Alternative Scenarios with logistic grids

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Low Carbon Transport in India
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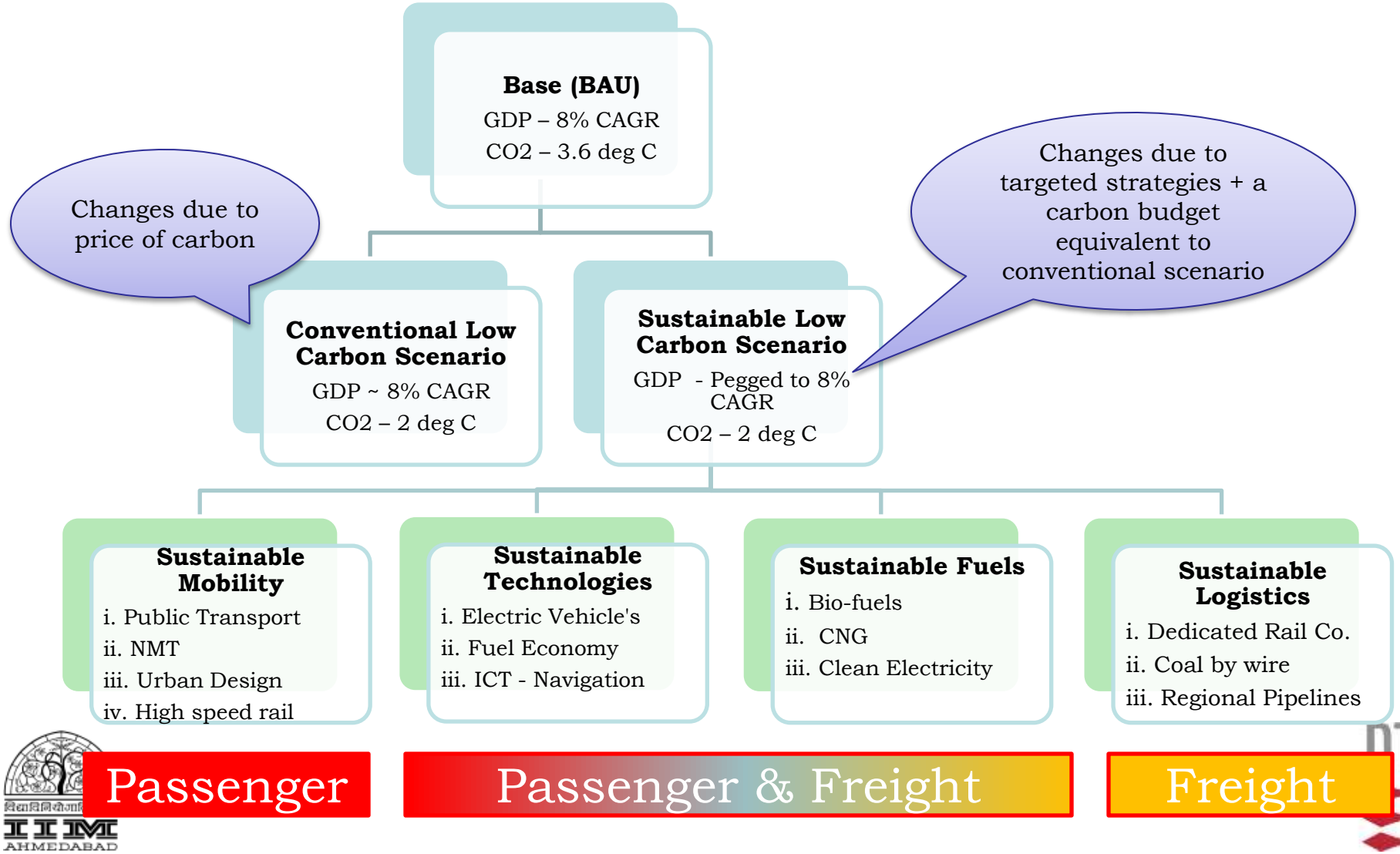
Overview

1. Scenario Architecture
2. Scenario storylines
    a. Coal by wire
    b. Regional Pipelines
    c. Dedicated Freight Corridors
3. Analysis
4. Conclusions

