

National Hydrogen Mission: Numerous Opportunities

6th Best Practices Study Tour and International Workshop on Agri PV Plants, RE Grid Integration and Green Hydrogen

Hotel Fairfield by Marriott, Jodhpur, 17th March 2023

Presented by



Heading of Economic Times on 18th March 2025

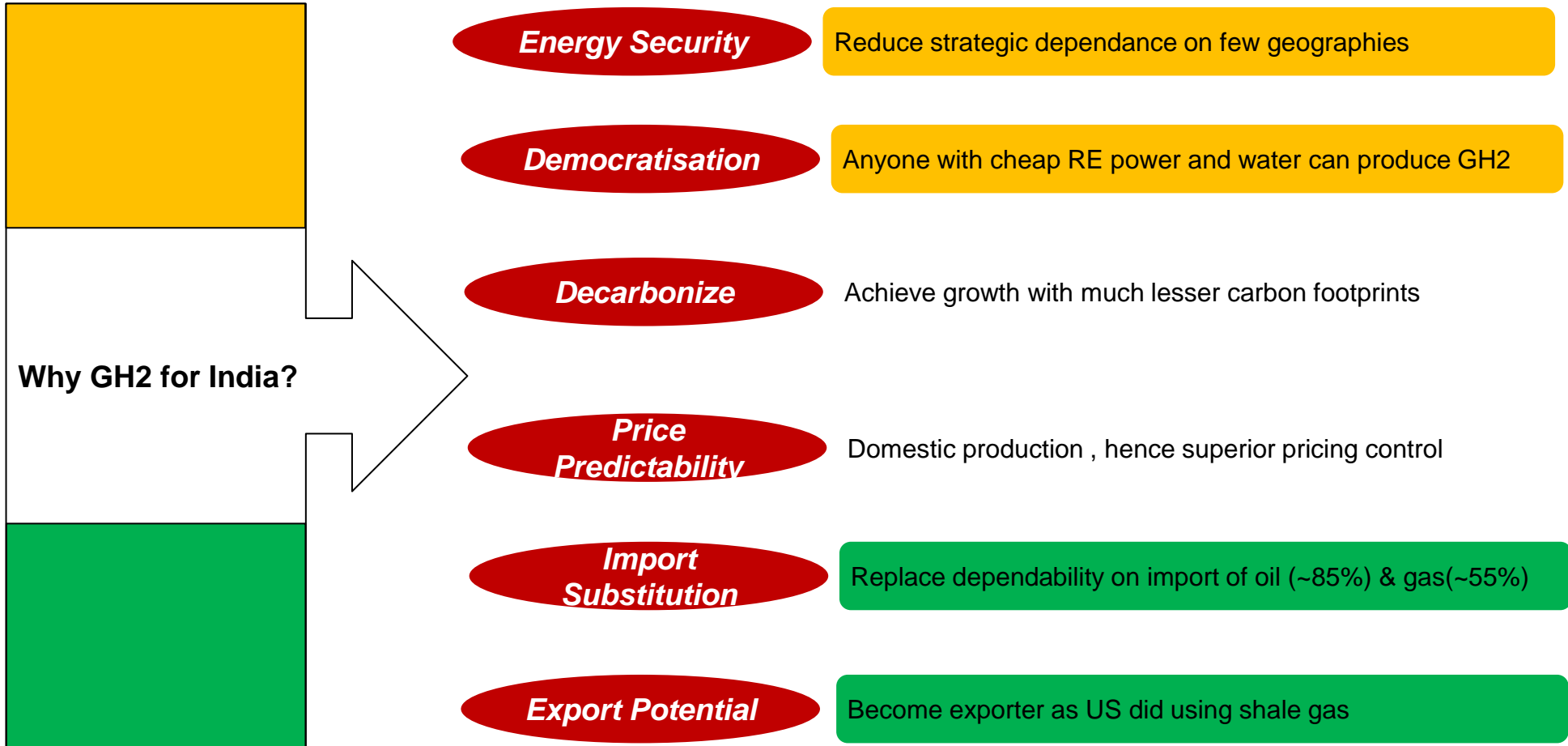
- ✓ **Country's GH2 production first time crossed 50,000 TPA**
- ✓ **Kakinada GH2 export facility sends first shipment of GNH3 to S Korea**
- ✓ **Price of GH2 certificates increased by 20% due to heavy demand from fertilizer sector**
- ✓ **India's carbon emission are slated to reduce from 7.3 MMTPA to 7.2 MMTPA thanks to slew of big capacity GH2 plants coming on stream**
- ✓ **SECI signs first USD denominated GNH3 contract at USD 500/MT**
- ✓ **BioH2 raised USD 100 million to enhance its biomass based GH2 production capacity to 400 KG/day through decentralized units for cold-storage applications**
- ✓ **EGoM for GH2 has recommended steep mandates for hard to abet sectors such steel and cement**

