

# **Investment in coal sector and business diversification**

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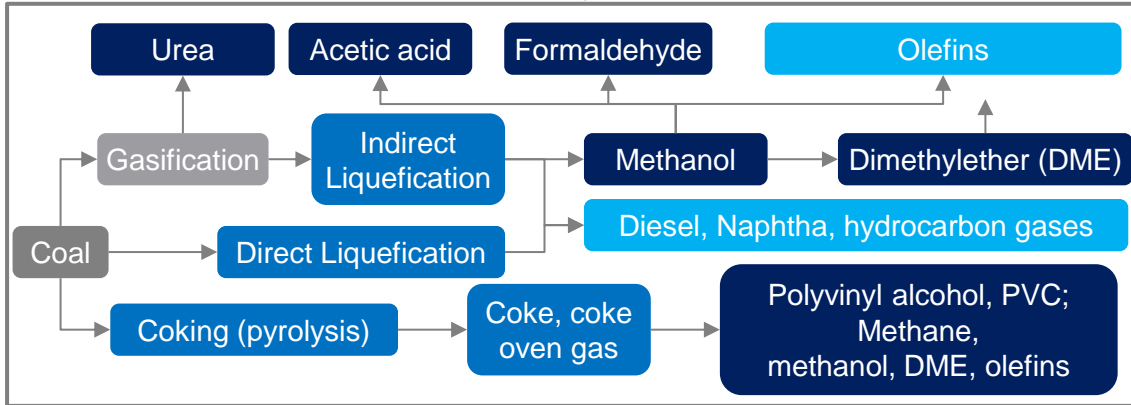
# Summary

- **Indian coal majors have large reserves, unmatched experience and strong balance sheets**
- **They must continue to invest in coal, and attract new investment, given India's twin needs:**
  - Growing energy demand, and
  - Need to reduce cost of power
- **The sector must also look beyond coal, considering:**
  - Expected slowdown in coal demand in 20-30 years
  - India's massive proven coal reserves of 150bn tons (R/P > 150 years)
  - India's strategic need to reduce energy import dependence
  - India's economic need to reduce cost of power
- **Two kinds of opportunities to make the most of this valuable national resource:**
  - Maximise use while coal demand remains
    - Unlock new markets, new reserves, new value
    - Create and operate essential evacuation and logistics infrastructure
    - Forward integrate into thermal power generation
  - Use available assets and experience in new, evergreen areas
    - Launch a national mission on coal to chemicals
    - Diversify into non-coal minerals
- **Lessons learned by others in diversification must be carefully considered**

# Coal to Chemicals (1/2)

- With environmental concerns slowdown expected in coal demand in 20-30 years
- Development of Coal to chemical industry to provide multiple opportunities to utilize India's massive coal reserves.

## Coal based chemical industry

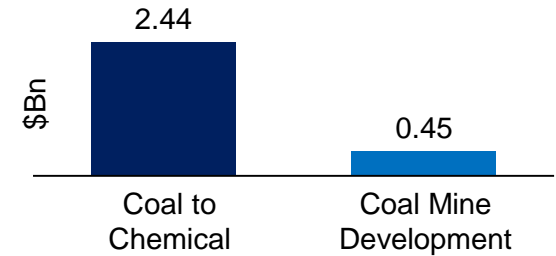


## Uses of main coal-based starting chemicals

| Urea                              | Acetic Acid      | Formaldehyde    | Olefins                                  |
|-----------------------------------|------------------|-----------------|--|
| Fertilizers                       | Chemical reagent | Textiles        | Industrial chemical reactions            |
| Plastics                          | Chemical solvent | Auto components | Polymerisation, oxidation, halogenation, |
| Adhesives                         | Ester production | Resins          | Detergents                               |
| Explosives                        | Inks, paints     | Paints          | Textiles, synthetic fibres               |
| Diesel combustion denitrification |                  | Explosives      | Personal Care                            |
| Animal feed                       |                  | Disinfectants   | Pharmaceuticals                          |
| Cloud seeding                     |                  |                 | Plastics                                 |

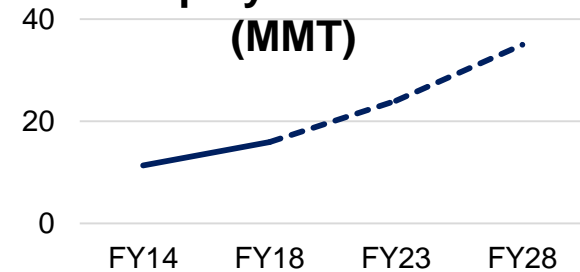
- China majors plans to invest more in coal to chemical projects than coal mines

