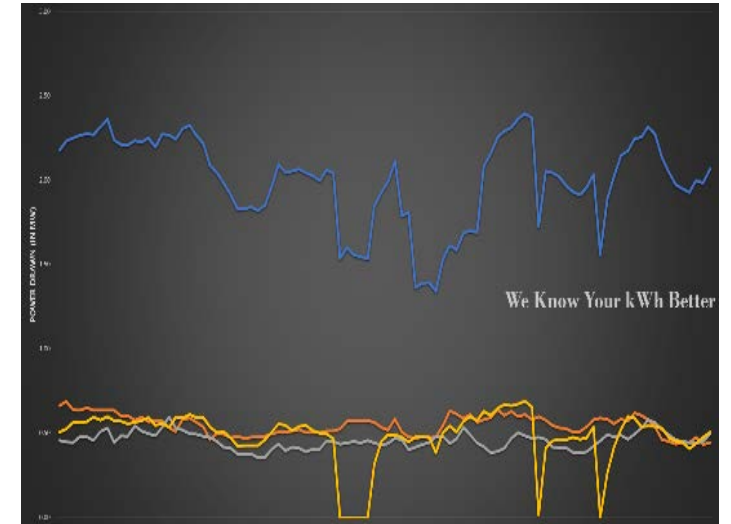


# Road Map on *Reduction of Carbon Footprint in Indian Railway*



- About us
- Transportation Sector & Greenhouse Gas
- Railways – *Less Carbon Intensive Transportation*
- *Possible Option for Carbon Footprint Reduction*

# About Us

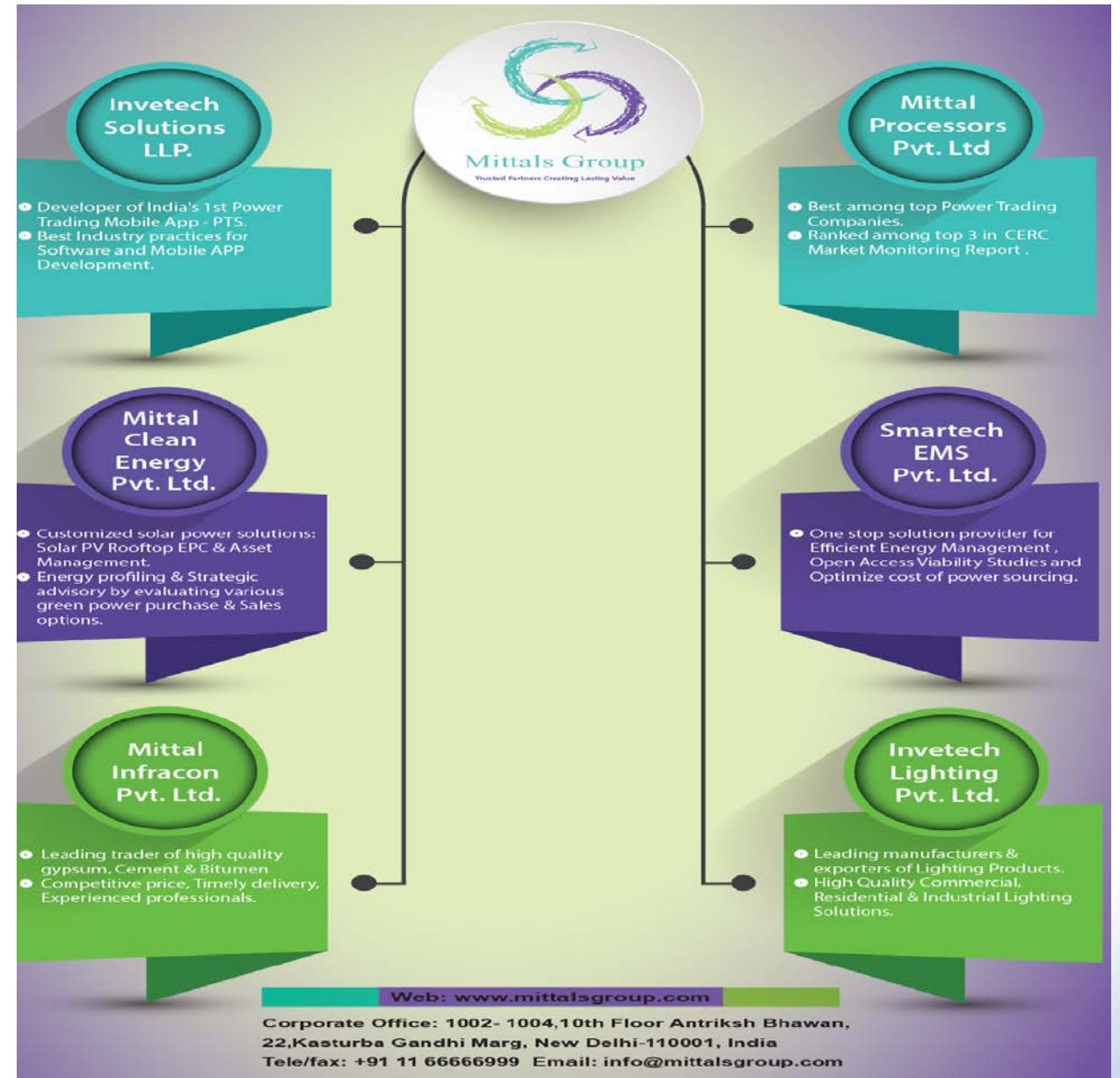
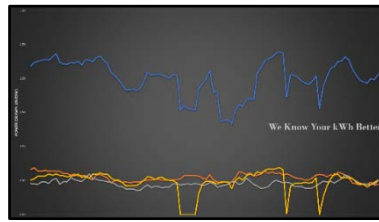


