



## **REPORT ON THE BUDGETARY AND FINANCIAL MANAGEMENT 2019**

31 March 2020

In accordance with Article 20 of the Statutes of the S2R JU annexed to Council Regulation (EU) No 642/2014 and with Article 20 and 39 of the Financial Rules of the S2R JU.

The report on budgetary and financial management will be made available to the European Parliament, the Council, the Commission and the Court of Auditors.

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# 1 INTRODUCTION

## 1.1 Legal framework

The Shift2Rail Joint Undertaking (hereinafter “S2R JU”) was established on 7 July 2014, under Article 187 of the Treaty on the Functioning of the European Union, by Council Regulation (EU) No 642/2014 of 16 June 2014<sup>1</sup> (hereinafter the “S2R Regulation” and, Annexe I, the “S2R Statutes”). The S2R JU Regulation entrusted the Joint Undertaking with tasks under the Horizon 2020 Framework Programme for Research and Innovation for the period up to 31 December 2024.

The S2R JU is an autonomous body with its own legal personality; the seat is located in Brussels, Belgium.

The S2R JU is a public-private partnership under the Horizon 2020 Framework Programme<sup>2</sup> managing all rail-focused research and innovation actions co-funded by the Union. This innovative concept provides a platform for the rail sector as a whole to work together with a view to driving innovation in the years to come.

In addition to the Union, the S2R JU has eight other Founding Members and nineteen Associated Members (hereinafter referred to as “Other Members”). The Founding Members were set as part of the S2R JU Regulation whereas the Associated Members were selected in 2015 following a call for expression of interest to become associated member of the S2R JU. In total, more than 400 public and private entities, representing the railway sector, participate to the S2R R&I activities.

The Members other than the Union deliver Research and Innovation activities to the S2R JU investing their own financial resources in the forms of staff, assets, technologies etc., that pave the way to major changes in the rail systems, which are matched by around up to 40% net by the Union funding.

The S2R JU is specifically entrusted to execute the S2R Programme for an overall value of EUR 920 million, out of which EUR 893 million correspond to Research and Innovation activities (hereinafter “R&I”) to be performed by the Other Members and through additional open calls. EUR 27 million correspond to the JU’s running costs.

The Union contribution amounts to a maximum of EUR 450 million, including EUR 52 million related to the so called “Lighthouse Projects” awarded by the Commission before the financial autonomy of the JU and EUR 13.5 million related to 50% of the JU running costs.

Article 4(2) of the S2R Regulation establishes that the total contribution to be provided by the Other Members and totalling EUR 470 million shall consist of:

**IKOP (in-kind operational):** at least EUR 350 million, including at least EUR 200 million from the founding members other than the Union and their affiliated entities, and at least EUR 150 million from associated members and their affiliated entities. In accordance with Article 16(3)b of the S2R Statutes, IKOP consists “**of the costs incurred by them [the Other Members] in implementing indirect actions less the contribution of the S2R JU and any other Union contribution to those costs**”.

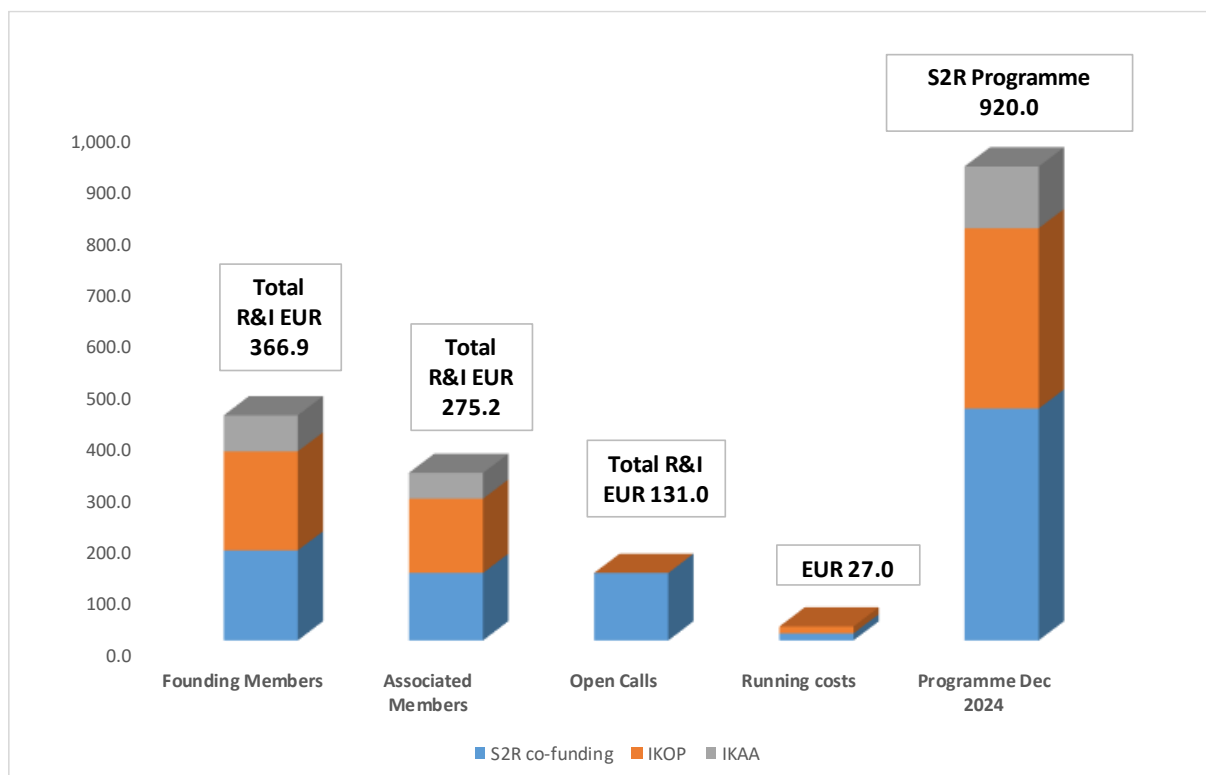
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<sup>1</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0642&from=EN>

<sup>2</sup> Council Decision (EU) No 2013/743/EU of 3 December 2013 establishing the specific programme implementing Horizon 2020 (2014-2020), OJ L 347, 20.12.2013, p. 965.

**IKAA (in-kind other activities):** of at least EUR 120 million, of which at least EUR 70 million from the founding members other than the Union and their affiliated entities, and at least EUR 50 million from associated members and their affiliated entities. These contributions shall consist of the costs incurred by the Other Members in implementing additional activities outside the work plan of the S2R Joint Undertaking, which are complementary to this work plan and contribute to the objectives of the S2R Master Plan. Other Union funding programmes may support those costs in compliance with the applicable rules and procedures. In such cases, Union financing shall not substitute for the in-kind contributions from the members other than the Union or their affiliated entities.

The following picture summarize the different types of contributions (EUR million):



## 1.2 Shift2Rail: moving European railway forward

The S2R JU is a mission-oriented Programme delivering a major system transformation, bringing railway at the centre of advanced integrated mobility.

The Vision of S2R JU is

TO DELIVER, THROUGH RAILWAY RESEARCH AND INNOVATION, THE CAPABILITIES TO BRING ABOUT THE MOST SUSTAINABLE, COST-EFFICIENT, HIGH-PERFORMING, TIME DRIVEN, DIGITAL AND COMPETITIVE CUSTOMER-CENTRED TRANSPORT MODE FOR EUROPE.

The mission statement of the S2R JU is

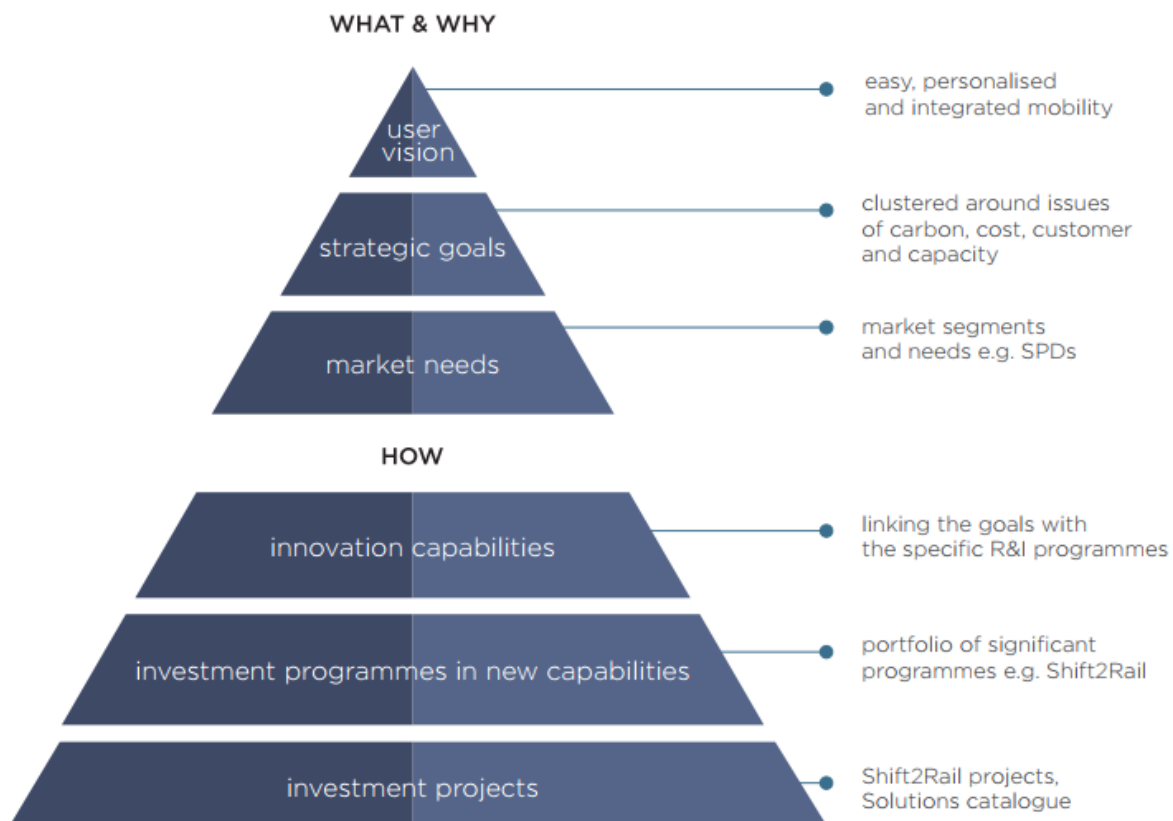
*“Shift2Rail: moving European railway forward”*

The mission of the S2R JU is to coordinate and manage the Union R&I investments in the European rail sector.

