Green Hydrogen Policy in Indian States Best practices

September 2024

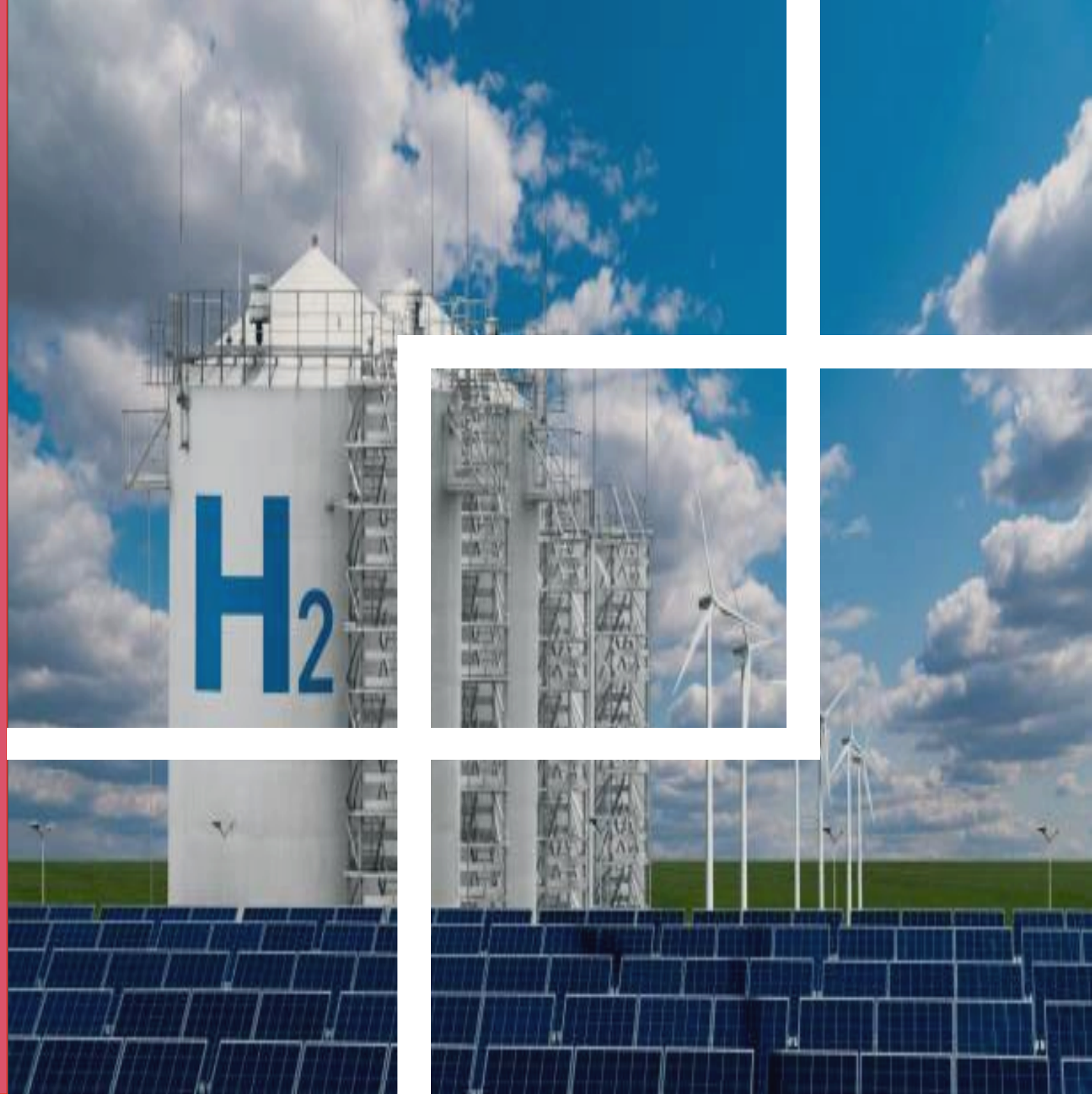
Presentation by

Mr Narendra Bhooshan, IAS

Principal Secretary

Energy and Additional Sources of Energy Department,

Government of Uttar Pradesh



National Green Hydrogen Mission

Key insights

- The mission seeks to promote development of green hydrogen production capacity of at least **5 MMT per annum by 2030**
  - with an associated renewable energy capacity addition of about 125 GW in the country by 2030.
- Encourage manufacturing of low-cost equipment & technologies, two types of incentives will be given –
  - *Incentives will be given on electrolyser manufacturing for 5 years and Incentive on production of green hydrogen.*
- Cumulative reduction in fossil fuel imports of over Rs 1 lakh crore and abatement of nearly 50 MMT of annual greenhouse gas emissions by 2030.
- Development of Turnkey infrastructure for hydrogen hubs and plan to set up at least two such Green Hydrogen hubs in the initial phase

