



NTPC Dadri 5MW



NTPC Bhadla 260MW



NTPC Kawas Blending GH2 - NG



# Green Hydrogen Initiatives

Kishore Hota

Chief General Manager (Hydrogen) NTPC

CEO, NTPC UP Green Energy Ltd.



NTPC Simhadri 25MW



Sambhu Ki Bhurj I 250MW



NTPC Rojmal 50MW

## Green Ports & Shipping - Chartering Sustainable Maritime Future

1<sup>st</sup> Aug, 2025

VOCPT, Tuticorin, Tamilnadu

1

NTPC Plan for Energy Transition

2

NTPC Green Hydrogen Initiatives

3

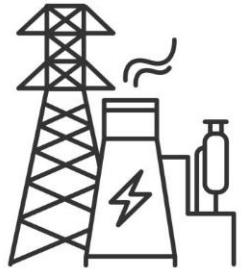
NTPC Green Hydrogen Mobility Project

4

H2 Mobility Key deliverables and Clearances



# NTPC: India's largest Power Generating Company



A Govt. of India enterprise with **50 years excellence;**

**Developed** projects of capacity **~83 GW**

- 105 Projects (Coal, Gas, Solar, Wind, Hydro, ESS)

**Coal Mines** – 7 Coal blocks with **71 MMTPA** prod.



Presence in Thermal, Hydro, Solar, Wind, **Green Chemicals (Hydrogen, Ammonia, Methanol)**, Biomass, Waste to Energy, Coal Mining;



NTPC Ranked **No. 1 IPP** Globally by S&P Platts-2022



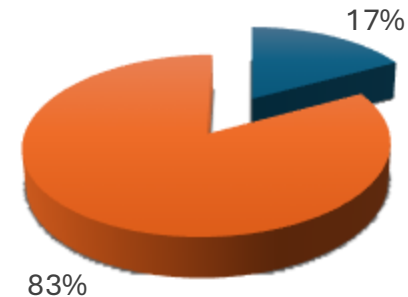
**In-house expertise:**

- Engineering & Project Management;
- Procurement;
- Erection, Testing, Commissioning & O&M;