Rising traffic demand, congestion, security of energy supply and climate change are some of the major issues that the European Union and the wider world are facing. Tackling these challenges will call for the railway sector to take on a larger share of transport demand in the next few decades.

The European Commission is working towards the creation of a Single European Railway Area (SERA) and has promoted a modal shift from road to rail in order to achieve a more competitive and resource-efficient European transport system. However, rail's share in the European freight and passenger transport markets is still not satisfactory. EU research and innovation (R&I) must therefore help rail play a new, broader role in global transport markets, both by addressing pressing short-term problems that drain rail business operations, and by helping the sector to gain a stronger market position.

Transparency, clarity and simplification of procedures are three essential characteristics of the S2R JU approach. R&I continues to be the key factor shaping the railway sector. Significant investment has been made in the past on research related to the three main constituents of the railway system i.e. infrastructure, rolling stock and operations. While this has been positive, the evolving needs of society e.g. end users, industry, citizens' demand a more targeted and integrated effort. The risk sharing financial contribution is instrumental not only to improve efficiency levels across the components of the system (e.g. rails, vehicle parts) overcoming technical barriers (development and transition) but ensure that the final outcome, available for the market, **will be user centric to deliver mobility as a service, for European citizens and freight**. This is expected to become the driver for a more competitive and attractive Railway mobility system, leveraging the know-how and excellence of the European industry to compete at plain-field level with other parts of the world.



The possibilities that the railway offers and what it can become are encapsulated in a vision where users are recognised as individuals with on demand personalised information related to their travel or goods, using a railway system that is comfortable, efficient, flexible, safe and reliable. Intelligent fully autonomous trains can adapt to each other's dynamic conditions maximising the use of existing infrastructure assets in high traffic, high volume vital corridors linking the main nodes of mobility networks seamlessly. Novel vehicle concepts are introduced to enhance the connectivity of less used parts of the network using approaches common to other sectors e.g. lightweight aircraft structures, ultra-efficient automotive drives and propulsion systems removing the need of expensive electrification investment.

The S2R JU contributes to:

- Enhancing the strengths of the railway system to become a core provider of mobility and logistics services in partnership with other stakeholders beyond the sector;
- A zero-emission railway system that is energy efficient placing energy conservation at its core;
- A traffic management system that is fully automated, intelligent, dynamic and demand-responsive;
- A fast, efficient and cost-effective process to take ideas and products from concept to service in competitive time scales learning from methods successfully implemented in other sectors e.g. advanced manufacturing processes;
- Creating, adopting and supporting technology advancement that will unlock the deployment of novel concepts in all parts of the system;
- Implementing the efficient transition to a fully digitalised railway system.

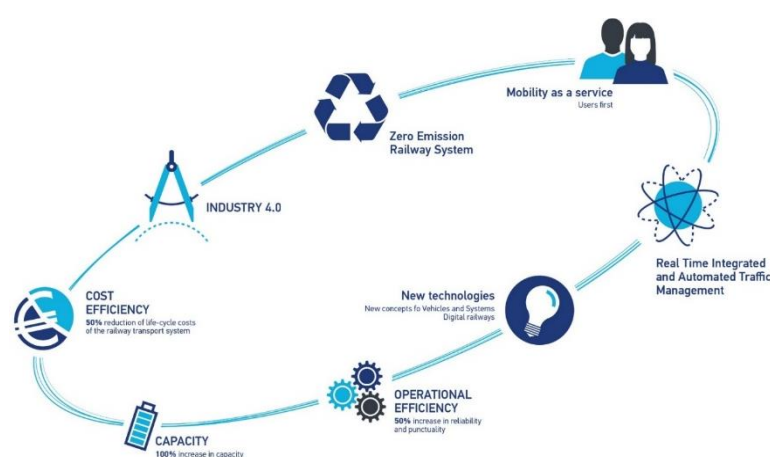
The S2R JU encapsulates this first integrated approach towards the achievement of these goals by actively performing in partnership the R&I necessary to place railway systems as the spine of all European intra-nodal and inter-nodal door-to-door travel. This applies for both passenger and freight

aspects and requires essential integration in the form of suitable outward looking connections of our system with other transport modes to deliver door-to-door services. This collaborative nature highlights the need for radical change in the sector.

To meet these expectations, the S2R JU through its membership and with the key contribution of the sector, runs a R&I Programme, implemented through several thematic areas of the railway system.

Specifically, the S2R Programme added-value arises from the following:

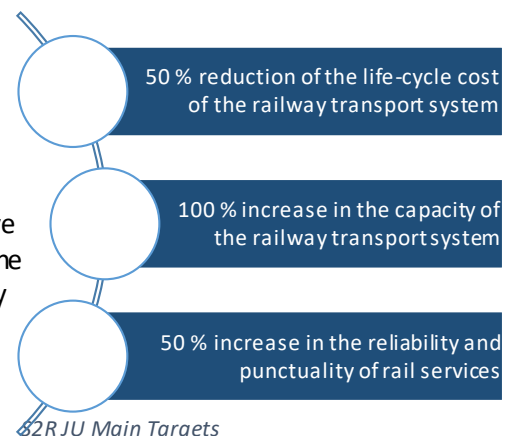
- A pioneering approach that is seeing for the first time defragmentation and coordination of R&I investments across and beyond the sector;
- A focus on taking closer to market uptake of R&I concepts with an already high TRL;
- Applying a whole systems lens to the railways to shape the future of mobility, avoiding the problem of sub-optimisation whereby optimising parts of the whole may miss crucial interactions between sub-systems leading to a non-optimal overall system performance (system architecture sector led).



The S2R JU contributes to the introduction of better trains to the market (quieter, more comfortable, more dependable, etc.), which will operate on an innovative rail network infrastructure reliably from the first day of service introduction, at a lower life-cycle cost, with more capacity to cope with growing passenger and freight mobility demand. All this will be developed by European companies, thereby increasing their competitiveness in the global marketplace.

It also contributes to the paradigm for the modal shift of attract users to rail. For EU passengers, this represents more travel options, more comfort and improved punctuality. For freight forwarder/shippers, rail freight will offer a more cost-effective, punctual and traceable shipment option.

The S2R JU shall deliver innovative solutions which will achieve cost efficiency by targeting 50% reduction of life-cycle costs of the railway system, capacity by targeting 100% increase in capacity and operational Efficiency by targeting into 50% increase in reliability and punctuality.



## 2 OVERVIEW OF THE BUDGET

At the year-end 2019, the JU had implemented 100% of its commitment appropriations made available in its active budget. The payment appropriations were executed up to 88% of the active funds. The implementation when compared to the full S2R budget (including Title 4) was 97% in commitment and 86% in payment appropriations.

S2R Governing Board adopted the initial Annual Work Plan and Budget for 2019 with its Decision 19/2018 on 4 December 2018. There was one amendment adopted to this document during the year 2019, GB Decision 2/2019 of 24 June 2019, including

- the re-entering of EUR 126 000 of unused administrative appropriations in the estimates of revenue and expenditure (commitment appropriations), in accordance with S2R JU FR art.6.5, and
- a number of transfers within the administrative budget. These transfers had the objective to allocate better the resources needed for the running costs.
- In addition to the transfers within the administrative expenses, the overall administrative budget was increased by EUR 171 000 in commitment appropriations and by EUR 396 000 in payment appropriations.

Considering the outcome of the Call 2019 in terms of expected value awarded, in agreement with the Governing Board as recorded in the minutes of its meeting of 4 December 2019, EUR 2 million of operational budget commitment and payment appropriations were transferred to Title 4 of the Budget (Title 4: Un-used appropriations not required in the year). This Title is of technical nature and, in accordance with the S2R Financial Rules, shows the appropriations available for applying n+3 rule on the following budgetary years. It is used to increase transparency and accurate reporting of the JU. By allocating the appropriations in Title 4, they were identified as being used in the following years to meet the JU's legal obligations on payments and the JU could re-activate them as part of the initial budget 2020.

In this particular case, the aforementioned EUR 2 million of unused appropriations 2019 have immediately been re-allocated to the S2R JU AWP 2020 for the Call 2020 in order to maximize the use of resources in accordance with a sound financial management approach. As part of the same agreement, kEUR 306 were re-inscribed in the budget 2019 from Other Members projects that release this overall amount due to efficiencies in the resources' consumption. This amount is recorded as assigned revenues. Following these changes, the total budget commitment appropriations for 2019 amounted to kEUR 83 071 and kEUR 81 563 in terms of payment appropriations.