Architecture for Transport Scenarios

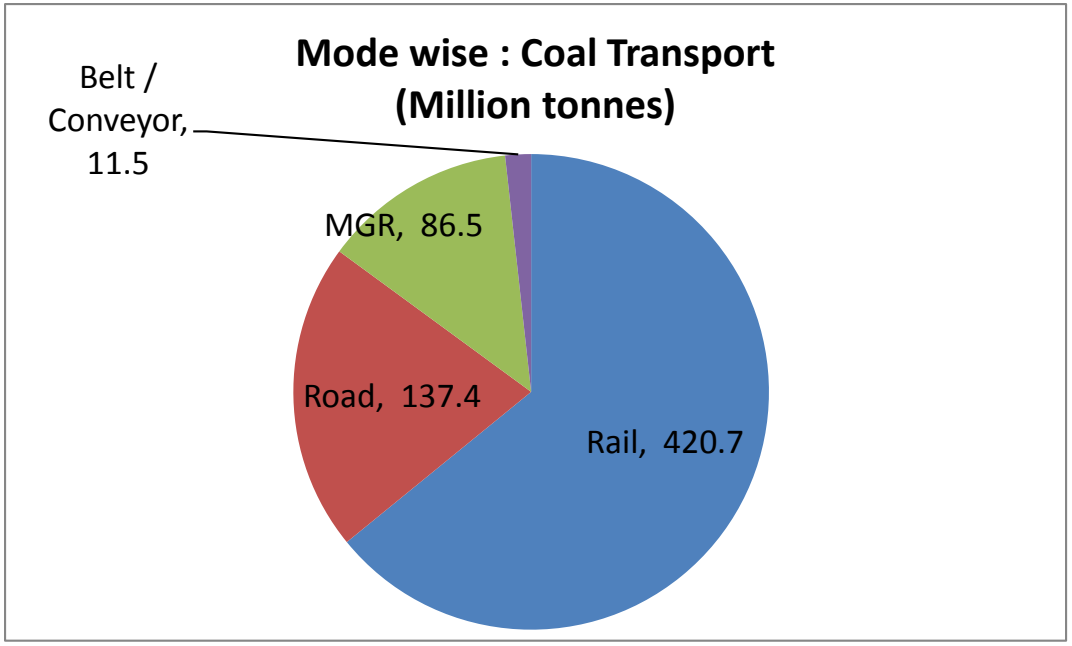


Demand Side Strategies

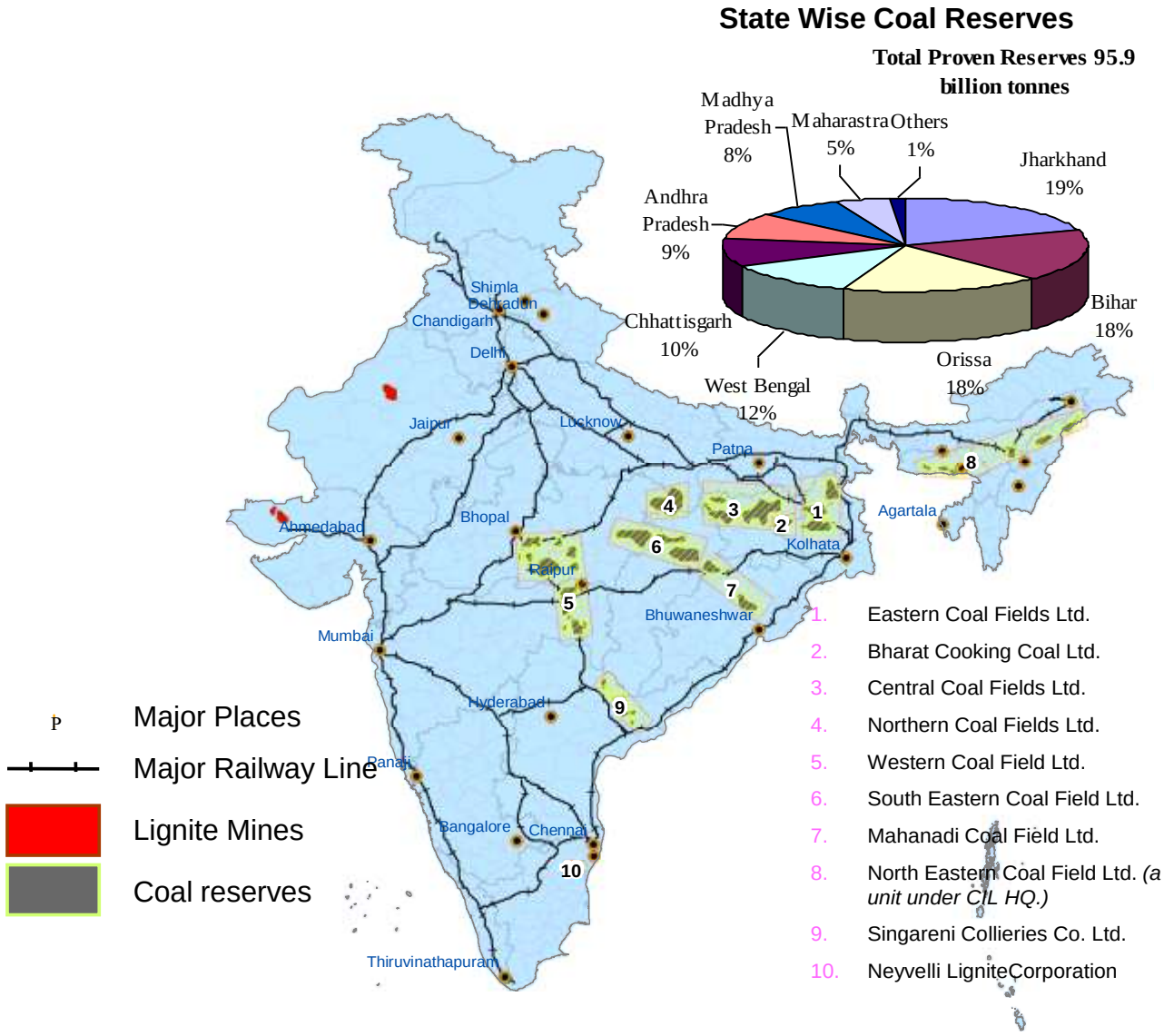
- Freight demand – Reduce through e.g.,
  - Coal by Wire : Reducing coal transportation
  - Regional Pipeline : Reducing gas transportation through LNG mode
- Modal Shift
  - Road to Rail: By improving efficiency of railways e.g., Dedicated Rail Freight Corridor
  - *Rail to Pipelines*