**~20000**

## NTPC Share

**Installed Capacity (as on 30.06.25)**



83%

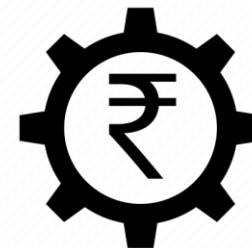
■ NTPC Group ■ Rest of India

**Generation (as on 31.03.25)**



80%

■ NTPC Group ■ Rest of India

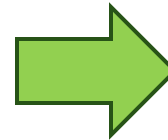
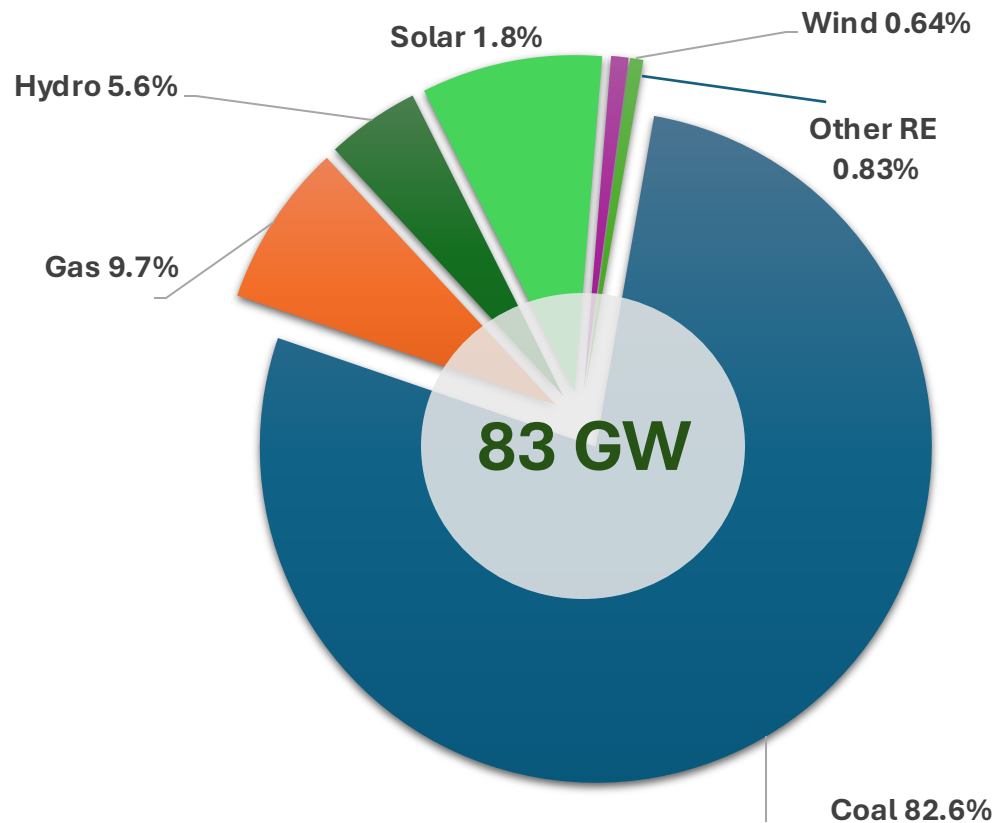


**Strong financials in FY: 23-24**

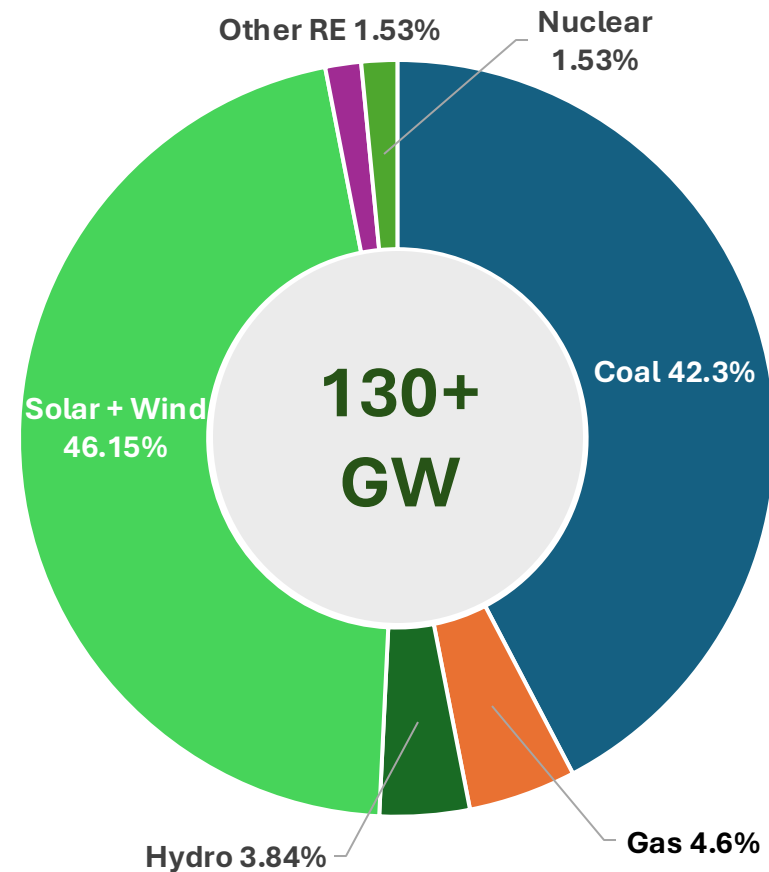
- **₹1.81 lakh Cr.** revenue;
- **₹1.50 lakh Cr.** net worth;
- **₹0.21 lakh Cr.** Profit;