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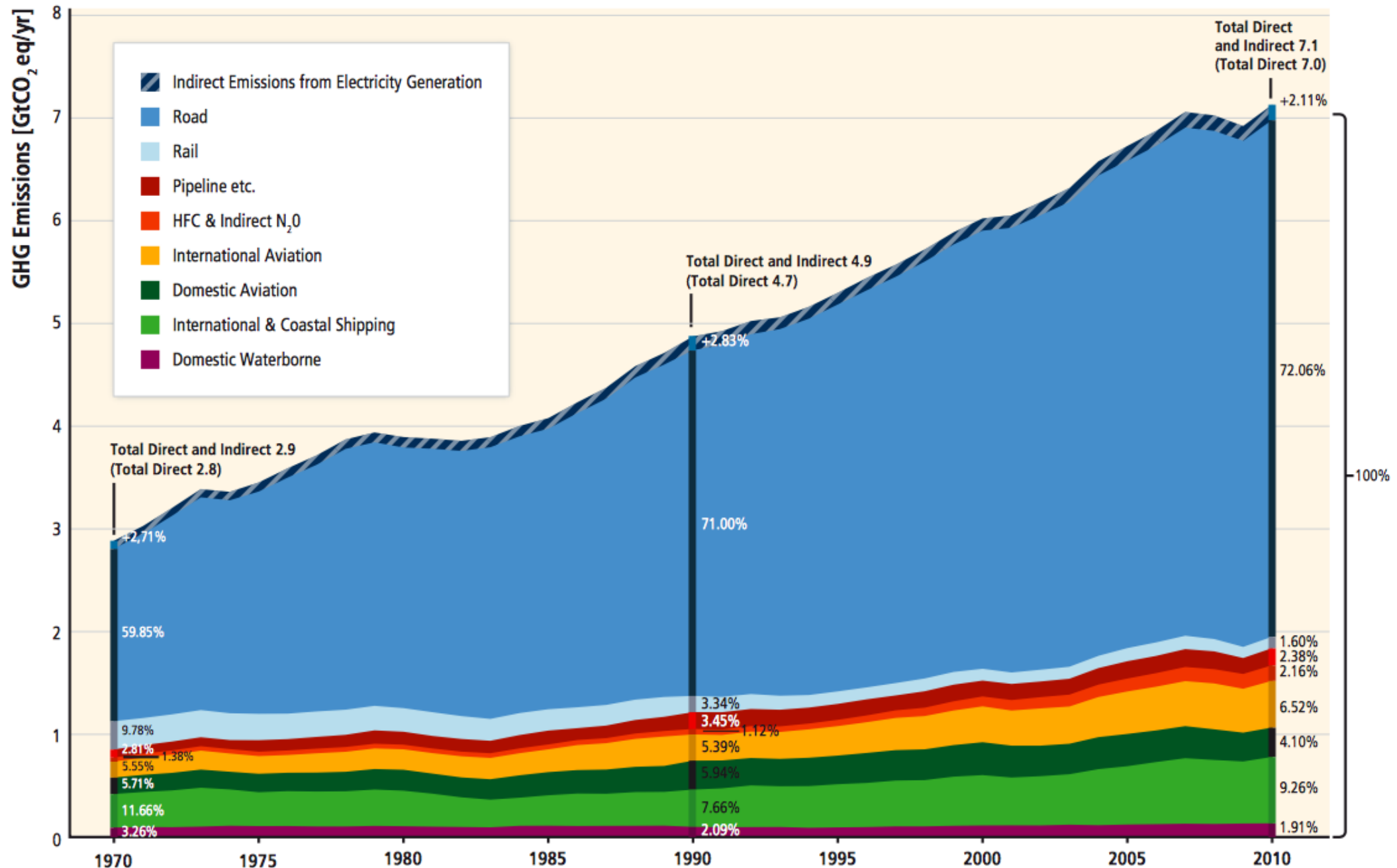


