



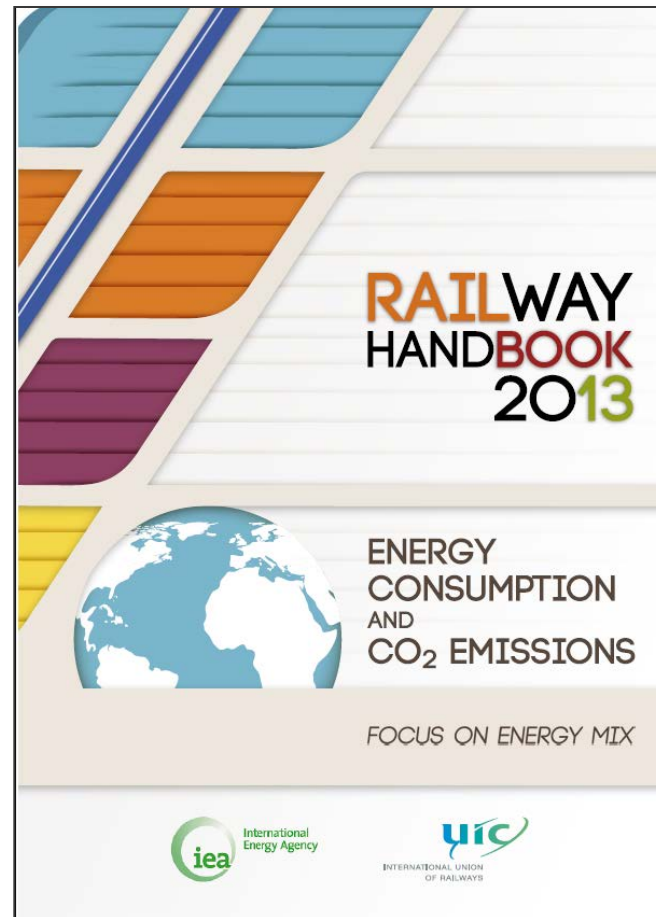
INTERNATIONAL UNION
OF RAILWAYS

unity, solidarity, universality

Railway handbook 2013

Recent reductions in CO2 emissions

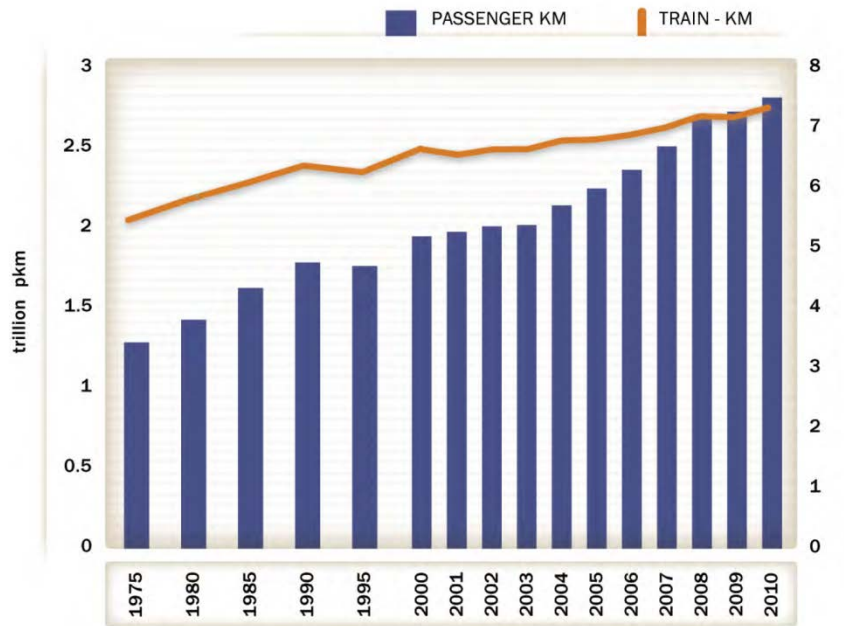
Nick Craven, 26 February 2014



www.uic.org/spip.php?article3193

Rail sector: worldwide passenger & freight activity

Fig. 3: Railway passenger transport activity, 1975-2010 (pkm and train-km)