2025

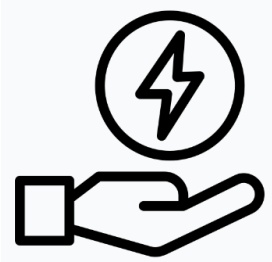


2032

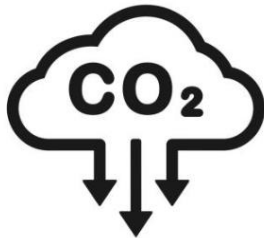


**Renewable Power (Solar & Wind) : ~8 GW (2025) → 60 GW (2032)**





## Energy Security



## Decarbonation



## Energy Source Decarbonization

- Renewable Power (Hydel / Solar / Wind and Energy Storage)
- Biomass blending with Coal
- Nuclear Power
- Green Hydrogen initiatives

Large scale Competitive Renewable Power to Help Decarbonize Major Sectors

Transportation

Refineries

Fertiliser

Port &  
Shipping

Aviation

Steel

Industry

Domestic Market Requirement & Export Opportunities



# NTPC Green Hydrogen Initiatives



## H<sub>2</sub> Mobility

**Green Hydrogen Mobility** in Leh (Ladakh), Greater Noida, Bhubaneswar, Kandla Port, Jodhpur Green Valley

## H<sub>2</sub> Blending

Commissioned India's **1<sup>st</sup> Green Hydrogen Blending Project** at Surat (Gujarat). Presently **8% v/v** of H<sub>2</sub> blending with PNG

## H<sub>2</sub> Micro Grid

Green Hydrogen based **25kW / 50 kW / 200 kW Microgrid** system for Indian Army

## H<sub>2</sub> Locomotive

1-New and 1-retrofitted **H<sub>2</sub> FCEV** based locomotive at Sipat Power Station

## gMethanol Plant

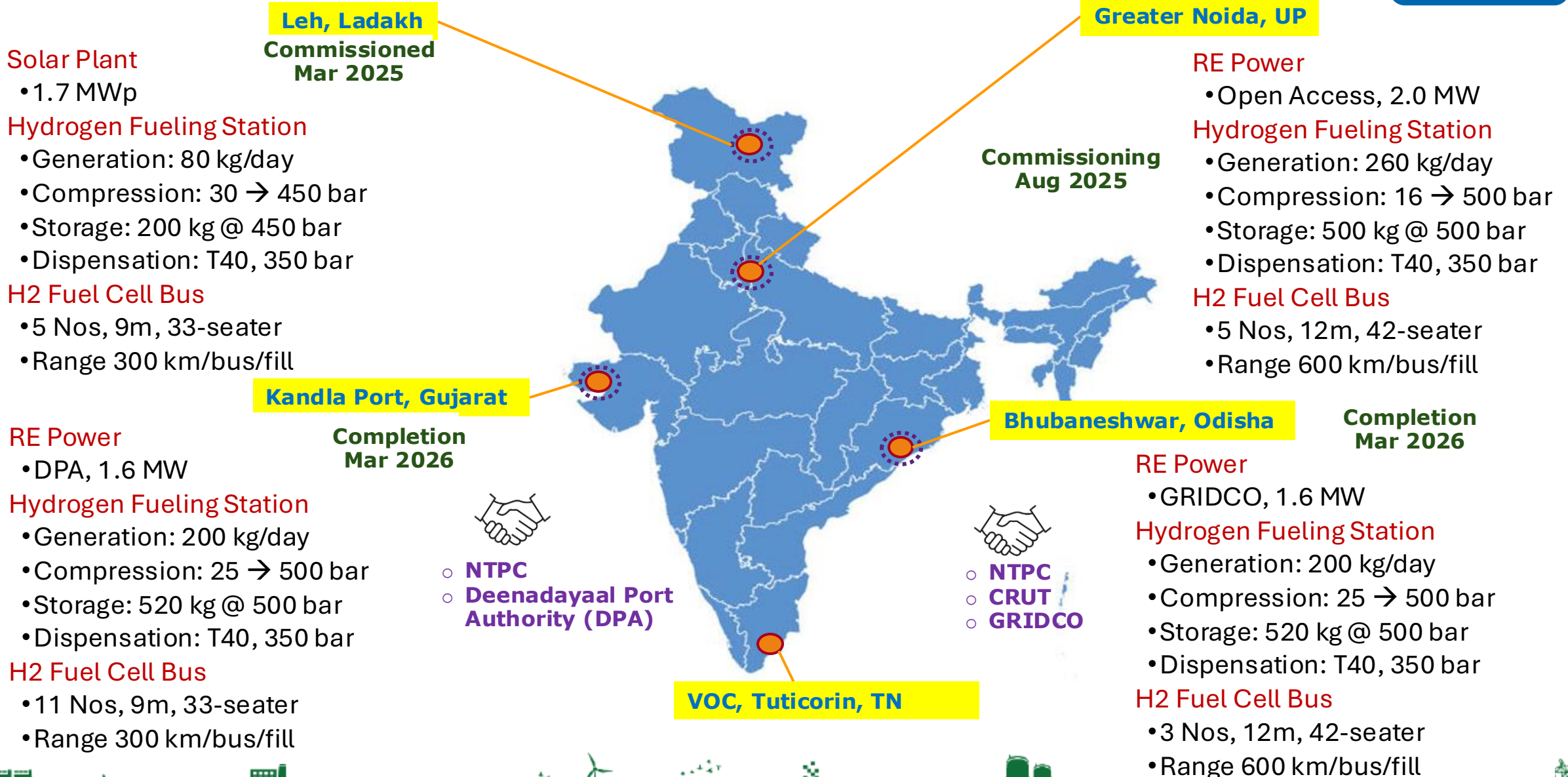
**10TPD Pilot project** using PEM Electrolyser and **Carbon Capture Utilisation** from flue gas of coal fired thermal boiler at Vindhyachal.