## China Coal investment 2020



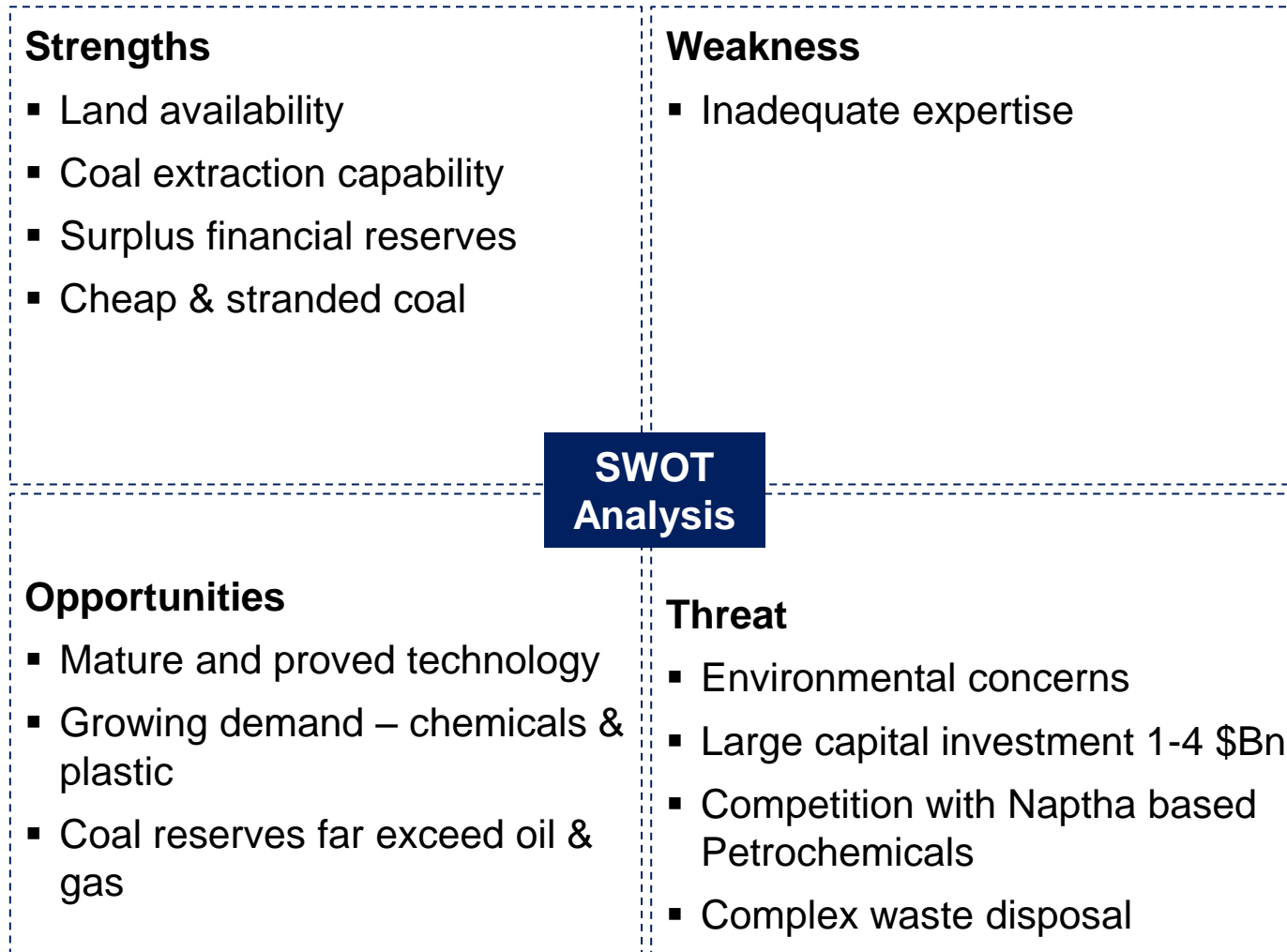
- Proven business model with more than 35 large-scale plants in China. Globally ~80 plants under development
- India virgin-grade polymer demand to grow at 7-8%

