

Identifying demand clusters for hydrogen in India as per end use industries - Urea & Ammonia

Part-1 (Global demand clusters, international trade and development hydrogen strategy roadmaps for different geographies)

Identification of key demand clusters of hydrogen in India

Across Indian industry, there are considerable efforts to establish a hydrogen economy in India, not least, the work being taken forward by oil marketing companies such as Indian Oil

Identification of key demand clusters of hydrogen in India by region & end use

Hydrogen is a promising energy carrier which has the potential to address several energy sector related challenges and technically from the application point of view can substitute the conventional fuels. Hydrogen can provide linkages between energy supply and demand in both a centralized or decentralized manner, thereby enhancing the overall energy system flexibility. The low carbon energy can be connected to sectors like transport and buildings or even hard to abate sector like steel and cement industry.

Presently, demand of hydrogen in India is 6 mt/year and is mainly driven from the industrial sectors such as chemical and petrochemical units.

Further, it is also extensively used in India mainly as an industrial feedstock in the creation of ammonia-based fertilizers. These sectors will continue to make up a large part of the demand with volumes, expected to surge with new demand coming from the steel industry as it seeks to decarbonize. Hydrogen is also likely to play significant role in the transport sector, particularly in heavy duty and long-distance segments.

By 2050, India intends to produce three-fourths of the hydrogen from renewable resources. R&D projects in India are focusing on improving the efficiency of water –splitting reaction and finding newer materials, catalysts and electrodes and electrodes to accelerate the reaction.

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India is committed to the rapid expansion of the hydrogen economy, ensuring the cost-effective deployment of low carbon technologies across the transport, industry and power sectors by 2030

– Hydrogen Mission Statement, India

Clear recognition of hydrogen's cross-economy role in India, outlines for scaling up use in transport, industrial applications and power

Presently, more than 100 research groups are focusing on fuel cell technology. There are a number of international and domestic companies in India that are involved in hydrogen production, storage and its distribution- including Praxair (USA), Linde (global member of hydrogen council), Inox (Indo-US joint venture), Air Liquide (France), SAGIM (France), Air Products (USA), Fuel cell energy (USA), H2Scan (USA), ITM Power (UK), Heliocentris (Germany), Aditya Birla Group, Bhoruka Gases Limited, Gujarat Alkalies and Chemicals Limited, Gujarat Heavy Chemicals Limited, Air Science Technologies and Sukan Engineering Private Limited.

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For India to guarantee its role as a technology leader in the next phase of the energy transition, it will need to greatly increase activity across the public and private sectors to develop a hydrogen economy

- Hydrogen Mission Statement, India

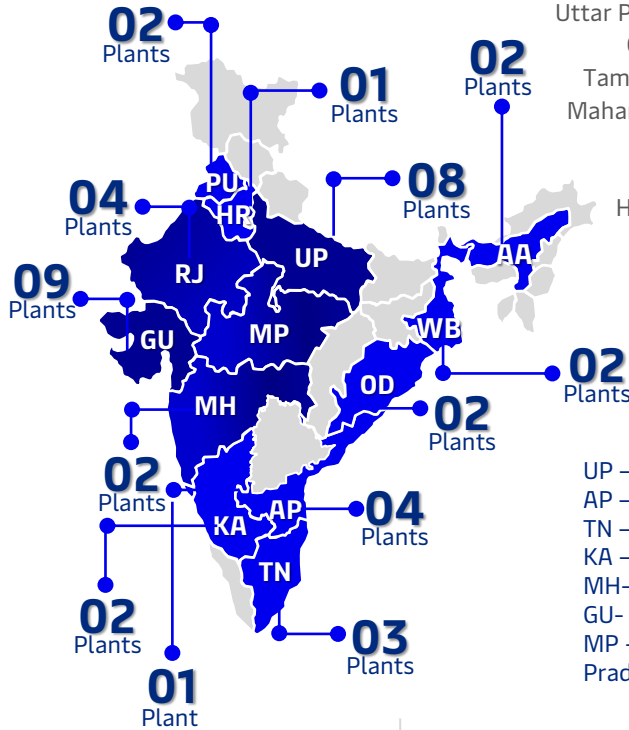
Identification of potential demand clusters for hydrogen in India – end use industry