## Green Hydrogen Hub

**2.5 MTPA of Green Chemicals** - Green Ammonia, Green Methanol, SAF/Green Urea, Liquid Hydrogen at Pudimadaka, Andhra Pradesh



# NTPC Green Hydrogen Mobility Project



# Hydrogen Mobility, Leh





# Hydrogen Mobility, Greater NOIDA

एनटीपीसी  
NTPC

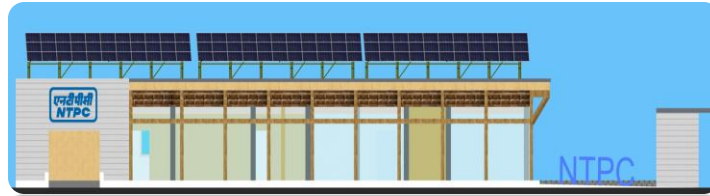


# Mobility - Key Deliverables Achieved



Solar

- Solar power at 3500m
- Inverters perf. at high altitude
- Right sizing of solar PV for green hydrogen generation



Hydrogen Station

- Design requirement at  $-30^{\circ}\text{C}$  and low oxygen content
- H2 from on-site solar with:
  - ramping capabilities
  - daily start-stop operation
- Dispenser performance.
- Usable storage of H2 at high pressure
- Operation during non-solar hrs.



FCEV Buses

- Actual Mileage
- Fuel Cell Limping range validation
- Long haul-Short haul Operation Performance
- H2 Filling time
- Maintenance issues



## For Establishment

S.N.	Approvals	Authority
1	Station Layout Approval	PESO
2	CTE - Air and Water Act	State/UT PCB
3	CTE – Prior to Construction	Local Administration
4	Water usage	Local Admin. / PCB
5	Building Plan	Local Admin. / Revenue Dept.
6	No Objection Certificate a. Revenue b. Police and Intelligence c. Traffic d. Fire and Safety e. Forest and Wildlife f. Electricity	District Magistrate
7	H2 vehicle homologation	ARAI/ICAT/CIRT

