

Chemical Logistics: Opportunities for R & I in Academia

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ChemConnect 2022

Chemical Logistics: Policy, Infrastructure
Gap, and Opportunity

Can you show any 3 man-made materials or products without the use of chemicals ?



Prize of 100 million pounds
waiting for anybody since 2008


Scope of Discussion

- Indian Economy: 5 T\$ by 2024-25
- 30 T\$ in next 30 years
(*Ref. Shri Piyush Goyal*)
- Opportunities for Chemical Companies and Academia to partner



Chemical Logistics

- Storage and transportation of chemicals
- Transport with extreme caution to avoid any safety risks such as contamination and spoilage
- Transportation and distribution services, storage and warehousing services, customs and security services, green logistics services, and consulting and management services



Rail Road Pipeline Sea

1. General chemicals
2. Flammable and explosive chemicals
3. Toxic chemicals
4. Gases

Chemical & Allied Industry



- **Petrochemicals**
 - **Refinery or Crude chemicals that undergo semi-continuous processing and**
 - **Specialty chemicals that undergo batch processing like pharma, perfumes, paints, coatings and dyes.**
-

Global **Logistics** Market

OPPORTUNITIES AND FORECAST,
2020-2027

Global Logistics Market size
is expected to reach
\$12,975.64 Billion by 2027.

Growing at a **CAGR of 6.5%**
(2020-2027)



Source: Allied Market Research



Market Size

- To grow from \$251.94 billion in 2021 to \$271.73 billion in 2022 at CAGR of 7.9%.
- Chemical market in the US increased by 1.4% in 2021 and 3.2% in 2022, while shipments increased by 8.1% in 2021 and 8.2% in 2022.
- India's chemical sector (including fertilizers and pharmaceuticals) : USD 178 billion in 2019 and is predicted to expand to USD 304 billion by 2025, with a CAGR of 9.3%.
- India will be a hub of Chemical Manufacturing
- Rise in chemical production is driving the growth of the chemical logistics market.

GLOBAL CHEMICAL LOGISTICS MARKET 2021-2025

Top
Players

BDP International Inc.
C.H. Robinson Worldwide Inc.
CEVA Logistics AG
Deutsche Post DHL Group
DSV Panalpina AS
FedEx Corp.



By Service

- Transportation
- Warehousing
- Others

Market Segmentation

By Geography



Incremental growth
Y-X=

\$ 507.36 bn



CAGR of over

10%



Growth for 2021 is likely to **Increase** compared to 2020

17000+ Reports covering niche topics. Read them at [technavio](#)

Chemical Logistics Market

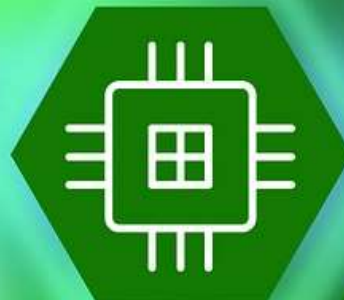
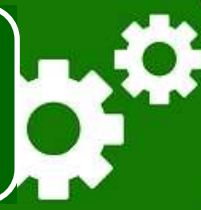
- Asia-Pacific was the largest region in the chemical logistics market in 2021. The regions covered in the global chemical logistics market report are Asia-Pacific, Western Europe, Eastern Europe, North America, South America, Middle East and Africa.

