Hydrogen Valley Innovation Cluster (HVIC) Pune

Team 1: Its TU'sday

Virtual Hackathon

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Cofinanciado por la Unión Europea

The Problem

Emissions Split

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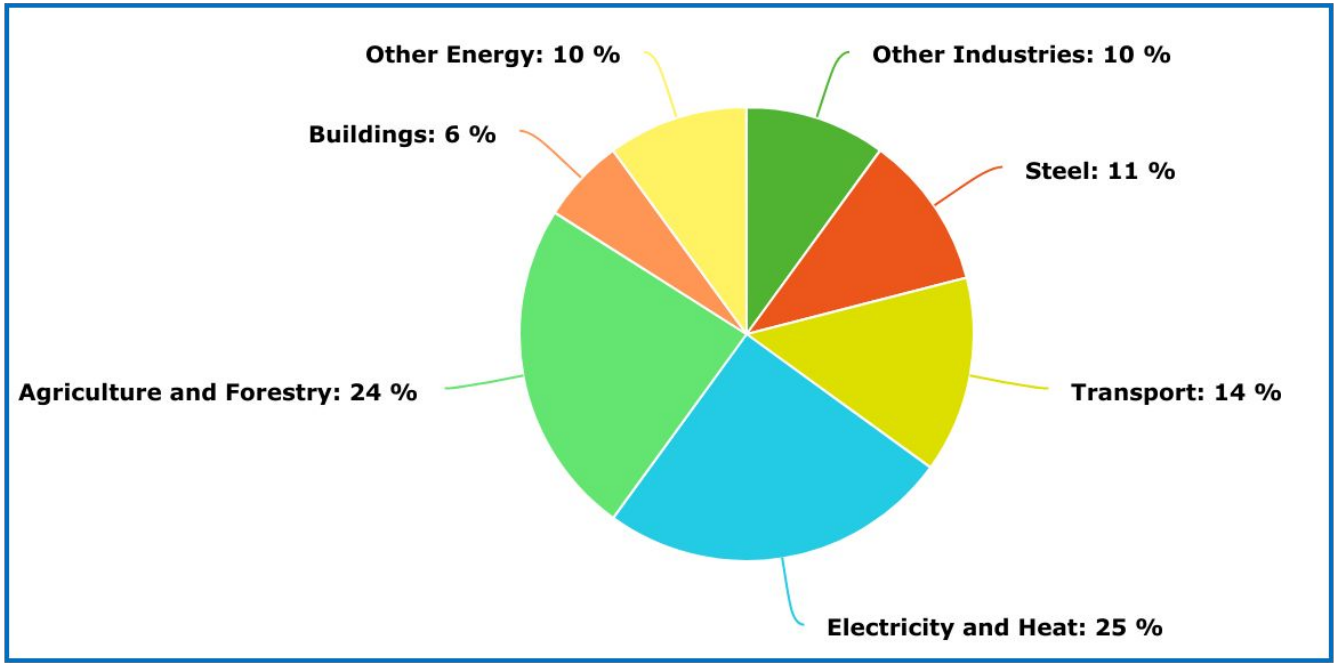
Kumar et al, 2020



Steel Industry **Crisis** in India

Time is running out

21 Million Tons

of steel exported yearly (Argus, 2021)

32%

of exports to Europe (MySteel, 2022)

33%

of all emissions by 2030 from steel industry (PIB, 2021),

35%

extra tariffs on export from **2026** (Reuters, 2024)

$2.87 Billion

yearly carbon tax tariff levied
(India Briefing, 2024)

90% CO2 reductions possible!

with green Hydrogen (CSTEP, 2022)

Where do we start?