## For Operation

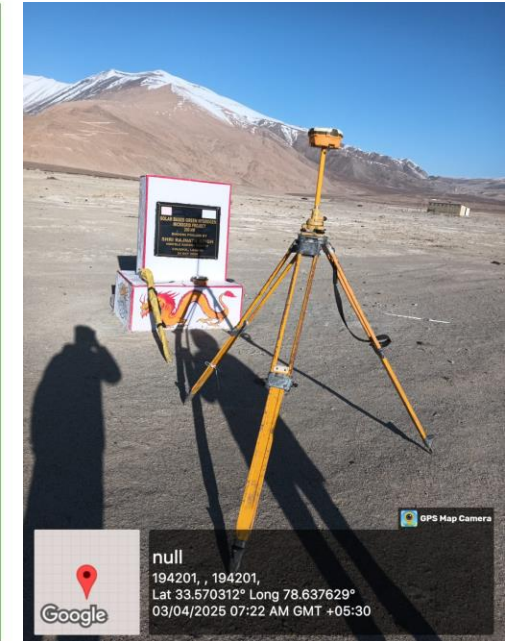
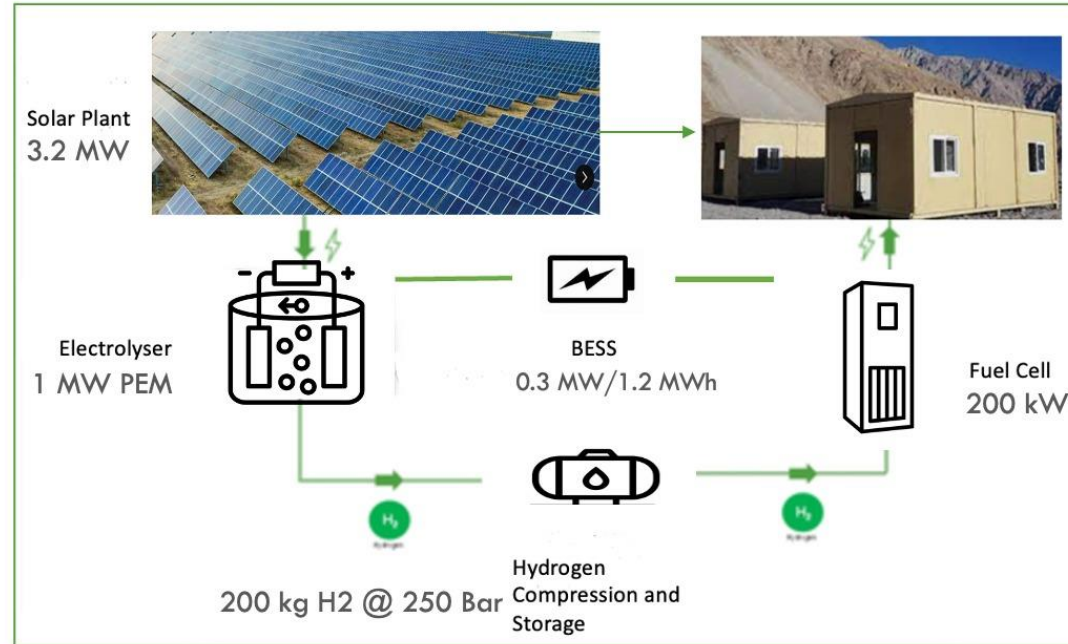
S.N.	Approvals	Authority
1	Trial Run Permission	PESO
2	CTO - Air and Water Act	State/UT PCB
3	Electricity Charging	CEA/CEIG Discom
4	H2 Vehicle Registration	State/UT Transport Department



