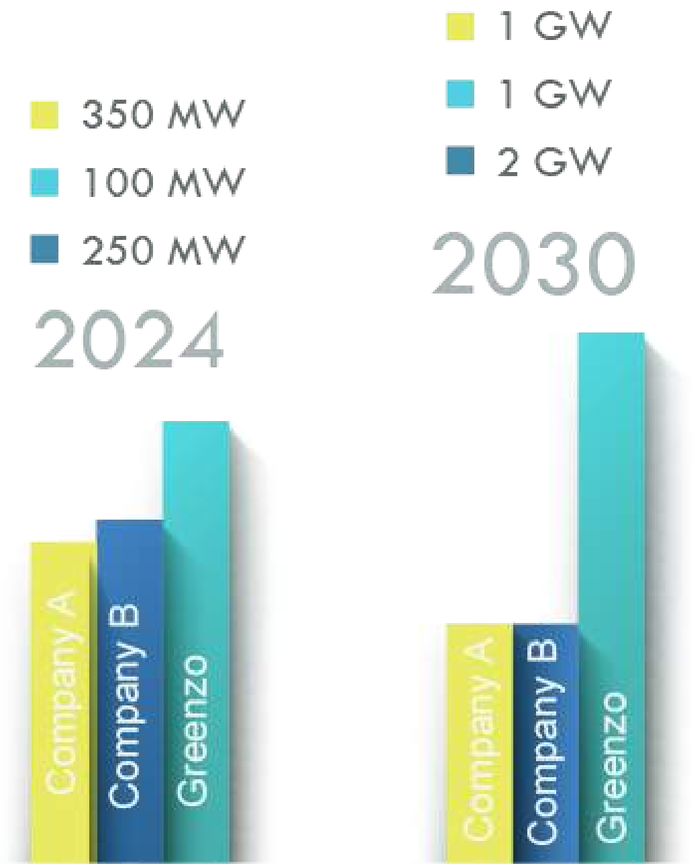
1000 Nm3/hr

Competitive Landscape

Particulars	Alkaline Electrolyzer competitors	PEM Electrolyzer competitors	Greenzo Energy
High Current Density Operation	✗	✗	✓
Small Foorprint	✗	✓	✓
High Efficiency	✓	✓	✓
High Gas Purity	✗	✓	✓
Operating Pressure	✗	✓	✓
Differential Operating Pressure	✗	✗	✓
System Response/ Ramp Time	✗	✓	✓
Stand By	✗	✓	✓
High Pressure	✓	✓	✓
Customizable for different end use application	✗	✗	✓
Al and IoT based SCADA systems	✗	✗	✓

Making India’s Green Hydrogen

Affordable, Accessible and Scalable



Company	Pressure Bar	No. of Compressors required
Green Hydrogen Systems	28	2
Cummins	10	2
Verde Hydrogen	16	2
Greenzo	30	1

By producing hydrogen at 30 bar, the electrolyzer eliminates the need for additional compressors saving **energy costs, reducing equipment needs,** and **enhancing overall**

System Efficiency

Lower values indicate higher efficiency, as less energy is used to produce the same amount of hydrogen. The electrolyzer would consume 42-44 kWhr of electricity to split water into hydrogen and oxygen, compared with 50-55 kWhr of a typical alkaline electrolyzer.

Energy Consumption

Company	Energy Consumption (kWh/Nm3)
Green Hydrogen Systems	4.5
Cummins	4.8
Verde Hydrogen	–
Greenzo	4.4

Partnerships enable Green HydrogenLeadership

Greenzo x RBM

- Aims to establish green hydrogen facilities with a combined capacity of 15 MW across Jamnagar, Kutch, and Bhuj
- Targeting refineries where reducing sulfur content and carbon footprint is vital
- The project is slated to commence in the fourth quarter of FY 2024-25 and will be implemented in phases over an 18-month period.
- Backed by an investment of ₹ 200 crore by RBM