Coal freight transport

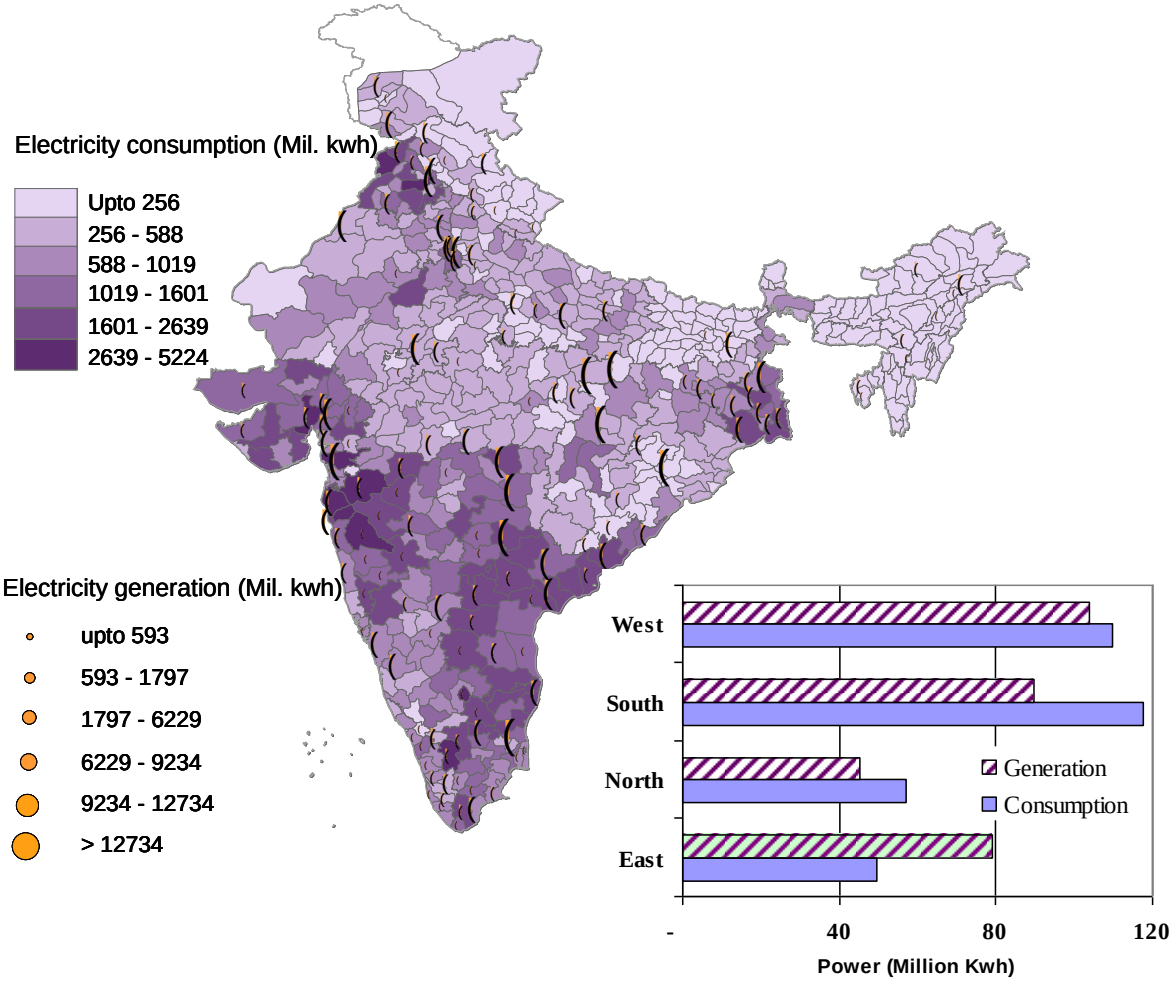
- Coal transportation accounts for **43% of rail freight**



Coal Reserves and Rail Infrastructures