Source: Elaboration by IEA based on UIC (2012a)

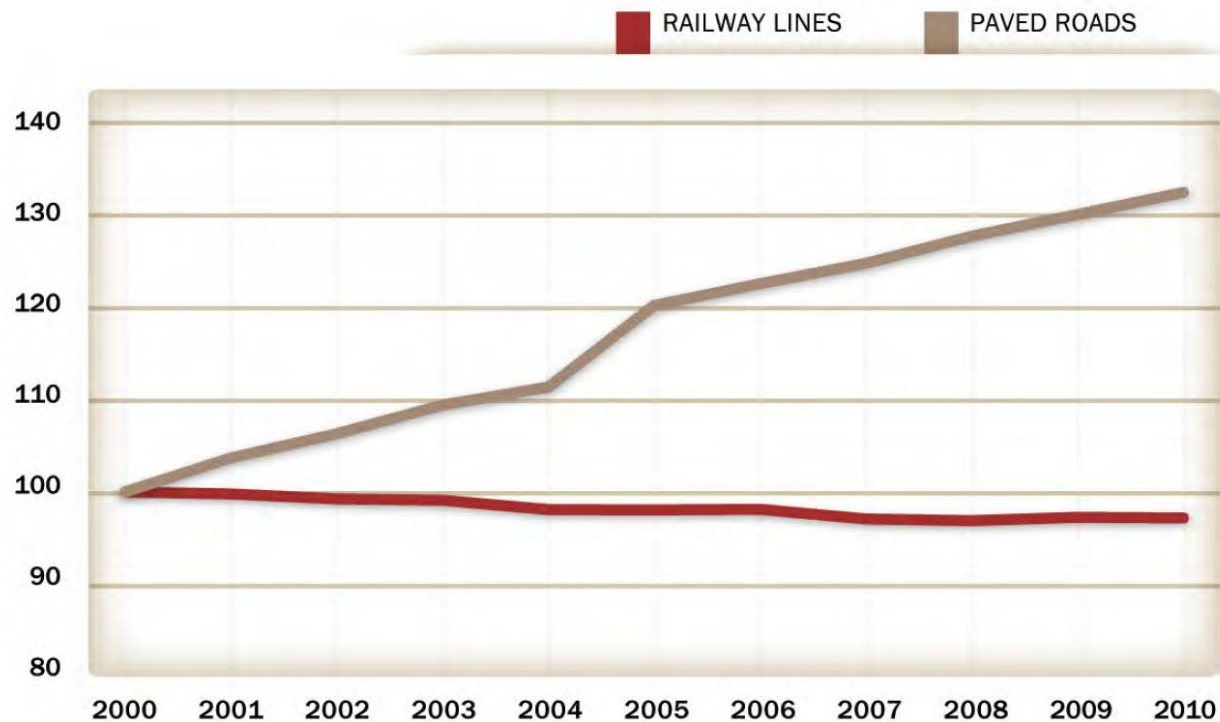
Fig. 6: Railway freight transport activity, 1975-2010 (tkm and train-km)



Source: Elaboration by IEA based on UIC (2012a)

Evolution of paved roads & railway lines

Fig. 15: Evolution of paved roads and railway lines, 2000-2010 (km)