Greenzo x BHEL

- Implemented at the 1,320 megawatt (MW) Ennore SEZ Supercritical Thermal Power Plant (TPP), owned by the Tamil Nadu Generation and Distribution Corporation (TANGEDCO)
- Bharat Heavy Electricals (BHEL) is a project engineering management company assigned to this project
- Clean transition in the power generation sector

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Greenzo x Felix Industries

- Signed an MoU to collaborate on technology development and execution for green hydrogen and solar projects
- Felix Industries plans to construct facilities near steel plants or current clients to provide power, hydrogen and water solutions via a modular system
- Greenzo Energy will serve as a consultant and contractor for the development of these projects
- The project will require an investment of Rs. 100-150 crores

Greenzo x API Power

- Will set up green hydrogen capacities totalling 50 megawatt (MW) at various locations in Nepal within a span of three years
- API will be investing Rs. 1000 crore in the project

Partnerships enable Green HydrogenLeadership

Greenzo x Kathmandu University

- MOU for collaboration to explore joint opportunities for research, innovations, pilot projects, and commercial ventures related to Green hydrogen production and its value chain development in Nepal and the Region.

Greenzo x Renew Gen Resources Nepal Pvt Ltd

- MoU for upto 5MW green hydrogen production works in Nepal and UK

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Greenzo x Trojan Energy

- Signed MoU with Trojan Energy, the on-street electric vehicle charging specialist, for a 5MW Green Hydrogen Plant at Vadnagar, Gujarat

Greenzo x Mac RK

- Joint Venture with Mac RK for manufacturing of fabricated metal products for electrolyzers

Key Operational Highlights for FY23-24

1. *Secured Green Hydrogen Project at Ennore Supercritical Thermal Power Plant*
2. *Signed MoU with RBM Infracon, to set up 15 MW of green hydrogen projects in Gujarat*
3. *Received 500 kW Solar Project Integrated with a 170 kW Green Hydrogen Plant and 50 kW fuel cell project at Gujarat from Felix Industries*
4. *Received 5.95 Crore Letter of Credit from Durga Steel in Nepal for a 50 Crore project*

Marquee Clients and Sustainability Strategy

Quality Assurance:

ISO 45001:2018

ISO 9001:2015

ISO 14001:2015

Marquee Clients:

Cummins

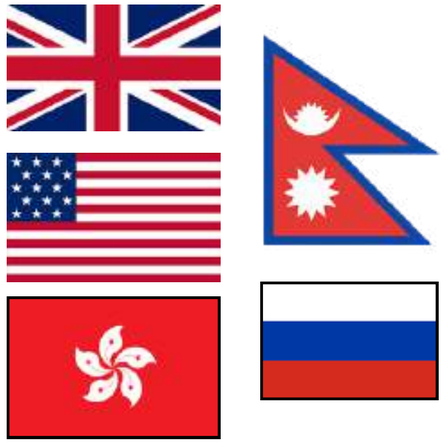
FIMER

HOERBIGER

ABB

ProteumEnergy

Global Projects



Construction Overview

Ground Breaking Ceremony by Union Home Minister Amit Shah at Sanand, Ahmedabad

Digital View of the Factory:

Focuses on skill development in the sunrise sector, it operates an engineering centre at the Gujarat plant that teaches about the hydrogen value chain and equips engineers with the R&D skills required in the field with 300-400 students being trained free of cost

Planned expansion in capacity upto 2 GW by 2030 at the facility

Greenzo's 2025 Priorities

our green hydrogen production capacity and solar projects

Scale up

Explore

new technologies like ammonia synthesis and carbon capture

to manufacture all critical components like membranes, gaskets and electrodes in-house

Backward Integration

Strengthen

our financial liquidity and operational efficiency with additional 50 Crore funding

- Market Expansion and technology integration
- For innovation and product development