Uttar Pradesh Green Hydrogen Policy 2024 - Overview

Goal - 1 MMT per annum production of Green Hydrogen by FY 2029

Employment Generation - 1,20,000 jobs to be created in Green Hydrogen value chain

Objectives

- To promote investments in establishing Green Hydrogen & Green Ammonia production facilities
- To promote Green Hydrogen based product manufacturing units
- To encourage research and innovation in Green Hydrogen/Ammonia production and consumption technologies to reduce the cost of Green Hydrogen/Ammonia
- To develop ecosystem/value chain of Green Hydrogen with employment opportunities

Financial Incentives

Option 1 - Capital Subsidy

Option 2 - Reimbursement of Net (SGST)

Option 3 - Top up on PLI

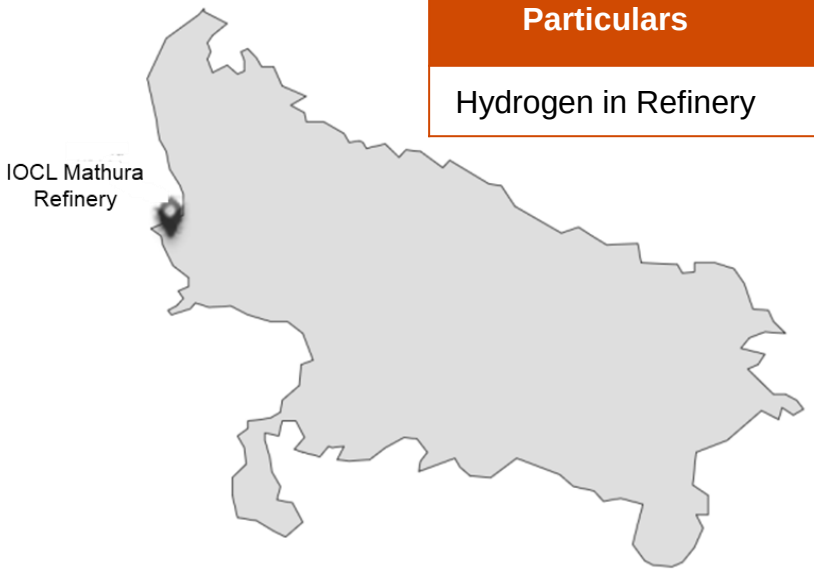
MoUs signed for 20 projects worth Rs 2.73 Lakh Crore with expected employment generation of 60,000

Green Hydrogen/Ammonia - Demand Centres in UP

End usage	Purpose	*Possible Off takers*
Ammonia production	• Production of nitrogen-based (urea), complex fertilizer - diammonium phosphate (DAP)	Prominent clusters for Ammonia in the state
Methanol and Chemical production	• Hydrogen is a main feedstock in the production of methanol • Methanol for chemicals and solvents, as fuel for transport in the form of various blends, marine fuel, and cooking	NTPC
Refinery	• De-sulphurization of diesel and petrol	IOCL
Power generation	• Power-H2-Power as another form to provide storage and flexibility using Fuel Cells	GAIL, IOCL, Torrent Power
City Gas Distribution	• Blending with Natural Gas to mix in City Gas distribution	Torrent Gas, IGL, GAIL
Transport	• HICE Engine - Trucks, buses etc.	UPSRTC, Private sector

Green Hydrogen/Ammonia - Demand Centres (Refinery & Glass)