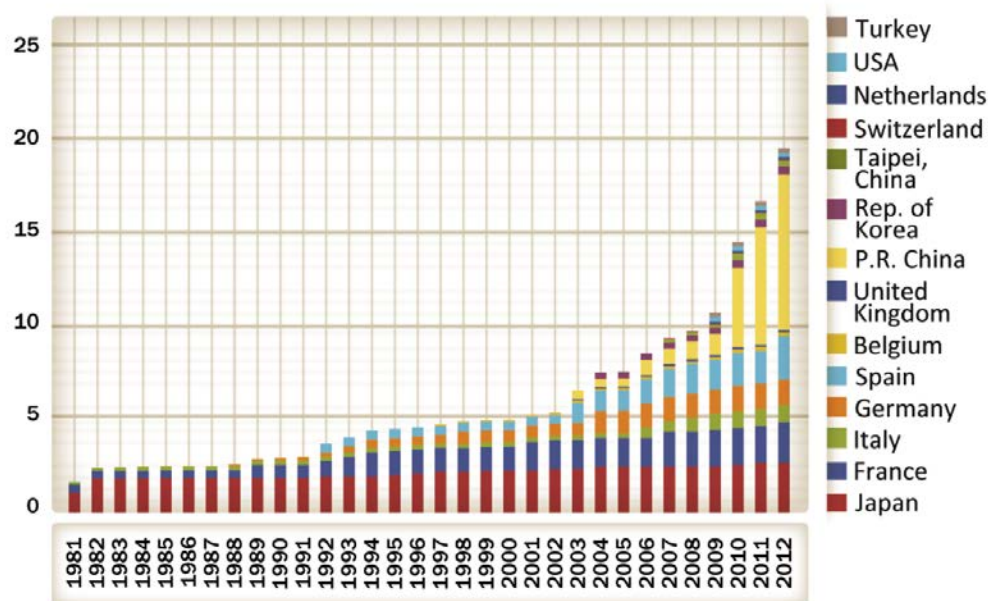


Year 2000=100

Source: Elaboration by Susdef from IEA (2013) and UIC (2012a)

High speed rail – new lines

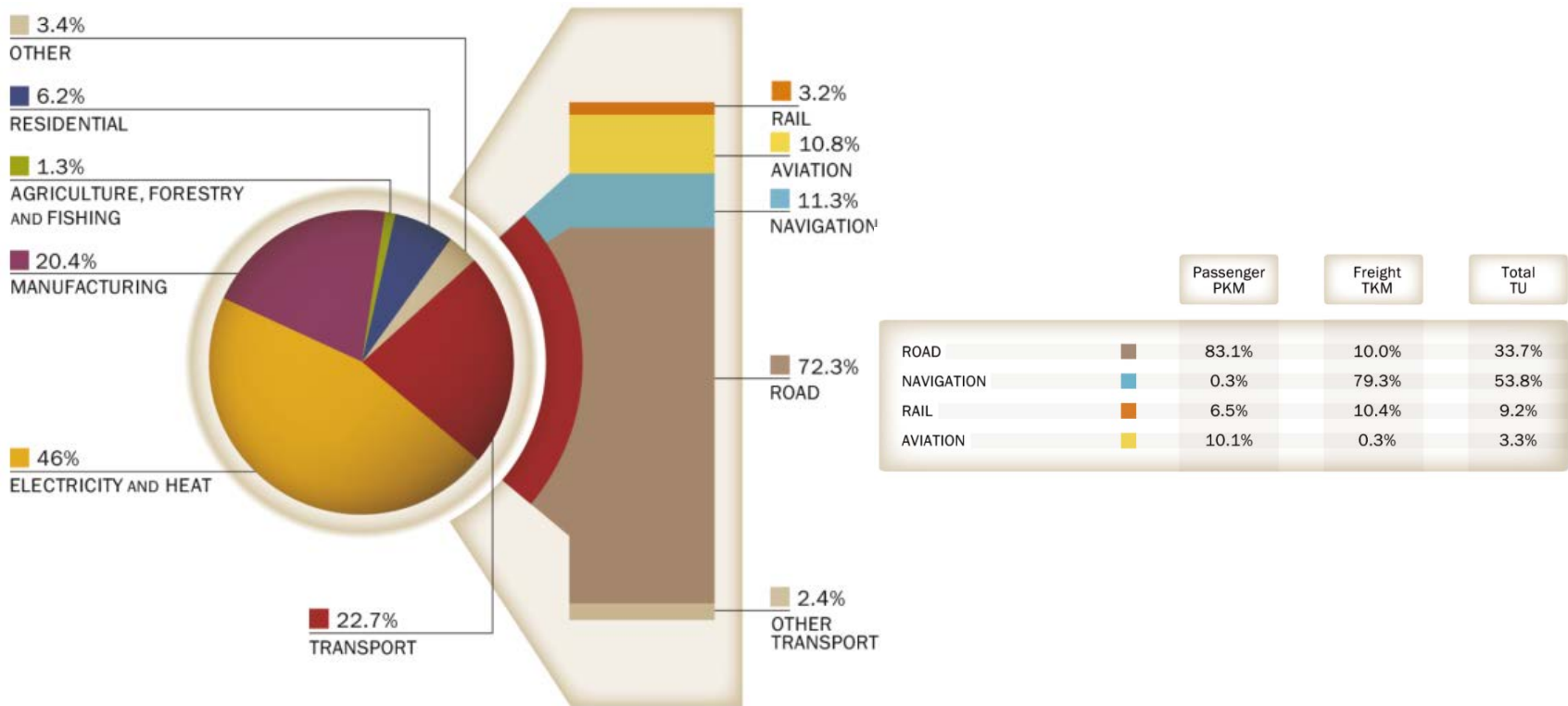
Fig. 13: High-speed lines in operation by country, 1981-2012 (thousand km)