FINANCIAL SNAPSHOTS

FY 2024 Snapshot	15 Cr Revenue	1Cr PAT	9% PAT Margin
FY 2025 Targets	100 Cr Revenue	30Cr PAT	30% PAT Margin
*FY 2026**	800 Cr Revenue	240 PAT	30% PAT Margin
*FY 2027**	1500 Cr Revenue	450Cr PAT	30% PAT Margin
*FY 2028**	2500 Cr Revenue	750Cr PAT	30% PAT Margin
*FY 2029**	5000Cr Revenue	1500Cr PAT	30% PAT Margin

Futuristic Projection*

The company's order book stood at INR 1400 Crore in October, 2024 with continued substantial growth

Orders from over 10 countries

20,000 sq meters manufacturing plant area in Gujarat

Successfully secured Rs. 65 Cr. in first phase funding

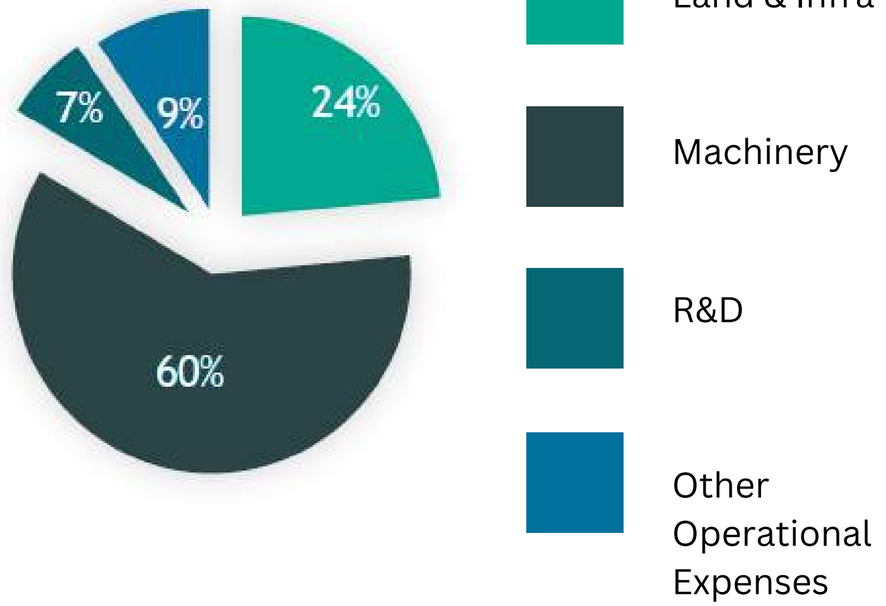
Funds Raised In Round 1

Promoter's Equity- 10 Cr.