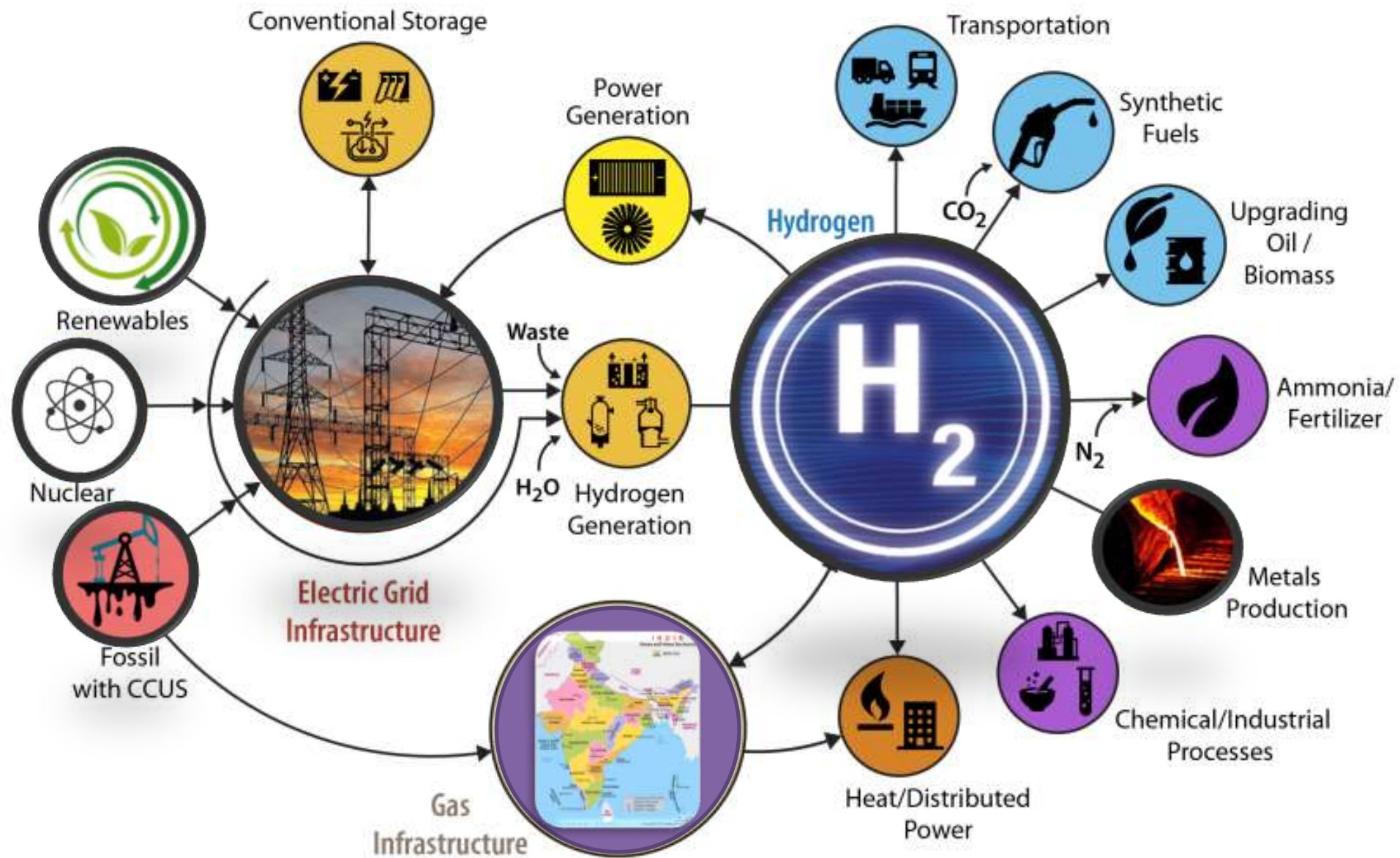
Ministry of Power, GoI, notifies Green Hydrogen Policy, Feb. 17, 2022



Water & Air as feedstock 2030

- The implementation of this policy will reduce dependence on fossil fuel and also reduce crude oil imports.
- To meet 50 per cent of the country's energy requirements using renewable energy sources by 2030.