Budget 2019: Amendments to the Annual Work Plan and Budget				
EUR '000				
Amendment Number	Date of adoption	Main subject Description	Impact on Commitment Appropriations (in EUR)	Impact on Payment Appropriations (in EUR)
1	4 December 2018	GB Decision 19/2018 Annual Work Plan and Budget 2019 Amendment –  No impact to the Budget 2019	N/A	N/A
2	24 June 2019	GB Decision 2/2019 Annual Work Plan and Budget 2019 Amendment - Amendment to the budget covering the following objectives: <ul style="list-style-type: none"> <li>transfers within the initially adopted budget to correspond to the evolving specific needs of the JU. The transfers were made within one Title.</li> <li>recognition of the unused Payment Appropriations on administrative expenditure in relation to the previous budgetary years</li> <li>re-entering of kEUR 126 of unused administrative appropriations (Commitment Appropriations)</li> </ul>	126	0

In addition to the transfers made as part of the budget amendment, the Executive Director has executed its rights in Accordance with Article 10 of the S2R Financial Rules by transferring appropriations. Majority of these transfers were performed within Titles with the exception of EUR 2 million moved from Title 3 to Title 4 as explained in the previous section above on the overview of the budget.

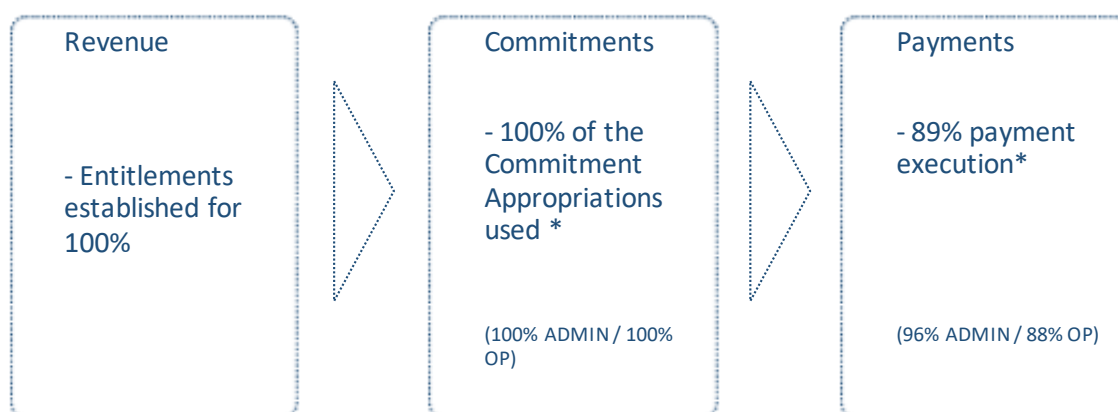
## 2.1 Initial budget, amending budgets and final budget

	Commitment appropriations (including reactivations)					EUR '000
Title	Initial budget adopted	Amending budget	Transfers	Final adopted budget	Commitments made	%
	(1)	(2)	(3)	(4)=(1)+(2)+(3)	(5)	(6)=(5)/(4)
1	2 277	0	0	2 277	2 277	100 %
2	1 045	171	0	1 216	1 216	100 %
3	78 753	0	(2 048)	76 705	76 705	100 %
<b>Total</b>	<b>82 075</b>	<b>171</b>	<b>0</b>	<b>80 197</b>	<b>80 197</b>	<b>100 %</b>
4	565	(45)	2 048	2 568	0	0 %
<b>GRAND TOTAL</b>	<b>82 640</b>	<b>126</b>	<b>0</b>	<b>82 765</b>	<b>82 765</b>	<b>97 %</b>

	Payment appropriations (including reactivations)					EUR '000
Title	Initial budget adopted	Amending budget	Transfers	Final adopted budget	Payments made	%
	(1)	(2)	(3)	(4)=(1)+(2)+(3)	(5)	(6)=(5)/(4)
1	2 277	86	0	2 363	2 336	99 %
2	1 045	310	0	1 354	1 236	91 %
3	76 900	0	(2 048)	74 852	66 310	83 %
<b>Total</b>	<b>80 222</b>	<b>396</b>	<b>0</b>	<b>78 569</b>	<b>69 822</b>	<b>88 %</b>
4	1 035	(396)	2 048	2 688	0	0 %
<b>GRAND TOTAL</b>	<b>81 257</b>	<b>0</b>	<b>0</b>	<b>81 257</b>	<b>69 882</b>	<b>86 %</b>

## 2.2 Budget Implementation Expenditure

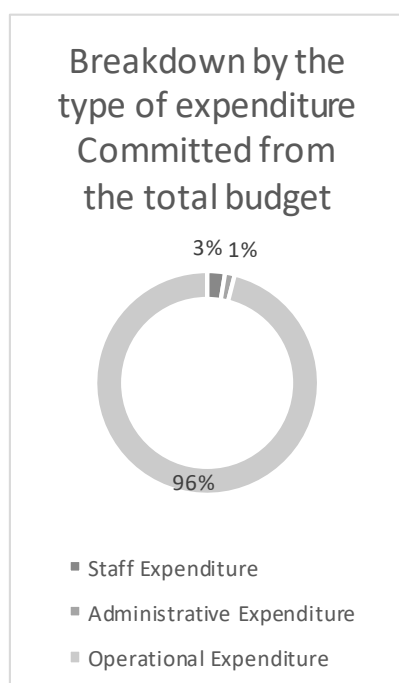
The main highlights of the 2018 Budget implementation are



*\*excludes appropriations foreseen as un-used (Title 4)*

### Administrative costs (Title 1 Staff Expenditure and Title 2 Administrative Expenditure)

Title 1 and Title 2 of the S2R Budget was executed up to 100% in commitment appropriations, demonstrating a reliable budgetary planning.



Title 1 - Staff Expenditure was mainly used for the salaries of the JU staff. During the year, the JU made also use of external support, to fill the gaps during the recruitment process on staff turnover and to cope with the important workload on JU activities.

The execution rate of the Payment Appropriations was 96% (75% in 2018), showing a constant improvement in the budget implementation in relation to the previous budgetary years.

The budget amendment under GB Decision 2/2019 allowed to re-entering EUR 126 000 of unused administrative appropriations in the estimates of revenue and expenditure (commitment appropriations), in accordance with S2R JU FR art.6.5. Following the budget amendment, the overall administrative budget was increased by EUR 171 000 in commitment appropriations and by EUR 396 000 in payment appropriations.

In addition, the Executive Director has executed its rights in Accordance with Article 10 of the S2R Financial Rules and transferred Appropriation within Administrative budget in the course of the year. These transfers had the objective to allocate better the resources needed for the running costs. In addition to the transfers within the administrative expenses,

It should be noted that the S2R JU has a unique staff establishment plan compared to all other Institutions, Agencies and JUs, with the minimum level of TAs allowed versus CAs (25% and 75% respectively). This may difficult the retention of staff who is offered for similar type of work much more

attractive conditions by other EU bodies; hence the need to make regular use of external support to ensure continuity of operations.

The execution rate of the Payment Appropriations was lower than Commitment Appropriations because the relative payments become due only in 2020 and/or afterwards. However, the execution rate has increased compared to 2018, as a result of the actions undertaken by the JUs with the concerned suppliers inviting them to submit in a timely manner requests for payments.

During the year, the S2R JU established the entitlements to the contributions against its Administrative Budget from the Union and its Members other than the Union in full. In addition, a revision of the specific needs within each line of Titles 1 and 2 were made to ensure the adequate funds to cover the planning for the year. The Payment Appropriations were increased in overall Administrative Budget as a response to the amounts due in relation to the previous budgetary years.

### **Title 3 Operational Expenditure**

Title 3 of the S2R Budget constitutes the JU's Operational Budget. The vast majority of the JU's budget falls under this category representing 93.0% of the adopted overall budget (including Title 4). This Title covers the JUs Calls for proposals, Operational procurement and expert fees occurred as part of the evaluation and review processes.

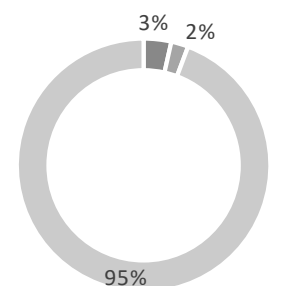
The execution rate of the Operational budget in both Commitment and Payment Appropriations was respectively 100% and 88%. Majority of the Payment Appropriations were used for the pre-financing of the Grants resulting from the 2019 Calls for Proposals, the clearing of pre-financing and interim/final payments of ongoing projects. Two 2018 Call pre-financing payments became due in 2019 and explain the majority (kEUR 8 273) of un-used Payment Appropriations for that year.

The Call 2019 was implemented already at the beginning of the year. The award of the call 2019 took place during the Governing Board meeting of 4 September 2019. With an exceptional commitment and effort, the Other Members and OC together with the JU were able to reach the signature of 17 grants related to the Call 2019 by year end, which will co-fund Research and Innovation activities up to EUR 74.8 million against a total value of EUR 148.6 million. As already mentioned, two other grants related to the Call 2018 were signed in the first quarter 2019.

The value of activities to be performed by the S2R JU Other Members in the coming years in respect to the amounts awarded and signed of the Call 2019 corresponds to EUR 130.8 million that will be co-funded by the S2R JU up to EUR 57.6 million. These projects normally started on 1 December 2019, however for some projects an earlier start date was agreed to guarantee continuity with previous R&I activities. Following the grants awarded from the Call 2019 and those in 2016, 2017 and 2018, the overall value of Other Members ongoing projects is EUR 489,9 million which are expected to be co-funded by the S2R JU up to EUR 216,7 million.