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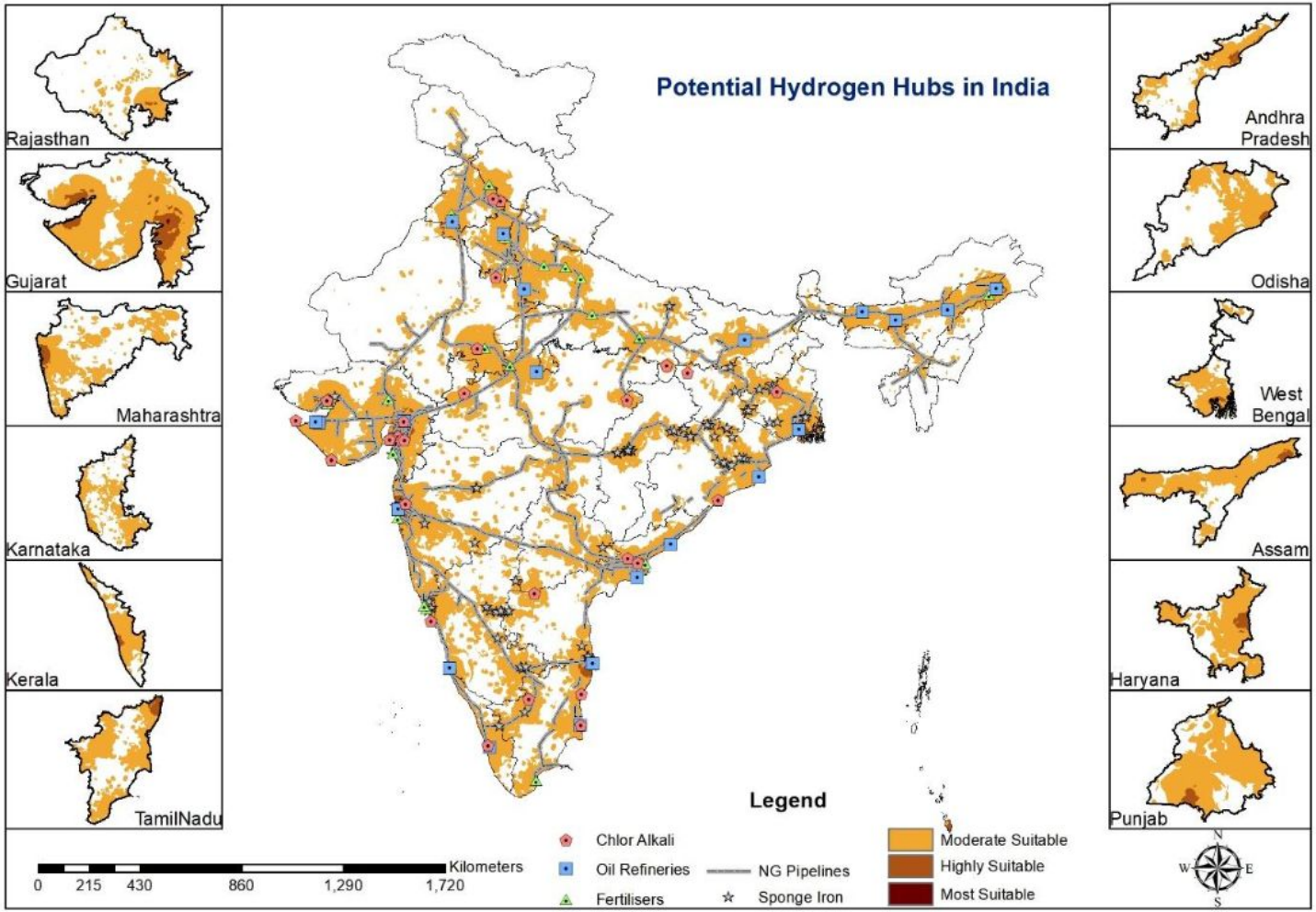

H2 Valleys: Opportunities and Trade-offs (CSTEP)