Refinery



Particulars	Demand (in KT per Annum)
Hydrogen in Refinery	45

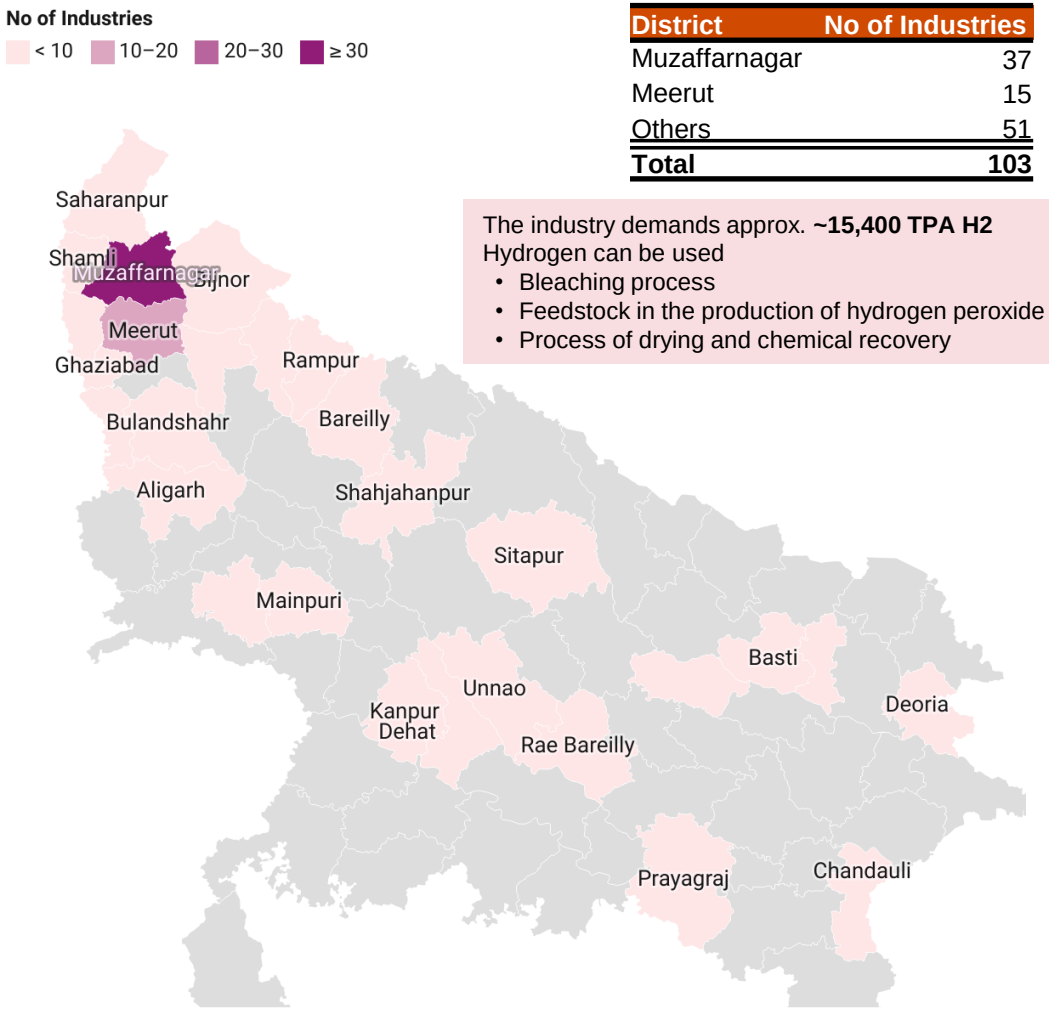
Usage:
Hydrogen is used to remove Sulphur based compounds from MS & Diesel and thus provide BS6 quality fuels in the market

Glass Industry

- Firozabad in Uttar Pradesh is a significant glass manufacturing hub in India, housing a large concentration of MSMEs, and contributing to about 70% of the total unorganized glass production in the country.
- The Firozabad industrial cluster produces an average of **1,500 tons of glass per day**, making it a key player in India's glass industry.
- Hydrogen can be used in Glass Industry for
  1. Melting Furnaces
  2. Batch Preheating
  3. Glass Forming
  4. Annealing

Green Hydrogen/Ammonia - Demand Centres (Paper & Pulp and Tanning)

Paper & Pulp Industry in UP



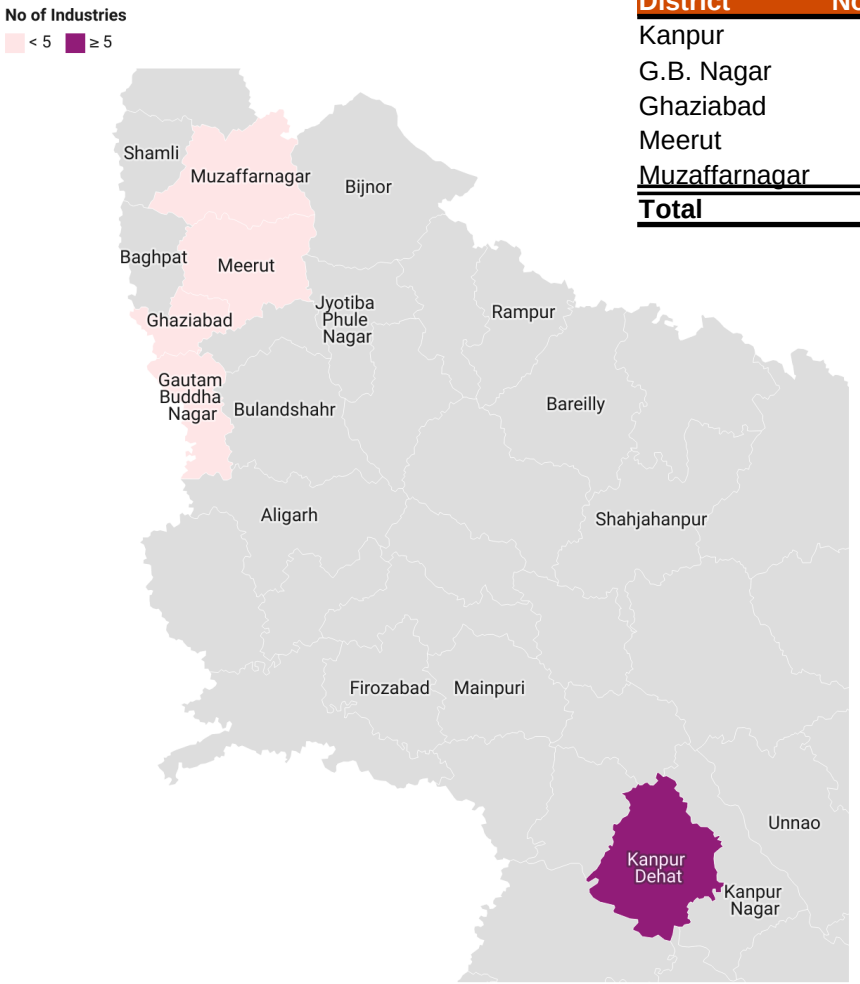
District	No of Industries
Muzaffarnagar	37
Meerut	15
Others	51
Total	**103**