TABLE OF CONTENT

1. NHM Provisions
2. What's it means in terms of ecosystem?
3. Possible Opportunities
4. Conclusion
5. About Deesha Power

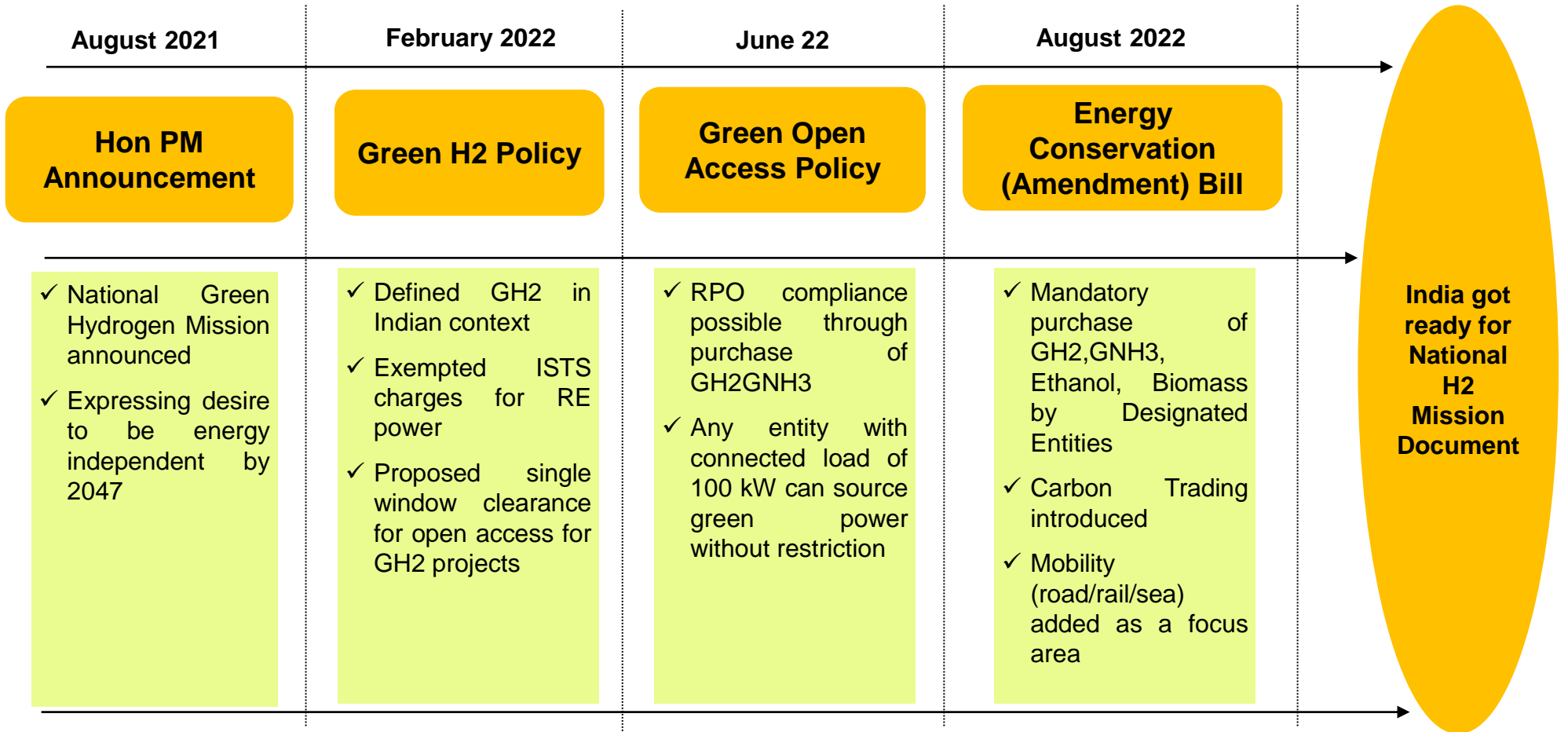
India need to harness GH2 for energy security & democratization of energy access

WHY GH2 FOR INDIA?