Land Availability for HVIC

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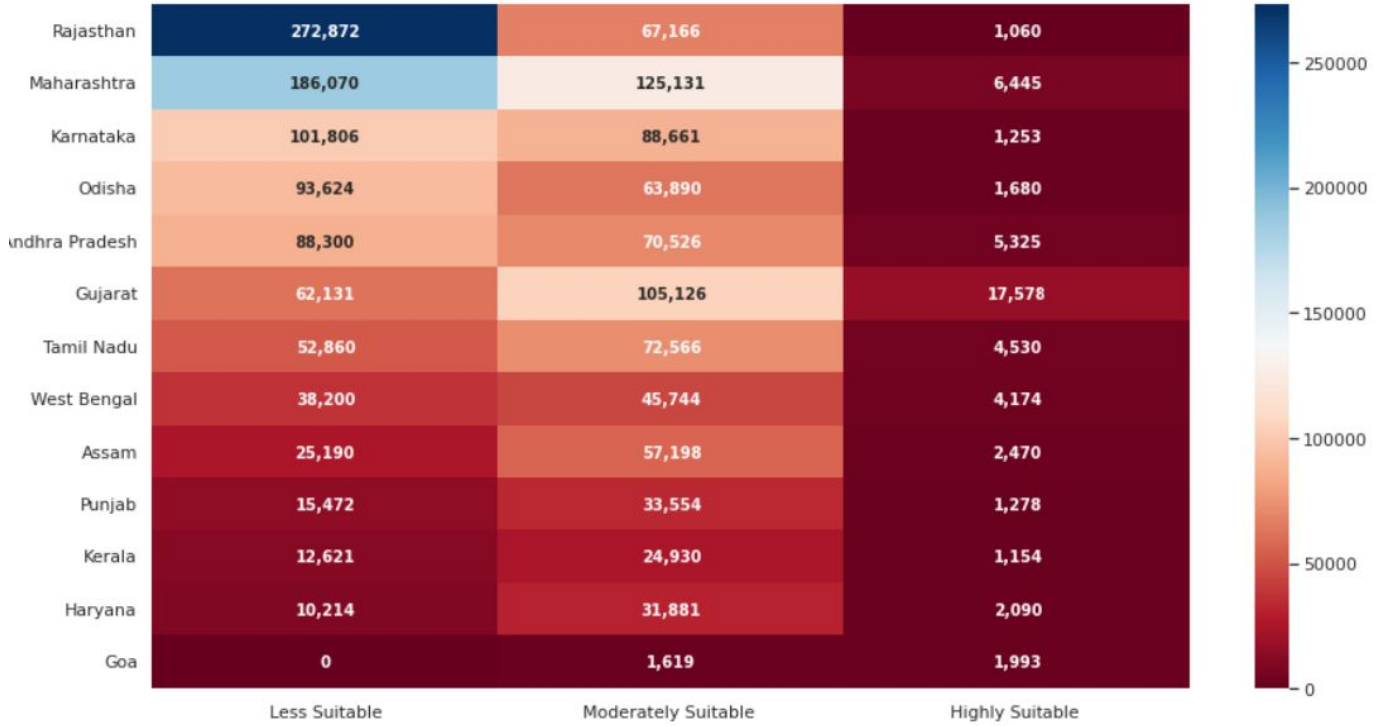

Figure 6: State-wise land suitability for hydrogen valleys (in km^2)

Existing Production

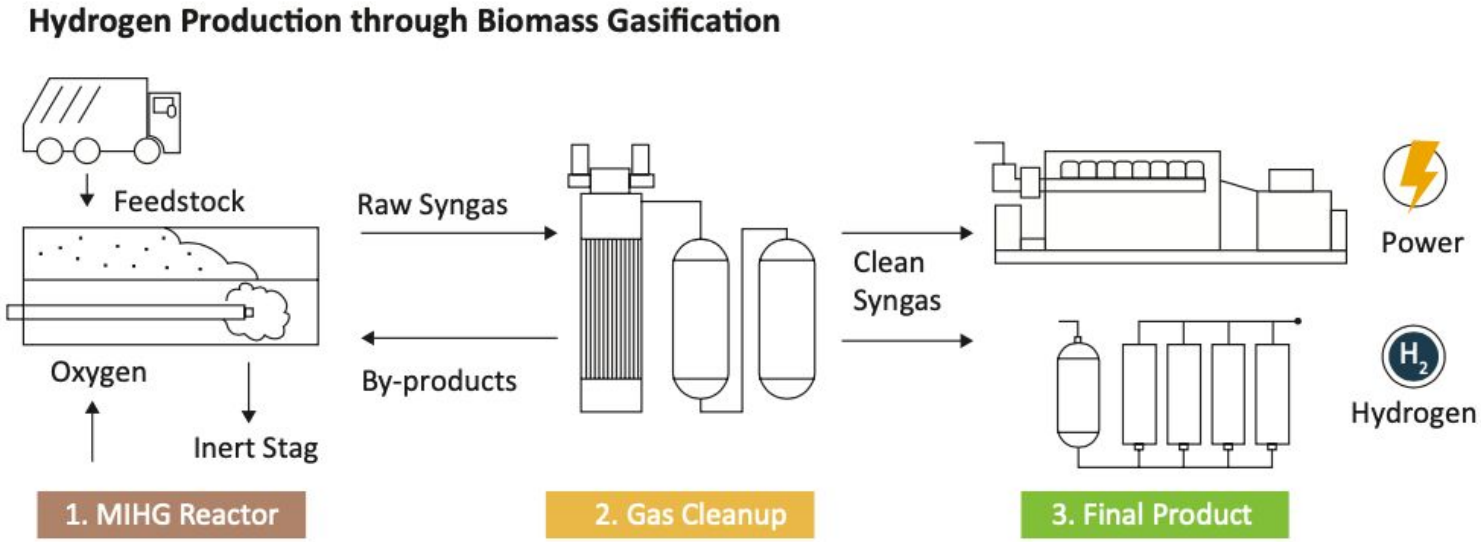

Figure 9: Hydrogen production through biomass gasification

Source: WRI India (2021)[27]