The industry demands approx. **~15,400 TPA H2**
Hydrogen can be used
- Bleaching process
- Feedstock in the production of hydrogen peroxide
- Process of drying and chemical recovery

Map data: © OSM • Created with Datawrapper

Source
https://www.infomerics.com/admin/uploads/Paper-industry-apr23.pdf
https://www.cpcb.nic.in/ngrba/GPI_UP.pdf
https://ippta.co/indexing-paper-mill-state-wise/

Tannery Industry in UP

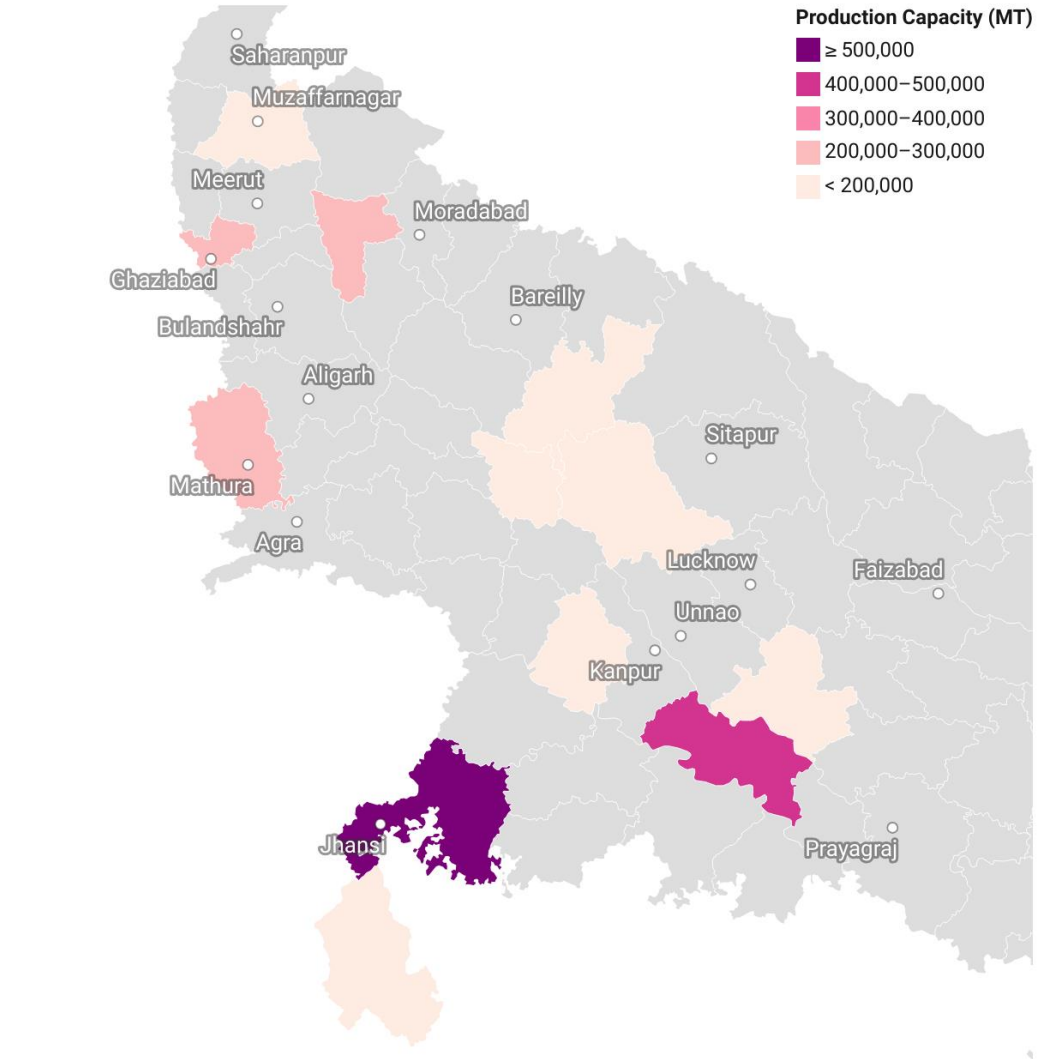


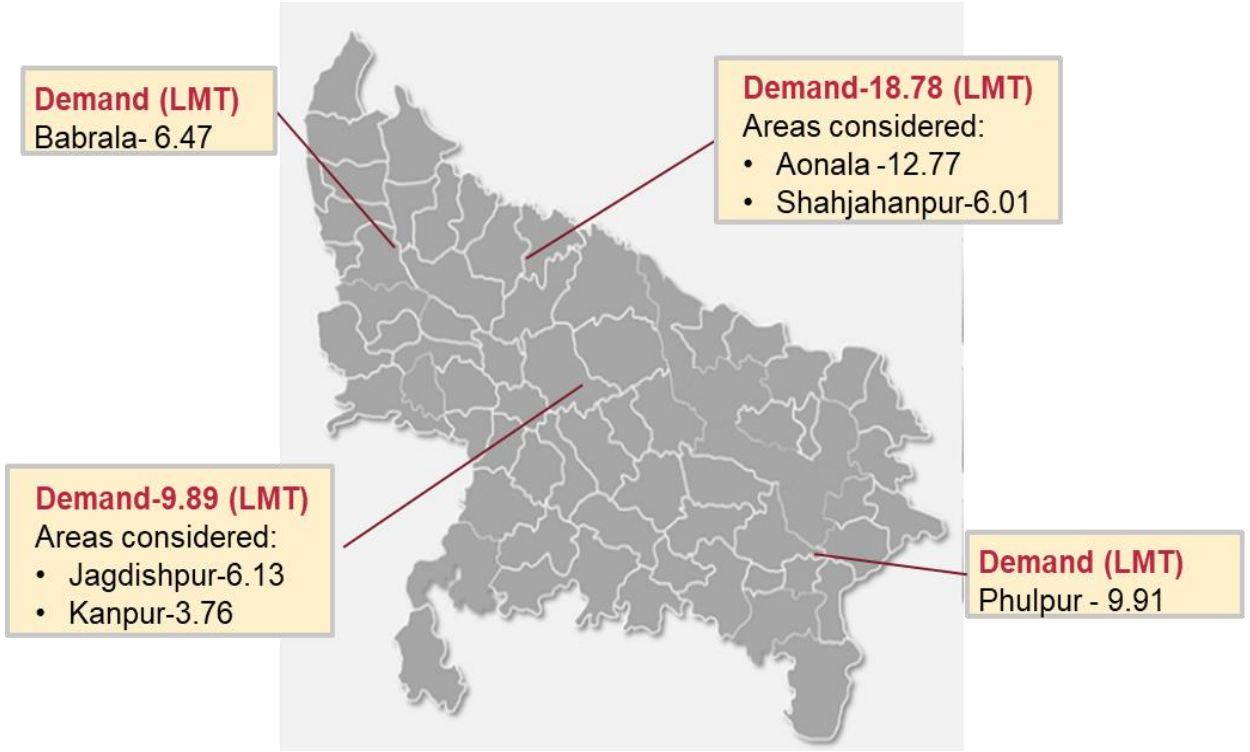
District	No of Industries
Kanpur	36
G.B. Nagar	1
Ghaziabad	3
Meerut	1
Muzaffarnagar	1
Total	**42**

Map data: © OSM • Created with Datawrapper

Green Hydrogen/Ammonia - Demand Centres (Fertiliser)

