

Shift2Rail 2 to decisively contribute to EU-wide objectives fulfilment



Pamela Luica is talking with...
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Research and innovation is the answer to the major challenges posed by the high transport demand, congestion and costs, energy consumption and climate changes. Innovation creates new opportunities, new challenges and demands, but it could also reduce fragmentation in Europe, as the railway sector is still facing this problem. It could also help level up products and services in the market and eliminate disparities, making it easier to reach the objective of creating a single railway market.

In Europe, the importance of research and innovation is now more than paperwork with the set-up of EU's biggest R&D&I Programme worth EUR 80 billion (for 2014-2020), to which the private investment adds, as the private sector has a significant implication in projects.

To launch new modern and efficient products, from new materials to new telecom systems, signalling and vehicles, the railway industry needs to invest in research and innovation to meet innovation demands and to harmonise the products and technologies that this transport mode requires.

Within the research, development and innovation plans, as well as in the Single European Railway Area objective, Shift2Rail has the potential to revolutionize the railway system by creating new products and services to be developed and launched in the market. Shift2Rail plans to reduce the infrastructure and rolling stock lifecycle costs by 50%, to improve the quality of services by increasing reliability and punctuality, reducing congestion and CO2 emissions by doubling the railway capacity. With the set objectives, Shift2Rail could help meet the objectives stipulated in the White Paper on Transport (2011), according to which 30% of road transport on distances over 300 km should be shifted to sustainable transport, especially railway, while another 50% should be directed to environmentally friendly corridors by 2050. For the passenger transport segment, Shift2Rail could answer EU's challenge on developing the high-speed railway network (by 2050) and increase its length threefold by 2030.

Shift2Rail Joint Undertaking (S2R JU) is the new public-private partnership in the railway sector which provides a platform for cooperation leading to the innovation of this transport mode. Last year, the European Commission announced S2R JU as the most successful research partnership, one of its positive effects being that it reunited several interested parties (companies, institutions etc.) which collaborated to maintain the competitiveness of the European railway sector, the development of technologies in this sector which help the EU preserve its title of worldwide technology leader. Within the report between public-private and public-public partnerships supported by Horizon 2020, seven partnerships representing a research and innovation investment value of EUR 19.5 billion (for seven years) were assessed. The EU contribution amounted to EUR 7.3 billion.

The S2R JU was set-up in 2014. In 2016 when R&D&I activities started, S2R JU managed to reach budgetary autonomy and concluded the first request for proposals which meant that progress towards the implementation of the R&D&I programme, launched the 2017 Call for

proposals and consolidated the JU structure.

At the end of 2017, the new Multi-Annual Action Plan – Executive View (MAAP part A) was adopted and presented to Commissioner for Transport Violeta Bulc. The document underlines, as Innovation Capabilities, the solutions that will contribute to achieving the most sustainable, cost-efficient, high-performance and competitive transport mode for Europe.

Since the beginning of the year, S2R JU published the call for proposals 2018 committing to finance over 50% of its financing programme. Projects are worth EUR 155.3 million, with 18 topics available, of which 7 open to S2R members. Participation results showed that 39 proposals with a total cost of EUR 185.4 million and a financing demand of EUR 108.2 million, 40% more than the available financing, were submitted.

All Shift2Rail participants



In 2018, S2R JU, together with Fuel Cells and Hydrogen JU, announced the tender for the elaboration of a study on the use of the hydrogen fuel cell in the railway industry. The market will be assessed and the potential of the hydrogen fuel cells for railway transport will be evaluated.

Investments in research and innovation are crucial for the launch and implementation of projects and programmes with a significant impact over the railway market, the launch of new products, solutions and services that will contribute to developing an efficient and sustainable transport system. It is important to say that after the request for proposals 2018, S2R JU invested EUR 490 million into research and innovation activities, representing over half its budget for 2014-2020.

Also, to continue the consolidation of European leadership in this segment, Shift2Rail 2 becomes vital, being an extension of S2R JU after 2020. Within the next programming period, it is necessary to focus on the research activities for which investments are vital, especially European financing, as well as the implication of local and regional factors. It is also important to be aware that research and innovation investments are the future >

> of Europe and, according to Commissioner for Research, Science and Innovation, Carlos Moedas, a budget of EUR 100 billion is proposed for EU's next research and innovation programme.