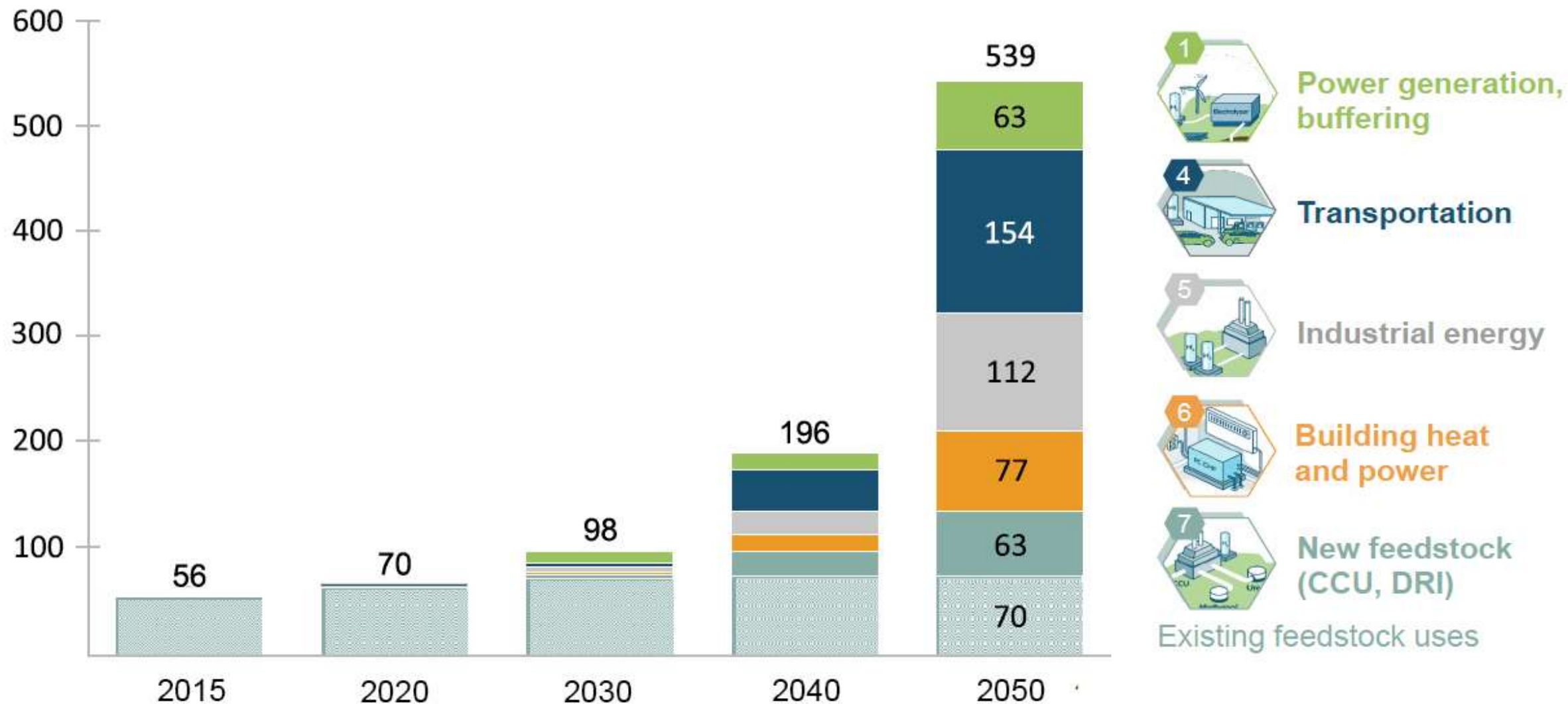




Benefits of Hydrogen Economy

Hydrogen demand could increase 10-fold by 2050

Demand in million metric tonnes H2

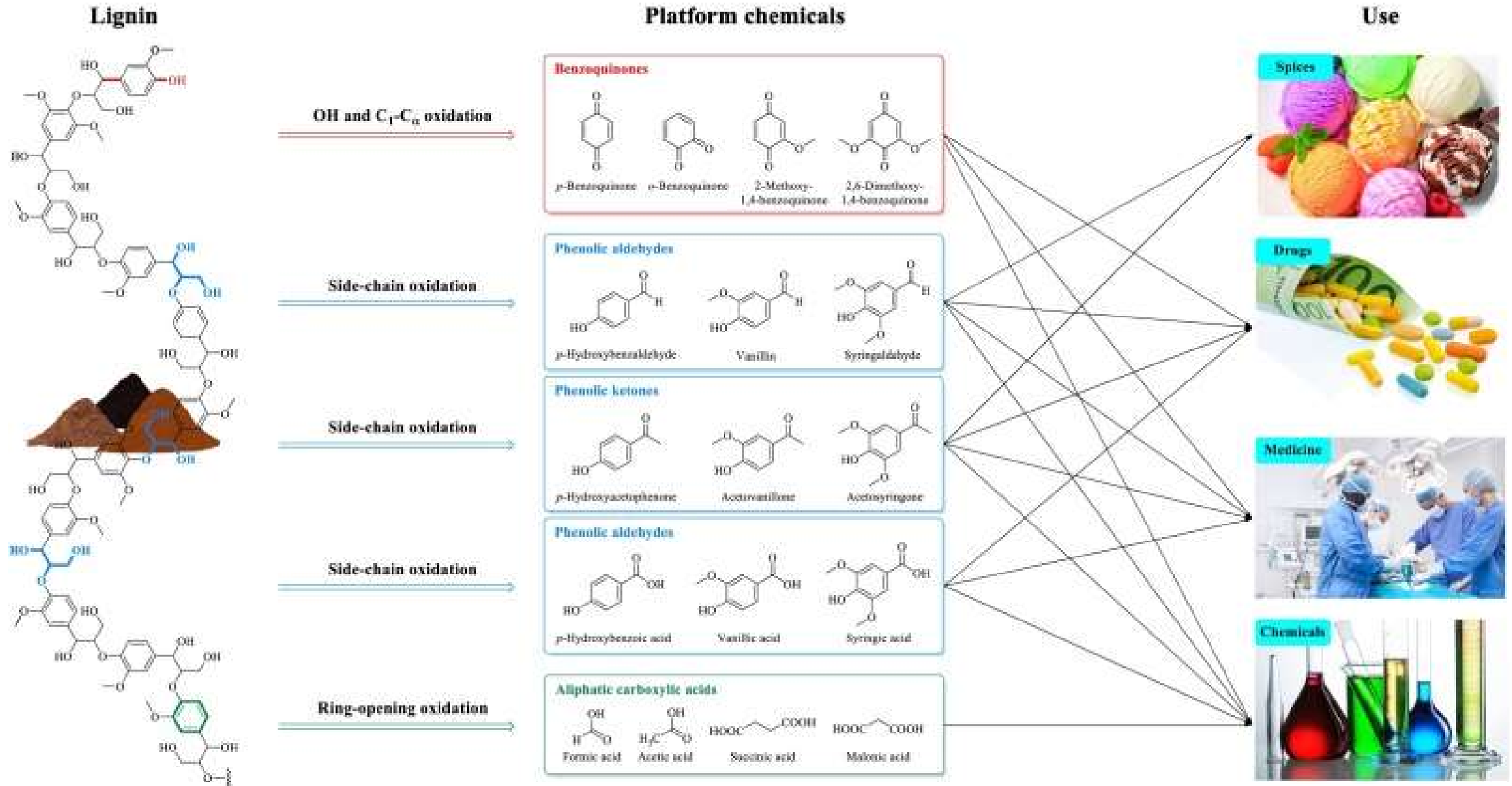


