

# Dynamics of Feedstock: Shifting Priorities

GCPMH 2021

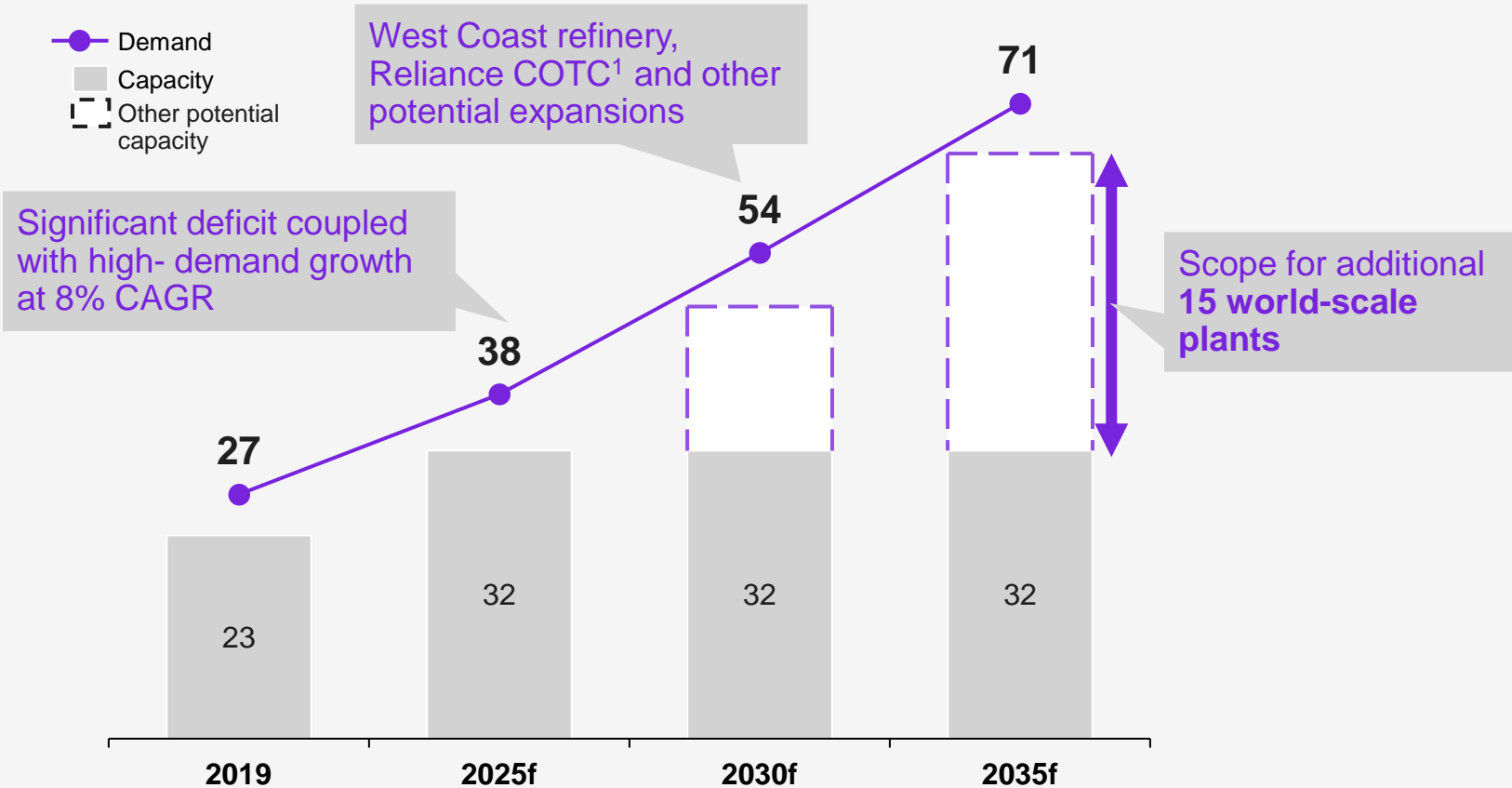
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# India's strong market fundamentals will drive rapid growth in petrochemical demand – potentially need 15+ world-scale petrochemicals assets by 2035 to meet domestic demand

**Petrochemical supply and demand in India** (million metric tons)



## Under-penetrated market

At ~10 kg, India's per capita plastic consumption is well below the global average of ~30 kg

## Robust GDP outlook

India is among the top two fastest-growing major economies, with an annual GDP growth rate of 6–7%