## India polymer demand (MMT)



- Huge investment potential 1-4 \$Bn a year.
- Employment intensive sector

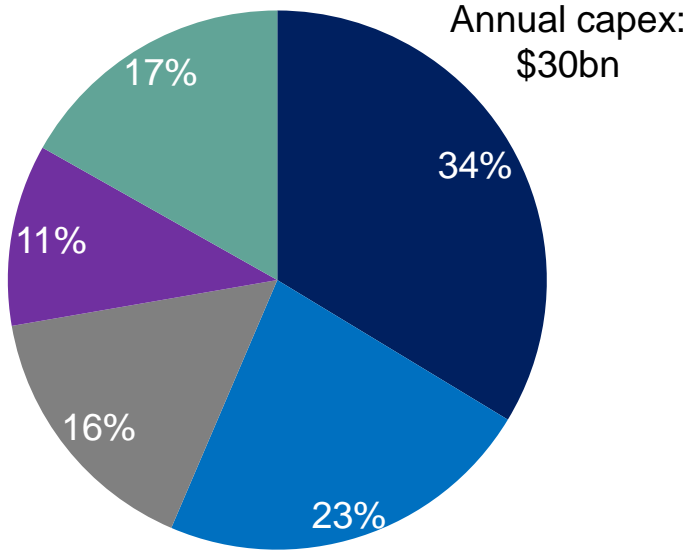
# Coal to Chemicals (2/2)



# Diversification to non-fuel minerals

- Top 40 global miners are investing more in Non-ferrous minerals and Precious metals.

**Capex by mineral (Top 40 miners)**

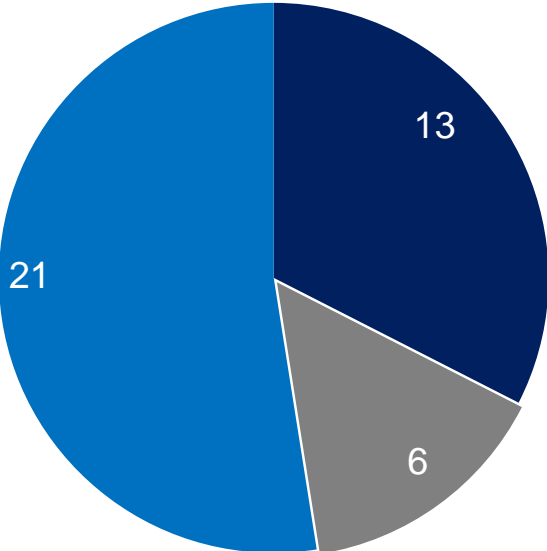


- Non-ferrous metal
- Precious metal
- Coal
- Ferro
- Industrial

- Major reserves in India** – Limestone, Iron Ore, Dolomite, Bauxite, Kaolin, Copper, Gypsum, Lead-zinc, Ilmenite, Manganese, Gold, Magnesite

- 34 out of 40 top global miners are into non-coal mining

**Product diversification (Top 40 global miners)**



- Diversified
- Single-Non-coal
- Single-Coal

Source: PWC Report: Mine 2019

# Evacuation and logistics

Evacuation issue from mines resulting in lower dispatch and higher end-user cost.

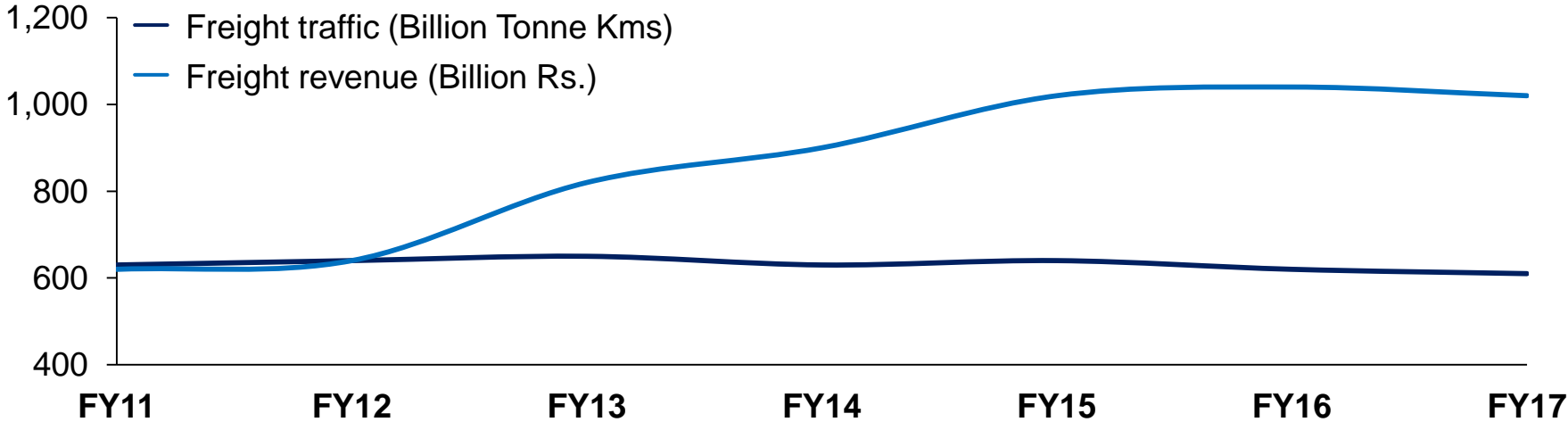
### Opportunities for CIL

- Captive rail / waterway infra
- Investment in Jetty / port
- Coal handling infra