Shift2Rail 2's objective to optimise the efficiency of the railway system and its competitiveness will contribute to the elimination of technological barriers to the establishment of SERA and to approach the existing objectives of S2R JU and will focus on the long-term demands regarding railway transport with the end purpose of increasing the market share and the benefits of society. Thus, Shift2Rail 2 will also focus on increasing the attractiveness, efficiency and profitability of railways.

To that end, UNIFE asks the European institutions to collaborate with Joint Undertaking and the profile industry to elaborate a budget according to Shift2Rail 2 objectives within the next MFF and FP9.

In the interview below, Philippe Citroën, Director General of UNIFE, explains the importance of Shift2Rail 2 for railway transport development, through research and innovation projects, the need for an increased budget for these activities and programmes with a defining implication in the establishment of a new railway transport system.

The European railway industry delivers half the global demand volume and is the main European supplier of products, solutions and services. Would you please explain the dimension of the European rail industry and its importance for the European economy and transport system?

Philippe Citroën: The European rail supply industry is a diverse and geographically widespread industry – from thousands of SMEs to major industrial champions; from rail supplies in rolling stock to signalling systems, energy and infrastructure, including all components and subcomponents.

The European rail supply industry is synonymous with approximately 400,000 jobs all over Europe. With absolute sales of EUR 53 billion, the European rail supply industry today accounts for 52.7% of the accessible market for rail products worldwide.

The European railway industry needs strong incentives from institutions to face the competitiveness imposed by Asia. In your opinion, what are the next steps (after several series of negotiations) for the industry to benefit from fair access on markets where there are still problems (such as Japan, China)?

Philippe Citroën: For years, UNIFE has been striving to achieve a level-playing field when it comes to accessing rail procurement markets. For a long time now, improving market accessibility has been our priority, especially by tackling the lack of transparency or discrimination in public procurement procedures, increasing local content requirements or forced partnerships and transfers of technology. European institutions have actually been quite instrumental in negotiating bilateral or plurilateral agreements with trading partners that have delivered concrete and positive results for our industry (e.g. trade

agreements with Canada and Japan).

However, negotiations are not ongoing with all the countries that tend to restrict their market access to European companies or that do not necessary support trade deals. UNIFE has consequently been long advocating an instrument to guarantee a level-playing field on procurement markets – the so-called International Procurement Instrument proposal made by the European Commission in 2012. Unfortunately, discussions regarding this matter have been difficult as some Member States still oppose the very concept of this instrument.

Another issue that is becoming increasingly problematic is the unfair competition on world markets. Financing packages and pricings are starting to change the rules of the game, especially with competitors from China. In this regard, our industry also needs support from institutions to avoid trade distortions and to make sure that all players have equal chances when they take part in tenders.

Eight key challenges faced by European Railway sector



Apart from a political approach, we are also talking about the quality of products/solutions/services. The leadership of the European railway industry is known worldwide, but the competitiveness of the Asian market is challenging the European railway industry which must preserve and consolidate its position in the global market. How could the European railway industry answer to this challenge?

Philippe Citroën: There is full awareness that third-countries, notably China, have launched a fast race for innovation which the European rail supply industry needs to keep up with. It is worth underlining that "advanced railway transportation equipment" is among the 10 priority sectors identified by the Chinese Government in its "Made in China 2025" strategy, which aims to turn the country into a 'manufacturing superpower' in the coming years. Moreover, CRRC has become by far the world's largest train builder, with considerable efforts in manufacturing upgrading and innovation. Accordingly, pursuant to its

“Made in China 2025” national strategy industry, the Chinese Government has been massively supporting its domestic rail manufacturers in the field of research & innovation.

Following this further, we also remark that China is getting more involved in the field of standardisation. In the process, China seeks to strengthen the distribution of its own national standards into the countries which fall within its One-Belt-One-Road strategy, as well as place Chinese standards more actively in international standardization efforts under the roof of ISO (International Organisation for Standardisation).