Source: Elaboration by IEA based on (UIC, 2012a)

There is rapid growth of high speed lines, yet these only represent about 1% of the total rail network. Roughly half of the worlds high speed lines are in China

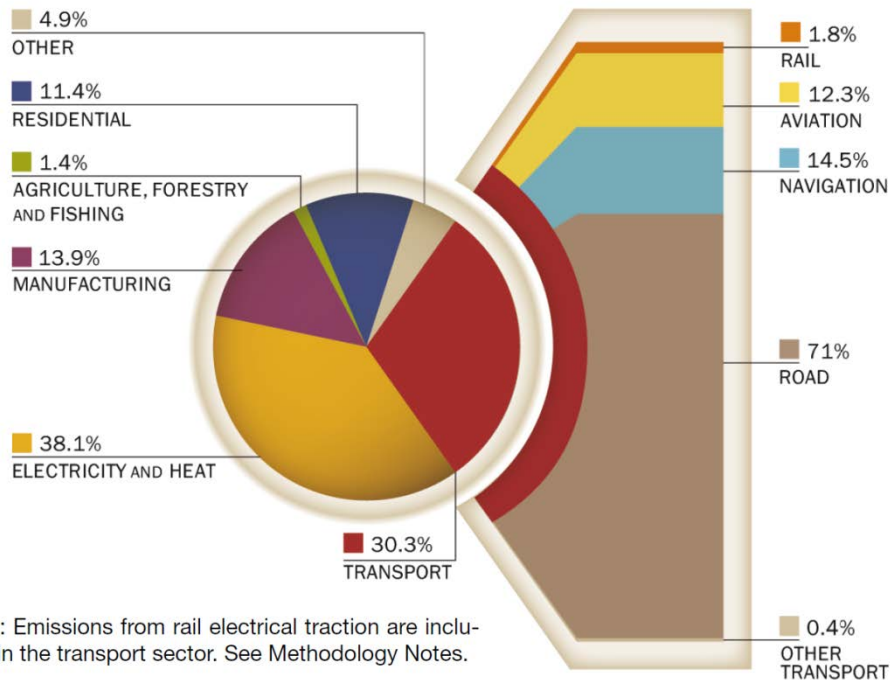
World level: Modal share & CO2 emissions



Rail accounts has a 9% modal share of the worlds transport activity but generates just 3% of transport related CO2