Round1 Investor- 65 Crore

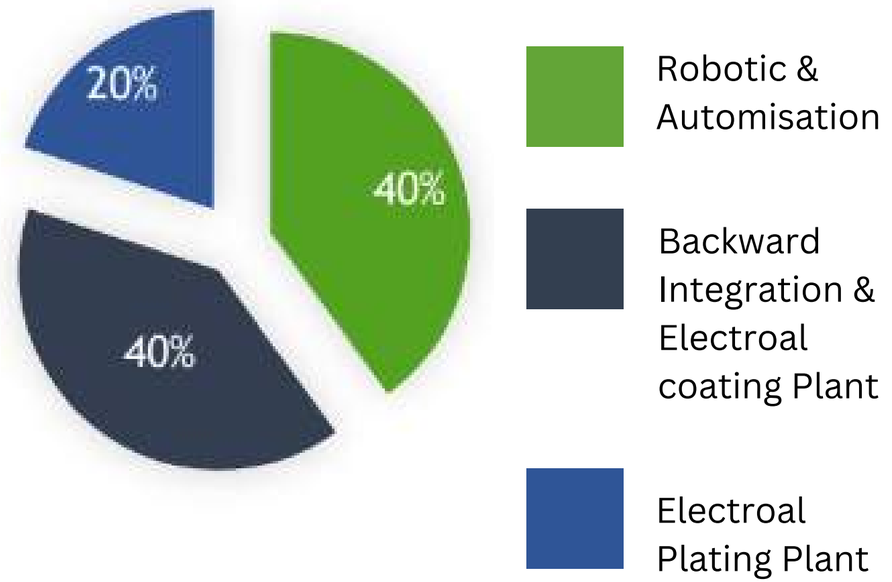
Pre-Money Valuation 430 crore

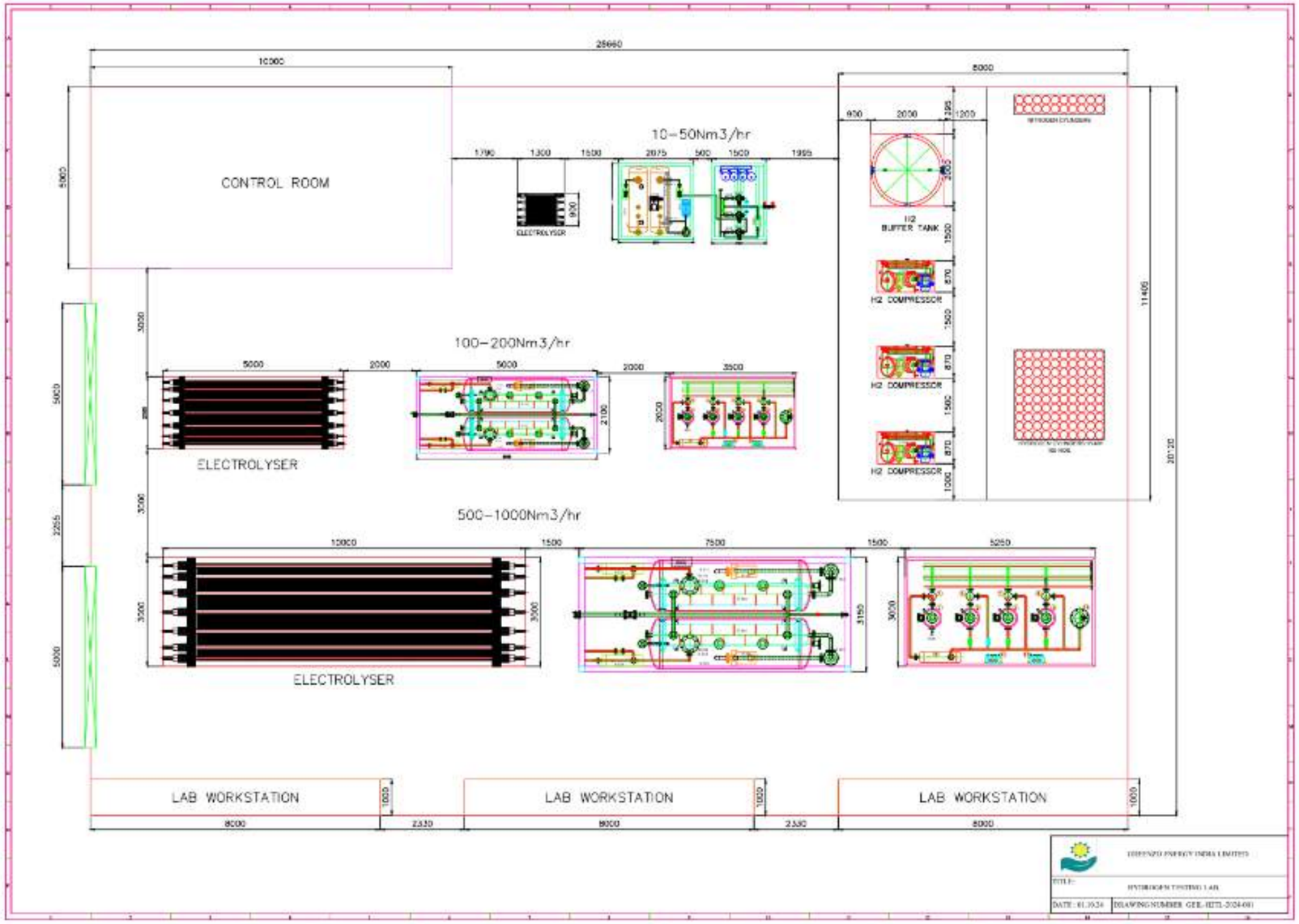