The applicants to the Call 2019 OCs covered 11 out of 12 topics open to them. The value of the activities to be performed by the awarded consortia amounts to EUR 17.7 million: EUR 17,2 million to be funded

Breakdown by the  
type of expenditure  
Paid from the total  
budget



- Staff Expenditure
- Administrative Expenditure
- Operational Expenditure

by the S2R JU up to 100% or 70% of the eligible direct costs, subject to respectively being RIA or IA actions. The overall OC amount of ongoing projects awarded in the 2016-2019 calls, is EUR 79.9 million.

In this respect, it should be noted that the Founding Members other than the Union and the Associated Members (jointly referred to as the “Other Members”) agreed to limit their requests for funding to 44.44% of the total project cost, the lowest in overall H2020 Programme.

As already mentioned, considering the outcome of the Call 2019 in terms of expected value awarded, in agreement with the minutes of the Governing Board meeting of 4 December 2019, EUR 2 million of operational budget commitment and payment appropriations were transferred to Title 4 of the Budget (Title 4: Un-used appropriations not required in the year) and the JU could re-activate them as part of the initial budget 2020.

#### **Title 4 Unused appropriations not required in current Year**

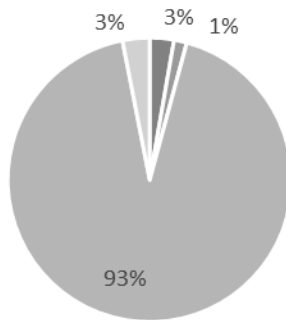
The amount included under Title 4 – Unused appropriations not required in Current year has been established to support a transparent implementation of S2R JU Financial Rules Art.6§5, the so called n+3 rule. In accordance with the Financial Rules and the general practise of the JU, these appropriations will be reactivated in the future year budget(s) of the following year and used first.

As a part of the minutes of the GB 4 December 2019, the JU has moved some of its commitment and payment appropriations from operational line to Title 4 - kEUR 2 048 of un-used appropriations (from call 2019) have been transferred to Title 4 in order to be immediately allocated to the S2R JU call 2020.

#### **Global Budget**

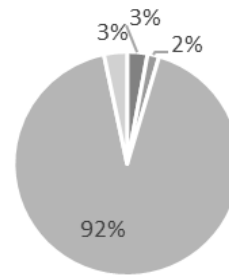
In terms of Payment Appropriations, the unused appropriations amount at kEUR 11 681, including kEUR 2 688 of the Title 4 (kEUR 22 485 in 2018). Nevertheless, it should be noted that this amount does not correspond to any cash available in the JU. In fact, this amount include also the non-cashed revenue of the budget. In addition, following a decision of the S2R Governing Board, the Treasury of the JU – as well as the Accounting Officer function – is performed by the Commission Accounting Officer. As a result, the unused appropriations is an accounting amount and does not represent actual cash in the bank. This amount is used to face the initial payments at the beginning of 2019.

### The portion of Titles in budget (Commitment Appropriations)



- Title 1: Staff Expenditure 3%
- Title 2: Administrative Expenditure 1%
- Title 3: Operational Expenditure 93 %
- Title 4: Un-used Appropriations not required in Current year 3%

### The portion of Titles in budget (Payment Appropriations)



- Title 1: Staff Expenditure 3%
- Title 2: Administrative Expenditure 2%
- Title 3: Operational Expenditure 92%
- Title 4: Un-used Appropriations not required in Current year 3%

# IMPLEMENTATION IN COMMITMENT APPROPRIATIONS

## Title 1

EUR '000

Item		Total approp. available	Commitments made				Appropriations carried over to 2020			Appropriations lapsing				
			from final adopt. budget	from carry- overs	from assign. revenue	Total	%	Assign. revenue	By decision	Total	from final adopt. budget	from carry- overs	from assign. revenue	Total
		1	2	3	4	5=2+3+4	6=5/1	7	8	9=7+8	10	11	12	13=10+ 11+12
110	Temporary agents	704	704	–	–	704	100 %	–	–	–	–	–	–	–
111	Contract agents, interim staff, trainees and SNEs	1 281	718	563	–	1 281	100 %	–	–	–	–	–	–	–
Total Chapter 11		1 985	1 422	563	–	1 985	100 %	–	–	–	–	–	–	–
130	Mission costs	105	105	–	–	105	100 %	–	–	–	–	–	–	–
Total Chapter 13		105	105	–	–	105	100 %	–	–	–	–	–	–	–
150	Training	4	4	–	–	4	100 %	–	–	–	–	–	–	–
Total Chapter 15		4	4	–	–	4	100 %	–	–	–	–	–	–	–
190	Other staff expenditure	184	183	–	–	183	99 %	–	–	–	–	–	1	1
Total Chapter 19		184	183	–	–	183	99 %	–	–	–	–	–	1	1
Total Title 1		2 278	1 714	563	–	2 277	100 %	–	–	–	–	–	1	1

**Title 2**

EUR '000

Item	Total approp. available	Commitments made			Total	%	Appropriations carried over to 2020			Appropriations lapsing			
		from final adopt. budget	from carry- overs	from assign. revenue			Assign. revenue	By decision	Total	from final adopt. budget	from carry- overs	from assign. revenue	Total
	1	2	3	4	5=2+3+4	6=5/1	7	8	9=7+8	10	11	12	13=10+ 11+12
200 Rental of buildings and associated costs	308	308	-	-	308	100 %	-	-	-	-	-	-	-
Total Chapter 20	308	308	-	-	308	100 %	-	-	-	-	-	-	-
210 IT expenditure and technical facilities	176	175	-	-	175	100 %	-	-	-	0	-	-	0
Total Chapter 21	176	175	-	-	175	100 %	-	-	-	0	-	-	0
220 Movable property and associated costs	1	1	-	-	1	100 %	-	-	-	-	-	-	-
Total Chapter 22	1	1	-	-	1	100 %	-	-	-	-	-	-	-
230 Current administrative expenditure	17	17	-	-	17	100 %	-	-	-	-	-	-	-
Total Chapter 23	17	17	-	-	17	100 %	-	-	-	-	-	-	-
240 Postage and telecommunications	14	14	-	-	14	100 %	-	-	-	-	-	-	-
Total Chapter 24	14	14	-	-	14	100 %	-	-	-	-	-	-	-
250 Administrative board expenditure	41	41	-	-	41	100 %	-	-	-	-	-	-	-
Total Chapter 25	41	41	-	-	41	100 %	-	-	-	-	-	-	-
260 Administrative support services	33	33	-	-	33	100 %	-	-	-	-	-	-	-
Total Chapter 26	33	33	-	-	33	100 %	-	-	-	-	-	-	-
270 PR and events	528	403	126	-	528	100 %	-	-	-	-	-	-	-
Total Chapter 27	528	403	126	-	528	100 %	-	-	-	-	-	-	-
290 Other infrastructure and operating expenditure	97	97	-	-	97	100 %	-	-	-	-	-	-	-
Total Chapter 29	97	97	-	-	97	100 %	-	-	-	-	-	-	-
<b>Total Title 2</b>	<b>1 216</b>	<b>1 090</b>	<b>126</b>	<b>-</b>	<b>1 216</b>	<b>100 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>0</b>



### Title 3

EUR '000

Item	Total approp. available	Commitments made					Appropriations carried over to 2020			Appropriations lapsing			
		from final adopt. budget	from carry-overs	from assign. revenue	Total	%	Assign. revenue	By decision	Total	from final adopt. budget	from carry-overs	from assign. revenue	Total
	1	2	3	4	5=2+3+4	6=5/1	7	8	9=7+8	10	11	12	13=10+11+12
300 Operational expenditure	77 010	76 272	432	-	76 705	100 %	-	-	-	-	-	305	305
Total Chapter 30	77 010	76 272	432	-	76 705	100 %	-	-	-	-	-	305	305
<b>Total Title 3</b>	<b>77 010</b>	<b>76 272</b>	<b>432</b>	<b>-</b>	<b>76 705</b>	<b>100 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>305</b>	<b>305</b>

### Title 4

EUR '000

Item	Total approp. available	Commitments made					Appropriations carried over to 2020			Appropriations lapsing			
		from final adopt. budget	from carry-overs	from assign. revenue	Total	%	Assign. revenue	By decision	Total	from final adopt. budget	from carry-overs	from assign. revenue	Total
	1	2	3	4	5=2+3+4	6=5/1	7	8	9=7+8	10	11	12	13=10+11+12
400 Administrative budget	520	-	-	-	-	0 %	-	-	-	520	-	-	520
Total Chapter 40	520	-	-	-	-	0 %	-	-	-	520	-	-	520
410 Operational budget	2 048	-	-	-	-	0 %	-	-	-	2 048	-	-	2 048
Total Chapter 41	2 048	-	-	-	-	0 %	-	-	-	2 048	-	-	2 048
<b>Total Title 4</b>	<b>2 568</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2 568</b>	<b>-</b>	<b>-</b>	<b>2 568</b>
<b>GRAND TOTAL</b>	<b>83 071</b>	<b>79 076</b>	<b>1 121</b>	<b>-</b>	<b>80 197</b>	<b>97 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2 568</b>	<b>-</b>	<b>306</b>	<b>2 874</b>