EU 27: Modal share & CO2 emissions

Fig. 29: Share of CO₂ Emissions from fuel combustion by sector, 2010

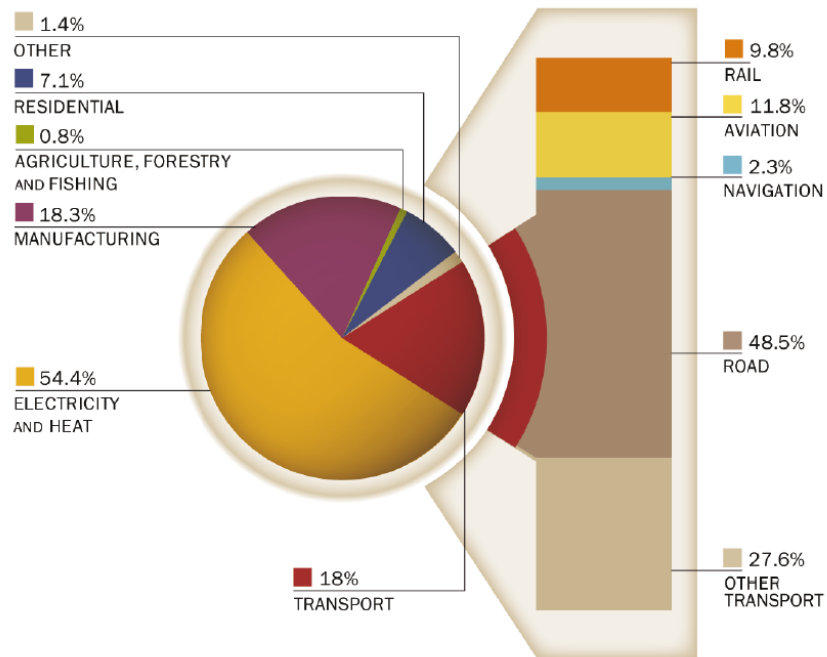


	Passenger PKM	Freight TKM	Total TU
ROAD	83.8%	47.2%	71.1%
NAVIGATION	0.6%	42.0%	15.0%
RAIL	7.4%	7.5%	7.4%
AVIATION	8.2%	0.1%	5.3%
OTHER	0.0%	3.2%	1.2%

Note: Emissions from rail electrical traction are included in the transport sector. See Methodology Notes.

Source: Elaboration by Susdef based on IEA (2012a) and UIC (2012b)

Russia: Modal share & CO2 emissions



	Passenger PKM	Freight TKM	Total TU
ROAD	32.9%	8.8%	12.6%
NAVIGATION	0.2%	2.4%	2.0%
RAIL	32.5%	88.6%	79.8%
AVIATION	34.4%	0.2%	5.6%

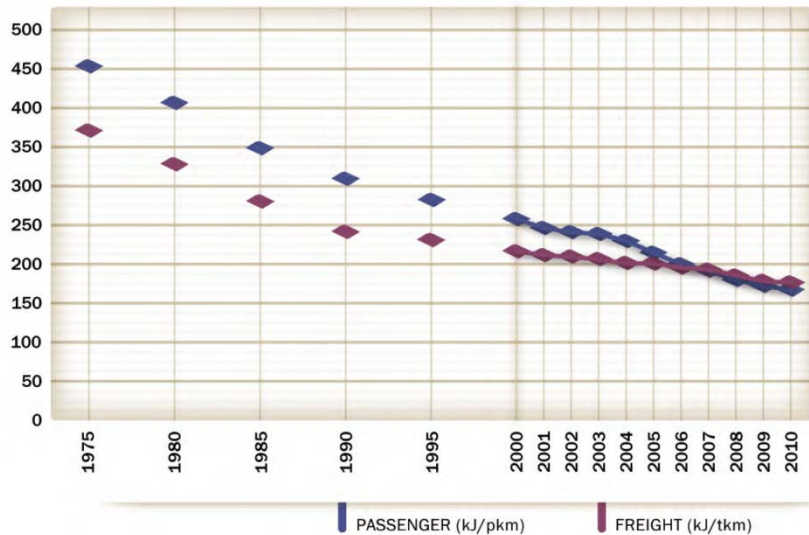
Source: IEA (2011b)

Note: Emissions from rail electrical traction are included in the transport sector.
See Methodology Notes.

Source: Elaboration by Susdef based on IEA (2012a), IEA (2012b), IPCC (2006) and IEA (2008).