### Distance from top 5 coal blocks under CM(SP) Act

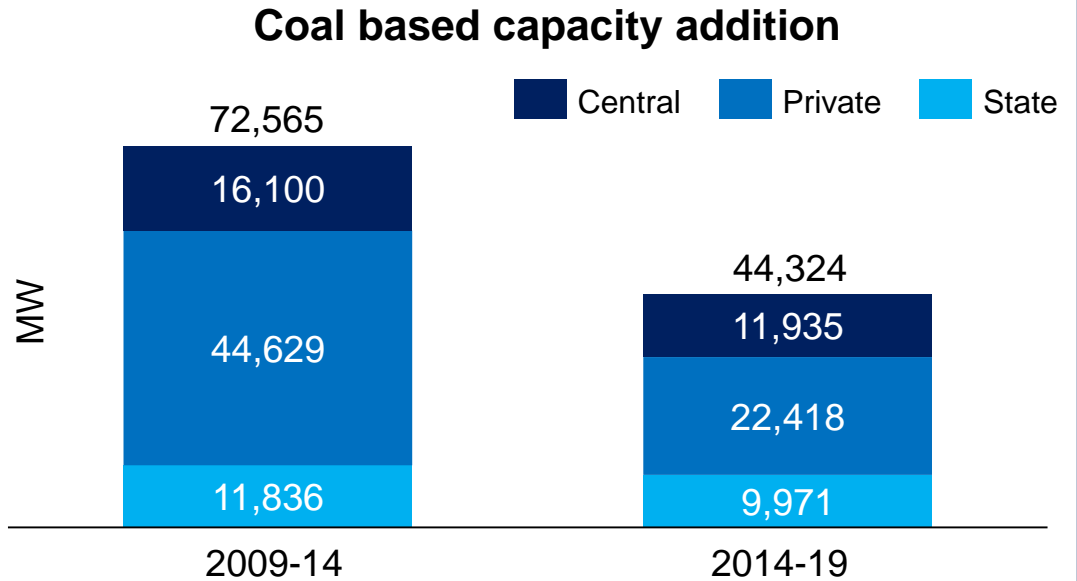
| Coal Block     | Reserve (MMT) | Distance from rail head |
|----------------|---------------|-------------------------|
| Mahanadi       | 1994          | 42 km                   |
| Ramchandi      | 1500          | 42 km                   |
| Machhakata     | 1401          | 42 km                   |
| Chhendipada-II | 1350          | 40 km                   |
| Chhendipada    | 559           | 40 km                   |

### Investment in rail infra to reduce end-user freight cost

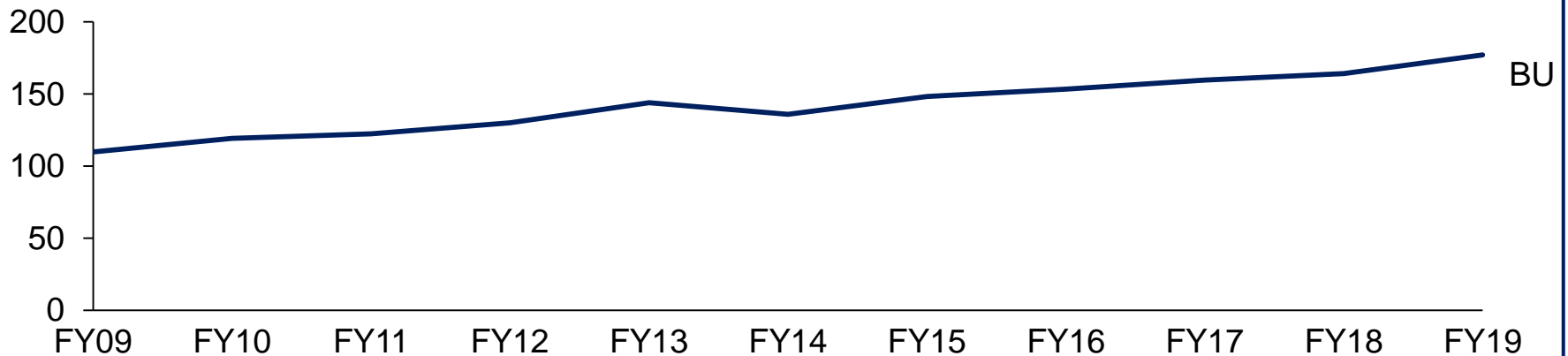


# Forward integration into thermal power generation

- Investment slow-down in coal-based power generation.
- Need to continue investment in coal based power generation to meet growing energy demand, and reduction in cost of power

