



EUROPEAN COMMISSION

## MEMO

Brussels, 16 December 2013

# The Shift2Rail Joint Undertaking – Frequently Asked Questions

## What is the challenge?

Ambitious EU goals relating to climate change, energy supply and the environment mean that the railway sector will have to take on a larger share of transport demand in the next decades. In its 2011 [White Paper on a Roadmap to a Single European Transport Area](#), the Commission underlined the importance of creating a Single European Railway Area in order to achieve a more competitive and resource-efficient European transport system. The White Paper aims for 30% of road freight over 300 km to shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050. It also aims for a majority of medium-distance passenger transport to go by rail by 2050.

However, rail is finding it difficult to challenge the dominance of road transport, despite positive developments in some markets. Overall, rail's share of intra-EU passenger transport has remained stable at just 6.3% since 2000. Rail freight has only grown by 8.8% since 1995, while the overall growth of other modes has been 25%. Furthermore, rail transport continues to rely to a large extent on public subsidies (some EUR 46 billion annually)<sup>1</sup>, while passenger satisfaction lags behind many other sectors, according to recent Eurobarometer surveys.

Faced with these challenges, the Commission has adopted proposals for a 4<sup>th</sup> Railway Package ([IP/13/65](#)) which aim to remove remaining administrative, technical and regulatory obstacles holding back the rail sector both in terms of market opening and in terms of interoperability. But these measures will have to be accompanied by research and innovation efforts to produce new technologies capable of reducing operational and infrastructure costs, enhancing safety and creating new business opportunities for the European rail supply industry, both in Europe and beyond.

In past decades, significant investments in EU rail research and innovation have helped the European rail supply industry to retain a leading position at global level, namely with the development of high-speed trains, ERTMS (European Rail Traffic Management Systems), automated metro systems, etc. However, a recent Commission study on the competitiveness of the railway supply industry shows that Asia is steadily overtaking Europe as the largest rail supply market, namely thanks to a surge in research and innovation investments in countries like China and Korea.

---

<sup>1</sup> [SWD\(2013\) 10 – Part 3](#)

## **Why is public intervention needed?**

Rail research and innovation suffers from the following important market and systemic failures that justify public intervention:

- High level of product customisation due to the diversity of national standards and operating frameworks in effect across Europe, making the development of pan-European vehicles that can be used in several Member States a truly challenging task, and hindering the creation of a single European railway market, to the detriment of citizens, business and the environment
- Lack of a system-wide approach to innovation due to limited or uncoordinated participation of actors from the full rail value chain and the complexity of interfaces between railway sub-systems. This limits the potential of achieving breakthrough solutions with a real impact on the whole system. For instance, the introduction of high-capacity or high-speed trains can only help to increase capacity if accompanied by infrastructure changes, such as removal of loading-gauge limits and switch and crossing constraints. Yet, past research projects have mostly focused on just one component of the rail system.
- Limited private investment in research and innovation and limited market uptake of innovations due to low operational margins and funding gaps in the full innovation cycle;
- Heightened financial risks due to the capital-intensity of investments and long product lifecycles. For example, a locomotive can be used for 40 years, compared to the typical renewal cycles of 7 years in the automotive industry or 20 years in the airline industry.

Set against these challenges, a coordinated EU approach to research and innovation in the rail sector via the establishment of a joint undertaking is proposed to support the completion of the Single European Railway Area and to increase the competitiveness of the EU rail sector as a whole.

## **What is the Shift2Rail Joint Undertaking?**

The Shift2Rail Joint Undertaking (the S2R JU) will be a public-private partnership in the rail sector, providing a platform for the rail sector to work together with a view to driving innovation in the years to come.

The main bodies of the S2R JU will be the Governing Board, in charge of strategic decision-making, and the Executive Director, responsible for day-to-day management of the S2R JU. There will also be two advisory bodies: a Scientific Committee and a States' Representatives Group.

Similarly to the Joint Technology Initiatives<sup>2</sup> set up under the Horizon 2020 Framework Programme the S2R JU will seek to pursue research and innovation activities in support of European competitiveness. However, an essential role of the S2R JU will also be to act as the technological arm of the Single European Railway Area (SERA).

The S2R JU will be charged with developing a European Strategic Master Plan defining the priority research and innovation activities, including large-scale demonstration activities, required to accelerate the penetration of integrated and interoperable technological innovations necessary to support the Single European Railway Area and to achieve operational excellence of the railway system, while increasing capacity and reliability and driving down costs of railway transport.