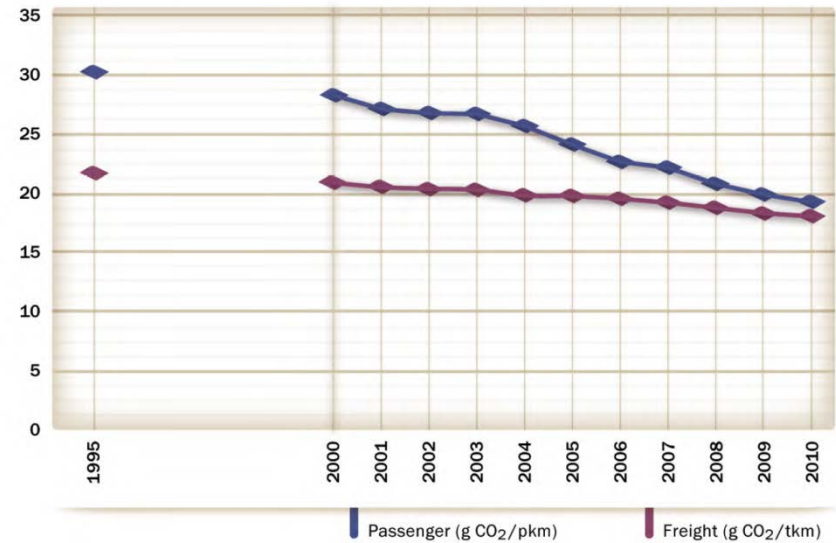
World level Energy efficiency & CO2

Fig. 17: Railway specific energy consumption, 1975-2010



Source: Elaboration by IEA and Susdef based on IEA Mobility Model and UIC (2012a)

Fig. 21: Railway specific CO₂ emissions, 1995-2010



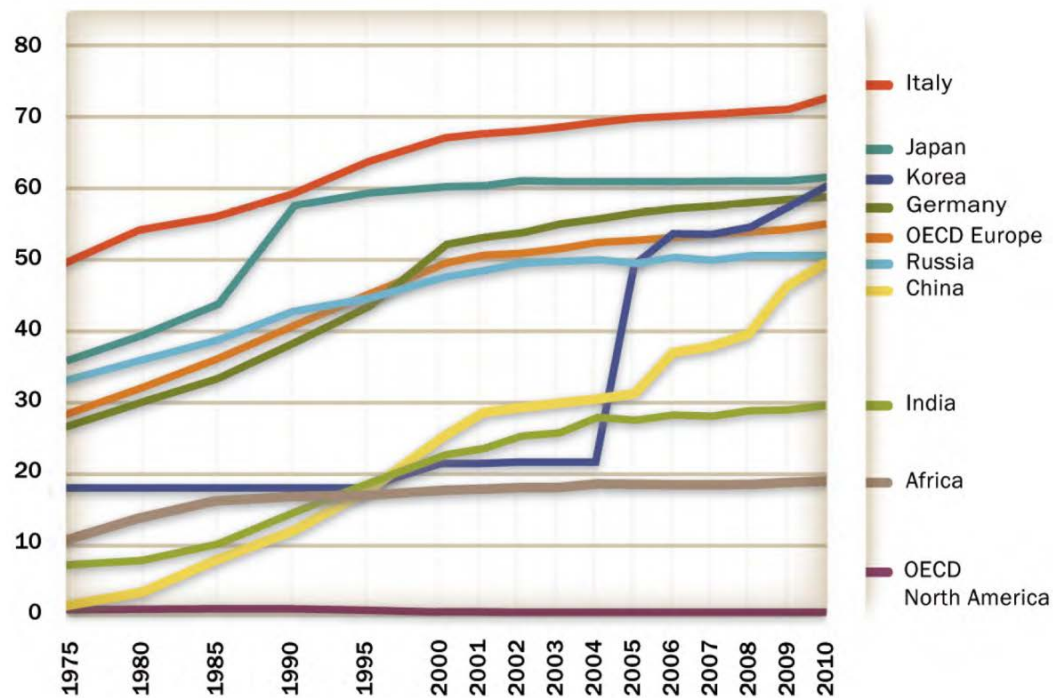
Source: Elaboration by IEA and Susdef based on IEA Mobility Model and UIC (2012a)

