



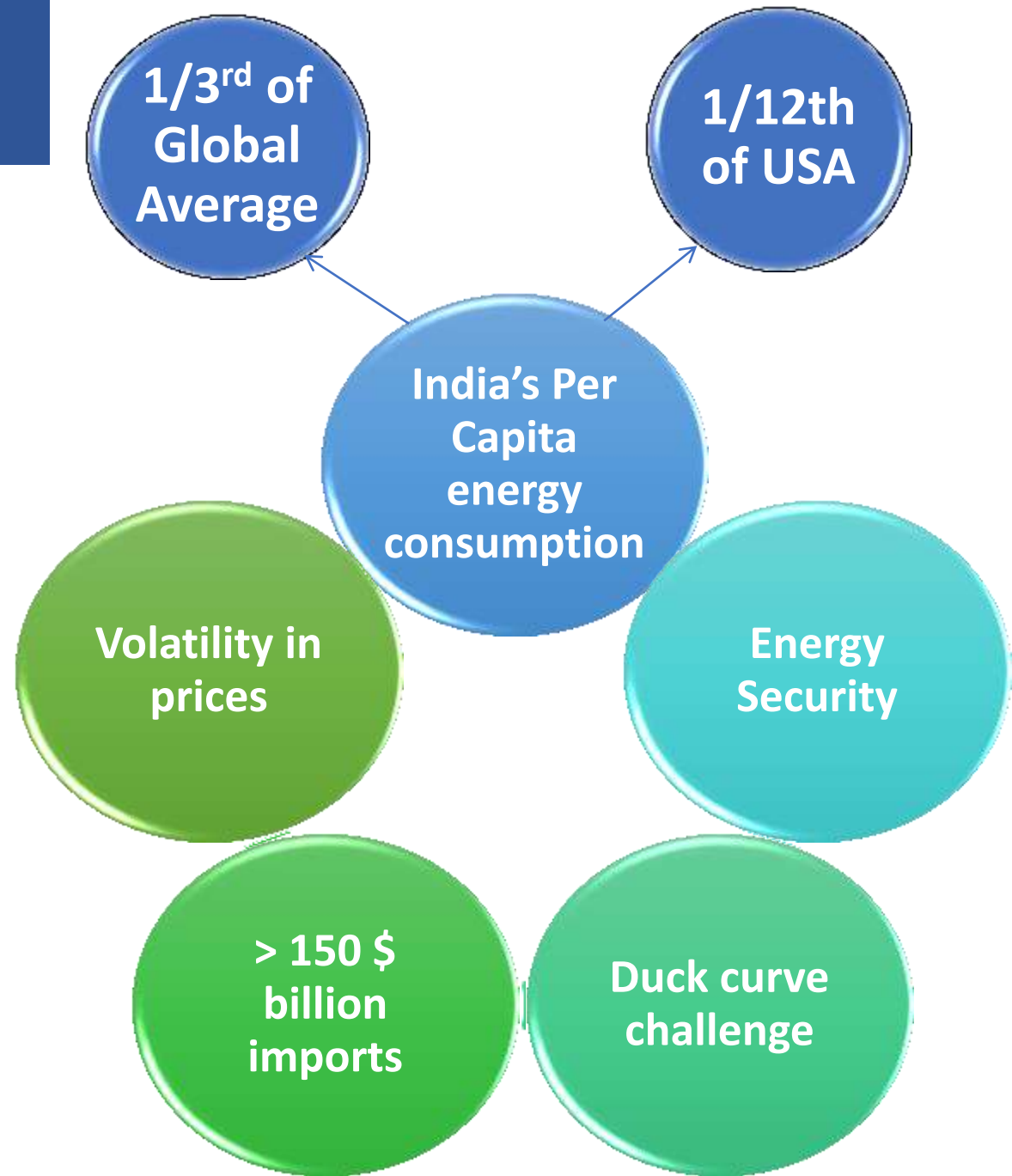
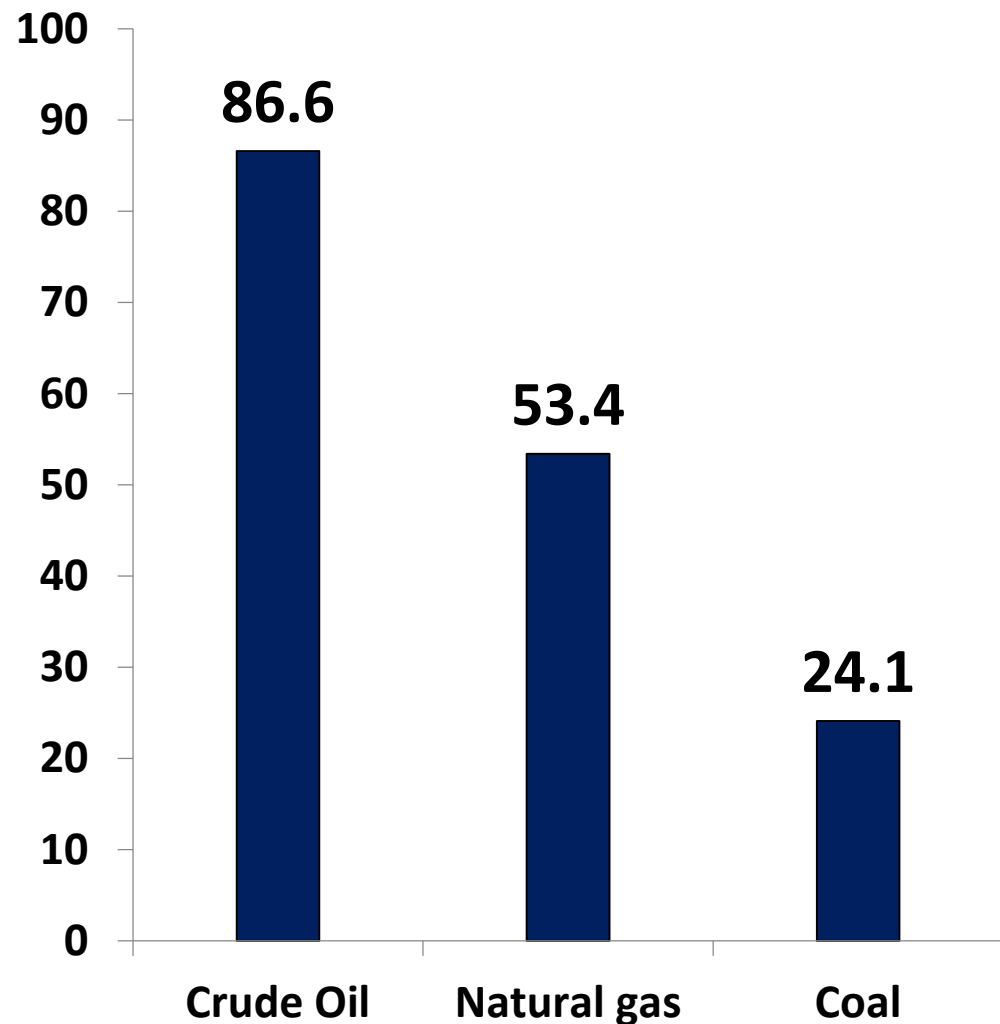
Hydrogen– Gateway to India’s Energy Independence