## IMPLEMENTATION IN PAYMENT APPROPRIATIONS

### Title 1

EUR '000

Item	Total approp. availab.	from final adopt. budget	Payments made		Total	%	Appropriations carried over to 2020				Appropriations lapsing			
			from carry-overs	from assign. revenue			Autom. carry-overs	By decision	Assigned rev.	Total	from final adopt. budget	from carry-overs	from assign. rev.	Total
	1	2	3	4	5=2+3+4	6=5/1	7	8	9	10=7+8+9	11	12	13	14=11+12+13
110 Temporary agents	704	704	-	-	704	100 %	-	-	-	-	0	-	-	0
111 Contract agents, interim staff, trainees and SNEs	1 325	270	1 034	-	1 304	98 %	-	-	-	-	21	-	-	21
<b>Total Chapter 11</b>	<b>2 029</b>	<b>974</b>	<b>1 034</b>	<b>-</b>	<b>2 008</b>	<b>99 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>21</b>	<b>-</b>	<b>-</b>	<b>21</b>
130 Mission costs	100	98	-	-	98	98 %	-	-	-	-	2	-	-	2
<b>Total Chapter 13</b>	<b>100</b>	<b>98</b>	<b>-</b>	<b>-</b>	<b>98</b>	<b>98 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>2</b>
150 Training	25	24	-	-	24	94 %	-	-	-	-	1	-	-	1
<b>Total Chapter 15</b>	<b>25</b>	<b>24</b>	<b>-</b>	<b>-</b>	<b>24</b>	<b>94 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>1</b>
190 Other staff expenditure	210	206	-	-	206	98 %	-	-	-	-	3	-	1	4
<b>Total Chapter 19</b>	<b>210</b>	<b>206</b>	<b>-</b>	<b>-</b>	<b>206</b>	<b>98 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>1</b>	<b>4</b>
<b>Total Title 1</b>	<b>2 364</b>	<b>1 302</b>	<b>1 034</b>	<b>-</b>	<b>2 336</b>	<b>99 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>27</b>	<b>-</b>	<b>1</b>	<b>28</b>

Title 2

EUR  
'000

Item	Total approp. availab.	Payments made			Total	%	Appropriations carried over to 2020				Appropriations lapsing			
		from final adopt. budget	from carry- overs	from assign. revenue			Autom. carry- overs	By decision	Assigned rev.	Total	from final adopt. budget	from carry- overs	from assign. rev.	Total
	1	2	3	4	5=2+3+4	6=5/1	7	8	9	10=7+8+9	11	12	13	14=11+ 12+13
200 Rental of buildings and associated costs	328	311	-	-	311	95 %	-	-	-	-	17	-	-	17
Total Chapter 20	328	311	-	-	311	95 %	-	-	-	-	17	-	-	17
210 IT expenditure and technical facilities	232	231	-	-	231	100 %	-	-	-	-	1	-	-	1
Total Chapter 21	232	231	-	-	231	100 %	-	-	-	-	1	-	-	1
220 Movable property and associated costs	6	1	-	-	1	18 %	-	-	-	-	5	-	-	5
Total Chapter 22	6	1	-	-	1	18 %	-	-	-	-	5	-	-	5
230 Current administrative expenditure	27	18	-	-	18	67 %	-	-	-	-	9	-	-	9
Total Chapter 23	27	18	-	-	18	67 %	-	-	-	-	9	-	-	9
240 Postage and telecommunications	11	11	-	-	11	93 %	-	-	-	-	1	-	-	1
Total Chapter 24	11	11	-	-	11	93 %	-	-	-	-	1	-	-	1
250 Administrative board expenditure	48	41	-	-	41	84 %	-	-	-	-	8	-	-	8
Total Chapter 25	48	41	-	-	41	84 %	-	-	-	-	8	-	-	8
260 Administrative support services	39	13	-	-	13	34 %	-	-	-	-	26	-	-	26
Total Chapter 26	39	13	-	-	13	34 %	-	-	-	-	26	-	-	26
270 PR and events	500	483	-	-	483	97 %	-	-	-	-	17	-	-	17
Total Chapter 27	500	483	-	-	483	97 %	-	-	-	-	17	-	-	17
290 Other infrastructure and operating expenditure	162	128	-	-	128	79 %	-	-	-	-	34	-	-	34
Total Chapter 29	162	128	-	-	128	79 %	-	-	-	-	34	-	-	34
<b>Total Title 2</b>	<b>1 354</b>	<b>1 236</b>	<b>-</b>	<b>-</b>	<b>1 236</b>	<b>91 %</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>118</b>	<b>-</b>	<b>-</b>	<b>118</b>

### Title 3

EUR  
'000

		Total approp. availab.	Payments made					Appropriations carried over to 2020				Appropriations lapsing			
			from final adopt. budget	from carry- overs	from assign. revenue	Total	%	Autom. carry- overs	By decision	Assigned rev.	Total	from final adopt. budget	from carry- overs	from assign. rev.	Total
Item		1	2	3	4	5=2+3+4	6=5/1	7	8	9	10=7+8+9	11	12	13	14=11+ 12+13
300	Operational expenditure	75 157	50 615	15 695	–	66 310	88 %	–	–	–	–	8 542	–	305	8 847
Total Chapter 30		75 157	50 615	15 695	–	66 310	88 %	–	–	–	–	8 542	–	305	8 847
Total Title 3		75 157	50 615	15 695	–	66 310	88 %	–	–	–	–	8 542	–	305	8 847

### Title 4

EUR '000

		Total approp. availab.	Payments made					Appropriations carried over to 2020				Appropriations lapsing			
			from final adopt. budget	from carry- overs	from assign. revenue	Total	%	Autom. carry- overs	By decision	Assigned rev.	Total	from final adopt. budget	from carry- overs	from assign. rev.	Total
		1	2	3	4	5=2+3+4	6=5/1	7	8	9	10=7+8+9	11	12	13	14=11+ 12+13
400	Administrative budget	640	–	–	–	–	0 %	–	–	–	–	640	–	–	640
Total Chapter 40		640	–	–	–	–	0 %	–	–	–	–	640	–	–	640
410	Operational budget	2 048	–	–	–	–	0 %	–	–	–	–	2 048	–	–	2 048
Total Chapter 41		2 048	–	–	–	–	0 %	–	–	–	–	2 048	–	–	2 048
Total Title 4		2 688	–	–	–	–	0 %	–	–	–	–	2 688	–	–	2 688
GRAND TOTAL		81 563	53 154	16 728	–	69 882	86 %	–	–	–	–	11 375	–	306	11 681

## COMMITMENTS OUTSTANDING

### Title 1

EUR '000

Item	Commitments outstanding at the end of previous year				Commitments of the current year				Total commitm. outstanding at year-end
	Commitm. carried forward from previous year	Decommit. Revaluation Cancellations	Pay-ments	Total	Commit-ments made during the year	Pay-ments	Cancel-lation of commit. which cannot be carried forward	Commit. outstanding at year-end	
	1	2	3	4=1+2-3	5	6	7	8=5-6-7	9=4+8
110 Temporary agents	–	–	–	–	704	704	–	0	0
111 Contract agents, interim staff, trainees and SNEs	201	(43)	158	–	1 281	1 146	–	136	136
Total chapter 11	201	(43)	158	–	1 985	1 849	–	136	136
130 Mission costs	13	(5)	8	–	105	90	–	15	15
Total chapter 13	13	(5)	8	–	105	90	–	15	15
150 Training	49	(8)	23	18	4	1	–	3	22
Total chapter 15	49	(8)	23	18	4	1	–	3	22
190 Other staff expenditure	98	(15)	83	–	183	123	–	60	60
Total chapter 19	98	(15)	83	–	183	123	–	60	60
<b>Total Title 1</b>	<b>362</b>	<b>(72)</b>	<b>272</b>	<b>18</b>	<b>2 277</b>	<b>2 064</b>	<b>–</b>	<b>213</b>	<b>232</b>

## Title 2

EUR '000

		Commitments outstanding at the end of previous year				Commitments of the current year				Total commitm. outstanding at year-end
Item		Commitm. carried for- ward from pre- vious year	Decommit. Revaluation Cancel- lations	Pay- ments	Total	Commit- ments made during the year	Pay- ments	Cancel- lation of commit. which cannot be carried forward	Commit. outstand- ing at year-end	
		1	2	3	4=1+2+3	5	6	7	8=5-6-7	9=4+8
200	Rental of buildings and associated costs	40	(29)	5	5	308	306	–	3	8
Total chapter 20		40	(29)	5	5	308	306	–	3	8
210	IT expenditure and technical facilities	476	(7)	190	279	175	41	–	135	414
Total chapter 21		476	(7)	190	279	175	41	–	135	414
220	Movable property and associated costs	9	(9)	–	–	1	1	–	0	0
Total chapter 22		9	(9)	–	–	1	1	–	0	0
230	Current administrative expenditure	2	(0)	2	–	17	16	–	1	1
Total chapter 23		2	(0)	2	–	17	16	–	1	1
240	Postage and telecommunications	13	(3)	7	2	14	3	–	11	13
Total chapter 24		13	(3)	7	2	14	3	–	11	13
250	Administrative board expenditure	8	(4)	3	2	41	38	–	3	5
Total chapter 25		8	(4)	3	2	41	38	–	3	5
260	Administrative support services	1	(0)	1	–	33	13	–	20	20
Total chapter 26		1	(0)	1	–	33	13	–	20	20
270	PR and events	388	(47)	291	50	528	192	–	337	387
Total chapter 27		388	(47)	291	50	528	192	–	337	387
290	Other infrastructure and operating expenditure	86	(6)	63	17	97	65	–	32	49
Total chapter 29		86	(6)	63	17	97	65	–	32	49
<b>Total Title 2</b>		<b>1 023</b>	<b>(106)</b>	<b>562</b>	<b>355</b>	<b>1 216</b>	<b>674</b>	<b>–</b>	<b>541</b>	<b>896</b>