# 200kW GH<sub>2</sub> Microgrid, Chushul, Ladakh for Indian Army



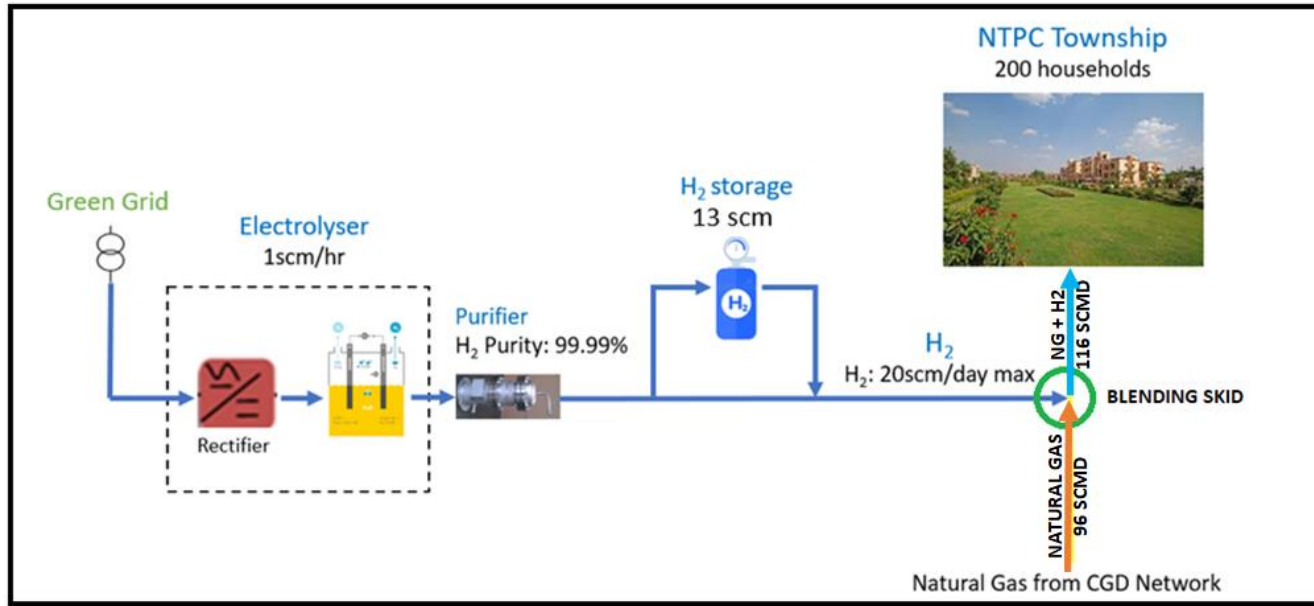
Ladakh



1. PPA signed on 3<sup>rd</sup> Feb' 2025
2. Work started in Apr' 25
3. Project Completion Jun' 2026



# GH2 Blending with Natural Gas



- 200 Households
- Commissioned in Jan' 2023 (5% Blending)
- Since Dec 2023 : 8% v/v blending achieved
- Request for 15% blending - submitted to PNGRB in Aug' 24
- **PNGRB in process of framing the Road Map**