Policy initiative started by Hon PM announcing NHM on 15th August 2021

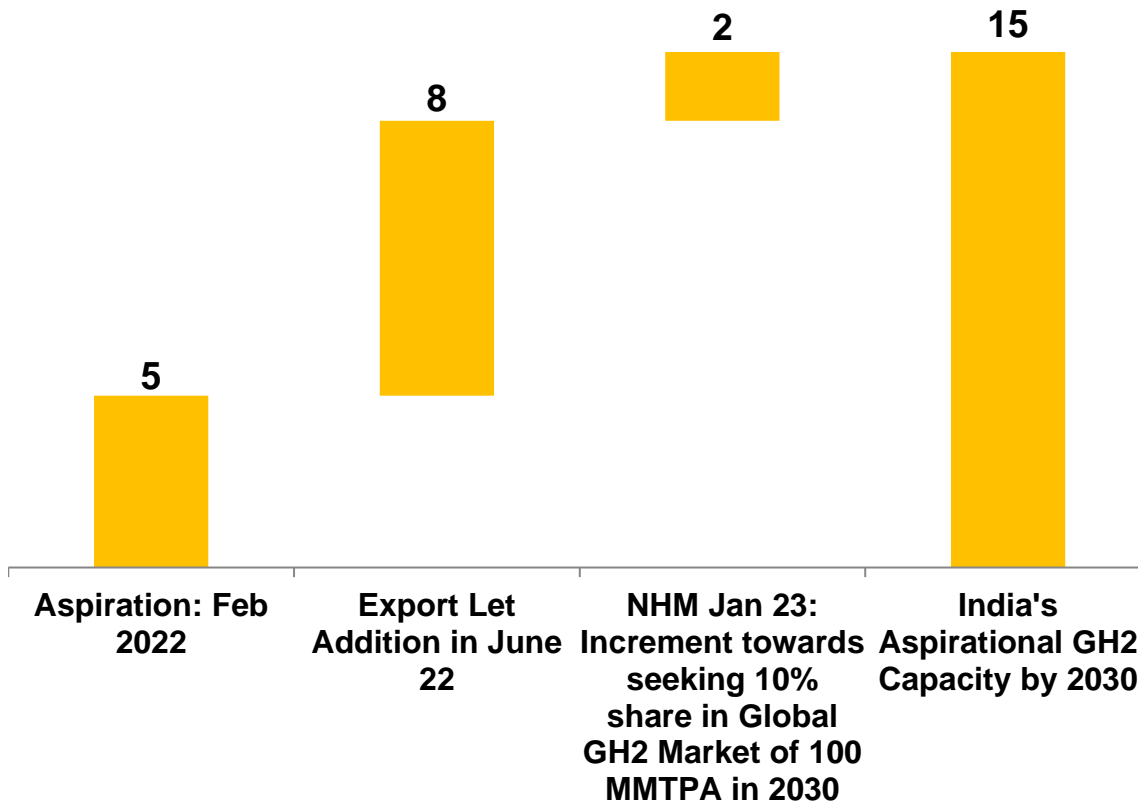
PRECURESER TO NHM



NHM target creation of GH2 production economy of atleast 5 MMTPA for domestic and an aspirational export economy of 10 MMTPA

NHM GH2 CAPACITY ASPIRATIONS

Visionary Export Led Target for GH2 by 2030 (MMTPA)



Drivers

- Domestic
 - Fertilizers
 - Refineries
 - City Gas Distribution
 - Green Steel
 - GH2 Derived Synthetic Fuels for mobility/shipping/aviation
- Exports
 - Germany
 - Japan
 - S Korea

NHM propose two phase approach to start decarbonization initiatives across the sectors