End use industry – Urea and Ammonia

Number of urea plants in India

44

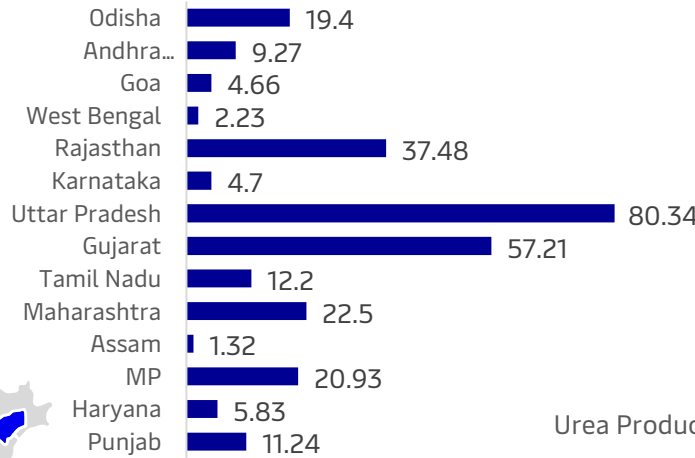
Total number of active urea production plants in India



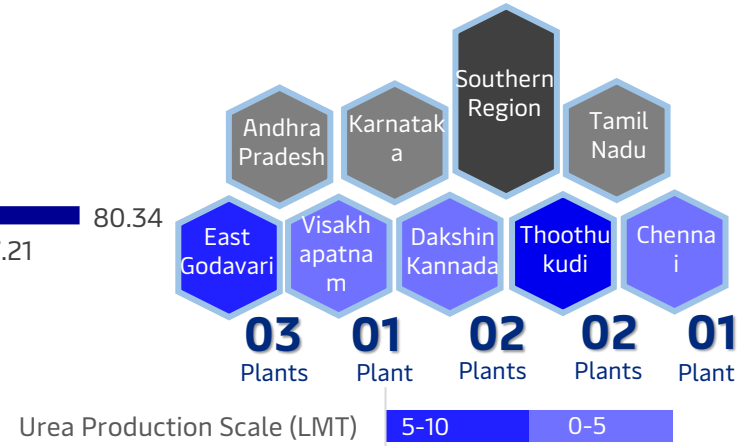
Urea Production Scale (LMT) 50-100 20-50 0-20

Note – LMT indicated Lakh Metric Tonnes per annum

Potential demand clusters for hydrogen w.r.t urea producing states (LMT) during FY'2020-21