It is therefore clear that staying at the forefront of R&D&I will be a key factor if our industry wants to maintain its industrial advantage against the challenge posed by foreign competition. In this regard, the European rail manufacturers have perfectly understood that our world leadership and strengths are largely due to our research & innovation capacities and efforts. Notably, the EU rail supply industry invest in R&D&I up to 3,6% of its annual turnover.



Since there are more and more concepts for transport systems (passenger and freight) which, in consequence, form new types of demands, the research and innovation segment becomes crucial. How do you see the impact on the European railway industry and what will be its contribution to transport development?

Philippe Citroën: New concepts enabled by new technologies are indeed rapidly emerging among other modes of transport. We can, for instance, think of connected autonomous vehicles (CAVs), or the increasing success of new business models. This technological progress achieved by other modes represents, for rail, both a challenge and an opportunity. Following this further, we are also confronted by global trends such as urbanisation, decarbonisation or digitalisation that are shaping our society and, consequently, affecting the transport system too.

The rail industry should anticipate any strategic move in the rail research and innovation landscape that could impact its competitiveness. Arguably, this complex scenario we have just described requires the creation of new mobility paradigms capable of delivering high-quality mobility services to people/end-users in their day-to-day lives/activities. We are convinced that rail transport can play a fundamental role in that, effectively responding to these global trends and to the challenges posed by technological

advancement in other modes.

Rail transport is already in a position to bring consistent benefits to the society at large, notably in terms of capacity, low carbon footprint and safety. Of course, on the other hand, rail needs to increase its attractiveness, in terms of efficiency or reduction of Life-cycle costs (and this does require the engagement of all rail actors). Therefore, on the basis of its current assets and its potential yet to be unleashed, we see rail transport as the backbone and system integrator of the mobility of the future for both passengers and freight.

To this extent, allow me to point out the excellent “RAIL 2050 Vision Document” prepared and published in 2017 by the rail European Technology Platform: European Rail Research Advisory Council (ERRAC). This document displays how the rail sector can think on the long-term with a forward-looking strategy by setting out the future capabilities needed from railways to meet the future needs of Europe.

To stimulate and support innovation and research, S2R JU is the major joint effort of the European railway industry. What are the main achievements so far?

Philippe Citroën: The S2R JU, launched in 2014, has truly represented a breakthrough for research and innovation in rail. S2R JU is truly an unprecedented commitment of all the stakeholders of the European rail sector to invest together in research and innovation, ensuring the continuity, stability and effectiveness of our collective innovation efforts. Arguably, the strongest aspect of the JU-model has been its focus on excellence and collaboration across a variety of research and innovation players ranging from industry (large companies, SMEs, clusters), infrastructure managers, railway undertakings, academia (universities & science academies) to public actors (regions & local actors) throughout Member States.

Accordingly, UNIFE supports working in Public-Private Partnerships (Institutional PPP) where the industry contributes to up to 50% of the overall budget. The Joint Undertaking model, managed by Executive Director Carlo Borghini, has proved to be an efficient way to tackle challenges affecting both industry and society. We truly believe that Europe’s crucial strengths lie in its innovation ecosystems where SMEs, mid-caps and large companies, start-ups (for the next programme), academics and Research Technology Organisations (RTOs) work together. Needless to say, this opportunity to embrace the widest spectrum of the innovation ecosystem across different Member States represents an indisputable European added-value.

Most notably, such commitment by all rail players to work collectively in research and innovation was revealed even before the Joint Undertaking officially began its activities. The so-called Shift2Rail lighthouse projects like Roll2Rail or IT2Rail, coordinated by UNIFE, displayed an overarching participation of all stakeholders of the sector – including manufacturers, academia’s representatives and railway undertakings. The combined final event of these projects organised during the Transport Research >

> Arena event that took place in Vienna in April 2018 in the presence of Violeta Bulc, European Commissioner for Transport, attracted many stakeholders willing to discover the outputs of these key projects that are feeding S2R JU on-going activities.

Last but not least, the presence of S2R JU at the last Transport Research Arena event in Vienna was a great opportunity to discover all the on-going research and innovation projects launched by S2R JU contributing to the transformation of the rail system. InnoTrans in Berlin between 10 and 21 September 2018 will be another opportunity to discover many S2R JU achievements.