Electricity Generation and Consumption



Scenario Storylines

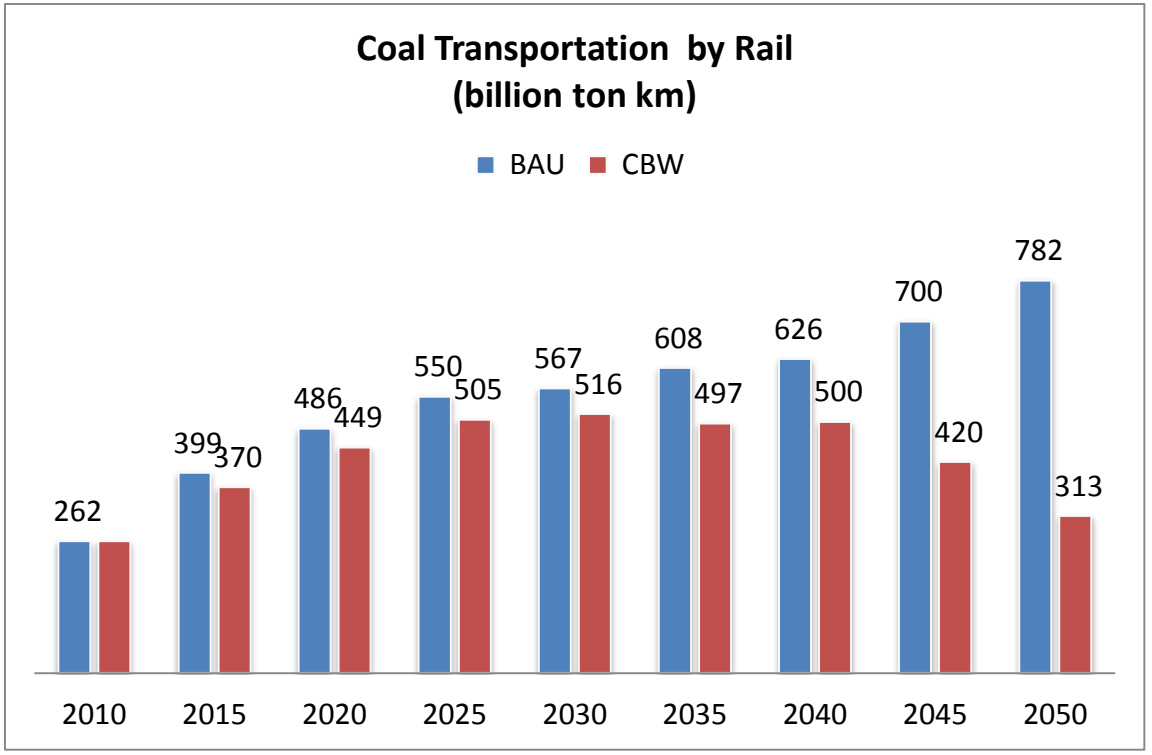
BAU Storyline : Active role of State Electricity utilities in power generation.