Location - NTPC Township, Surat, Gujarat



# Green Hydrogen Hub, Pudimadaka, AP

## NTPC-Demonstration Projects

10 TPD Ethanol (Dec 26)

6 TPD SAF (Jun 27)

150 TPD Urea (Nov 29)



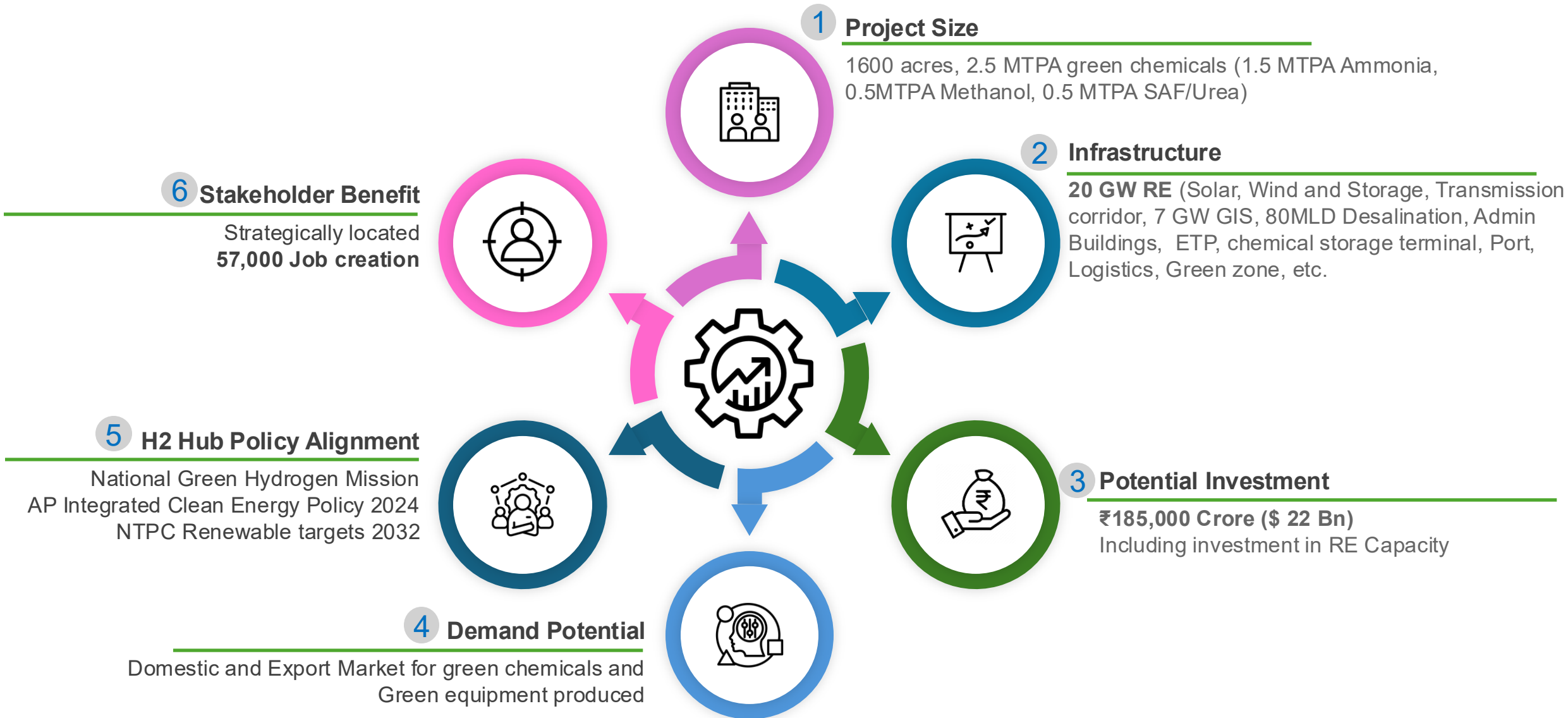
Pudimadaka

## 2.5 MTPA green chemicals

- Green Hydrogen: 1500 TPD
- Green Ammonia: 4500 TPD
- Green Methanol: 1500 TPD
- SAF/ Green Urea: 1500 TPD
- Liquid: H<sub>2</sub> 300 TPD



# Pudimadaka Project Potential





Migratory Birds at NTPC Dadri

# Thank You

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NTPC Ramagundam

Website: [www.ntpc.co.in](http://www.ntpc.co.in)

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- ISO Std.: ISO 22734, ISO 19880;
- Fuelling: SAE J2601; SAE J2799;
- PESO: GCR 2016; SMPV Rules 2016;
- AIS 157:2020;
- Piping: ASTM G93; ASME A13.1, B31.2;
- Safety: NFPA; NEC; IS and IEC Std.;