Utilization of fund

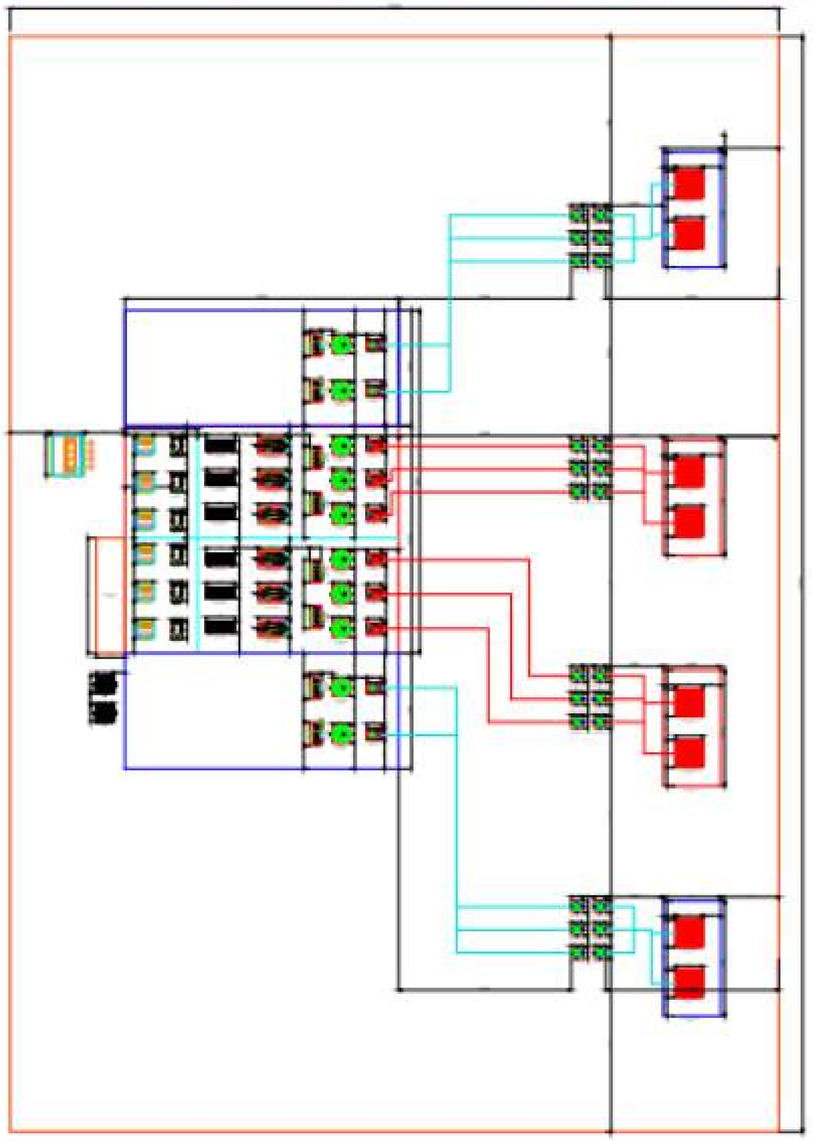


Funds to be Raised In Round 2

Funds Required -50 Cr.	Pre Money Valuation -1200 Cr.