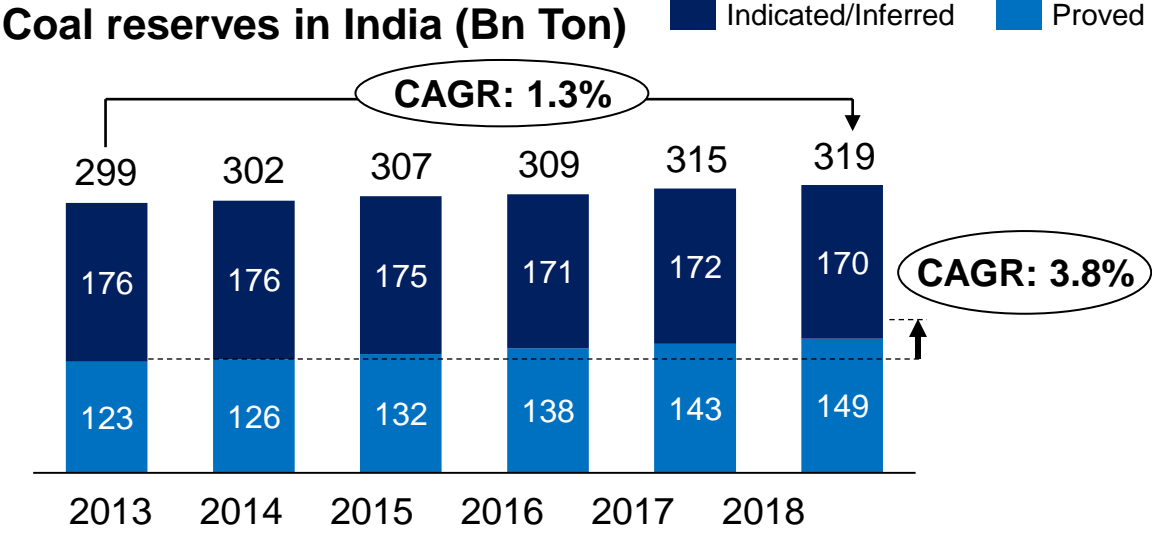


## Growing electricity requirement

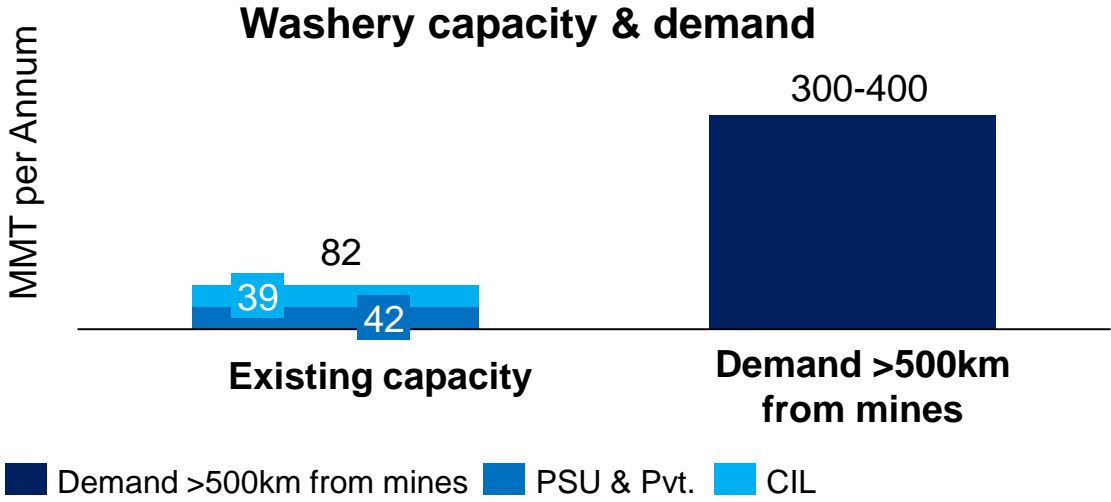


# Unlock new market and reserves

- **Mine exploration:** Under investment leading to subdued growth in coal exploration and proven reserves
- Exploration as a 3<sup>rd</sup> party activity?