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(Manager EIL)**

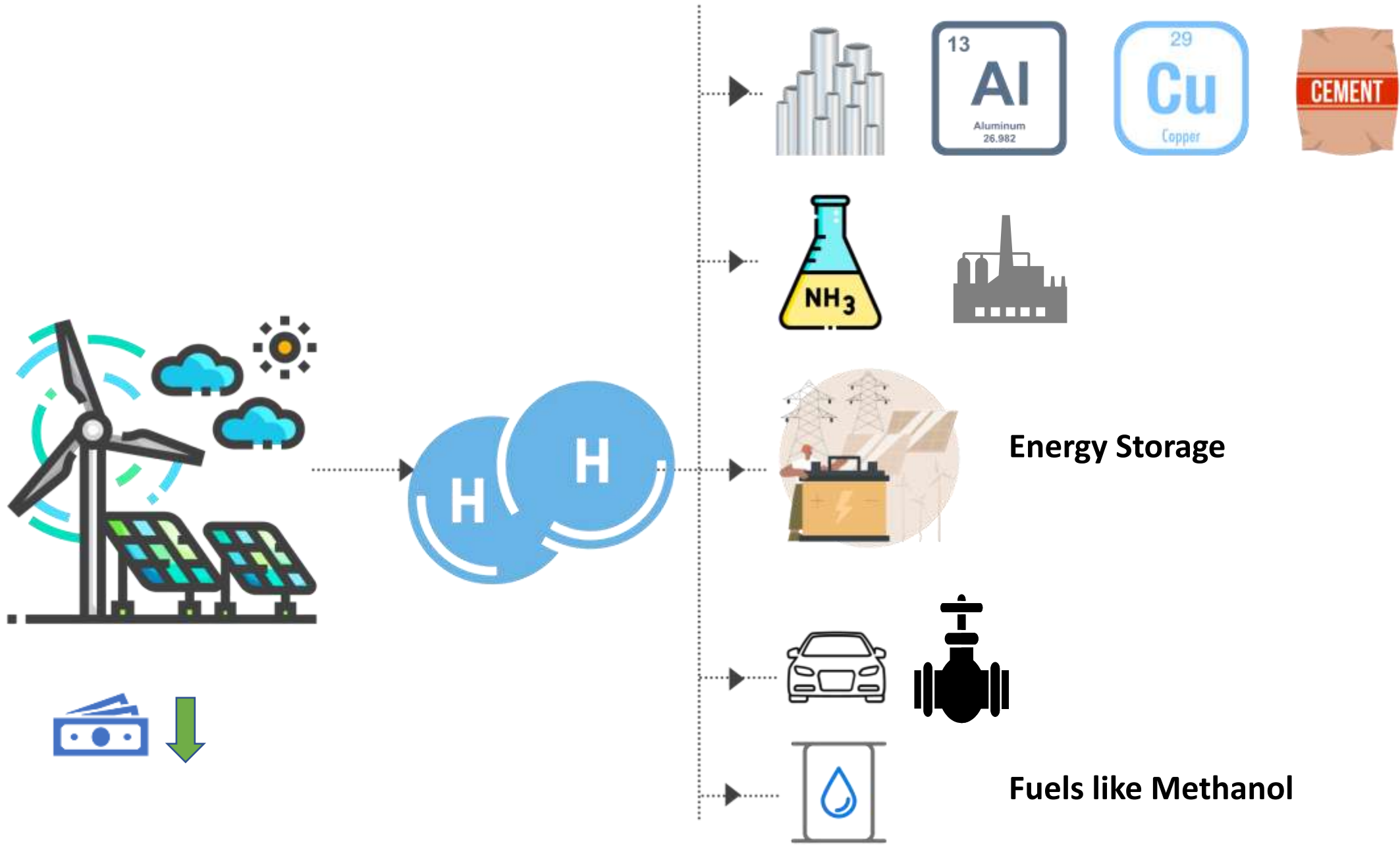
14th June, 2022

Why Hydrogen ? Gateway to India's Energy Independence

Net Energy Import Dependency %



Hydrogen - Opportunities



Hydrogen for Mobility



Heavy Duty Vehicles

- **20% of total freight vehicles**
- **74% road freight movement.**
- **Biggest emitter ~ producing 60% of road-freight CO2 emissions**