Shift2Rail 2 becomes a necessity in carrying on the railway research and innovation activity, providing not just new products and services in the market, but also the establishment of the Single European Railway Area and the significant development of competitiveness. What are the necessary elements that will maximise Shift2Rail 2's contribution to innovating the railway system?

Philippe Citroën: It is undisputable that the extension of the S2R JU activities after 2020 – through a e.g. “Shift2Rail 2” programme – will spread its benefits even beyond the pure market development, enabling rail to contribute decisively to the fulfilment of ambitious EU-wide objectives. Notably, I can think of the achievements of the European Commission's climate and energy-efficiency targets: here is where rail transport can play a fundamental role, supported by continuous and stable innovation streams.

Therefore, two and a half years after the S2R JU's research and innovation activities started under Horizon 2020, this collaborative research-approach has clearly still an enormous potential to unleash.

First and foremost, a Shift2Rail 2 programme will enable rail transport to tackle and be part of the solution vis-à-vis the ongoing mega-trends, especially in terms of urbanisation, growing interest for environmental issues and an ageing population. Secondly, it will embrace the increasing need for shared mobility, customer-focused, digital and intermodal transport solutions. Eventually, most importantly, Shift2Rail 2 shall reinforce the attractiveness of rail transport toward passengers and businesses and contribute to achieving the ambitious objectives set by the European Commission – notably the 2011 White Paper on Transport targets, the completion

UNIFE Key Enablers:

1. Automated rail transport;
2. Mobility as a seamless service;
3. Digitalisation;
4. Towards an efficient Zero Emission Railway;
5. Maintenance of the future;
6. Enhancing the security and the protection of the rail system;
7. Optimized infrastructure;
8. Digitization of the supply chain (Industry 4.0);
9. New certification framework.

of the Single European Railway Area (SERA) and the creation of a Digital Single Market.

Eventually, Shift2Rail 2, in its Joint Undertaking-model, will be crucial to enable rail to become the backbone of the mobility of the future as stipulated in the ERRAC “Rail 2050 Vision Document”. UNIFE has identified 9 Key enablers (e.g. automated rail transport) that should be the basis of the new rail transport system.

EC Communication to the Parliament and the Council stipulates that, in the next MFF, a 50% increase of the Framework Programme (to EUR 120 billion) means a GDP growth of around 0,3% and the creation of 420,000 jobs, while doubling the Framework Programme (to EUR 160 billion, compared to the EUR 80 billion) will mean the creation of 650,000 jobs and a contribution of 0,46% to the GDP. The duplication of funds will make EU the world leader in widescale initiatives and preparation to launch innovative products in the market. How do you comment on these financial hypotheses and how do you think that European authorities could be persuaded to spend more on research and innovation?

Philippe Citroën: These figures simply reflect the crucial role that research and innovation has in Europe, no matter the sector. Arguably, research and innovation are essential for a successful, modern economy, and they shall be at the heart of the European Commission's policies to boost jobs, growth, decarbonisation and social inclusion.

Furthermore, we need to acknowledge that the coming years will be shaped by further globalisation, digitisation and the transition to a knowledge society. The European Union needs to be bold and ambitious to shape the trends of the future, rather to be affected by them. Back then, Horizon 2020 was a remarkable step in the right direction, becoming the European Union's primary tool to bolster its scientific potential – as well as advancing its economic and social integration. It is legitimate to expect no less from the forthcoming Research and Innovation Framework Programme.

In this regard, the European rail supply industry welcomes the proposal presented by Carlos Moedas, European Commissioner for Research, Science and Innovation, included in the new Multi-Annual Financial Framework that aims to increase the new budget for research & innovation, called Horizon 2020, to up to EUR 97.9 billion for the period 2021-2027. As a matter of fact, the EU is facing a moment of budget constraints, triggered by Brexit. Therefore, we are grateful that the European Commission implicitly recognises the significance of R&I through the increased resources allocated.

Even though the proposal will need to be carefully scrutinised by the Council of the European Union, and by the European Parliament we call for the Council to support the commitment shown by the European Commission. Research and innovation must, more than ever, be considered as essential to relaunch Europe's competitiveness and economic cohesion as well as, most importantly, to safeguard the sustainability of the European economic model for the generations to come.