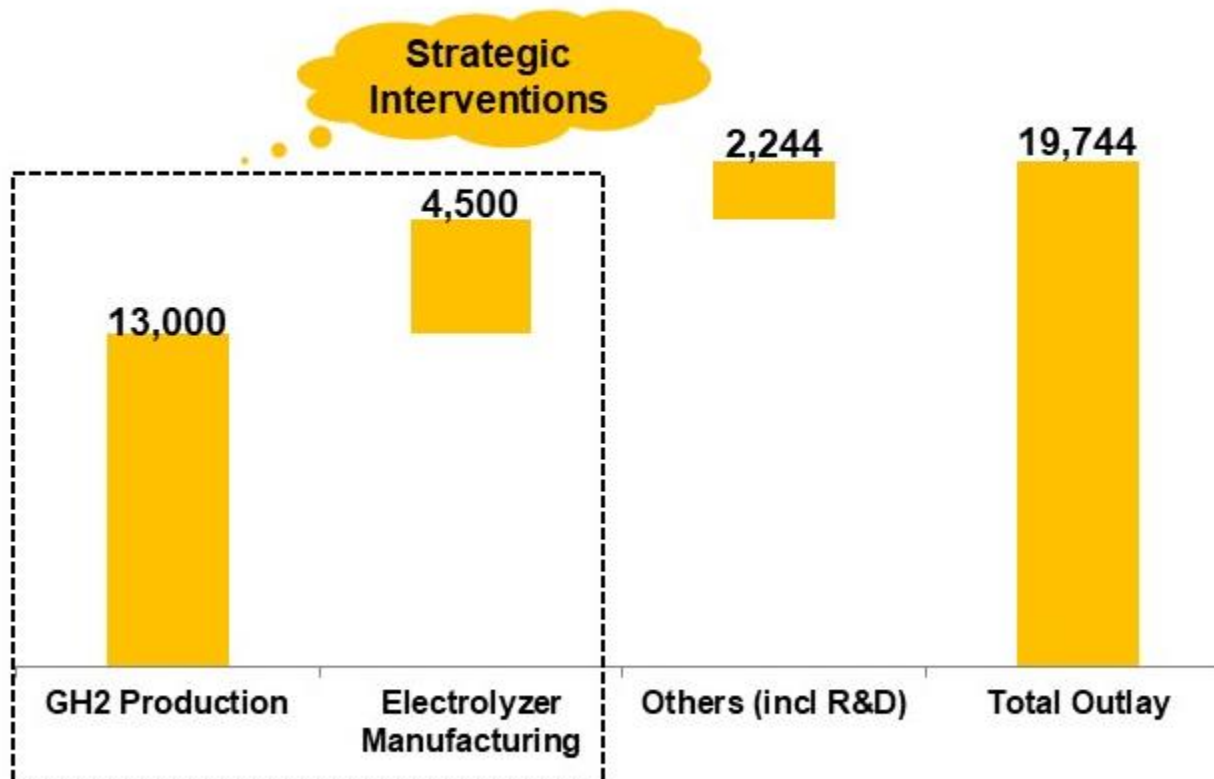
PHASED APPROACH

Phases	Phase I: 2022-23 to 2025-26	Phase II: 2026-27 to 2029-30
Target Sectors	<ul style="list-style-type: none">• Refineries• Fertilizers• City Gas Distribution	<ul style="list-style-type: none">• Steel• Shipping• Mobility
Activities	<ul style="list-style-type: none">• DD creation in target sectors• Pilot Projects for Phase II target sectors• Market mechanisms/R&D to bring cost down	<ul style="list-style-type: none">• DD creation in target sectors• Pilot Projects for railways, aviation etc• Deep decarbonization across economy

India's Hydrogen program envisages outlay of ~19,700 Cr under various initiatives under NHM

NHM FINANCIAL OUTLAY

Cabinet Approved Planned Outlay for GH2 (Rs Cr)