## Transportation contributes 23% of GHG Emission



- As per IPCC; the total contribution of Transport sector 7.0 GtCO<sub>2</sub> equivalent direct GHG emission (Including non-CO<sub>2</sub> gases)
- Climate deliberation often focuses on energy and industrial activity, whereas transport sector is responsible for 23% of energy-related greenhouse gas (GHG) emissions worldwide
- Without aggressive and sustained mitigation policies, transport emissions will increase at a faster rate than emissions from the other energy end-use sectors and reach around 12 Gt CO<sub>2</sub>eq/yr by 2050
- It is quite evident and established facts that Railways transit system is one of the less carbon intensive transportation mode
- ***Taking evidence of research studies Northern Countries, CO<sub>2</sub> emission (g-CO<sub>2</sub>/Person-Km) for Railway system (19) is the lowest in comparison with Bus (51), Aviation (109) and Automobile (147)***

# Transportation Sector & GHG Emission



Direct GHG emissions of the transport sector (shown here by transport mode) rose 250 % from 2.8 Gt CO<sub>2</sub>eq worldwide in 1970 to 7.0 Gt CO<sub>2</sub>eq in 2010 (IEA, 2012a; JRC / PBL, 2013; see Annex II.8).

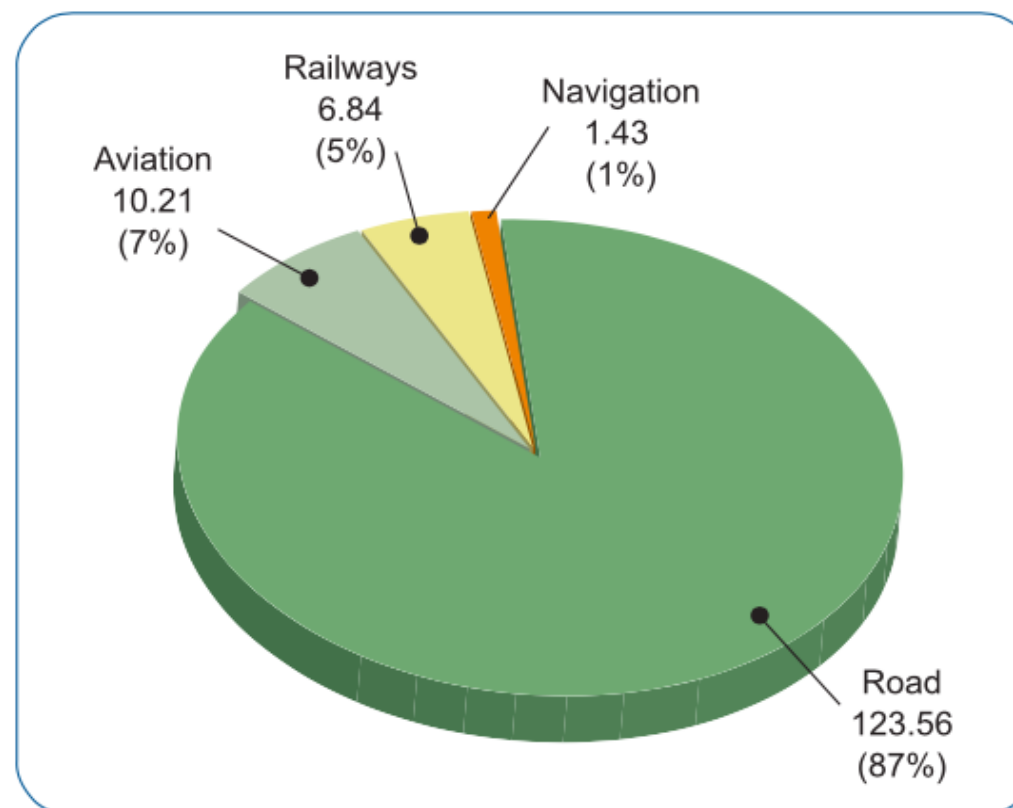
## Indian Railway is most efficient in GHG Emission terms

- As per data published by Planning Commission / NITI Aayog (2014), CO<sub>2</sub> emission from Indian Railway is ~6.84 million tons while road transport contributes 123.55 million tones (18 times)

- Emission intensity of Indian Railway:

- Passenger Traffic (kgCO<sub>2</sub>/Passenger-Km)
  - Non-Suburban 0.007837
  - Suburban 0.007976

- Freight Traffic (kgCO<sub>2</sub>/Ton-Km)
  - 0.00996



## Indian Railway actively reducing CF, can do much more through some out of box approach

- It is evident that Indian Railway is been active in planning and taking measures towards a less carbon intensive system