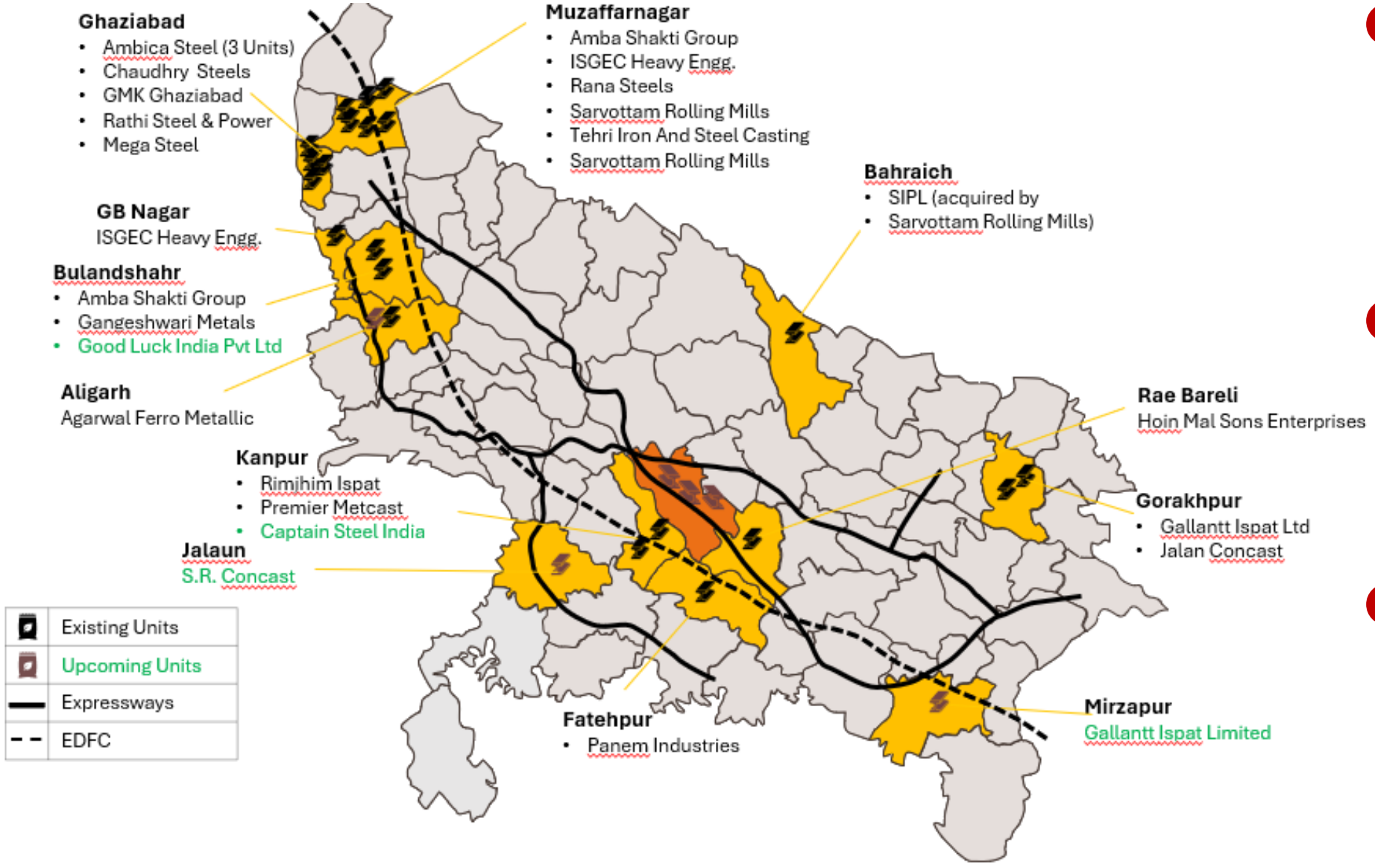
Fertilizer (SSP) Production in UP





Map data: © OSM • Created with Datawrapper

Green Hydrogen/Ammonia - Demand Centres (Steel)