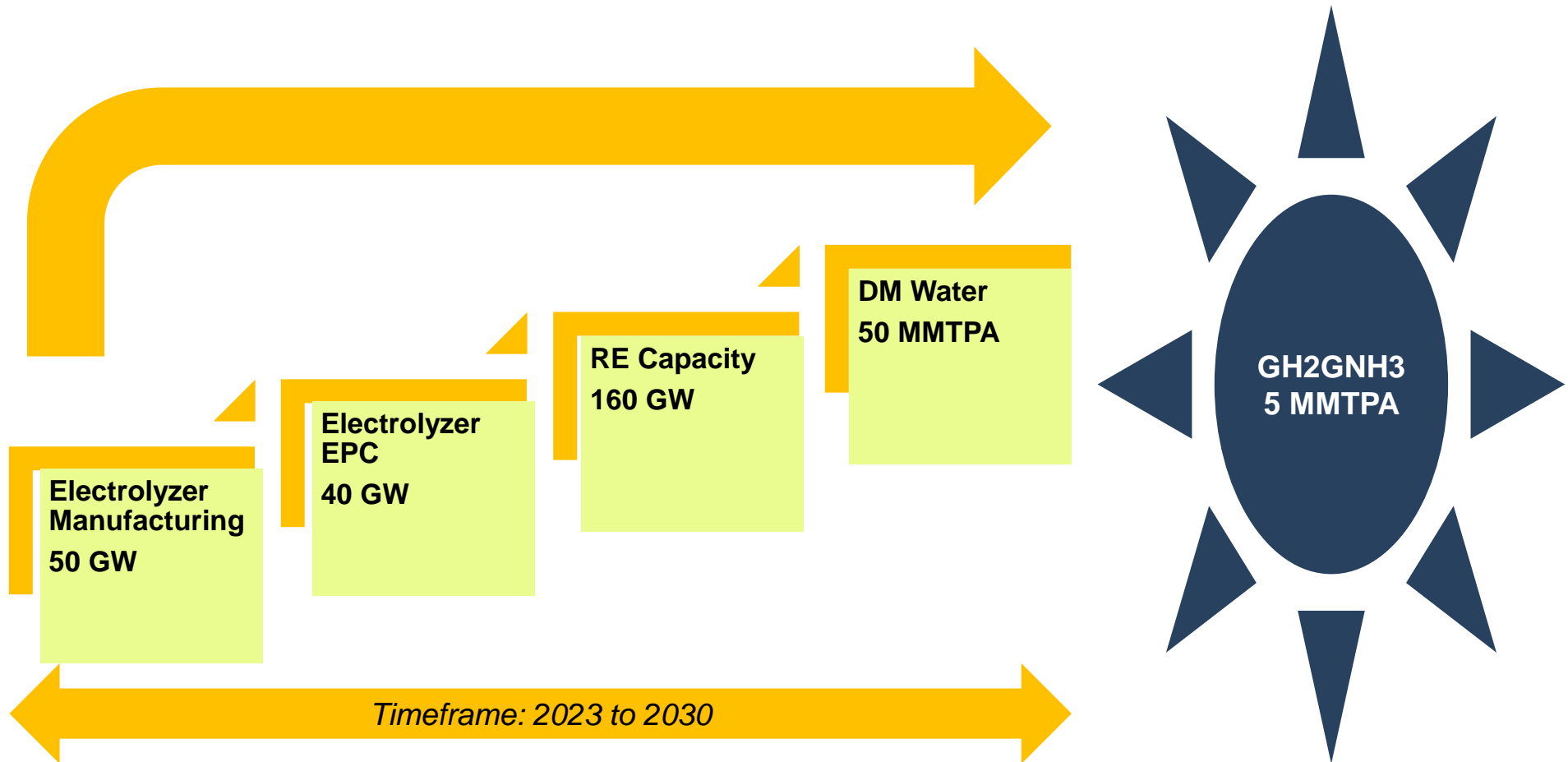
2030 Targets

- ✓ 5 MMTPA of GH2
- ✓ Rs 8 Trillion private investment
- ✓ 50 MMT of carbon savings

What's it means in terms of ecosystem?

To create a GH2 5 MMTPA ecosystem, one would need electrolyzer installations of 40 GW and RE capacity of 160 GW to power it

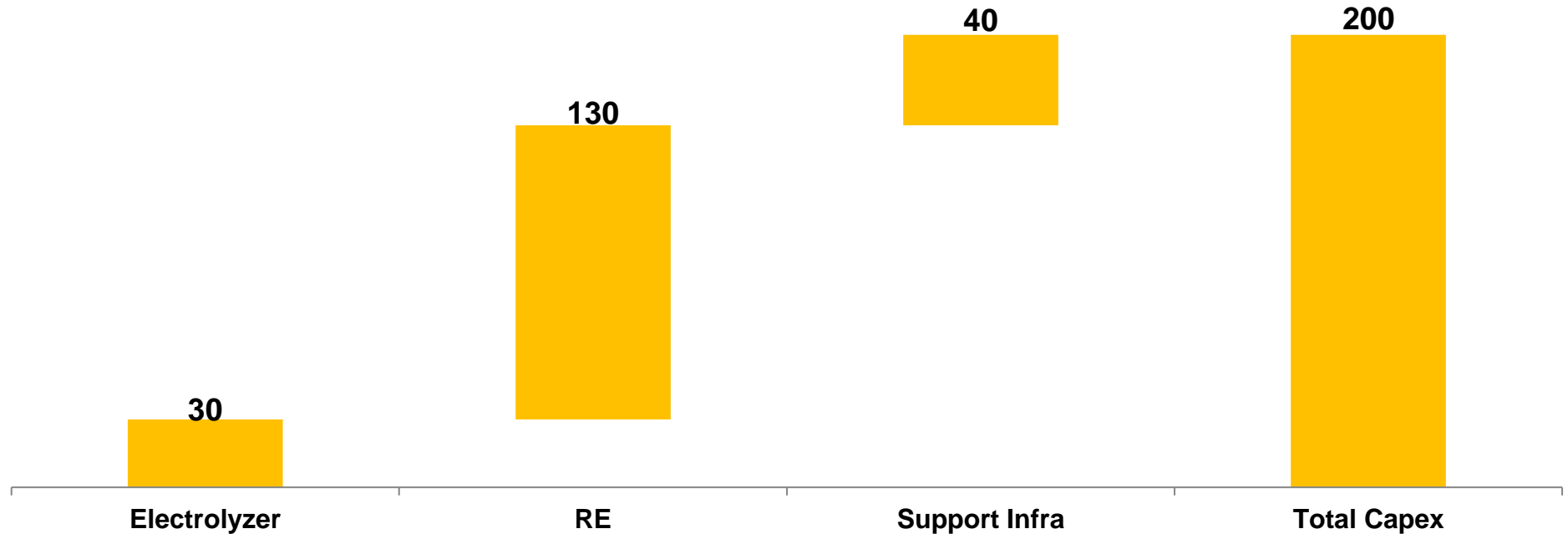
ECOSYSTEM FOR 5 MMTPA GH2 PRODUCTION



NHM implies a capex opportunity ~USD 200 billion over next 8 years to establish ~5 MMTPA GH2 assets in India