Aviation

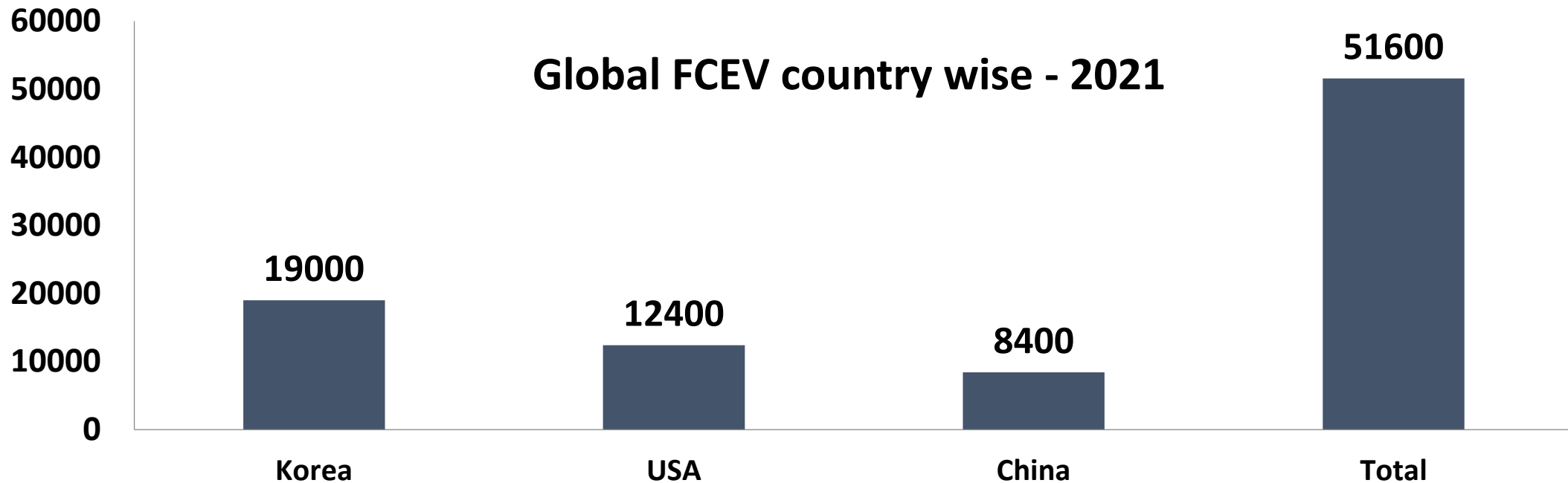
- **Highest carbon emissions intensity**
- **Emissions will grow exponentially**
- **Few alternatives options**



Maritime

- **7% of the world's oil, is presently consumed by ships**
- **IMO has set a goal of reducing international shipping emissions to 50% of 2008 levels by 2050.**

Global FCEV Overview



❖ Total 730 Hydrogen Refueling stations worldwide

❖ China accounts for almost 90% of fuel cell buses and over 95% of fuel cell trucks worldwide.

2050 PROJECTIONS

CHALLENGES

**Current
demand ~ 7
M.t. ~ 8 % of
global
demand**

**Hydrogen
demand –
35 Mt**

**Electrolyzers
Demand - 192 to
224 GW of
electrolyzers .**

**India itself would
require an
electrolyzer capacity
of 640 to 750 times
the current global
capacity, by 2050**

**Electricity demand of
around 1500 to 1800
TWh, implying that just
for hydrogen production;**

**India would require 110-
130% of its current total
electricity generation
(2020-21) by 2050.**



Electricity Demand



**High Manufacturing
Cost**



Water Scarcity

Hydrogen Development in India

National Hydrogen Mission on India's 75th Independence Day (i.e. 15th August, 2021).