Small-Scale Hydrogen Valley Innovation Cluster

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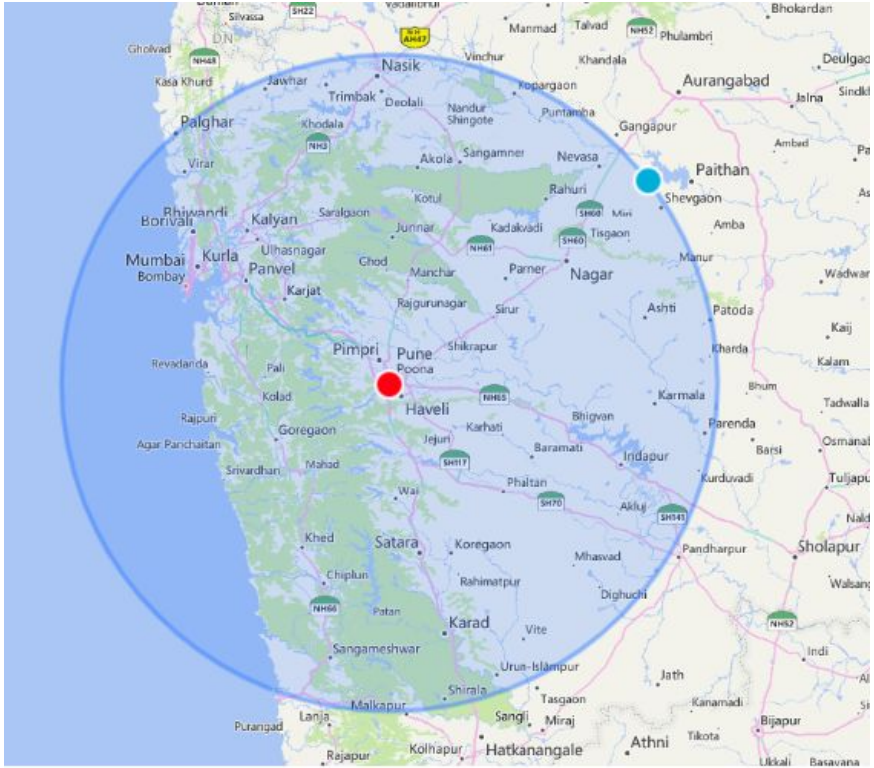