### Title 3

EUR '000

Item	Commitments outstanding at the end of previous year				Commitments of the current year				Total commitm. outstanding at year-end
	Commitm. carried for- ward from pre- vious year	Decommit. Revaluation Cancel- lations	Pay- ments	Total	Commit- ments made during the year	Pay- ments	Cancel- lation of commit. which cannot be carried forward	Commit. outstand- ing at year-end	
	1	2	3	4=1+2-3	5	6	7	8=5-6-7	9=4+8
300 Operational expenditure	102 362	(3 550)	31 542	67 270	76 705	34 768	–	41 937	109 207
Total chapter 30	102 362	(3 550)	31 542	67 270	76 705	34 768	–	41 937	109 207
<b>Total Title 3</b>	<b>102 362</b>	<b>(3 550)</b>	<b>31 542</b>	<b>67 270</b>	<b>76 705</b>	<b>34 768</b>	<b>–</b>	<b>41 937</b>	<b>109 207</b>
<b>GRAND TOTAL</b>	<b>103 748</b>	<b>(3 727)</b>	<b>32 376</b>	<b>67 644</b>	<b>80 197</b>	<b>37 506</b>	<b>–</b>	<b>42 691</b>	<b>110 335</b>

## 3 MULTI –ANNUAL OVERVIEW

The S2R JU applies differentiated budget appropriations in its Administrative and Operational Budget. This means that the Commitment Appropriations cover, for the current financial year, the total cost of the legal obligations entered into for operations whose implementation extends over more than one financial year. Whereas majority of the contracts under the Administrative budget are paid within one year, the legal obligations under the operational expenditure are implemented over multiple years.

### 3.1 Operational Expenditure

The S2R MAAP translates the S2R Master Plan into detailed, result-oriented R&I activities to be performed to start delivering the S2R vision as from 2016 onwards.

Addressing through R&I the challenges as they are detailed in the MAAP Executive View opens three opportunities for the railway:

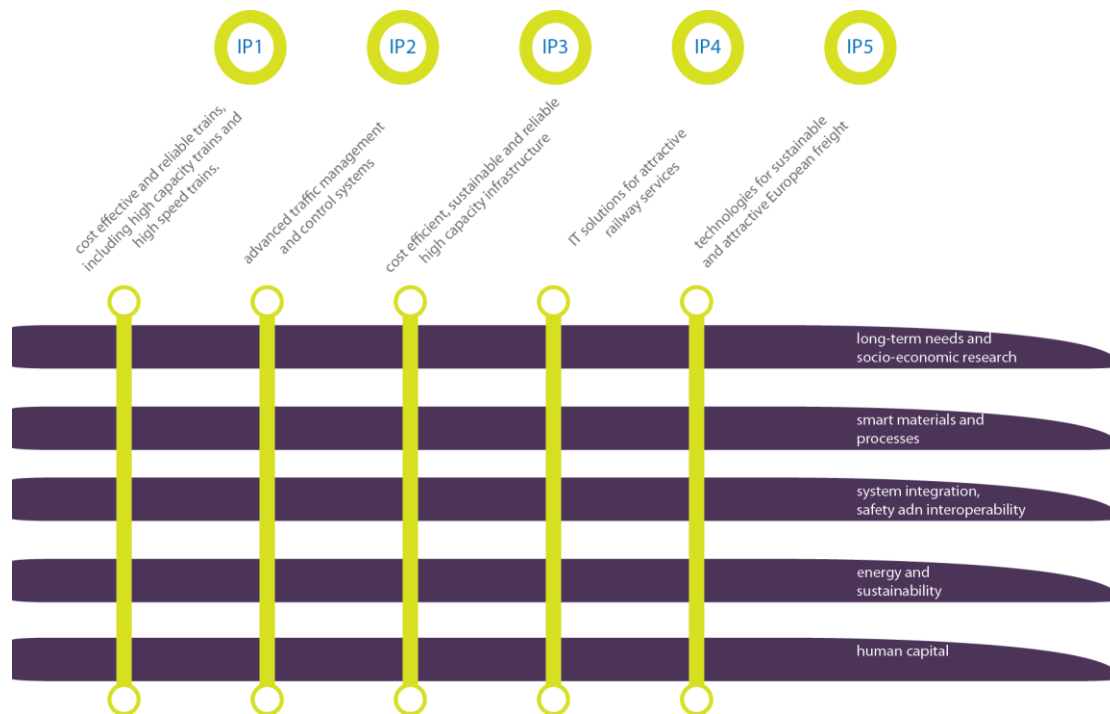
- To become the backbone of current and future mobility concepts (e.g. mobility as a service-MaaS) and on-demand future logistics, through integrations with other modes in view of reaching a climate neutral European economy by 2050;
- To identify and establish new market segments for exploitation;
- To enhance the overall competitiveness of the industry, both in Europe and globally.

This is what the Regulation tasks the S2R JU to do when requesting it to manage all rail-focused research and innovation actions co-funded by the Union. Developing the Innovation Capabilities requires a coordinated effort among different rail and non-rail stakeholders to drive innovation at levels in Europe. The S2R JU and its Programme are designed to make a decisive contribution to delivering the essential knowledge and innovation that will provide the building blocks to develop the Innovation Capabilities.

The work conducted within the S2R framework is structured around five asset-specific Innovation Programmes (IPs), covering the different structural (technical) and functional (process) sub-systems of the rail system. These five IPs are supported by work in five cross-cutting areas (CCA) covering themes that are of relevance to each of the projects and which address the interactions between the IPs and the different subsystems:

- IP1: Cost-efficient and Reliable Trains, including high-capacity trains and high-speed trains
- IP2: Advanced Traffic Management & Control Systems
- IP3: Cost-efficient, Sustainable and Reliable High-Capacity Infrastructure
- IP4: IT Solutions for Attractive Railway Services
- IP5: Technologies for Sustainable & Attractive European Freight.





S2R introduced in the updated MAAP also some IPx activities, R&I designed to look beyond currently planned technology applications (of the Technology Demonstrators) and how to integrate the S2R TDs with new operational concepts. IPx activities will help to realise the global optimal approach for this System of Systems which is railway mobility, by starting to build a railway Functional System Architecture and a Conceptual Data Model (CDM).

With a holistic approach, the role of the S2R JU is also to ensure that interactions between the various IPs are adequately considered and managed, as technological developments in one part of the system could lead to changes in performance, or even create barriers, in other parts. In addition, cross cutting activities include research on long-term economic and societal trends such as customer needs and human capital and skills, which must be taken into account by the different IPs.

Different types of activities contribute to the Programme development, including:

- studies, fundamental and “blue-sky” research (TRL 0 – 2),
- scientific/applied research and laboratory demonstrations (TRL 3 – 6)
- operational demonstrations and innovation activities (TRL 6-7)
- other supporting activities.

In addition to these activities that are co-funded by the S2R JU and conducted within the scope of the S2R Programme, the Other Members are required to conduct Additional Activities with a view to leveraging the effect of the overall R&I. These Additional Activities are not eligible for financial support from the S2R JU but must contribute directly to the broader objectives set out in the Master Plan.

At the end of 2019, in agreement with the GB, the ED adopted a decision establishing a renewed Programme Governance and Change Management to foster the integration of innovations and subsystems making use of a new functional (or better service-oriented) system architecture. The renewed Programme Governance and Change Management will support the integration within the S2R Programme of new concepts, ideas, solutions, etc. compared to the MAAP and its AWP.

At the end of October 2019, the S2R JU presented the Catalogue of Solutions, which demonstrates successful R&I results in the form of possible stand-alone and integrated implementable solutions. It highlights the benefits of Shift2Rail solutions for final users, operators, infrastructure managers and/or suppliers, as well as specifying delivery dates. This milestone publication demonstrates to the entire rail community and beyond the potential of Shift2Rail solutions in contributing to a more sustainable, punctual, interoperable, high-capacity rail system, providing a backbone for the whole mobility and transport sector in Europe. The Catalogue of Solutions is therefore an important milestone, which demonstrates the potential impact of S2R R&I when its results will be industrialized and introduced in the market.

Considering the annual budget availabilities and the R&I activities planned in the S2R MAAP, the S2R Programme is implemented through combined and interdependent multi-annual Projects. This structured interdependence of the S2R Projects reflects the Technological Demonstrators (TD) and Work Areas (WA) approach set within the Programme and each IP and CCA.

The following table summarises the amounts and topics available under the 2019 Call, against Budget Commitments of 2019. This Call, based on the amended Annual Work Plan 2019, was launched on 15 January 2019 and awarded by the JU following the Decision of the S2R GB of 4 September 2019<sup>3</sup>.

It is presented showing the values of the topics open to Other Members (CFM) and those excluding them (OC).