CONTROL ROOM
10-50Nm3/hr
ELECTROLYSER
H2 BUFFER TANK
H2 COMPRESSOR
H2 COMPRESSOR
H2 COMPRESSOR
100-200Nm3/hr
ELECTROLYSER
500-1000Nm3/hr
ELECTROLYSER
LAB WORKSTATION
LAB WORKSTATION
LAB WORKSTATION



BILL OF QUANTITY (EXPANSION PLAN)		
SR.NO.	DESCRIPTION	QTY.
01	RECTIFIER PANEL WITH TRANSFORMER	01 NOS.
02	MCC PANEL	02 NOS.
03	PLC PANEL	03 NOS.
04	ELECTROLYSER STACK 1MW	02 NOS.
05	ELECTROLYSER STACK 0.5MW	01 NOS.
06	GAS SEPARATION UNIT 200Nm3	02 NOS.
07	GAS SEPARATION UNIT 100Nm3	01 NOS.
08	H2 PURIFICATION UNIT 500Nm3 (WORKING)	01 NOS.
09	H2 PURIFICATION UNIT 500Nm3 (STANDBY)	01 NOS.
10	H2 BUFFER TANK 1500 Nm3	03 NOS.
11	H2 COMPRESSOR	03 NOS.
12	H2 STORAGE TANK	06 NOS.
13	CASCADE FOR HYDROGEN CYLINDERS (1 CASCADE = 40EPOS)	02 NOS.
14	O2 PURIFICATION UNIT 500Nm3 (WORKING)	01 NOS.
15	O2 PURIFICATION UNIT 500Nm3 (STANDBY)	01 NOS.
16	O2 BUFFER TANK 1500 Nm3	02 NOS.
17	O2 COMPRESSOR	02 NOS.
18	O2 STORAGE TANK	04 NOS.
19	CASCADE FOR OXYGEN CYLINDERS (1 CASCADE = 40EPOS)	02 NOS.

BILL OF QUANTITY		
SR.NO.	DESCRIPTION	QTY.
01	TRANSFORMER 3.5mv*4Nos	01 NO.
02	RECTIFIER PANEL WITH TRANSFORMER	03 NOS.
03	MCC PANEL	02 NOS.
04	PLC PANEL	03 NOS.
05	ELECTROLYSER STACK 1MW	02 NOS.
06	ELECTROLYSER STACK 0.5MW	01 NOS.
07	GAS SEPARATION UNIT 200Nm3	02 NOS.
08	GAS SEPARATION UNIT 100Nm3	01 NOS.
09	H2 PURIFICATION UNIT 500Nm3 (WORKING)	01 NOS.
10	H2 PURIFICATION UNIT 500Nm3 (STANDBY)	01 NOS.
11	H2 BUFFER TANK 1500 Nm3	03 NOS.
12	H2 COMPRESSOR	03 NOS.
13	COOLING TOWER	01 NOS.
14	H2 STORAGE TANK	06 NOS.
15	CASCADE FOR HYDROGEN CYLINDERS (1 CASCADE = 40EPOS)	02 NOS.
16	O2 PURIFICATION UNIT 500Nm3 (WORKING)	01 NOS.
17	O2 PURIFICATION UNIT 500Nm3 (STANDBY)	01 NOS.
18	O2 BUFFER TANK 1500 Nm3	02 NOS.
19	O2 COMPRESSOR	02 NOS.
20	O2 STORAGE TANK	04 NOS.
21	CASCADE FOR OXYGEN CYLINDERS (1 CASCADE = 40EPOS)	02 NOS.

LAND REQUIREMENT : 2 ACRE
TOTAL AREA REQUIRED FOR 2.5 X 2MW HYDROGEN PROJECT : APPROX 100 X 133 MTRS.

CONTRACTOR:

GREENZO ENERGY INDIA LIMITED

BMS INFRASTRUCTURE JAM JODHPUR

TITLE: GA LAYOUT DRAWING OF HYDROGEN GENERATION PLANT - 2.5 X 2MW

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Cracking the Code

Greenzo's Green Hydrogen Revolution