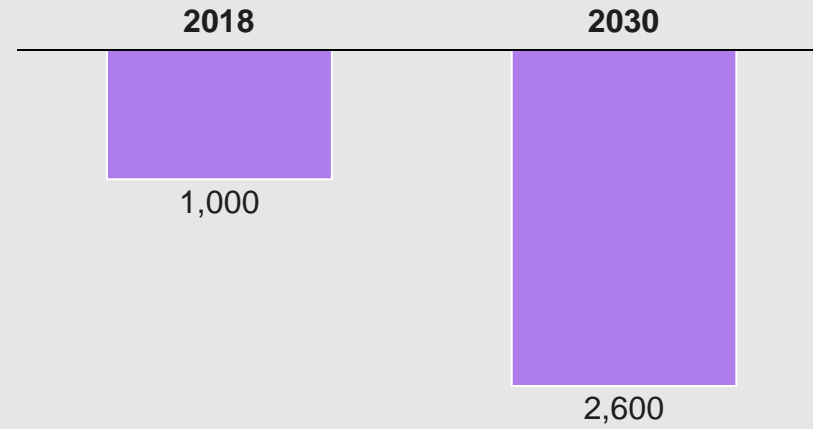
## Strong end-market growth

Strong growth outlook in end-sectors such as packaging, building and infrastructure, textiles and automotive

Domestic availability of petrochemical feedstocks remains a key challenge

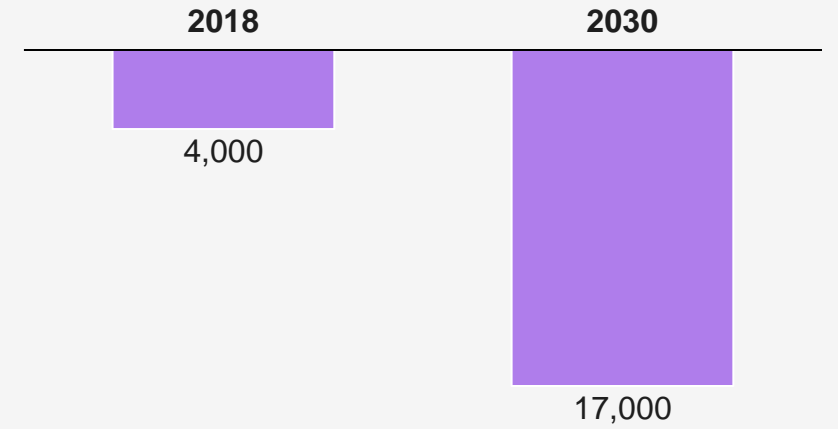
Propylene

(Net deficit, KTPA)



Ethylene

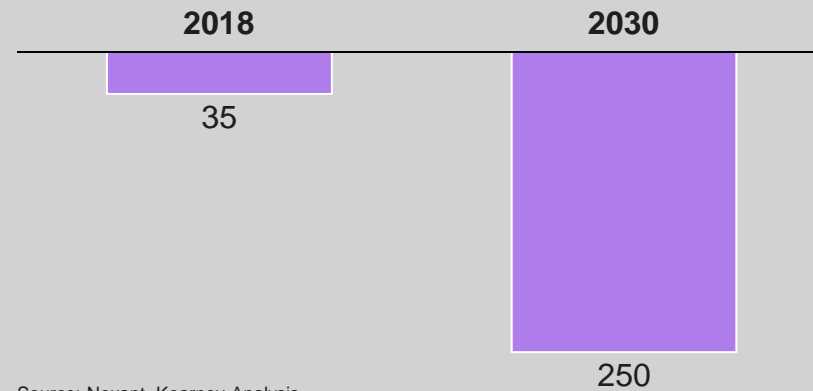
(Net deficit, KTPA)



Select Examples

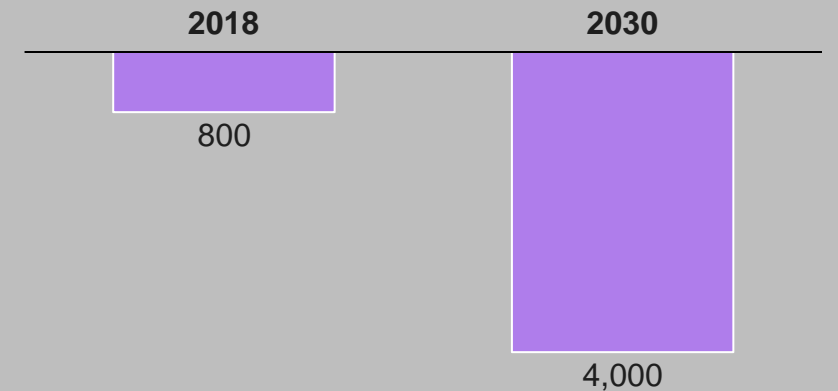
Propylene Oxide

(Net deficit, KTPA)