Between 2000 & 2010, CO₂ emissions reduced by:

- 32% per passenger km
- 18% per tonne km

Electrification

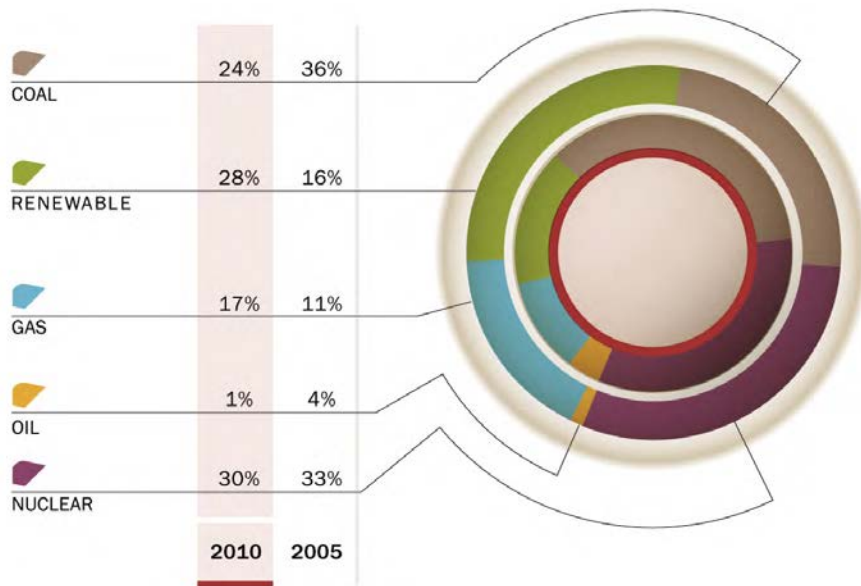
Fig. 11: Share of electrified railway lines in selected countries and geographic areas, 1975-2010 (%)



Source: Elaboration by IEA based on UIC (2012a)

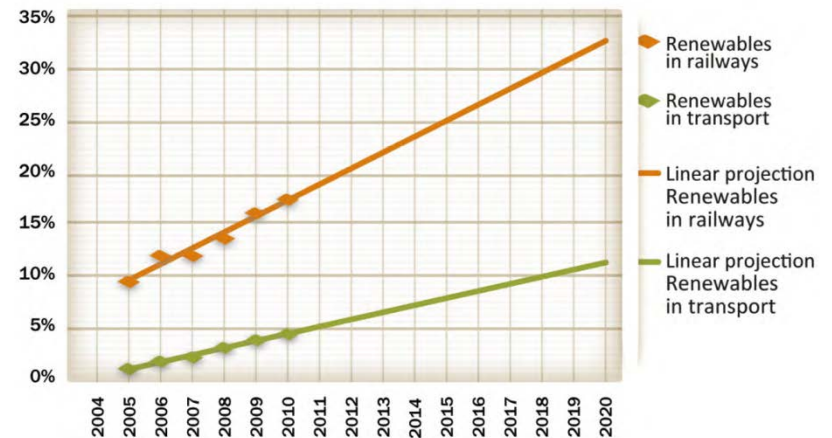
European railway & renewable energy

Fig. 125: Railway electricity mix evolution in EU27, 2010 outside – 2005 inside



Source: Elaboration by Susdef from UIC (2012b)

Fig. 119: Forecast of the share of renewables in transport and in railways in EU27, 2005-2020



Source: Elaboration by Susdef based on IEA (2012b) and UIC (2012b)

More than half of the energy used by European railways is electricity related

Case study: railway renewable energy



Green tunnel, Belgium

Railway tunnel designed to provide renewable energy to power infrastructure and traction, protect wildlife and control noise :

16,000 solar panels

50,000m²

3.5 km railway tunnel

4MW per year / 3.3GWh

Case study: railway renewable energy



Blackfriars Station, central London

4,400 photovoltaic panels have been installed on the roof. These will provide half of the station's energy, reducing its CO₂ emissions by 511 tonnes per year