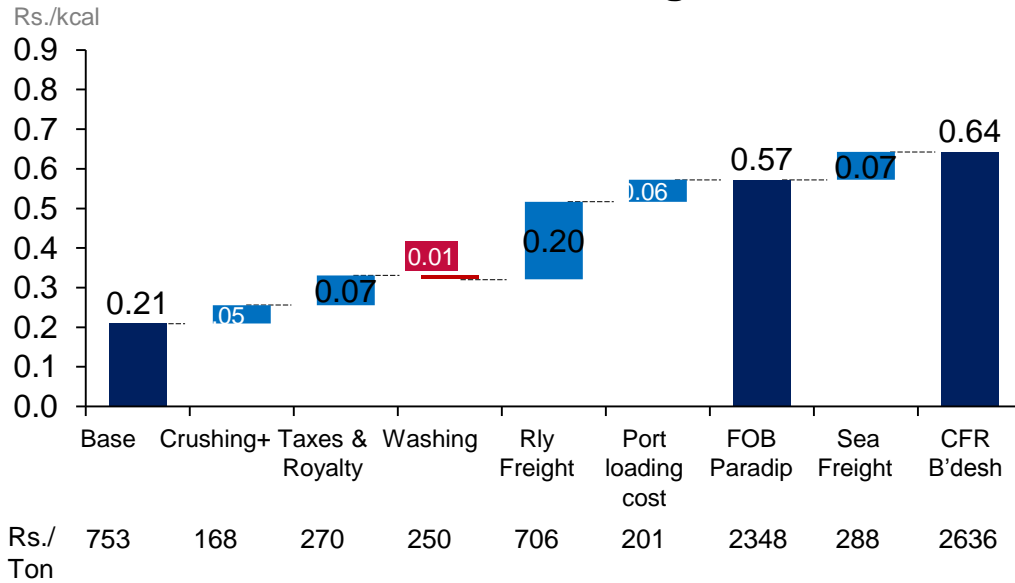
- **Investment in washeries and blending hubs?**
  - Product augmentation
  - Creation of grade/user oriented market
  - Quality assurance
  - Reduced burden on logistics



