Dedicated Freight Corridor - Decoupling Energy Consumption from Indian Railways' Growth

India's economy has seen unprecedented growth during the last three decades, averaging 7-8% per annum. While this has created a great deal of opportunities to industry and her people, the resulting surplus income in the hands of industry and middle class consumers in India has created additional demand of transport for movement of passenger and freight. The passenger and freight traffic on Indian Railways are expected to grow from 3635 billion passenger kilometers and 961 billion ton kilometers respectively in 2005 to 19,427 billion passenger kilometers and 6677 billion ton kilometers respectively by 2030.

Although, rail as a mode of transport has less specific energy consumption than road for passenger and freight movement, road sector has witnessed steady rise in its share in India, at the cost of rail sector. The share of road in freight movement in expected to rise from about 57 percent in 2005 to nearly 68 percent in 2030. In business-as-usual scenario, it posed huge challenge for India energy security and her intention to decarbonize economic growth.

These were concerns, besides saturation of capacity of Indian Railways on the Golden Quadrilateral that weighed heavily in the mind of Indian policy makers while taking decision to construct dedicated freight corridors (DFC). It envisages linking the four metropolitan cities of Delhi, Mumbai, Chennai and Kolkata, along with its two diagonals (Delhi-Chennai and Mumbai-Kolkata). In the first phase, the Government of India took decision to construct only two corridors-the Western DFC (1520 route km) and Eastern DFC (Estimated 1856 route km).

The construction of DFC would enable Indian Railways to meet the growing demand for freight transport and induce modal shift of freight traffic from road to rail. It would also help achieving global target, agreed during Climate Summit 2014, to achieve rail freight activity equal to that of road by 2030. Since the entire corridor is planned to have superior asset standards – 25 tonne axle load, 75 KMPH average speed and more efficient locos powered by electric traction, the completion of project would lead to higher operational efficiency resulting in substantial energy saving and significant reduction of GHG emissions. The resulting saving in energy consumption as a result of DFCC would dwarf energy saving as a result of other measures undertaken by Indian Railways to reduce energy consumption in traction and non-traction uses.

According to an study undertaken by IIM, Ahmedabad (supported by UNEP Risø Centre on Energy, Climate and Sustainable Development) in 2012, the specific fuel consumption for electric traction in DFC scenario would be 30% lower than No-DFC scenario, reflecting the energy efficiency gains due to operational efficiency, regenerative braking systems in locomotives and other energy saving technologies. Further Ernst & Young study undertaken in 2011 estimates that cumulative GHG emissions over the 30 years period, after completion of project, in the No-DFC and DFC scenario would be 582 million ton CO2 and 124.5 million ton CO2 respectively. This demonstrates that implementation of DFC project would reduce cumulative GHG emission over 30-years period for freight transportation in the Eastern and Western Corridor to approximately less than one-fourth.

Therefore, early completion of DFCC project would be critical not only to sustain current rate of economic growth but also to decouple economic growth from increase in GHG emission from transport sector as a whole.

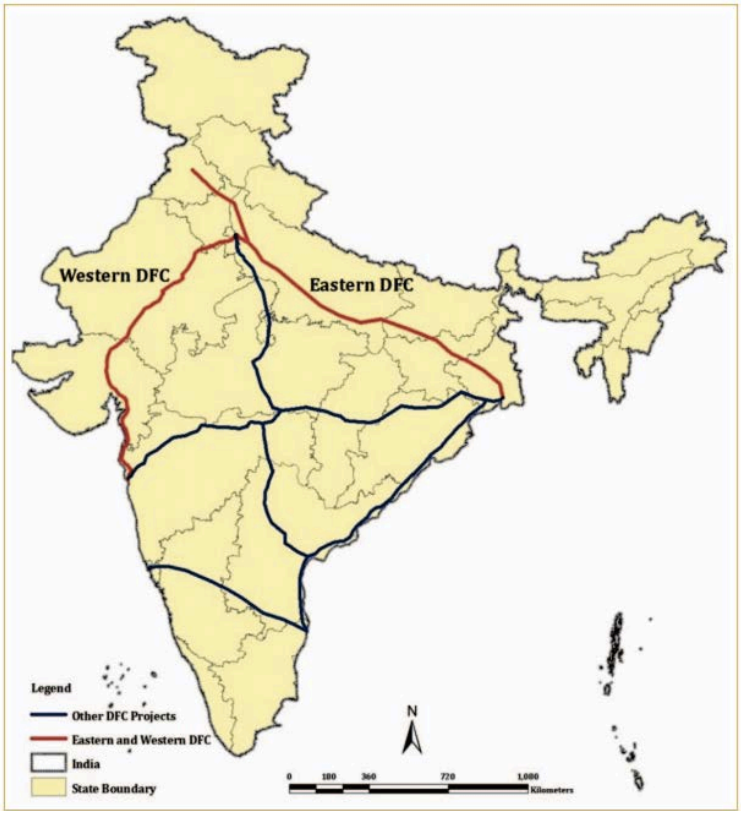

Fig 1: The proposed DFCC Corridors

Fig 2: Eastern & Western Dedicated Freight Corridors

Fig 3: Track linking by NTC machine in progress

Fig 4: Trial run on Durgawati - Sasaram Section on 30.06.2015