- Central policy is driven by setting up of large **coal power plants at pit heads and at coastal locations**.
- States capacities located closer to demand.

Coal by Wire: Strong role of central policy in grid creation and generation

- **<u>80% of coal based capacity</u>** at pit head or at coast by 2050.
- Rail based transportation would therefore be limited to only **20% of coal demand in 2050**.

Coal by Wire Scenario



Dedicated Rail Freight Corridor (DFC)

- By 2046 DFC's expected to transport 2712 btkm (RITES, 2009)
- 47% of Projected Freight Demand will move on DFC's

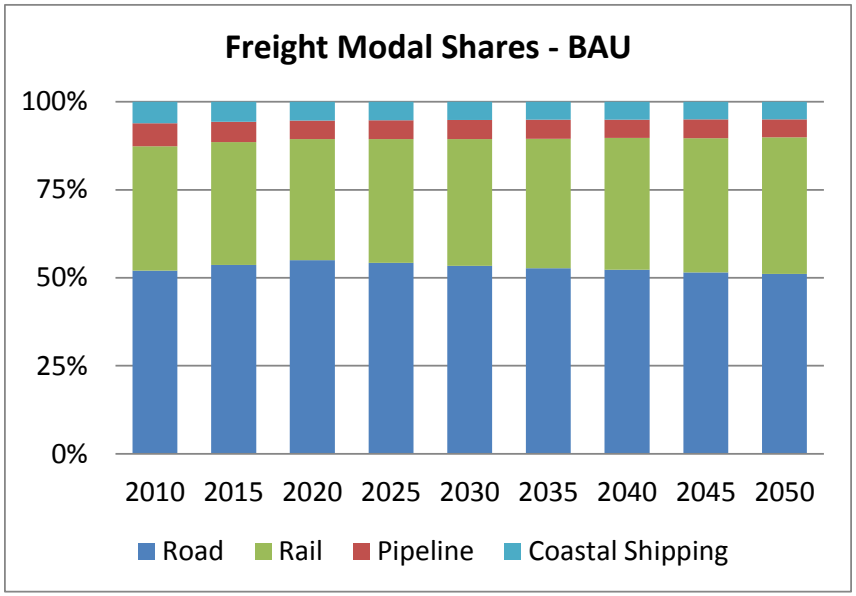
Scenario Storylines

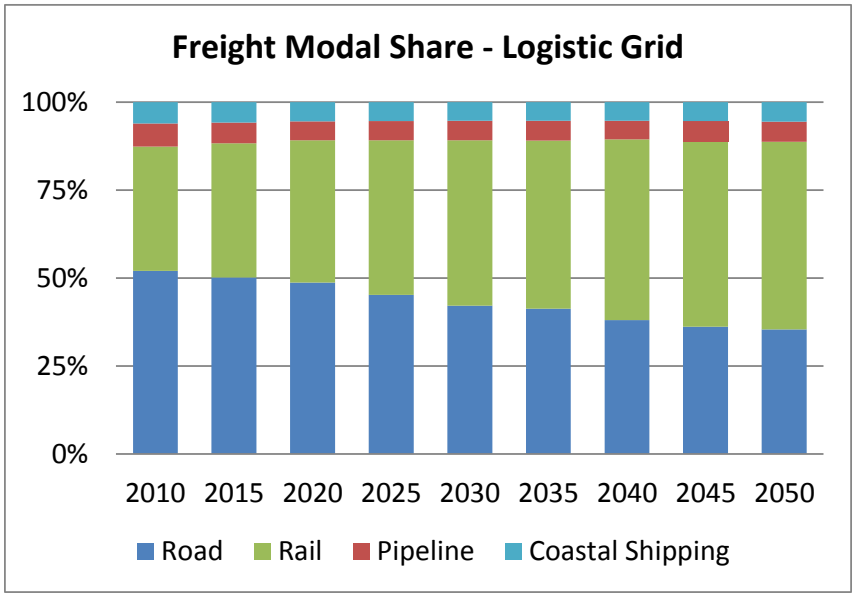
- **BAU Storylines**
  - **Slower rollout of DFC** and slow pace in creating interconnecting infrastructures
  - By **2050 only 33% of traffic projections made by RITES study** realised