Ethylene Oxide






(Net deficit, KTPA)



Source: Nexant, Kearney Analysis

Multiple avenues have been suggested to overcome feedstock challenges in the domestic chemicals sector

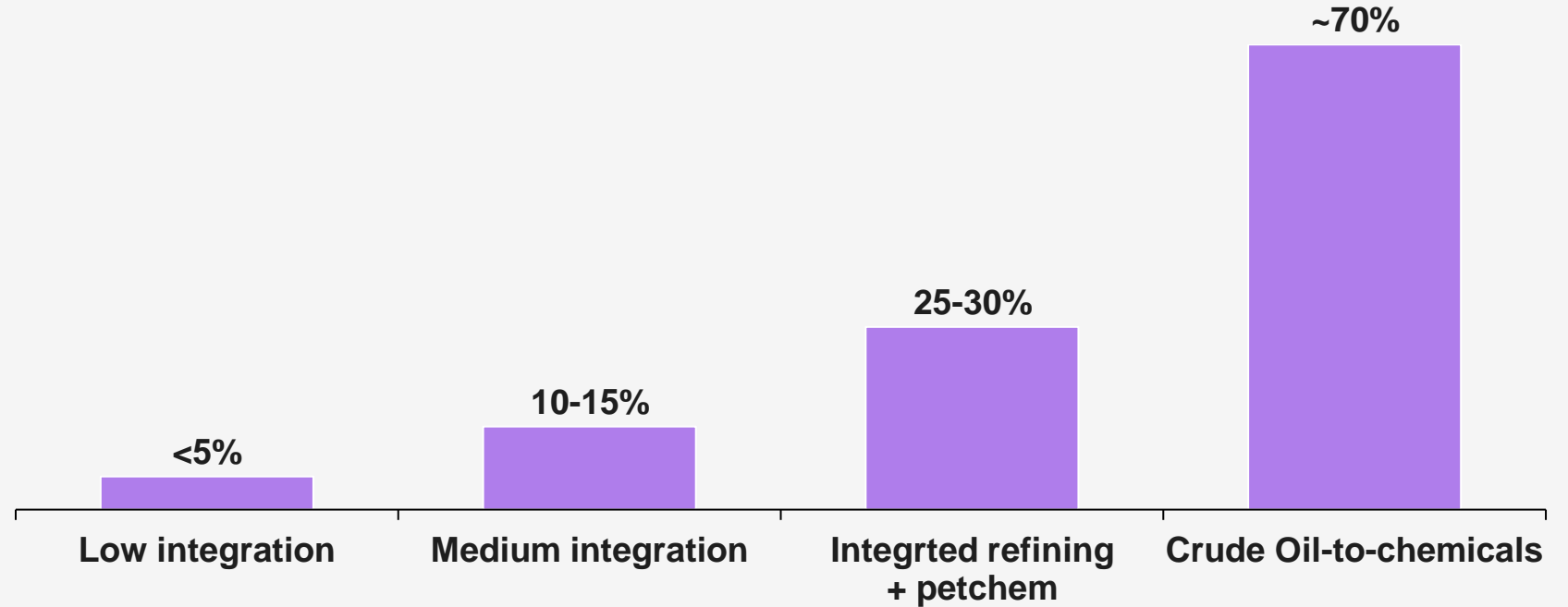
## Feedstock Sources

-  **1 Integration of petrochemical with refinery**
  - Significant progress in recent past with majority of standalone refineries planning petchem integration (e.g. multiple examples such as IOCL, BPCL Mumbai, HPCL, HMEL, Nayara etc )
-  **2 Robust ecosystem with downstream players**
  - PCPIRs have seen limited progress due to issues related to land acquisition, feedstock sharing, planning and implementation focus
  - Critical to shore up implementation with a focused task force
-  **3 Partnerships & Alliances**
  - Partnerships with feedstock advantaged regions to secure feedstock (JV or offtake agreements, buying consortiums) can be a viable alternative
-  **4 Non-traditional hydrocarbon feedstocks**
  - MTO/CTO suffer from issues such as high capex, economics and sustainability concerns
  - PDH and ethane can be viable alternatives for select coastal locations
-  **5 Alternative non-hydrocarbon Feedstock**
  - Chemicals derived from bio based feedstock have seen selective success. However, technology, scale and economics remain big challenges
  - Unlikely to capture major share in next decade or two

**Robust ecosystem with close integration of petrochemical and downstream players is critical to solve feedstock problem for domestic chemical sector**

While  
**Petrochemical intensity has risen**  
with increasing  
downstream  
integration in the  
past few years...