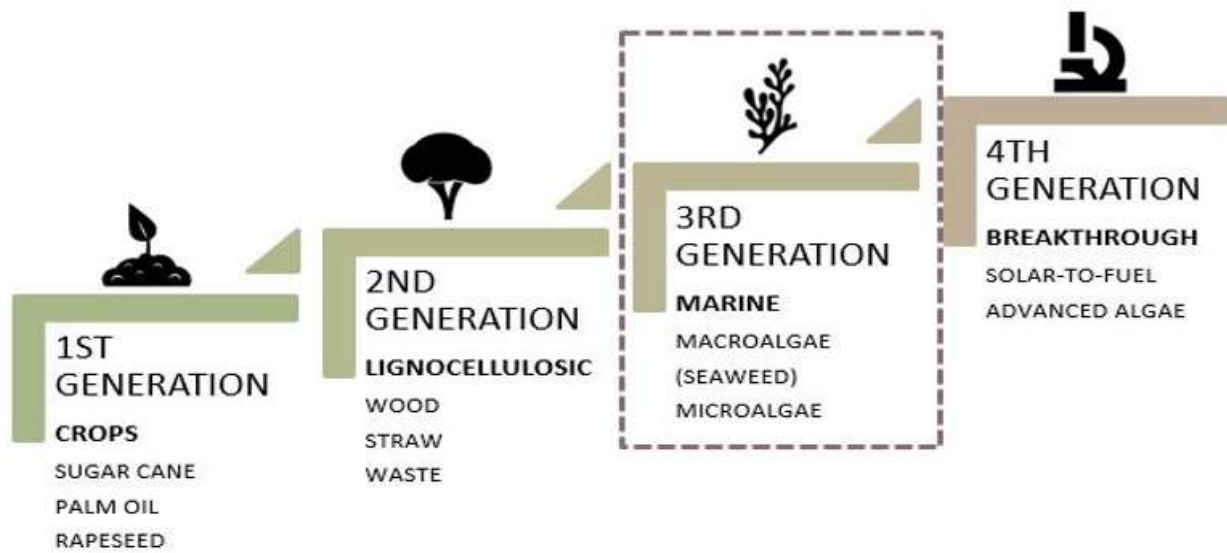
Adapted from *Scaling Up*, Hydrogen Council, 2017. Original units in EJ converted to tonnes H2; 1 EJ = 7,000,000 tonnes H2.