  - It has set an target to add 200 MW of Wind and 1000 MW of Solar by 2022; As of March 17, Indian railway has already installed 37MW of wind and 16MW of Solar
  - Some researchers has express the possibility of meeting 25% of electric power from Renewables
  - These efforts will help in addressing the supply side aspects towards Carbon Footprint Reduction
- But, Indian Railway should a take from break from past approach and adopt a more aggressive efficient Carbon friendly transportation policies





# Out of the Box! Dramatic ....Yes it may be feasible

- Europe declaring an **Carbon neutral power sector by 2050** ! And replacing **95% of its road transportation into electric vehicle!**
- Recent report from Morgan Stanley shows that the **Energy Storage will be at least 75% cheaper in next 4 years, will lead to develop a commercially viable 100% RE power grid**

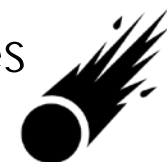
➤ So.....

➤ **India Railway**, should come up with their aggressive targets like

➤ 100% electrification of all its traction by .....?



➤ At least ~~50 / 60 / 75~~ % of electricity source from Renewables by.....2032?



➤ Can MNRE and Railway jointly launch programme to make storage a affordable technological options ?? (like LED programme)



➤ It will push down the cost of energy storage technology more quickly than what predicted by Morgan Stanley

➤ And 175 GW RE Targets may look more practical achievable limit!!!





## More Structured Approach for Future

**Mainstreaming, Lifecycle Carbon Footprint Assessment** in Decision making procedure for new development

- Lifecycle Carbon accounting and reduction strategies should be integrated at the planning stage for new development towards
  - Material Planning
  - Identification of Technology
  - Operative efficiency
  - Carbon Friendly Energy sources
  - Energy Security



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*“Trusted Partners Creating Lasting Value”*

# Thank You

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