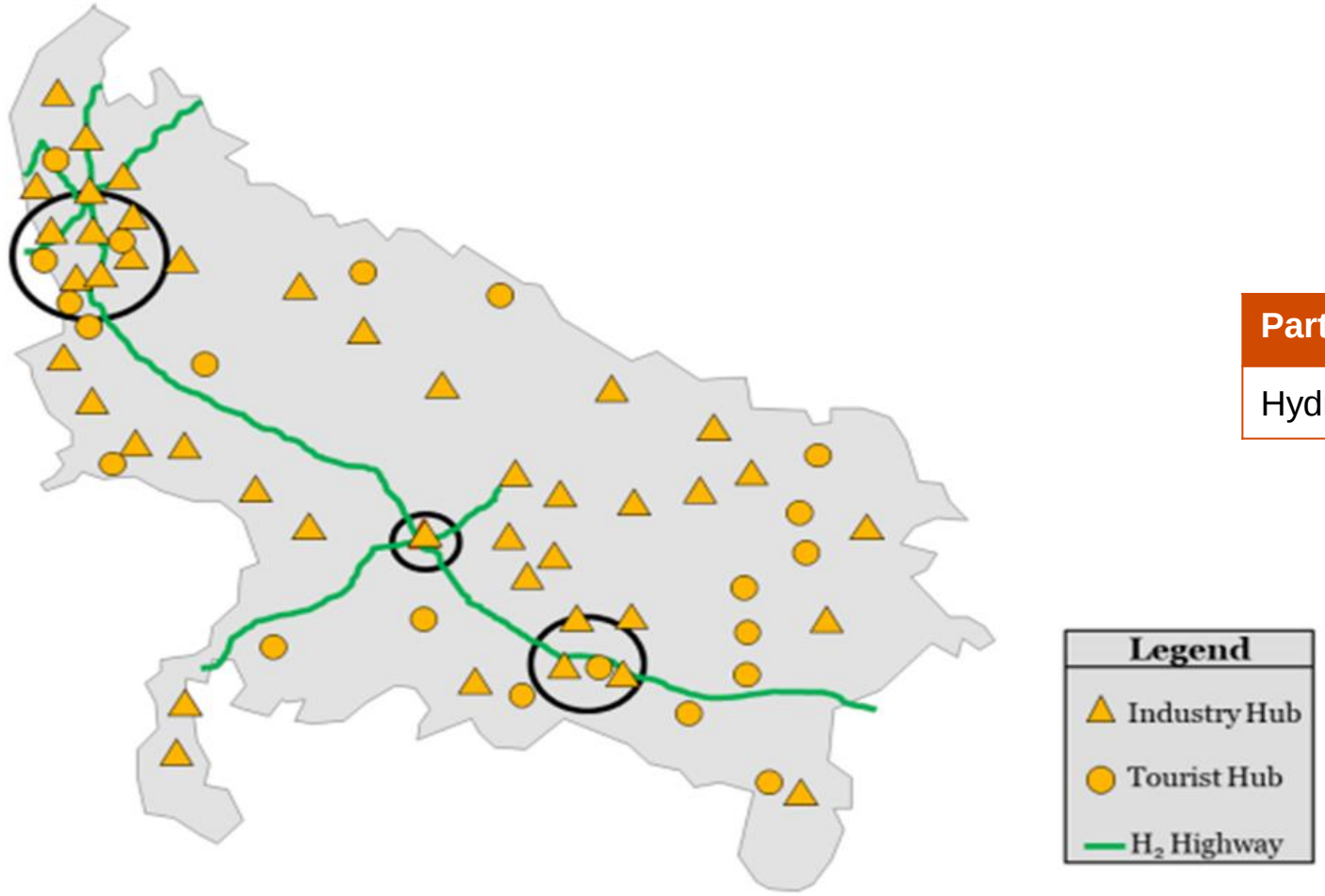
1 **Logistic Connectivity:** Connectivity with high quality logistics infrastructure such as expressways, EDFC, railway network for raw material and goods transportation