Activities will focus around five key areas, corresponding to the five "Innovation Programmes" defined in the Regulation:

- developing a new generation of high-quality reliable **rolling stock** that substantially reduces the cost of rail services, drastically improves the quality of rail services and facilitates the use of trains throughout various Member States;
- developing intelligent **traffic management and control systems**, beyond signalling, building on current ERTMS, to optimise capacity, reliability and minimise life-cycle cost;
- delivering a new railway **infrastructure** system that will radically improve capacity and performance and reduce costs related to development, maintenance and renewals;
- developing innovative **IT solutions** and services to make railway services more attractive;
- developing sustainable and attractive **freight** solutions, helping rail to enter into new market segments and become an integrated part of advanced logistic solutions.

---

<sup>2</sup> Such as the Clean Sky, Innovative Medicines (IMI), Fuel Cells and Hydrogen (FCH), Bio-based Industries (BBI) and Electronic Components and Systems (ECSEL) Joint Technology Initiatives to be established under the Horizon 2020 programme, following the Commission's Communication of 10 July 2013 on "Public-private partnerships in Horizon 2020: a powerful tool to deliver on innovation and growth in Europe"

## **What are the objectives and targets of the Shift2Rail Joint Undertaking?**

The S2R Joint Undertaking shall seek to develop, integrate, demonstrate and validate innovative technologies and solutions that uphold the strictest safety standards and can be measured against the following key performance indicators:

- a 50% reduction of the life-cycle cost of railway transport, through a reduction of the costs of developing, building, maintaining, operating and renewing infrastructure and rolling stock, as well as through increased energy efficiency;
- a 100% increase in the capacity of the railway transport system to meet increased demand for passenger and freight railway services;
- a 50% increase in the reliability and punctuality of rail services;
- the removal of remaining technical obstacles holding back the rail sector in terms of interoperability and efficiency, in particular by endeavouring to close points which remain open in Technical Specifications for Interoperability (TSIs) due to lack of technological solutions and by ensuring that all systems and solutions developed by the S2R Joint Undertaking are fully interoperable;
- the reduction of negative externalities linked to railway transport, in particular noise, vibrations, emissions and other environmental impacts.

## **Who will be part of the Shift2Rail Joint Undertaking?**

The Founding Members of the S2R JU will be the Union and 8 rail industry partners, including rail equipment manufacturers Alstom, Ansaldo STS, Bombardier, Siemens, Thales and CAF, as well as infrastructure managers Trafikverket and Network Rail.

Founding Members other than the Union consist of single legal entities, having their headquarter (or the headquarter of the division related to the rail sector) in a member state of the EU, that have expressed, in writing, following intensive stakeholder consultations, their agreement to an individual own contribution of at least EUR 30 million to pursue research activities in the area of the Shift2Rail Joint Undertaking.

Next to these Founding Members, additional members of the Joint Undertaking (Associated Members) will be selected through an open call for membership. Associated Members may consist of groupings or consortia of legal entities, established in a Member State or in a country associated to the Horizon 2020 Framework Programme. The S2R Joint Undertaking shall encourage the participation of SMEs, and of actors from the entire rail value chain, as well as from outside the traditional rail sector.

Further to these members, the European Railway Agency (ERA) will have a role of advisor to the Joint Undertaking to ensure that the research and innovation activities undertaken by the JU will have a strong link with the goal of achieving a Single European Railway Area and to provide its expertise on issues relating to interoperability and safety in particular.

## What will the total budget be?

The EU's share of the funding, amounting to a maximum of 450 million Euros over the period 2014 to 2020, will come from the Horizon 2020 programme, as part of the EU's new Multi-Annual Financial Framework.

To access this funding, the rail industry will have to commit to a contribution of at least EUR 470 million, bringing the total S2R JU budget up to at least EUR 920 million.

This will ensure a significant leverage effect of the EU contribution in boosting competitiveness, growth and jobs in Europe.

Additional funds complementing the Horizon 2020 funds may be allocated from other Union instruments, such as the Connecting Europe Facility, to support actions for the deployment of mature outcomes of the S2R Joint Undertaking.

At least 30% of the Union contribution will be reserved for fully open calls, while up to 40% will be allocated to Founding Members other than the Union and up to 30% to Associated Members.