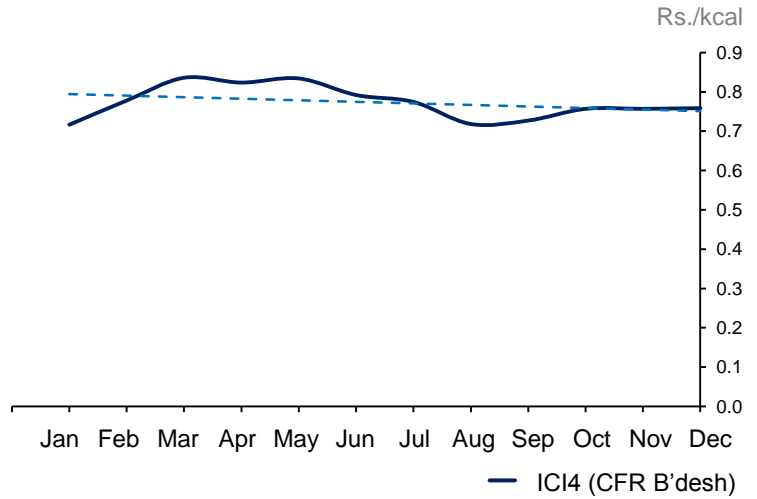


# Competitiveness of Indian coal in export market?

## Indian coal: CFR Bangladesh



## Indonesian coal: CFR Bangladesh

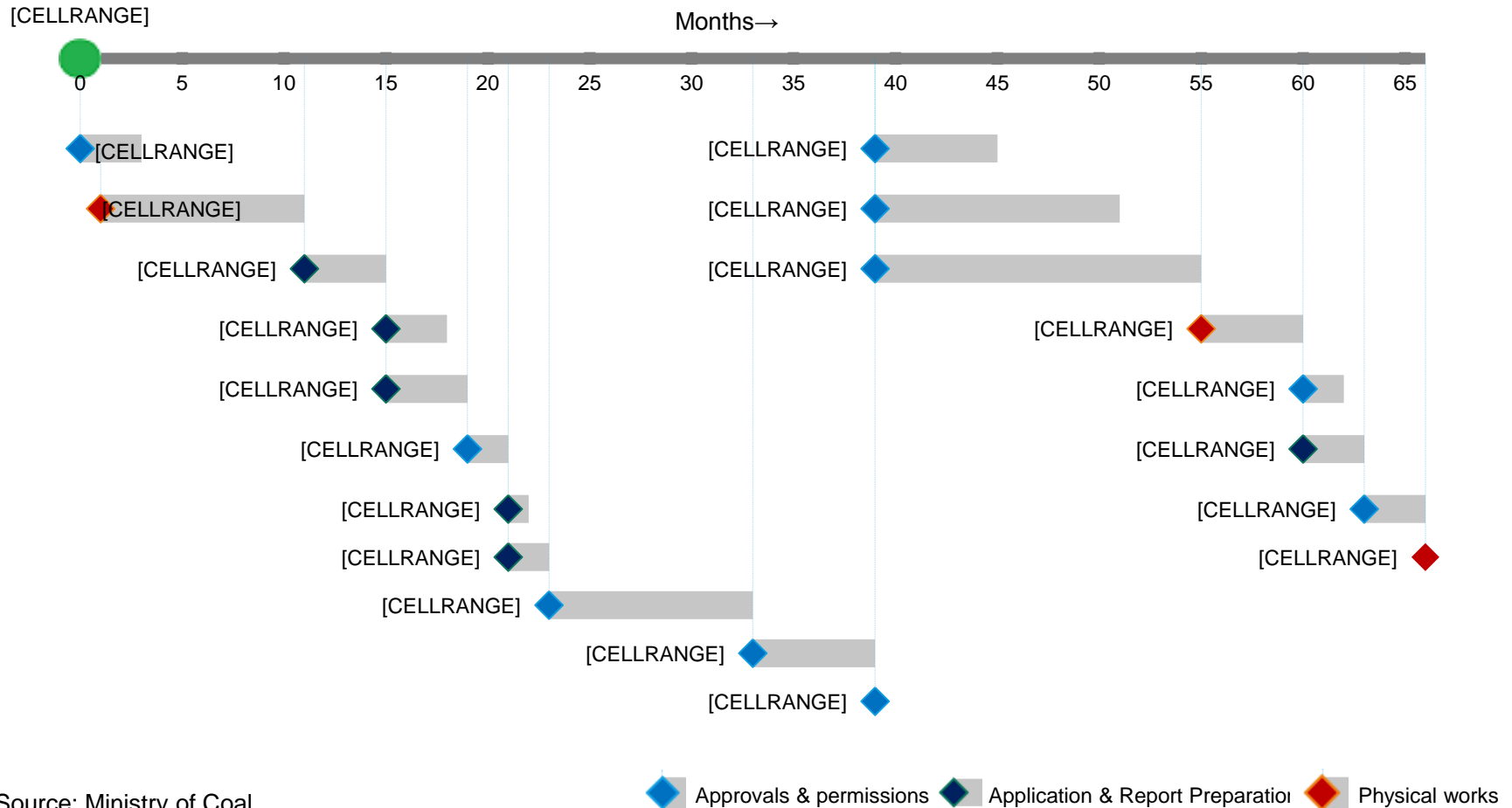


- Pre-washed GCV: 3600 kcal/kg
- Post-wash GCV: 4100 kcal/kg

- Indian coal prices competitive for neighbouring export markets
- Market development for coal with low GCV / high Ash content in neighboring countries

# Current coal mining approval timelines: good enough?

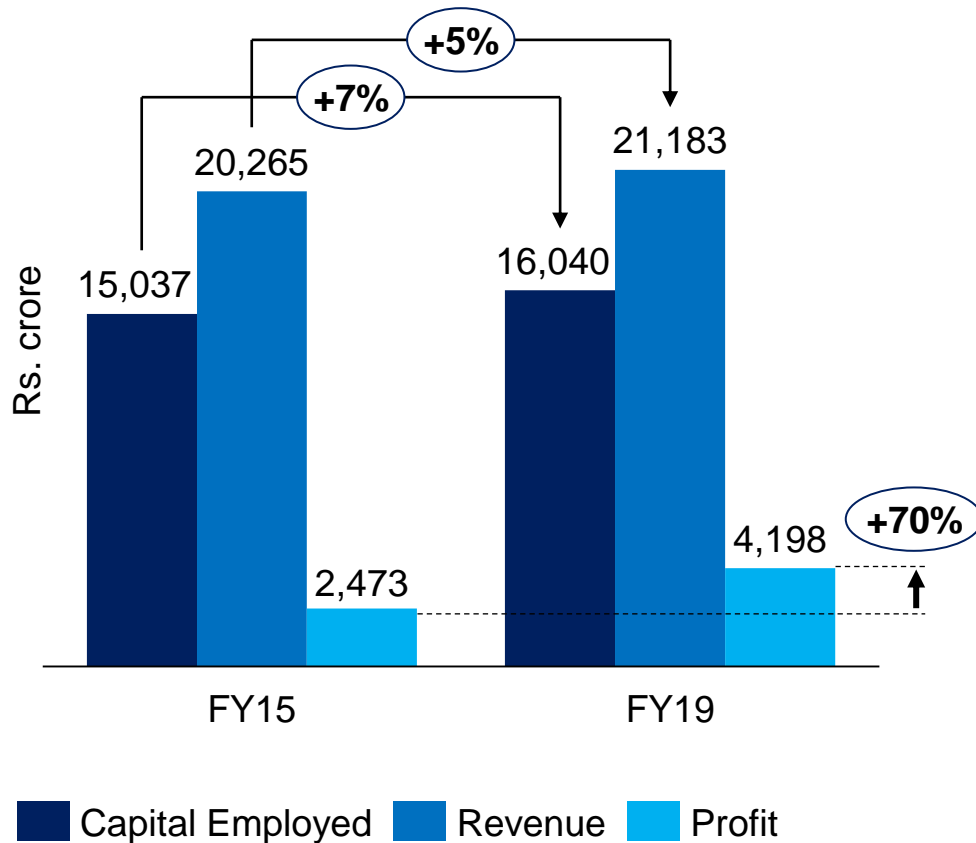
53 out of 66 months are required for approvals – can this be reduced to 12-24 months?