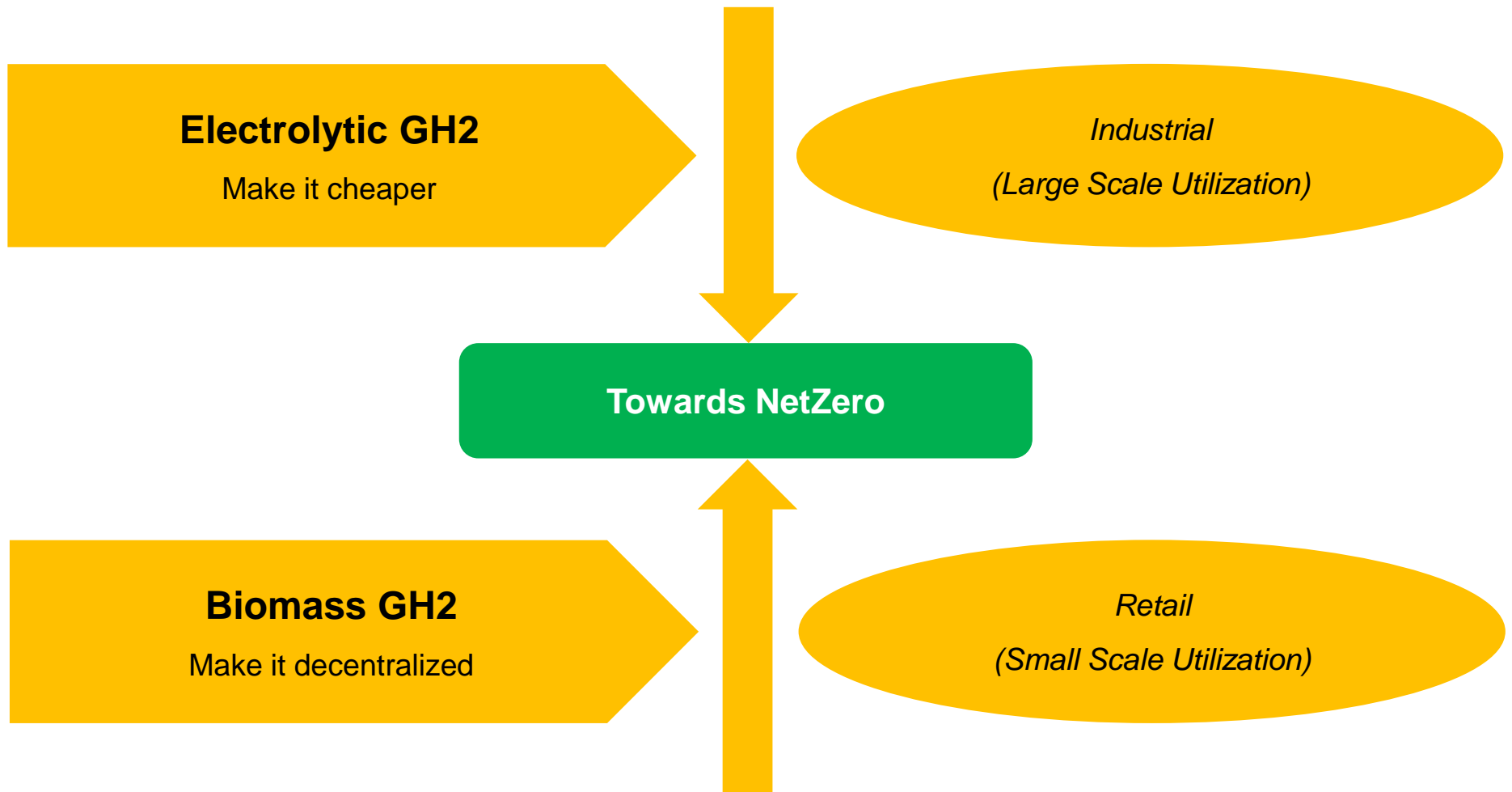
CAPITAL EXPENDITURE FOR 5 MMTPA

Capex for 5 MMTPA by 2030 (USD B)