Call	Type	Estimated S2R JU funding	Number of topics
<b>H2020-S2RJU-2019</b>	CFM	57.5 M€	6
	OC	19.3 M€	12

The total number of proposals received in response to the call for proposals was 50:

Call	Type	Number of proposals received	Number of topics
<b>H2020-S2RJU-2019</b>	CFM	8	6
	OC	42	11

The total S2R JU contribution requested by all the submitted proposals amounted to EUR 117.9 million compared to EUR 76.8 million available for funding:

Call	Type	Requested S2R JU funding	Estimated S2R JU funding available
<b>H2020-S2RJU-2019</b>	CFM	58.8 M€	57.5 M€
	OC	59.1 M€	19.3 M€

<sup>3</sup> Governing Board Decision No 0717/2019 of 4 September 2019: [https://shift2rail.org/wp-content/uploads/2019/09/GB-Decision-07-2019\\_Call-2019.pdf](https://shift2rail.org/wp-content/uploads/2019/09/GB-Decision-07-2019_Call-2019.pdf)

On 4 September 2019, the S2R GB agreed with the proposal of the ED to award grants which resulted in the following data:

Call	Type	Total Project Cost	S2R funding	IKOP	Other contributions to R&I
<b>H2020-S2RJU-2019</b>	CFM	130.9 M€	57.6 M€	73.2 M€	
	OC	17.7 M€	17.2 M€		0.6 M€ <sup>4</sup>
	<b>TOTAL</b>	<b>148.6 M€</b>	<b>74.8 M€</b>	<b>73.2 M€</b>	<b>0.6 M€</b>

The S2R JU Other Members submitted project proposals to cover five call topics open to them.

The value of activities to be performed by the S2R JU Other Members in the coming years in respect to the amounts awarded and signed of this call corresponds to EUR 130.8 million that will be co-funded by the S2R JU up to EUR 57.6 million.

The applicants to the OC The S2R GB on 4 September 2019 approved the list of actions selected for funding proposed by the Executive Director; evaluation result letters were sent to all applicants on 10 January 2020.

At the end of 2019, 72<sup>5</sup> projects were ongoing (32 CFM and 40 OC): 56 projects were distributed on the 6 Innovation Programmes, and 10 projects on the Cross Cutting Activities and 6 projects in IPx, as follows:

IP1: Cost-efficient and Reliable Trains, including high-capacity trains and high-speed trains

Project Title	Call Reference	Period	Project Value (signed GA)
PIVOT	S2R-CFM-IP1-01-2017	01/10/2017 - 31/12/2019	€ 17 432 048
CONNECTA	S2R-CFM-IP1-02-2016	01/09/2016 - 30/09/2018	€ 11 480 307
CONNECTA-2	S2R-CFM-IP1-02-2018	01/10/2018 - 31/03/2021	€ 9 687 622
PINTA	S2R-CFM-IP1-01-2016	01/09/2016 - 31/12/2018	€ 28 855 184
PINTA-2	S2R-CFM-IP1-01-2018	01/09/2018 - 30/11/2020	€ 28 534 184
Mat4Rail	S2R-OC-IP1-01-2017	01/10/2017 - 30/09/2019	€ 3 495 216
RUN2RAIL	S2R-OC-IP1-02-2017	01/09/2017 - 30/09/2019	€ 2 732 464
SAFE4RAIL	S2R-OC-IP1-02-2016	01/10/2016 - 31/12/2018	€ 6 681 211
SAFE4RAIL-2	S2R-OC-IP1-01-2018	01/10/2018 - 30/04/2021	€ 3 991 632
PIVOT2	S2R-CFM-IP1-01-2019	01/10/2019 - 31/12/2022	€ 40 155 405
CARBODIN	S2R-OC-IP1-01-2019	01/12/2019 - 30/11/2021	€ 3 549 291
NEXTGEAR	S2R-OC-IP1-02-2019	01/12/2019 - 30/11/2021	€ 2 573 877

<sup>4</sup> This is the difference between the Research and Innovation activities declared by a beneficiary and the funding received from the JU.

<sup>5</sup> Four Lighthouse projects (2015) not included. One Open Call project, Dynafreight in IP5, has been finalised.

### IP2: Advanced Traffic Management & Control System

Project Title	Call Reference	Period	Project Value (signed GA)
X2Rail-1	S2R-CFM-IP2-01-2015	01/09/2016 - 30/04/2020	€ 41 224 381
X2Rail-2	S2R-CFM-IP2-01-2017	01/09/2017 - 31/08/2020	€ 30 152 828
X2Rail-3	S2R-CFM-IP2-01-2018	01/12/2018 - 30/11/2021	€ 38 728 459
X2Rail-4	S2R-CFM-IP2-01-2019	01/12/2019 - 28/02/2023	€ 41 109 700
VITE	S2R-OC-IP2-02-2015	01/11/2016 - 31/10/2018	€ 947 756
ASTRAIL	S2R-OC-IP2-01-2017	01/09/2017 - 31/10/2019	€ 1 797 307
ETALON	S2R-OC-IP2-02-2017	01/09/2017 - 29/02/2020	€ 1 699 999
MOVINGRAIL	S2R-OC-IP2-01-2018	01/12/2018 - 31/12/2020	€ 1 299 135
GATE4RAIL	S2R-OC-IP2-02-2018	01/12/2018 - 30/11/2020	€ 1 019 994
EMULRADIO4RAIL	S2R-OC-IP2-03-2018	01/12/2018 - 31/05/2020	€ 748 097
4SECURAIL	S2R-OC-IP2-01-2019	01/12/2019 - 30/11/2021	€ 549 875
OPTIMA	S2R-OC-IP2-02-2019	01/12/2019 - 28/02/2023	€ 2 249 897

### IP3: Cost-efficient, Sustainable and Reliable High-Capacity Infrastructure

Project Title	Call Reference	Period	Project Value (signed GA)
In2Track	S2R-CFM-IP3-01-2016	01/09/2016 - 30/04/2019	€ 6 324 052
IN2SMART	S2R-CFM-IP3-02-2016	01/09/2016 - 31/10/2019	€ 16 405 563
In2Stempo	S2R-CFM-IP3-01-2017	01/09/2017 - 31/08/2022	€ 13 439 981
Fair Stations	H2020-S2RJU-OC-2017	01/09/2017 - 31/12/2019	€ 1 199 875
IN2DREAMS	H2020-S2RJU-OC-2017	01/09/2017 - 31/10/2019	€ 2 195 715
S-CODE	S2R-OC-IP3-01-2016	01/11/2016 - 31/10/2019	€ 4 999 771
MOMIT	H2020-S2RJU-OC-2017	01/09/2017 - 31/10/2019	€ 599 172
ASSETS4RAIL	S2R-OC-IP3-01-2018	01/12/2018 - 31/05/2021	€ 5 506 631
FUNDRES	S2R-OC-IP3-01-2019	01/12/2019 - 30/11/2021	€ 749 540
In2Track2	S2R-CFM-IP3-01-2018	01/11/2018 - 30/04/2021	€ 29 676 014
IN2SMART2	S2R-CFM-IP3-01-2019	01/12/2019 - 30/11/2022	€ 23 091 203

### IP4: It Solution for Attractive Railways Services

Project Title	Call Reference	Period	Project Value
CO-ACTIVE	S2R-CFM-IP4-01-2015	01/09/2016 - 31/05/2019	€ 7 621 915
ATTRACTIVE	S2R-CFM-IP4-02-2015	01/09/2016 - 31/05/2019	€ 5 256 030
CONNECTIVE	SR2-CFM-IP4-01-2017	01/09/2017 - 30/06/2022	€ 7 906 243
COHESIVE	S2R-CFM-IP4-02-2017	01/09/2017 - 30/06/2022	€ 4 039 492
My-TRAC	S2R-OC-IP4-01-2017	01/09/2017 - 30/09/2020	€ 3 494 476
SPRINT	S2R-OC-IP4-01-2018	01/12/2018 - 31/12/2020	€ 1 999 500
SHIFT2MAAS	S2R-OC-IP4-02-2018	01/12/2018 - 31/12/2020	€ 1 499 906
MaaSive	S2R-CFM-IP4-01-2018	01/11/2018 - 31/05/2021	€ 11 692 236
RIDE2RAIL	S2R-OC-IP4-01-2019	01/12/2019 - 31/05/2022	€ 2 999 993

### IP5: Technologies for Sustainable & Attractive European Freight

Project Title	Call Reference	Period	Project Value
ARCC	S2R-CFM-IP5-02-2015	01/09/2016 - 31/10/2020	€ 3 600 360
FFL4E	S2R-CFM-IP5-03-2015	01/09/2016 - 31/07/2019	€ 3 375 017
FR8HUB	S2R-CFM-IP5-01-2017	01/09/2017 - 31/08/2020	€ 9 900 990
FR8RAIL	S2R-CFM-IP5-01-2015	01/09/2016 - 31/08/2019	€ 7 826 783
FR8RAIL II	S2R-CFM-IP5-01-2018	01/05/2018 - 30/04/2021	€ 12 450 390
INNOWAG	S2R-OC-IP5-03-2015	01/11/2016 - 30/06/2019	€ 1 500 562
OptiYard	S2R-OC-IP5-01-2017	01/10/2017 - 30/09/2019	€ 1 499 900
SMART	S2R-OC-IP5-01-2015	01/10/2016 - 30/09/2019	€ 999 599
M2O	S2R-OC-IP5-01-2018	01/12/2018 - 31/12/2020	€ 599,955
LOCATE	S2R-OC-IP5-01-2019	01/11/2019 - 31/10/2021	€ 1 499 072
SMART2	S2R-OC-IP5-02-2019	01/12/2019 - 30/11/2022	€ 1 708 737
FR8RAILIII	S2R-CFM-IP5-01-2019	01/09/2019 - 31/08/2022	€ 13 061 601

IPX:

Project Title	Call Reference	Period	Project Value
FLEX-RAIL	S2R-OC-IPX-01-2018	01/12/2018 - 30/06/2021	€ 1 099 230.00
TER4RAIL	S2R-OC-IPX-02-2018	01/12/2018 - 30/11/2020	€ 499 992
B4CM	S2R-OC-IPX-03-2018	01/12/2018 - 30/11/2021	€ 124 951
MVDC-ERS	S2R-OC-IPX-03-2018	01/12/2018 - 30/11/2021	€ 125 000
RAILS	S2R-OC-IPX-01-2019	01/12/2019 - 30/11/2022	€ 299 953
TRANSLATE4RAIL	S2R-OC-IPX-02-2019	01/12/2019 - 30/11/2021	€ 248 094