Potential demand hubs for hydrogen across the urea producing clusters



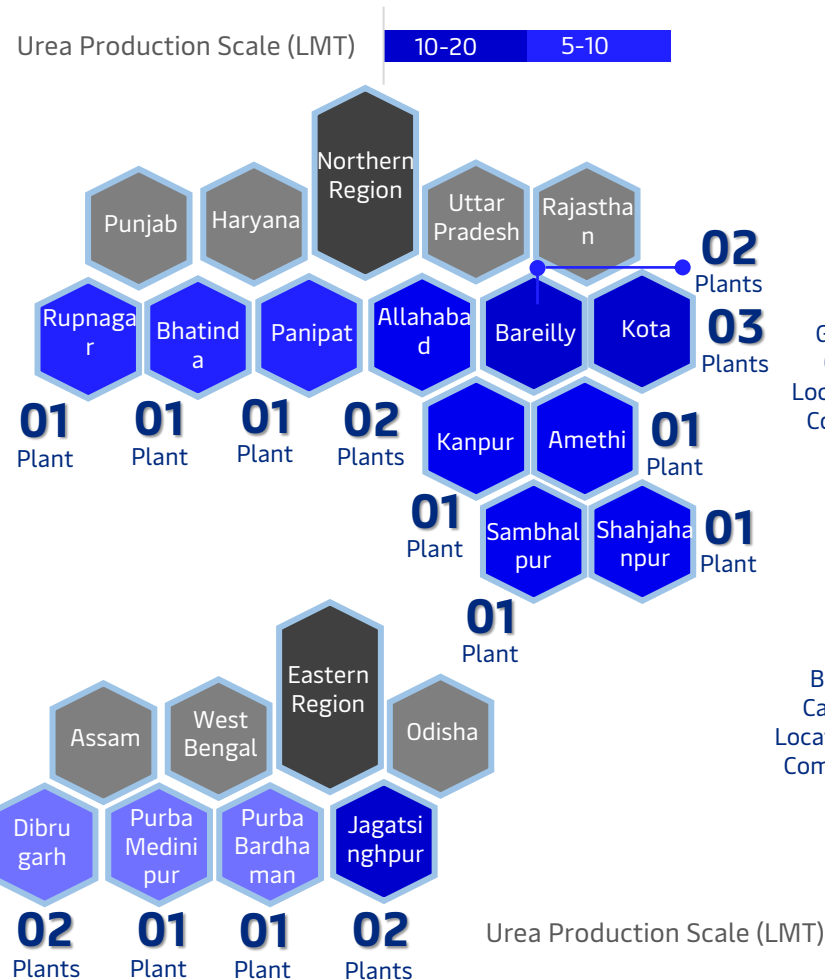
Urea Production Scale (LMT) 5-10 0-5

Urea Production Scale (LMT) 20-50 5-10 0-5

Identification of potential demand clusters for hydrogen in India – end use industry (contd.)

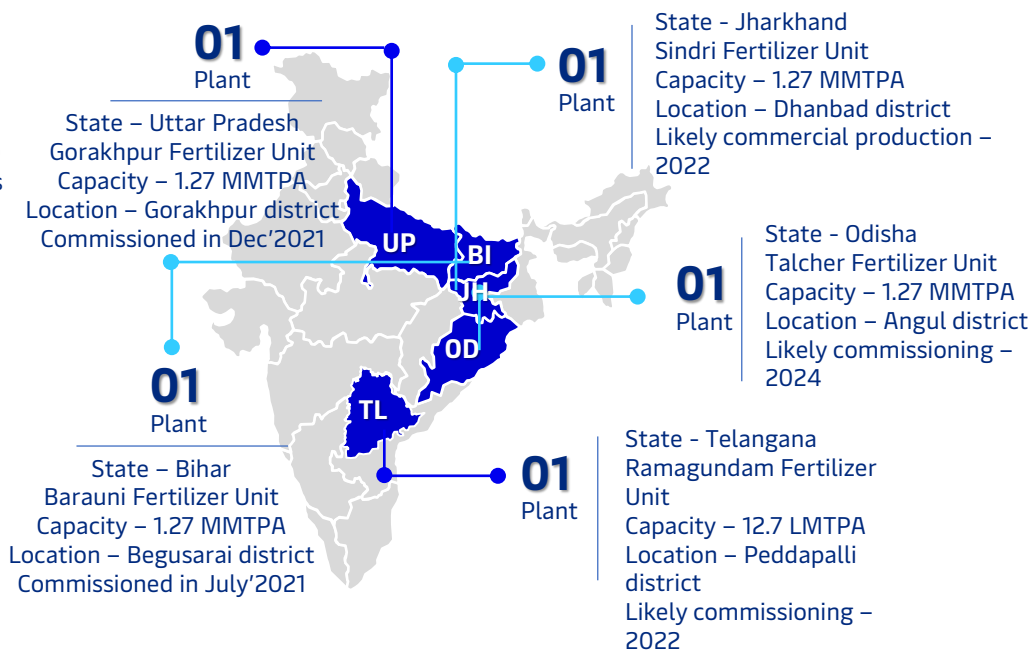
End use industry – Urea and Ammonia (Contd.)

Potential demand hubs across the urea producing clusters



Newly commissioned fertilizer units in India during 2021 in addition to the existing plants