DFC Scenario Major modal shift from road to rail due to

- **Complete achievement** of projections in the RITES, 2009 study. As a result a.
- **Faster electrification** of railways

Logistic Grid – Modal Shares





Overall Freight Demand
2010 – 1771 btkm CAGR 2010-50 = 3.6%
2050 - 7341 btkm

Overall Freight Demand
2010 – 1771 btkm CAGR 2010-50 = 3.3%
2050 – 6558 btkm

Regional Gas Pipelines

- **BAU Storyline**
  - No regional pipelines
- **Regional Cooperation**
  - **3 regional pipelines** which can bring 45 bcm of gas closer to markets

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Assessment

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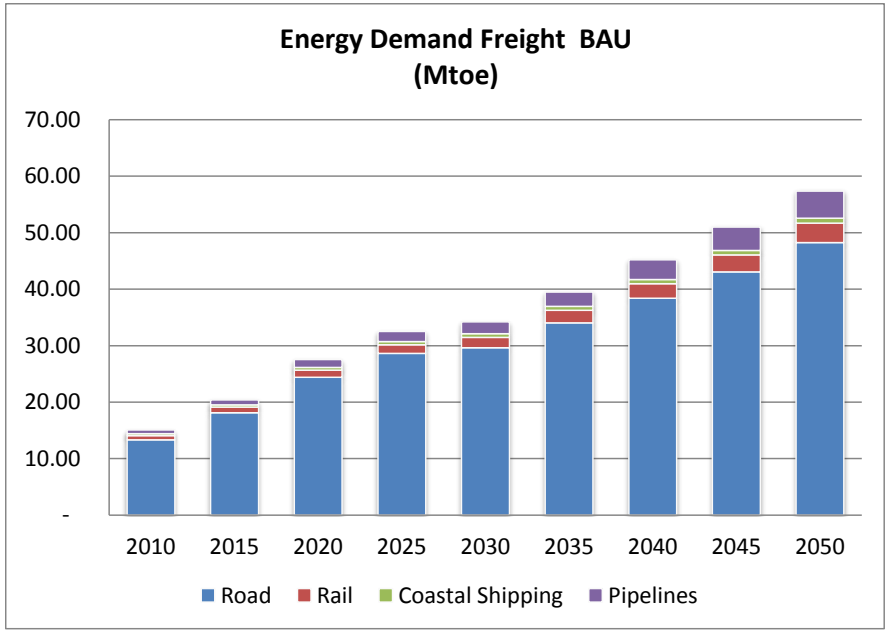
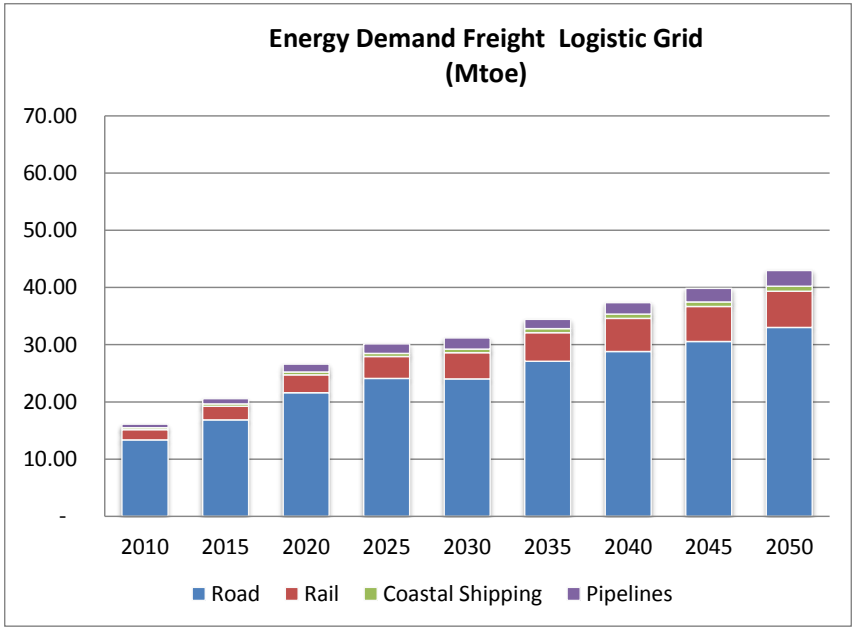
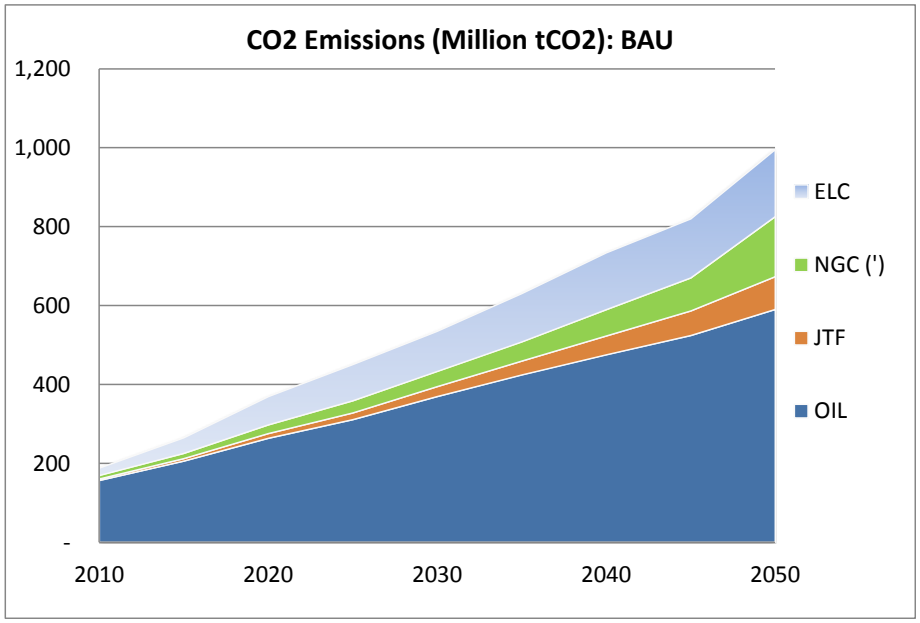
Energy Demand Freight