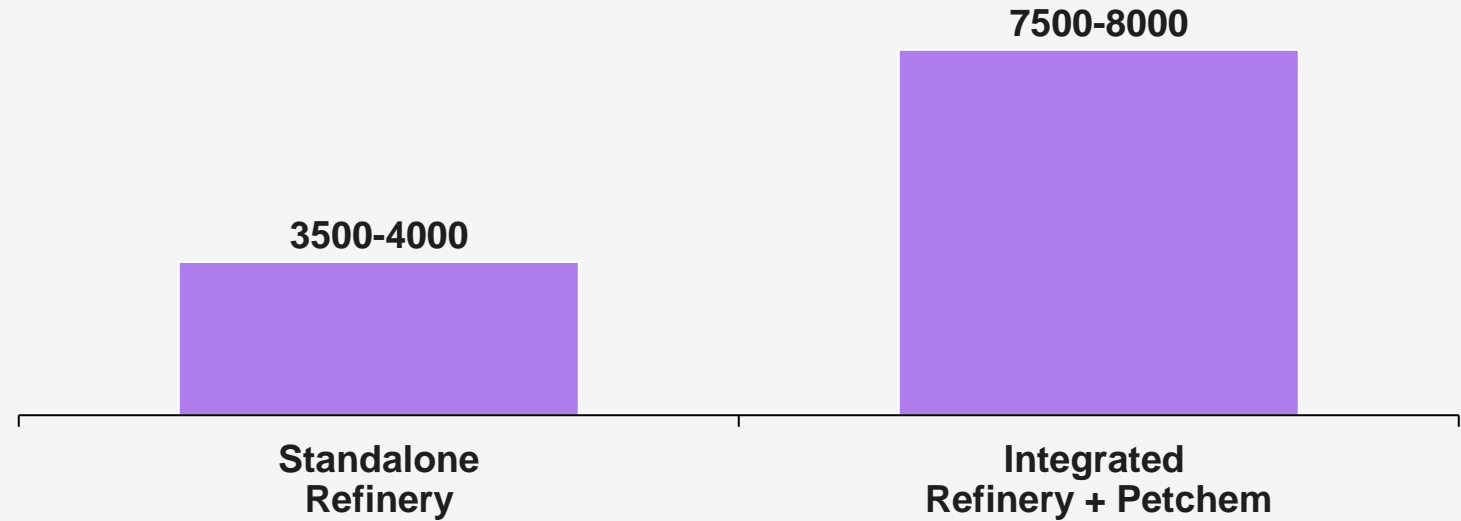
## Petrochemical intensity



- Petrochemical feedstock accounts for 12% of global oil demand, a share that is expected to increase consistently  
*E.g., Some OMCs targeting 15% PII by 2030, increasing ~3.5x from current PII (4.5%)*
- Downstream Capex is increasingly focused on petrochemical integration to unlock value rather than refining capacity additions while greenfield investments are geared towards integrated complexes than standalone refineries  
*E.g., Petronas RAPID project, Aramco's Jazan refinery*
- With technology advances (COTC), petrochemicals can account for 70-80% of the barrel producing chemical feedstocks instead of ~10% in non-integrated refineries  
*E.g., Saudi Aramco-SABIC COTC, Reliance COTC*

...high capex requirements require focused attention to ensure viability

### Capex Estimates (INR Cr./MMT)



### Key Drivers



**Licensing costs** for integrated refineries due to multiple uses of feedstock



**Additional Infrastructure requirements** (storage, logistics etc.)



**Higher project execution complexity** leading to higher EPC costs



**Higher utility and HSE cost**

Three key areas of support that can act as tailwinds for the sector.



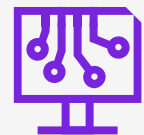
### Regulatory

- **Incentives** for project specific infrastructure
- Lower effective **tax regime**
- **Streamlining approvals**, accelerated land acquisitions
- Contract enforcement



### Ecosystem & Infrastructure

- Operating model support like **Plug and Play infrastructure** (e.g., Jubail in KSA, Pengerang in Malaysia)
- **Industrial Clusters, centralized utilities** and ancillary industries
- **Ownership model innovations** like BOO/BOOT to lower upfront Capex



### Technology

- Innovations to drive down **licensing costs**,
- Further advancements in **Crude oil-to-chemicals (COTC)** technology
- Advancement in **carbon capture and use (CCU)**



Thank you