Target of production of 5 million tonnes by 2030

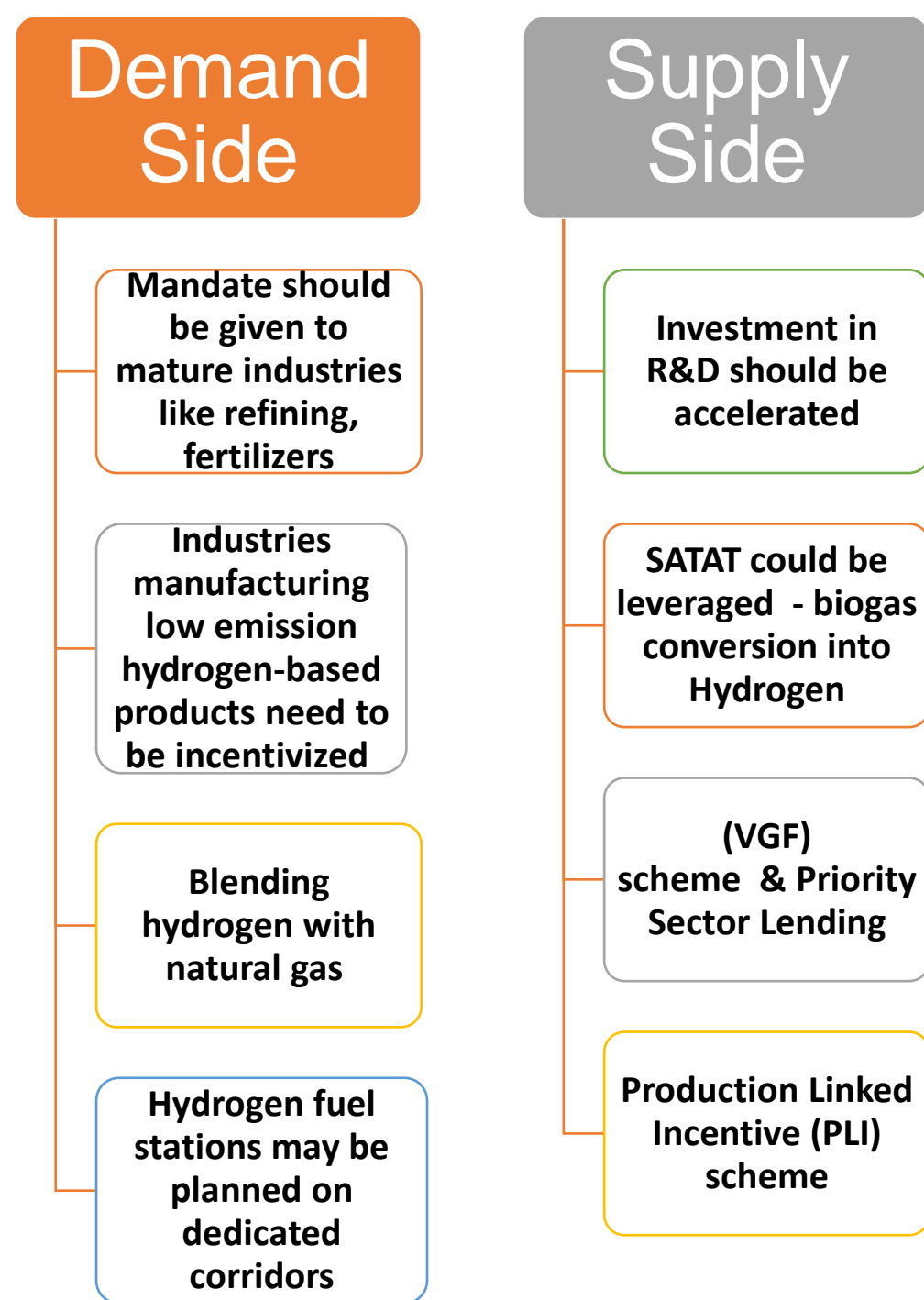
India's Green Hydrogen Policy released on 17th February 2022

Blending with natural Gas - GAIL 2%, supplied to Avantika Gas Limited (AGL), at Indore, MP. (Potential Hydeploy)

OIL has commissioned India's First pure Green Hydrogen pilot plant, with an installed capacity of 10 kg per day in Assam.

L&T has commissioned 380 kW (45 kg/day) green hydrogen plant at Hazira

Demand & Supply side Interventions



India's Transport Fuel Roadmap for Future



Heavy/ Long Distance Vehicles & Mining equipment

- **Hydrogen/LNG**



Two wheelers & four wheelers

- **Ethanol Blended Petrol, Electric, CNG**



Public Transport, Buses along with other transport vehicles

- **Electric, CNG**



Aviation

- **ATF, Bio Jet fuel, Synthetic kerosene**



Compressed Bio Gas & Hydrogen

- **Natural Gas to be blended with CBG/ Hydrogen**

THANK YOU