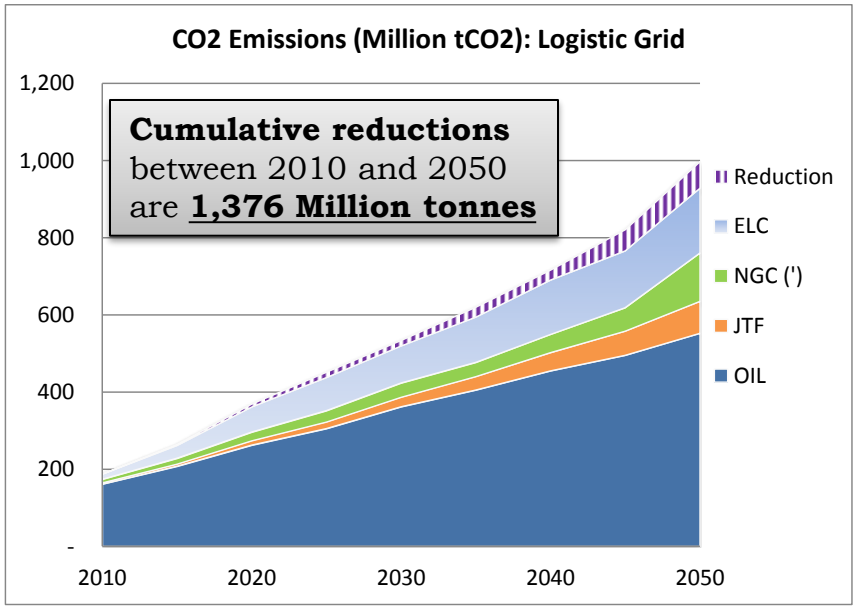




- **Overall demand** for energy from freight decreases due to sustainable logistics lower by **3.3% in 2020** and by **25.1% in 2050**
- Despite a lower share in demand the share of energy for road transport is higher