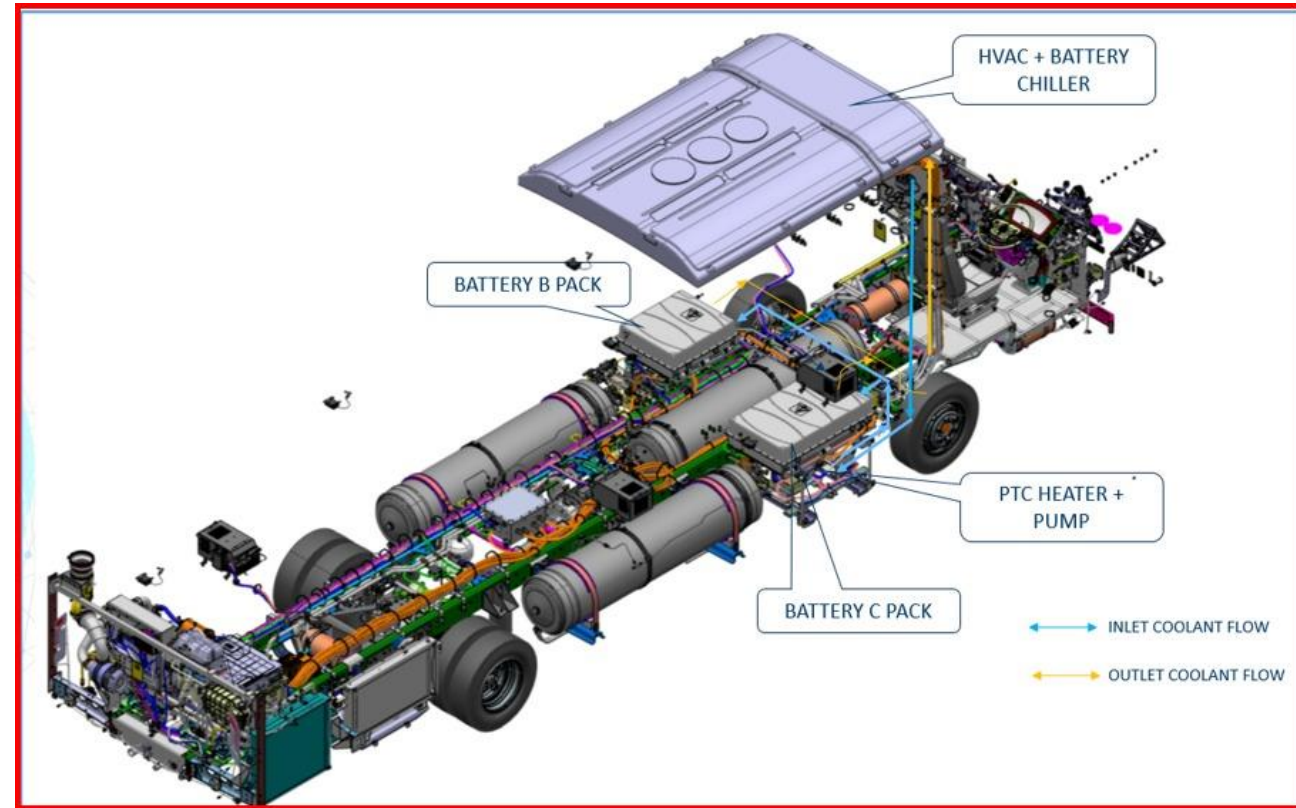
- PESO Approval for Plant and Equip.
- 3<sup>rd</sup> Party Equipment Certification
- HAZOP, QRA, HIRA
- IP Std. Compliance
- ARAI Approval

- Continuous detection of H<sub>2</sub> purity through GC
- Safety devices
  - H<sub>2</sub> Leak, Flame Detectors
  - Smoke and Heat Detectors
- Personnel Area Monitor : Measure H<sub>2</sub>, O<sub>2</sub>
- PLC based and hard wired ESD
- 100% Redundant power back up

- Water hydrant and sprinklers
- CO<sub>2</sub> Flooding system
- Portable Fire extinguishers



# H2 Bus (9m)



# H2 Bus (12m)