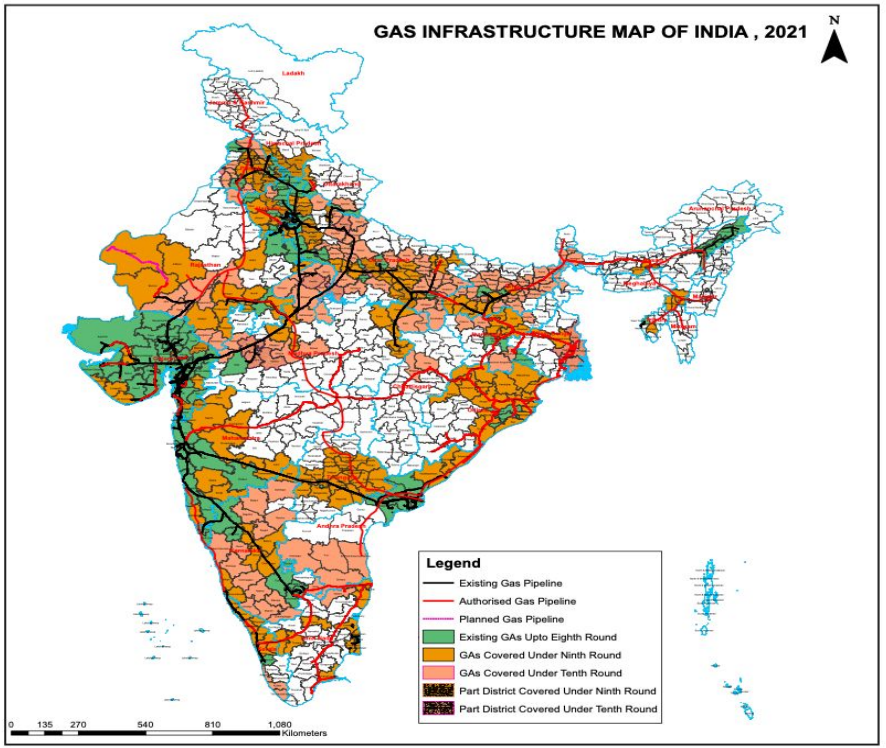

Figure 11: Gas infrastructure map of India (2021)

Source: Ministry of Petroleum and Natural Gas (2021)[32]

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Pune!

Home / Economy / News / Country's first waste-to-hydrogen plant to be set up in Pune, said official

Country's first waste-to-hydrogen plant to be set up in Pune, said official

The country's first solid waste-to-hydrogen plant will be set up in Pune at a cost of over Rs 430 crore, an official said on Tuesday.

Business Standard, 2023

Business News / Business / Industry / Pune Poised To Become Hydrogen Hub

Pune poised to become hydrogen hub

A Hydrogen Valley is a defined geographical area where hydrogen serves more than one end sector or application in mobility, industry, and energy.

Financial Express, Dec 2022

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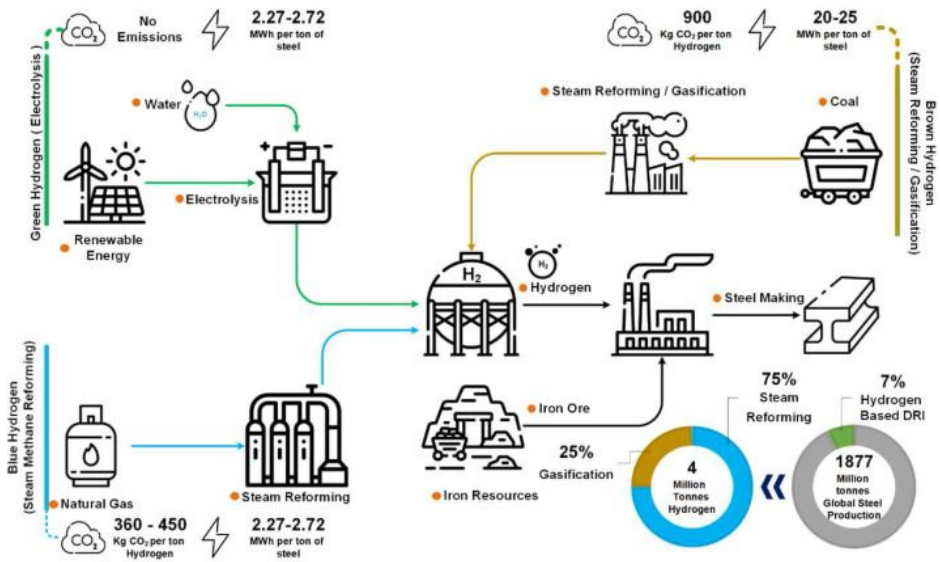
Status Quo



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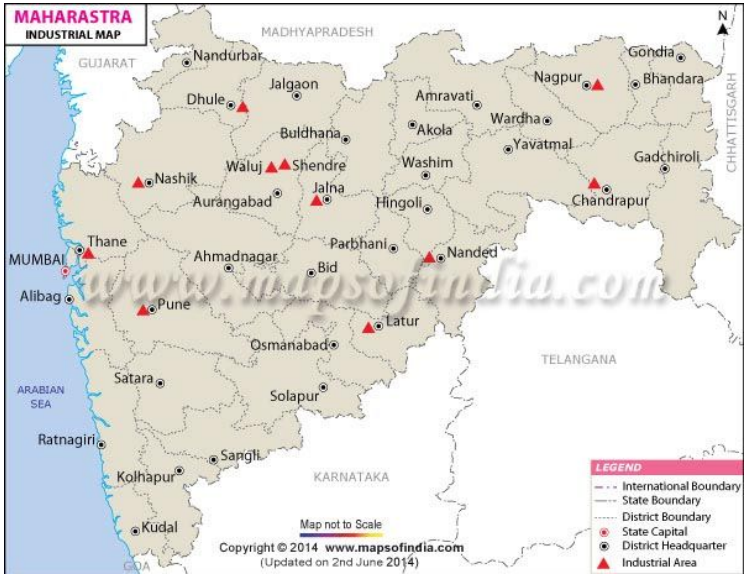