2 **Raw Material Availability:** Iron Ore: ~100 million tonnes of iron ore containing 25%-30% iron has been established in Berwar-Girar area of Lalitpur.

3 **Proximity to End Market:** Proximity to Delhi-NCR & Lucknow-SCR

Green Hydrogen/Ammonia - Demand Centres (Mobility)

Probable locations for Hydrogen Refueling Stations in Uttar Pradesh *



Particulars	Demand (in KT per Annum)*
Hydrogen in Mobility	2,901

*Indo German Energy Forum

Uttar Pradesh Green Hydrogen Policy 2024 | Subsidy Details

Option 1 - Capital Subsidy

Capital Subsidy and Annual Limit (ECI = Eligible Capital Investment)				
District Area	Large	Mega	Super Mega	Ultra Mega
Gautam Budh Nagar and Ghaziabad	10% of Total ECI in 10 annual instalments	18% of Total ECI in 12 annual installments	20 % of Total ECI in 15 annual installments	22 %of Total ECI in 20 annual installments
Madhyanchal & Paschimanchal)Except Gautam Budh Nagar & Ghaziabad(	12% of Total ECI in 10 annual installments	20% of Total ECI in 12 annual installments	22% of Total ECI in 15 annual installments	25% of Total ECI in 20 annual instalments
Bundelkhand and Purvanchal	15% of Total ECI in 10 annual instalments	22% of Total ECI in 12 annual instalments	25% of Total ECI in 15 annual instalments	**30%** of Total ECI in 20 annual instalments
Annual limit	Rs 5Crore	Rs 10 Crore	Rs 50 Crore	Rs 150 Crore
Annual limit with booster	Not Applicable	Rs 15 Crore	Rs 75 Crore	Rs 210 Crore

Option 2 - Reimbursement of Net SGST

Net SGST Reimbursement					
Description		Large	Mega	Super Mega	Ultra Mega
Annual percentage of reimbursement of Net SGST		100%	100%	100%	100%
period (in years)		6	12	14	16
Gautam Buddh Nagar & Ghaziabad	Annual limit as percentage of ECI	16%	7%	6%	5%
	Overall limit as percentage of ECI	80%	80%	80%	80%
Madhyanchal and Paschimanchal (excluding Gautam Buddh Nagar and Ghaziabad)	Annual limit as percentage of ECI	18%	17%	14%	13%
	Overall limit as percentage of ECI	90%	200%	200%	200%
Bundelkhand and Purvanchal	Annual limit as percentage of ECI	20%	25%	21%	19%
	Overall limit as percentage of ECI	100%	300%	300%	300%

Option 3 - Production Lined Incentive

- 30 % of the sanctioned PLI incentives (as and when disbursed by GOI)

UP Industrial Investment & Employment Promotion Policy 2022 | Manufacturing Units (Electrolyser)