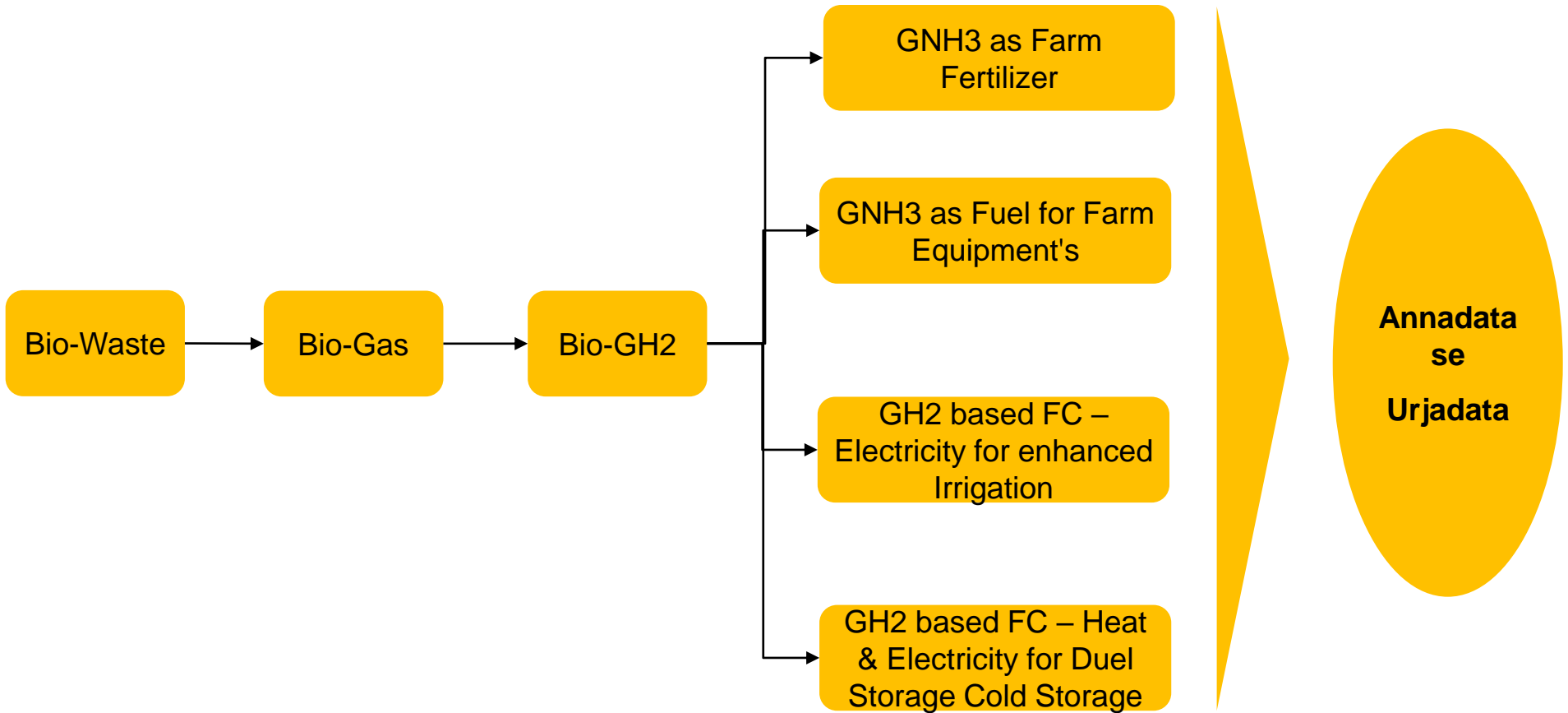
While bulk of NHM is concentrating upon electrolytic H₂, biomass based decentralized GH₂ is equally promising for agrarian economy like India

OPPORTUNITIES FROM NHM



Decentralized production of GH2 could aid several agri applications such as fertilizers, irrigation, fueling farm equipment & cold storage

AGRI APPLICATIONS



All stakeholders need to work together to ensure clearer tomorrow

CONCLUSION

India need to harness GH2 for energy security & democratization of energy access

NHM target creation of GH2 production economy of atleast 5 MMTPA for domestic and an aspirational export economy of 10 MMTPA

India's Hydrogen program envisages outlay of ~19,700 Cr under various initiatives under NHM

NHM implies a capex opportunity of ~USD 200 billion over next 8 years to establish ~5 MMTPA GH2 assets in India

While bulk of NHM is concentrating upon electrolytic H2, biomass based decentralized GH2 is equally promising for agrarian economy like India

Decentralized production of GH2 could aid several agri applications such as fertilizers, irrigation, fueling farm equipment & cold storage

All stakeholders need to work together to ensure clearer tomorrow

We, as Team Deesha, happy to partner with the sustainability stakeholders for India's decarbonization and GH2 transitioning

Deesha Power has two types of consulting offerings for GH2GNH3 sector viz strategy & implementation support

DEESHA POWER:CONSULTING OFFERINGS



Strategy

- ✓GH2GNH3 Strategy Workshop
- ✓Growth Strategy
- ✓Market Assessment
- ✓Strategic Technology Selection



Solutions

- ✓Feasibility Study & Financial Modeling
- ✓Strategy/Project Monitoring Support
- ✓Opportunity/Partner Identification

Deesha Power has worked with reputed clients and list is growing

SELECT CLIENTS



Deesha Power Team is passionate for sustainability aspects

DEESHA POWER:TEAM



Shardul Kulkarni

MD & CEO

- An energy transition professional with ~21 years of experience. During this tenor, he facilitated investments in energy transition projects with cumulative investment of USD 1 billion+ across multiple geographies viz South East Asia and Western Africa.
- In the past, he worked with blue chip organizations like SBICAP, Crisil Infra, Singapore PE Advisory and Tata Strategic. Now he is advising multiple clients for their foray in GH2GNH3.
- He has been invited at many industrial events to share his unique point of view in the areas of Green Hydrogen, Net Zero, Energy Transition, waste to energy, Energy Efficiency & Managing Cost of Energy, ash management, coal gasification, etc



Manish Panchal

Senior Advisor & Mentor

- Manish is an Executive Director – Investment Banking Business at Equirus Capital a leading Merchant Bank of India. He is also a Mentor at Deesha Power. He has overall 32 years of experience with equal mix of Industry and Strategy and Operation Consulting.
- Prior to joining Equirus he has served as Senior Leader at DuPont Sustainable Solutions (DSS)– a global leader in Operation Risk Management and ESG Consulting. And, prior to DSS he has worked as Sr. Practice Head Chemicals & Energy practice at TATA Strategic Management Group, India's leading Strategy Consulting Firm where he helped 50+ large and medium size corporations for Sustainable Business Growth.
- Manish is a 'NEW ENERGY' enthusiast and his area of expertise is Strategy Development, Operationalizing Strategy Execution (Organic & Inorganic), M&A, Turnaround Management and Operation Excellence.