Innovative Products

- Major players in the chemical logistic market are making partnerships and collaborations for the development of innovative and technologically advanced products
- IoT devices and intelligent cloud platform.
- highly specialized tractors and trailers

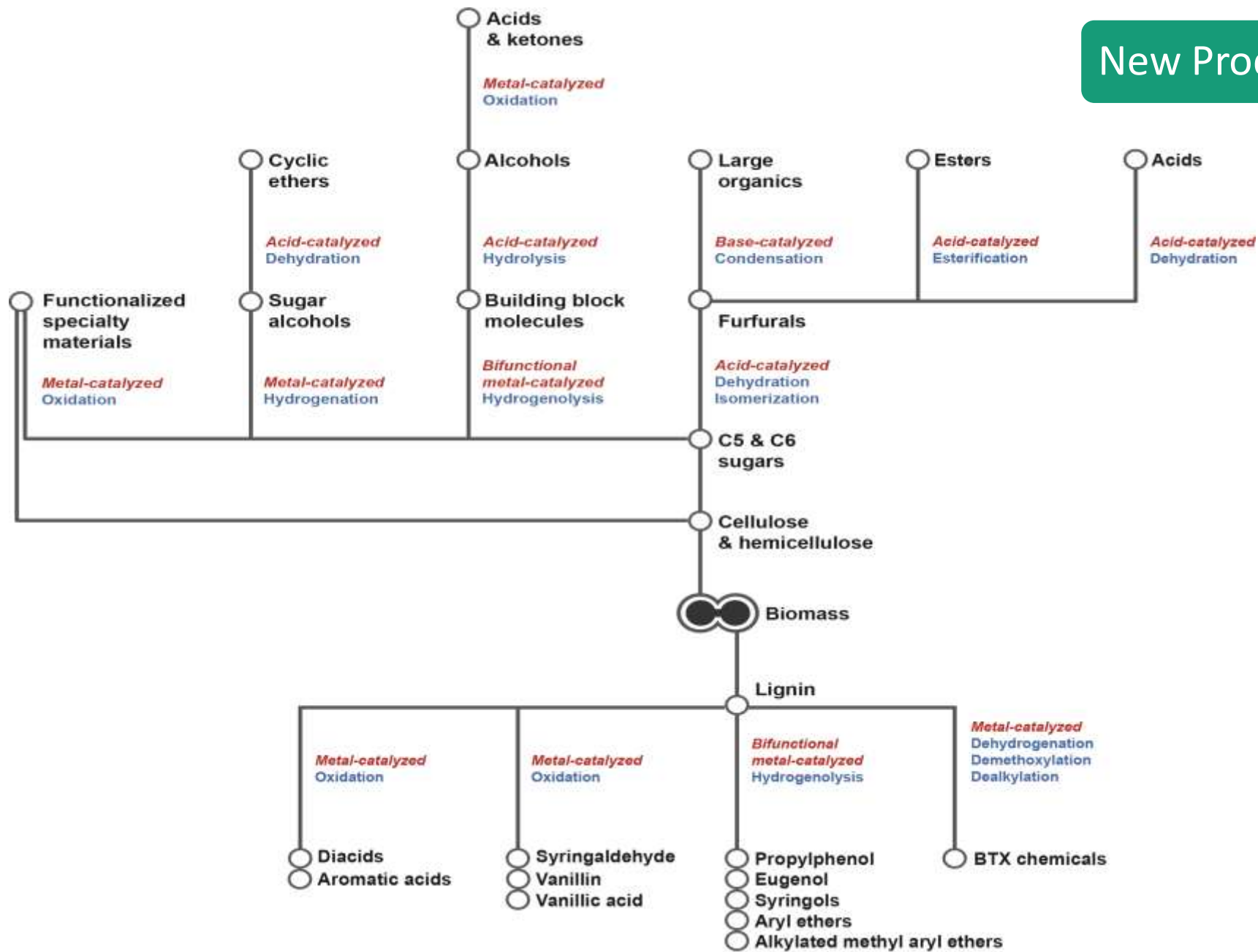
Logistics of Managing Feedstock and Warehouses





Biofuels

New Products and New Businesses



A rich catalog of catalytic processes is available for producing value-added chemicals from biomass.

Future Logistics

- Green Energy
- GH2 and GNH3
- CO2 capture, storage and transport
- Biomass Valorization
- DME
- Methanol
- Formic acid
- Waste to wealth
- Solar panels
- Waste plastic
- MSW

Role for Academia to Partner with Logistic Companies

- Scope for Modeling and Simulation
- Hazard and Safety
- Training of personnel associated with storage, transport and delivery
- Studies on hazardous properties and prevention of incidents and accidents.
- AI and ML



US NAE Election on 8th Feb. 2022
National Science Chair March 2022

Thank you all

- R.T. Mody Distinguished Professor Endowment
- Tata Chemicals Darbari Seth Distinguished Professor of Leadership & Innovation
- J.C. Bose National Fellowship, Dept of Sc and Tech, GOI
- National Science Chair (Mode I), SERB, DST, GoI
- ONGC Energy Centre

Ph Ds
107

Patents
115

Masters
134

Papers 507

PDFs 47