CO2 Emissions transport



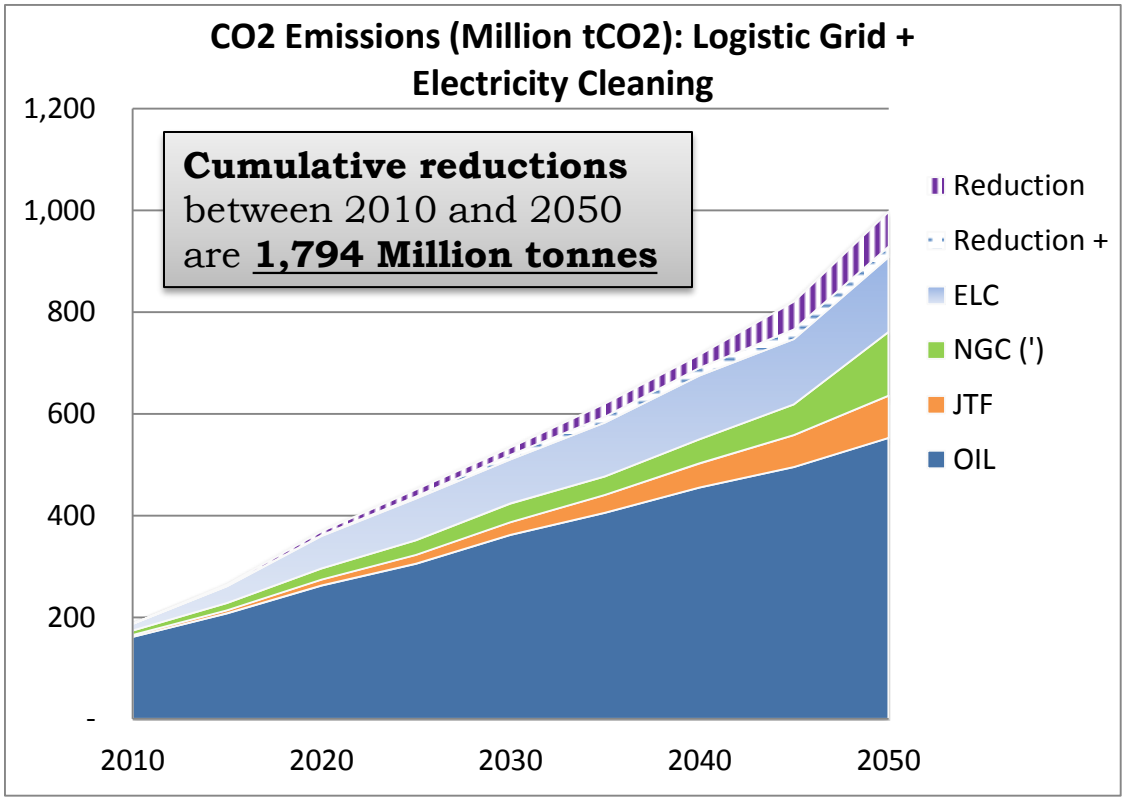


(*) Natural Gas emissions include both emissions from energy and fugitive emissions

Emission Intensity of Grid (Million tCO2/GWh)

Scenario	2010	2020	2030	2040	2050
Base Case	0.99	0.94	0.86	0.74	0.69

CO2 Reduction: Logistic Grid



Emission Intensity of Grid (Million tCO2/GWh)

Scenario	2010	2020	2030	2040	2050
2 deg C Stabilization	0.99	0.73	0.34	0.19	0.11
BAU	0.99	0.94	0.86	0.74	0.69

Conclusions

1. **Location decisions** for industries which consume or produce materials with large demand for logistics essential for reducing freight demand (e.g., Coal based power plants)
2. **Railways** can play a major part in reducing CO2 emissions from freight. The contribution can be much higher if electricity is cleaned.
3. **Regional gas pipelines** can deliver reductions in GHG emissions by lowering fugitive emissions.

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Thank You

Questions / Suggestions

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