Dr G D Yadav

Technical Advisor

- Dr Ganapati D. Yadav is one of the topmost, highly prolific, and accomplished engineering scientists of hydrogen sector in India. He is now selected as the National Science Chair (Mode I) by the Science & Engineering Research Board (SERB) of the Department of Science & Technology, Govt. of India, which is a very prestigious national honour.
- He also holds the titles of Emeritus Professor of Eminence and was bestowed with J.C. Bose National Fellowship by DST since 2010 until recently. He is internationally recognized by many prestigious He was conferred Padma Shri, the fourth highest civilian honour, by the President of India in 2016 for his outstanding contributions to Science and Engineering.

Thank You !



Shardul Kulkarni

MD & CEO

Deesha Power Solutions Pvt Ltd

Mobile: +91 99308 50279

E-mail: shardul.kulkarni@deeshapowersolutions.com

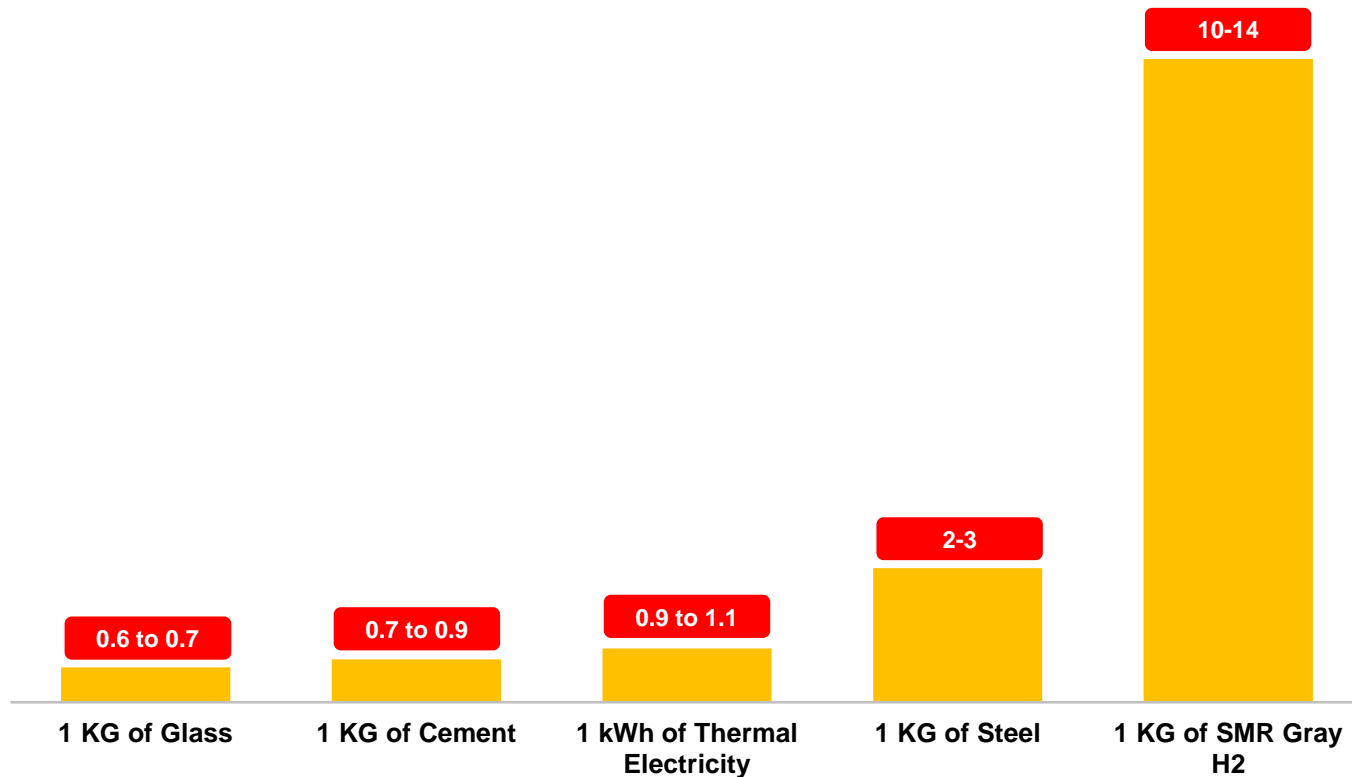
Website: www.deeshapowersolutions.com



India need to harness GH2 for energy security & decarbonization

EMISSION INTENSITY

Carbon Emission (KG)



GH2 led Energy Transition will be the key to decarbonise