Railway handbook 2013

Recent reductions in CO2 emissions

Nick Craven, 26 February 2014
Rail sector: worldwide passenger & freight activity

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

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)
There is rapid growth of high speed lines, yet these only represent about 1% of the total rail network. Roughly half of the world’s high speed lines are in China.
Rail accounts has a 9% modal share of the world's transport activity but generates just 3% of transport related CO2 emissions.
EU 27: Modal share & CO2 emissions

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

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

Note: Emissions from rail electrical traction are included in the transport sector. See Methodology Notes.
World level Energy efficiency & CO2

Between 2000 & 2010, CO2 emissions reduced by:
- 32% per passenger km
- 18% per tonne km

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

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

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.