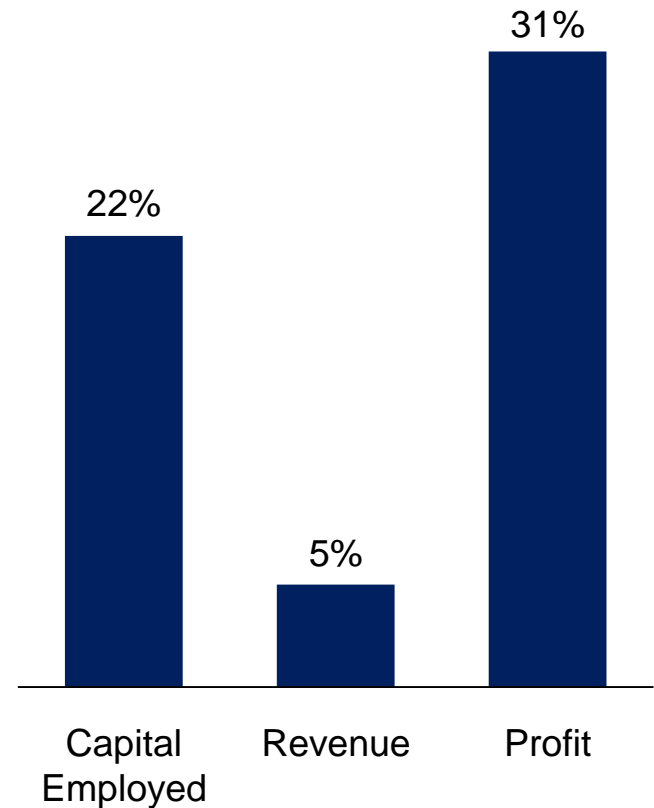
- Coal ministry alone cannot achieve – Rail, MOEFCC, States, joint accountability will be needed. Single window clearance through inter-ministerial committee (Central, State level)
- Adoption of UMPP/Solar park model for clearances prior to bidding

# Indian oil case-study

## Capital employed, Revenue & Profit –Petrochemical Business



## Share (%) of Petrochemical of overall (FY15)



IOCL successfully diversified into petrochemicals business

# Key success factors for new ventures

- Opportunities arise mostly out of industry discontinuities
- Benchmark with the best, and plan with high aspirations
- Create independent teams with the best of external and internal talent, empowerment and resources
- Ensure top management of the parent company are well versed in the KSFs and risks of the new business
- Especially, recognise when businesses look similar but are not
- Engage external technical and business expertise, including partners selectively
- Give it time, be prepared for challenges

# Annexure

# Full cost of renewables different from headline tariff

Example: Generation source connected to central grid in Gujarat, with power being procured by UP discoms

| S.No | Component  | Cost<br>INR/kWh | Remarks  |
|------|--|-----------------|--|
| 1    | Power Cost   | 2.93            | Current ceiling tariff for SECI wind bids  |
| 2    | Thermal fixed charges<br>(for addressing RE variability) | 1.12            | FY 19, average fixed charges for UPRVUNL thermal plants as per MYT petition.<br><br>PLF of 80% assumed for thermal power plants. |
| 3    | POC Charges  | 1.62            | POC charges for UP as per POSOCO x 3 to adjust for lower PLF   |
| 4    | Gujarat Injection Losses                                 | 0.02            | 0.52% as per POSOCO  |
| 5    | UP Withdrawal Losses                                     | 0.09            | 3.15% as per POSOCO  |
|      | Total Landed Cost  | 5.78            | Total landed cost assuming full transmission charges, losses and standby thermal capacity.                                       |