05 Fertilizer plants that are newly commissioned/under commissioning process

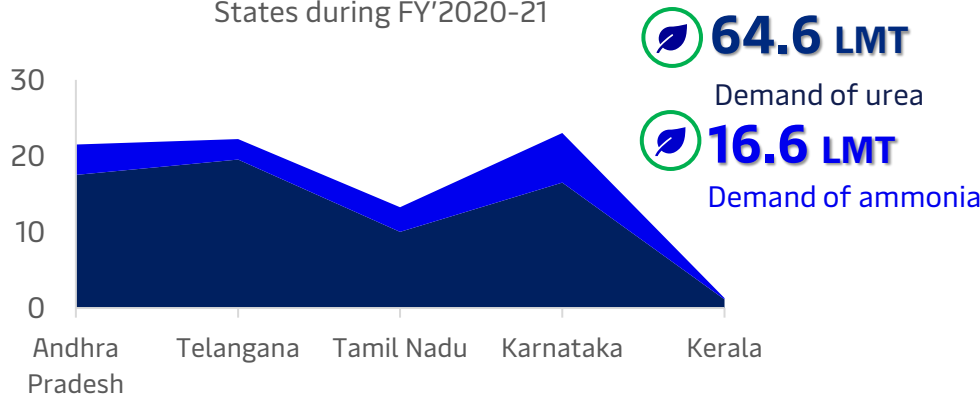


Note – LMT indicated Lakh Metric Tonnes per annum

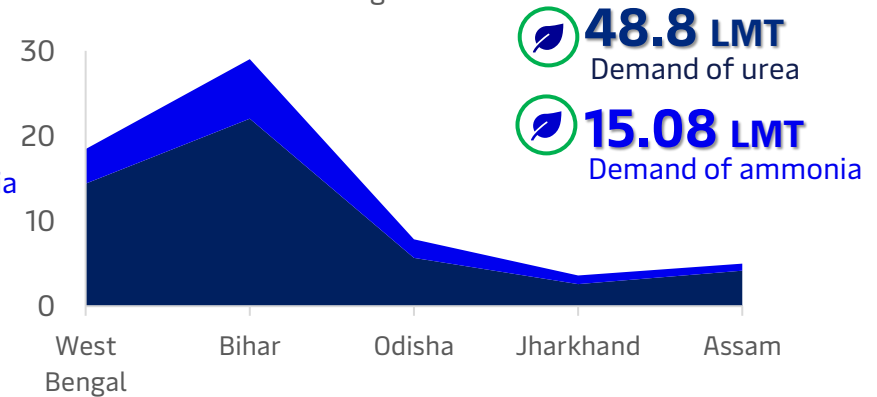
Identification of potential demand clusters for hydrogen in India – end use industry (contd.)

End use industry – Urea and Ammonia (Contd.)

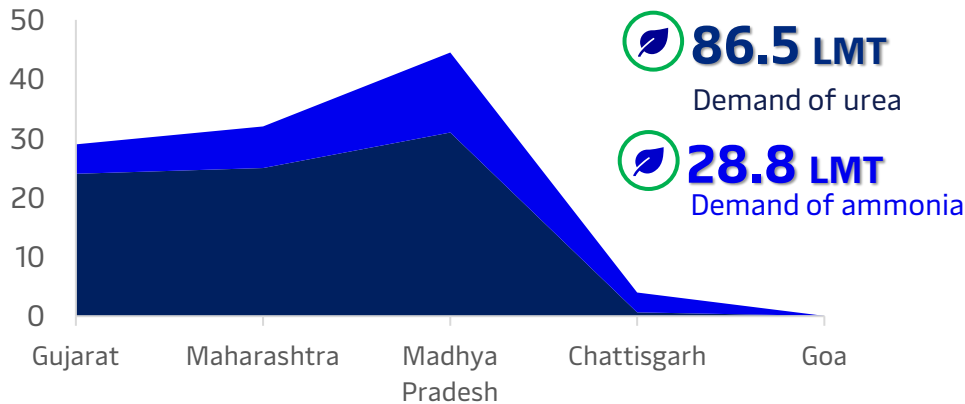
Demand of Urea and Ammonia by Southern States during FY'2020-21



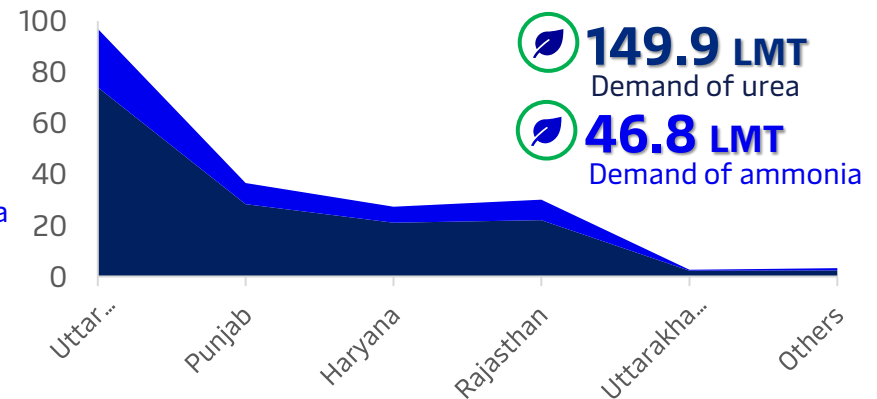
Demand of Urea and Ammonia by Eastern States during FY'2020-21



Demand of Urea and Ammonia by Western States during FY'2020-21



Demand of Urea and Ammonia by Northern States during FY'2020-21



Note – LMT indicated Lakh Metric Tonnes per annum

Source: Eninrac research, MoC&F, Channel Checks

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