## Who will benefit from the initiative?

The proposed initiative will affect all actors in the rail sector, by proposing a range of novel business, operational and service solutions that support the search for a "best-in-class" profile for rail. In particular, the following actors will be affected:

- **Rail supply industry**, which encompasses manufacturers of products and components for railway operation (i.e. rolling stock and locomotives, electrification, signalling, control command, telecommunication and track equipment), as well as their suppliers and service companies. These companies are present in all Member States and their future depends on the competitive edge they can derive from the timely development and deployment of innovative and integrated rail technologies and procedures. Such an initiative will help open new market perspectives, offering significant employment and export opportunities and reinforcing European leadership worldwide.
- **Rail undertakings and operators** running passenger and freight services will benefit from innovations enabling increased reliability and quality of services. A more efficient use of resources and optimised operating models will help to reduce operating costs.
- **Rail vehicle leasing companies or rolling stock companies** that lease out trains to rail undertakings will benefit from increased interoperability and standardisation of products, enabling them to broaden their client base and increase operational margins.
- **Rail infrastructure managers**, responsible for the safety, planning, construction, operation, management and maintenance of rail infrastructure, will benefit from innovations in the field of command and control, harmonisation of specifications and increased line capacity, helping to overcome network saturation and ensure better intermodal connections. Innovations in the field of assets, safety and energy management will also help to significantly reduce maintenance costs.
- **Rail regulatory and safety bodies** that are responsible for promoting and/or enforcing competition and health and safety on the railway will benefit from advances in communication (command-control technologies, interoperability across applications, etc.), and surveillance technologies.

Other industrial sectors, including tiered suppliers and actors in economic subsectors that make use of the goods and services provided by the rail sector, may also be affected.

By contributing to reducing infrastructure and operating costs, the initiative will help to reduce the scale of subsidies paid out by national governments. By retaining European leadership in the rail sector, this will also help to create new high quality European jobs.

Passengers and freight service users will be indirectly affected as reliability and quality of services are enhanced. Improved competitiveness of the rail sector, combined with increased capacity, will help it to take on an increased share of transport demand, thereby contributing to reducing traffic congestion and CO<sub>2</sub> emissions. Citizens' health and wellbeing will also be positively affected thanks to reduced noise pollution from rail.

### **What are the benefits of the way the S2R JU works?**

- Within the S2R JU, all relevant stakeholders will be involved in decision-making processes and share responsibilities. The S2R JU will make it possible for interested parties to shape the strategic orientation of the JU, as well as the technical framework for rail research and innovation, through participation in the Governing Board, in Working Groups relating to the different Innovation Programmes, in the Scientific Committee or in the Member States Representatives Group. Furthermore, the S2R JU will work in close consultation with the European Railway Agency and the European Rail Research Advisory Council (ERRAC) Technology Platform, benefiting from their extensive experience and expertise on issues relating to rail research in general, as well as on more technical issues, including interoperability and safety.
- The establishment of a Joint Undertaking will enable stakeholders to build strong relationships together and develop strategic partnerships. The S2R JU will also strengthen the link with the market, as suppliers and the end users of rail research – i.e. rail operators and infrastructure managers – will be directly involved in defining research needs and assessing and validating research results.
- By bringing together the coordination, programming and execution of rail-related research and innovation activities under the responsibility of a single, dedicated structure, the JU will ensure continuity and avoid fragmentation of research and innovation efforts. It will act as a central reference point on rail-related research and innovation actions funded at Union level, making it easier for stakeholders to know what funding is available. Also, by gathering together all components of the rail sector, the JU will help to ensure a system-wide approach to innovation in the rail sector.
- The development of a Strategic Master Plan, in close cooperation with all market players, will ensure that research and innovation projects support the competitiveness of the rail sector and are in line with business needs. At the same time, the Commission's leading role will ensure the coherence of the research and innovation agenda with Horizon 2020 and with Single European Railway Area objectives of high societal relevance, such as interoperability, safety, energy efficiency and decarbonisation.
- The Shift2Rail JU will become a recognised reference point in the domain of rail innovation, enabling the European rail industry to maintain a strong position on the international scene generally and with standardisation bodies more specifically.

## **Key facts and figures**

- The European rail service sector has a turnover estimated at EUR 73 billion, with around 800,000 employees.
- The European rail manufacturing industry accounts for more than EUR 49 billion of a global rail market worth some EUR 131 billion, and employs some 400.000 employees in the EU.
- Rail is critical to the effective functioning of the European economy. More than 8 billion passenger journeys are made by rail each year. Rail carries about 10% of all freight traffic across Europe, with estimated revenue of €13 billion.
- Each year public authorities invest huge sums in the railway sector. In 2009 this amounted to some €46 billion of public subsidies. This kind of public funding is becoming scarcer.
- Rail traffic is stagnating or declining in many EU Member States. Despite positive developments in a few markets, the modal share of passenger rail in intra-EU transport has on average remained more or less constant since 2000, at around 6%, whereas the modal share of rail freight has decreased from 11.5% to 10.2%.
- Under the Seventh Framework Programme, the Commission provided funding for rail research and innovation amounting to roughly EUR 155 million for the period 2007 to 2013.