

# European Commission sets up EU Shift<sup>2</sup>Rail programme

## Sectoral industrial policy on the right track

A Joint Undertaking to revive the rail industry

The European rail manufacturing industry provides a job to some 400,000 workers and has a global market share of 37%. The sector is a strategic part of Europe's industrial fabric and delivers solutions to a number of our major social challenges such as mobility, climate change and energy efficiency. With inventions such as the high speed train, ERTMS (European Rail Traffic Management Systems) and automated metro systems, the sector has been able to maintain a leading position on the international stage. Last year, in order to preserve this industrial stronghold and to deliver on Europe's transport objectives, the Commission set up Shift<sup>2</sup>Rail, a large public-private partnership to promote innovation. Prior to this, the Commission has set up other public-private partnerships such as Clean Sky, Innovative Medicines, Fuel Cells and Hydrogen, Bio-based industries and Electric Components and Systems. The objective of all of these EU joint undertakings is to mobilise and pool European, national and private efforts in the development of new technologies and their introduction onto the marketplace.

### Trainspotting: Facts and Figures

- The European rail equipment industry employs 400,000 employees and has a global market share of 37%.
- The EU has 66 production sites for rolling stock, employing 160,000 employees, half of which work for Bombardier, Siemens and Alstom. Voestalpine, Delachaux and Vossloh are the largest of the 255 companies producing rail infrastructure, employing 50,000 workers between them. Finally, the market for signalling and electrification is extremely fragmented with Invensys, Thales and Balfour Beatty amongst the best known companies in this area.
- Around 800,000 employees work for the European rail services.
- Each year the sector receives €46bn in public subsidies.
- Rail traffic is stagnating or even declining in many EU member states. The modal share of passenger rail in European transport has remained more or less constant since 2000, at around 6%.
- Rail freight has only grown by 8.8% since 1995, while there has been an overall growth of 25% in the other modes of transport.

- The global market for railroad infrastructure and rolling stock is experiencing an annual growth of 10%.
- Europe runs a trade surplus with all of its main trading partners (except Japan). Nevertheless, there has been a sharp increase in Chinese exports, although they have not yet entered the EU market.



### A climate for rail

Ambitious European climate objectives require the railway sector to take on a larger share of transport. The 2011 White Paper on a Roadmap to a Single European Transport Area aims for 30% of road freight over 300 km to shift to rail or waterborne transport by 2030, and more than 50% by 2050. It also aims for a majority of medium-distance passenger transport (up to 1,000 km) to travel by

rail by 2050. Therefore the length of the existing high-speed rail network has to be tripled. Finally, the use of cars in urban transport with an internal combustion engine should be halved by 2030 and completely phased out in cities by 2050. These goals will be supported by the EU's new programme for research and innovation, Horizon 2020, for a total amount of €6.4bn



### Visible hand needed

For a number of reasons, a more co-ordinated approach is required in this sector. The diversity of national standards and operating frameworks is leading to unnecessary surplus costs and is hindering innovation. Research and innovation are also being hampered by the huge financial risks associated with the capital intensity of investments and long product cycles. The lifecycle of a locomotive is 40 years (as opposed to 20 years for a plane or seven years for a car). The European Commission was therefore of the opinion that creating a platform for enhancing collaboration and driving innovation would greatly contribute to a stronger European railway equipment sector.

### The road to rail

Shift2Rail was set up by the Commission and eight rail industry partners: Alstom, Ansaldo Breda, Bombardier, Siemens, Thales, CAF, Trafikverket and Network Rail. They will each contribute at least €30m to the programme. The total contribution of the rail industry may end up amounting to as much as €470m.

The EU's share of the funding amounts to a maximum of €450m over the period from 2014 - 2020. The money will come from the Horizon 2020 programme. By contrast, during the period from 2007 to 2013, the Commission provided just €155m funding for rail research.

Most of this money will be spent on demonstration activities (prototypes for use in operational environments). This is the last non-commercial step in terms of demonstrating the operational performance and reliability of innovation, following which the technology can then be realistically shifted to the commercial scale.

### Activities

- Innovative solutions to extend vehicle lifetime and simplify retrofitting
- Intelligent doors and access systems
- New energy-efficient traction systems
- Safer and enhanced brake systems, and recovery of the braking energy
- Next generation of lightweight bogie systems
- Intelligent maintenance systems with integrated auto-diagnostic functions and self-healing processes, as well as simplified architectures and less disruptive maintenance (e.g. remote infrastructure monitoring)
- Increase capacity of infrastructures by advanced and highly reliable management and signalling systems
- Improved station concepts
- Development of automatic train operations
- Development of intermodal rail freight transport (containers, trailer trains)
- Making a step change in the small volume freight market by means of flexible and reliable services
- Virtual testing of new technologies

The money will be used to fund innovation programmes related to a new generation of rolling stock, intelligent traffic management and control systems, high performance railway infrastructure, the development of attractive and sustainable freight solutions and technologies for sustainable and attractive European freight.

These programmes will take into account cross-cutting themes such as:

- Long-term needs and socio-economic developments
- Smart materials and processes (composites, light metallic alloys, nanomaterials, 3D-printing of spare parts)
- System integration, safety and interoperability

- Energy and sustainability
- Addressing the shortage of expertise (30% of the workforce is expected to retire in the next ten years). The major gap in engineering skills has to be solved. There is also a need for new skills to be promptly identified and virtual learning environments need to be developed. In the meantime, knowledge transfer from other sectors such as aerospace or automotive is required in order to integrate non-railway specific technologies.

### No lack of ambition

A number of key performance indicators have been identified and will be used to measure the results of the programme:

- A 50% reduction in the lifecycle cost of railway transport
- A 50% increase in the reliability and punctuality of rail services
- A 100% increase in the capacity of the railway transport system to meet increased demand
- Removal of all remaining technical obstacles that are hindering interoperability and efficiency. The fragmented national rail systems of the EU need to be integrated and become an integral part of the broader European mobility system.
- Reduce negative external factors such as noise, vibrations, emissions and other environmental aspects

**The main aim of Shift2Rail is to ensure a modal shift towards rail through the promotion of a more attractive, user-friendly, efficient, reliable and sustainable European rail system. This should allow the sector to retain and consolidate its leadership on the global market. The concentration on demonstration activities covers one of the most important gaps in the European innovation system: the market introduction of new innovations. It goes without saying that with a budget of at least €920m, the programme will benefit all those active in the the railway equipment sector, as well as rail operators and rail regulatory and safety bodies, and will help to create new, high quality jobs in Europe's industry.**