Categories	Capital Investment	Investment Period	Old investment
Large	Above ₹50 Cr but below ₹200 Cr	Up to 4 years	Investment starting in the **last 5 years (except land)** from Policy Date will be considered up to **20%** for deciding project category**,** but **incentive on remaining 80% only (ECI)**
Mega	₹200 Cr or above but below ₹500 Cr	Up to 5 years	
Super Mega	₹500 Cr or above but below ₹3,000 Cr	Up to 7 years	
Ultra-Mega	₹3,000 Cr or above	Up to 9 years	

Incentive package

- **Stamp Duty Exemption**
  - 100% in Bundelkhand & Poorvanchal,
  - 75% in Madhyanchal & Paschimanchal (except Gautam Buddh Nagar & Ghaziabad districts)
  - 50% in Gautam Buddh Nagar & Ghaziabad districts
- **Investment Promotion Subsidy -** A **one-time choice** between three mutually exclusive options during the time of application.
  - **Option 1: Capital Subsidy with boosters**
  - **Option 2: Net SGST Reimbursement**
  - **Option 3: PLI Top-up**

Uttar Pradesh Green Hydrogen Policy 2024 | Additional Incentives

Enhanced Subsidy for FIRST five projects

Ultra Mega Projects

Investment - INR 3,000 Cr or more

Total Subsidy - 40%

No of Projects - 3 nos.

Super Mega Projects

Investment - INR 500 Cr to 3,000 Cr

Total Subsidy - 35%

No of Projects - 2 nos.

Selection Criteria

- **First come first serve**
- **Project received within each 30 days through Green Hydrogen Portal**
- **Investment size**

Uttar Pradesh Green Hydrogen Policy 2024 | Other Incentives

Land Incentives

- For Private Developers - Govt. Revenue land for 30 years lease @ Rs. 15000/ Acre/year.
- 100% exemption on stamp duty charges

Operational Incentives

- ***100% exemption*** on Electricity Duty for first 10 years
- ***100% exemption*** on intra-state wheeling/transmission/cross subsidy surcharges for first 10 years
- **100% waiver** on wheeling/transmission charges on **sale** to third parties (intra-state) renewable energy or captive use of renewable energy.
- **100% waiver** on **cross-subsidy surcharge** and **wheeling/transmission charges** on intra-state transmission for **purchase** of renewable energy within the state.
- **Demand Charges** will only apply to the portion of energy consumed from DISCOMs, according to UPERC - CRE Regulations, 2019, as amended
- **100% captive use** of generated power will be allowed for setting up of green hydrogen projects
- Allocation of **transmission infrastructure** for evacuation of power on priority basis
- Facility to **bank the renewable energy** used for production of Green Hydrogen/Ammonia will be available in the state

Uttar Pradesh Green Hydrogen Policy 2024 | Ease of doing Business

*Uttar Pradesh earns **'Top Achiever'** status in Business Reforms Action Plan*

Single Window Clearance

- UPNEDA has launched a **dedicated portal** for Green Hydrogen projects
- Portal is linked with Nivesh Mitra portal of InvestUP and National Portal of Government of India

Environmental Clearance and Regulatory Exemptions for Green Hydrogen Projects

- All green hydrogen projects will receive **"white category"** status for environmental clearance.
- Green hydrogen projects are **exempt** from obtaining consent or NOC under the Uttar Pradesh Pollution Control Board's Pollution Control Rules.

Resource Availability

- The Uttar Pradesh Irrigation and Water Resources Department will **provide water** from nearby sources to green hydrogen projects, based on the developer's estimated consumption
- Aid will be provided to the developers in **providing land** and in case of Government land being available, land will be made available for production, consumption, storage, transportation, and other related purposes in Green Hydrogen/Ammonia projects

Uttar Pradesh Green Hydrogen Policy 2024 | R&D Initiative & Startups

Purpose

- To reduce high cost of Green Hydrogen with innovation
- Address challenges in Green Hydrogen applications, indigenous manufacturing of electrolyzer, System Efficiency, Transportation, Storage etc.

Centre of Excellence

- ***Two (2) Centres of Excellence*** will be established to reduce the production cost
- ***100% financial incentive (Maximum up to Rs 50 Crores)*** will be provided to Government educational institutions for establishing Centre of Excellence
- **Initiative:** Floated ***public advertisement*** for COE on 25th July'24; Last date of COE proposal submission is 15th Sep'24

Promotion of Startups

- Financial incentive of ***Rs 25 Lakhs per year for 05 years***
- Startups registered under incubators of any educational institutions
- ***3 incubators*** will be encouraged with each incubator allowing 10 startups

“Green hydrogen, being clean energy, helps achieve the target of net zero and must be encouraged”

- Chief Minister Yogi Adityanath ji

Thank You

For more details, please contact

Uttar Pradesh New & Renewable Energy Development Agency

Vibhuti Khand, Gomti Nagar, Lucknow, Uttar Pradesh

Website: https://upneda.org.in/ ; https://upnedagh.in/

Nodal Officer : Mr Ajai Kumar

Mobile No.: +91 9415609005

Email id: nedaup@gmail.com