https://www.mapsofindia.com/maps/maharashtra/industries.html

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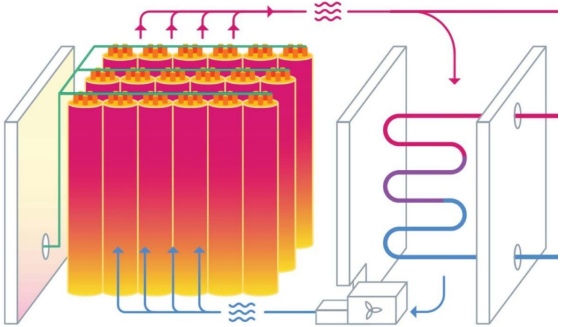
Our Implementation

- 700 MW Plant (based on Wind Energy Potential at 120m hub neight)
- SOECs + PEMECs
- 700 Bar hydrogen storage + Liquid Storage
- Heat Batteries (for steel heat cogeneration)



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The Impact

12 Million Tons

of green steel

500 MW

of green energy conversion and storage potential for Maharashtra

26 Million Tons

of CO_2 emission reductions across Maharashtra

$1.64 Billion

saved in carbon taxes if all steel from Maharashtra exported

Hydrogen Economy in Pune is the first step to decarbonising the Steel industry of India

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Distribution

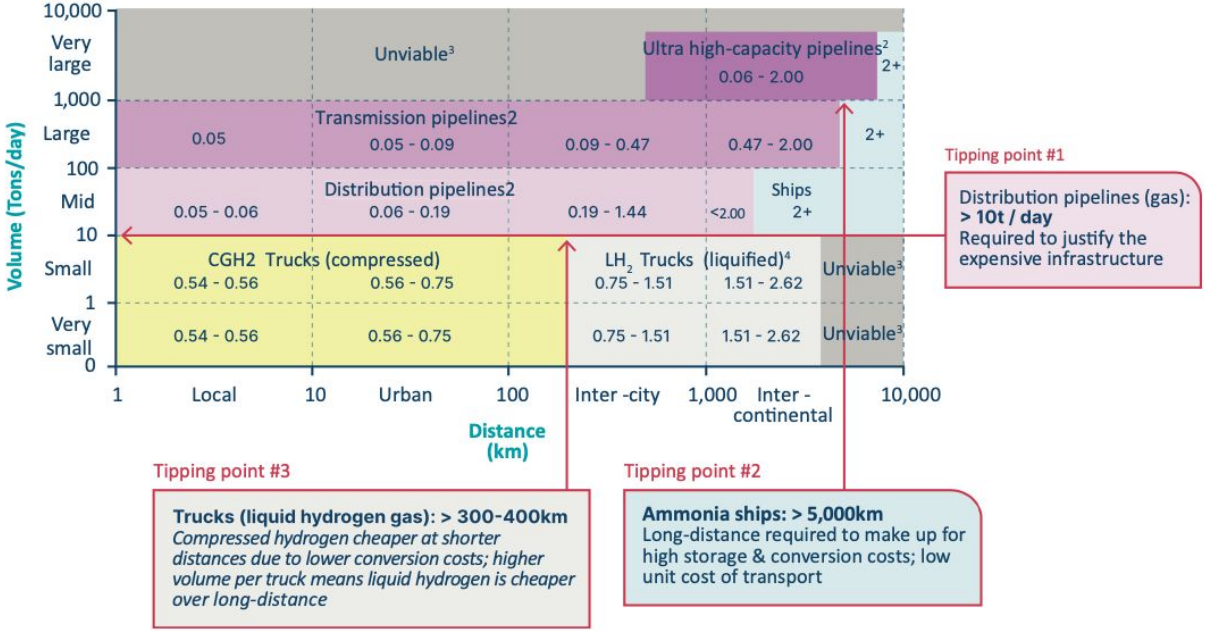

Figure 10: Lowest cost form of hydrogen transportation based on volume and distance

Source: Making the Hydrogen Economy Possible (report), Energy Transition Commission (ETC) (2021)[31]

7. [Next steps]

- India Target-
  - Energy independent by 2047
  - Net Zero by 2070