CCA: Cross Cutting Activities

Project Title	Call Reference	Period	Project Value
FINE1	S2R-CFM-CCA-02-2015	01/09/2016 - 31/10/2019	€ 3 017 282
IMPACT-1	S2R-CFM-CCA-01-2015	01/09/2016 - 30/04/2018	€ 674 958
IMPACT-2	S2R-CFM-CCA-01-2017	01/09/2017 - 30/08/2022	€ 7 096 428
LINX4RAIL	S2R-CFM-IPX-CCA-01-2019	01/12/2019 - 30/11/2022	€ 5 216 494
PLASA-2	S2R-CFM-CCA-01-2018	01/09/2018 - 31/10/2020	€ 1 853 384
GoSAFERAIL	S2R-OC-CCA-04-2015	01/10/2016 - 30/09/2019	€ 1 298 750
OPEUS	S2R-OC-CCA-02-2015	01/11/2016 - 31/10/2019	€ 797 130
SMaRTE	S2R-OC-CCA-01-2017	01/09/2017 - 31/10/2019	€ 731 202
TRANSIT	S2R-OC-CCA-01-2019	01/12/2019 - 30/11/2022	€ 1 308 718
FINE2	S2R-CFM-CCA-01-2019	01/12/2019 - 30/11/2022	€ 8 179 973

*Closed Projects related to Call for member topics for S2R JU Members*

TOPIC	ACRONYM	TITLE	PROJECT VALUE	GRANT	START DATE	CLOSURE DATE
S2R-CFM-CCA-03-2015	PLASA	Smart Planning and Safety for a safer and more robust European railway sector	0,8	0,3	01/09/2016	07/06/2019

*Closed Projects related to Open call topics for S2R JU non-Members*

TOPIC	ACRONYM	TITLE	PROJECT VALUE	GRANT	START DATE	CLOSURE DATE
S2R-OC-IP2-01-2015	CYRAIL	Cybersecurity in the RAILway sector	1,5	1,5	01/10/2016	16/11/2019
S2R-OC-IP2-03-2015	MISTRAL	Communication Systems for Next-generation Railways	0,5	0,5	01/11/2016	28/06/2019
S2R-OC-IP4-01-2016	GoF4R	Governance of the Interoperability Framework for Rail and Intermodal Mobility	1,8	1,8	01/11/2016	10/10/2019
S2R-OC-IP4-02-2016	ST4RT	Semantic Transformations for Rail Transportation	1,0	1,0	01/11/2016	19/04/2019
S2R-OC-CCA-01-2015	NEAR2050	NEAR2050 - future challenges for the rail sector	0,4	0,4	01/10/2016	21/09/2019
S2R-OC-CCA-03-2015	DESTINATE	Decision supporting tools for implementation of cost-efficient railway noise abatement measures	10	10	01/11/2016	19/07/2019
S2R-OC-IP5-02-2015	DynaFreight	Innovative technical solutions for improved train DYNAMics and operation of longer FREIGHT Trains	0.9	0.9	01/11/2016	31/06/2018

In addition to these activities that are co-funded by the S2R JU and conducted within the scope of the S2R Programme, the Other Members are required to conduct Additional Activities with a view to leveraging the effect of the overall R&I. These Additional Activities are not eligible for financial support from the S2R JU but must contribute directly to the broader objectives set out in the Master Plan.

## ***Programme Status***

By the end of 2019, the Programme reached a pivotal milestone in term of Programme implementation: more than 50% of the Programme has been delivered in view of the TRL6/7 operational demonstrations planned for conclusion in 2022. At large, all Projects have delivered the planned activities: only 8 TDs/WAs report having performed less than 80% of their planned activities in the year, of which one TD below 50%. In addition, by year-end, also the R&I activities of the Call 2019 started: they set the implantation of the first TD Demonstrators at TRL 6/7. In total, it is estimated that the Total Project Cost of the activities performed in 2019 amounts to EUR 114.9 million, of which EUR 97.1 million delivered by the Members other than the European Union (hereinafter Other Members).

During the month of April 2019, the S2R JU assessed its R&I activities through a third Control Gate exercise<sup>6</sup>. This exercise took into account the deliverables and reports submitted in the context of the Annual Review of the 2015-2016 and 2017 Projects coordinated by the Other Members. The S2R JU also ensured through this process that the recommendations made during the previous Control Gate Assessment had been properly applied. The overall result is that the Programme benefited from such feedback, built upon also external expertise.

The quality of some submitted deliverables was below standard and the S2R JU requested several re-submissions of deliverables and suspended technical and financial reports. This process is still particularly demanding as no advance planning can be made. In 2019, the S2R JU piloted with some projects a new continuous review process of deliverables combined with a control gate at the moment of the annual review. In this way, the concerned projects were much less at risk of being subject to payment suspensions due to the quality of the deliverables, as those were already corrected or resubmitted. The pilot made by the JU was considered successful and it will be extended further during 2020.

In addition, this process is integrated in the overall Programme monitoring realized through the quarterly meetings of the Innovation Programmes (IPs) where it is assessed how the different R&I activities organized in Projects are progressing.

Similarly to the previous year, the S2R JU decided not to insert the 2018 Other Members Projects in the Control Gate assessment process of 2019 (no Project Review) due to the limited number of results available; those projects will perform their first Control Gate assessment in 2020.

The S2R JU Programme Team conducted also projects review meetings for non-S2R Members during 2019. The request of such projects to better interact with the reviewing experts and the S2R Programme Managers will have to be considered at the light of the future staffing of the JU.

This Programme assessment allowed the S2R JU to confirm that overall the progress of the activities has been in line with the expectations. In addition, the launch of the system approach activities within IPx allowed providing additional coherence and consistency between the interdependencies of the implementing Projects.

the status of the progress of the TDs reported in Section 1.7. Only few TDs show delays compared to the initial scheduling, mostly due to external factors.

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<sup>6</sup> Accordingly to the procedure set in the S2R Governance and Process handbook, transparently published on the S2R website: [https://shift2rail.org/wp-content/uploads/2017/12/S2RJU-Governance-and-Process-Handbook\\_20171010\\_v11\\_Cleanv-nd.v2.pdf](https://shift2rail.org/wp-content/uploads/2017/12/S2RJU-Governance-and-Process-Handbook_20171010_v11_Cleanv-nd.v2.pdf)

In such cases, the JU has requested the concerned Project Teams to put in place the necessary mitigating measures.

- **IP1**

Positive progress has been reported on all TDs that on average have reached 98% of the estimated work planned in 2019 and all IP1 TDs started between 2016 and 2017 have reached the significant milestone of being half-way through their implementation. TD1.8 instead only started at the end of 2019 because it is a newly introduced activity to greening the heating and ventilation system, showing the ability of IP1 to tackle new challenges. The initial results in each TDs show that the investment in research and innovation is going to bring the expected results in terms of more efficient, lighter, automated and customer oriented passenger trains.

The TDs are preparing for the TRL 6/7 demonstrations and are producing quality technical results. Several IP1 innovation results are expected to affect European or international standards; for this reason, its work is closely monitored and activities are shared with standardisation setting organisations and regulatory bodies. During 2019, synergies between IP1 and IP2 have continued in particular with regard to Train Control and Monitoring System (TCMS) and telecoms. The IP1 programme has also contributed with valuable results to Cross Cutting Activities (CCA) work areas (Energy, Noise and Vibration, Smart Maintenance, Virtual Certification, etc.).

- **IP2**

Positive progress has been reported on all TDs that on average have reached 94% of the estimated work planned in 2019 and all IP2 TDs started between 2016 and 2017 have reached the significant milestone of being half-way through their implementation. TD2.8 on “virtual coupling” instead only started at the end of 2018, showing also some implementation delays and having reached an overall implementation maturity at 30% by the end of 2019. S2R started to provide, in 2019, to the European Union Agency for Railways the first sets of specifications for a number of ERTMS Game Changers, and notably on Automated Train Operation over ETCS and Moving Block. Test benches are ongoing or finalised and the pilot tests for interoperability purposes will start soon to demonstrate the validity of the specifications, allowing as well for fine-tuning where needed.

The preparations for the ATO demonstrator progressed very well; nevertheless there are still pending discussions on the availability of the NR train and network for the demonstrations. Where such issues would not be solved within the 1<sup>st</sup> Quarter 2020, the demonstration will have to take place in another network.

Overall, the results achieved are key milestones for the market uptake of the solutions of this IP and prepare the integration of functions and its specifications in the Control Command and Signalling TSI, in the next revision, currently targeted by 2022. The work performed in IP2 will show how R&I will feed the new regulatory framework and become a test bed for the future deployment of S2R innovative solutions. The next couple of years will demonstrate the expected Game Changers benefits of IP2 to ERTMS: in particular, how the rail sector in S2R is able to feed the working groups of ERA that will shape R&I results in regulatory proposals for future proof systems.

With particular regard to the activities of IP2, in agreement with the GB, the ED adopted a decision establishing a renewed Programme Governance and Change Management to foster the integration of innovations and subsystems making use of a new functional (or better service-oriented) system architecture. The renewed Programme Governance and Change Management



will support the integration within the S2R Programme of new concepts, ideas, solutions, etc. compared to the MAAP and its AWP. This renewed Programme Governance and Change Management are also an answer to the initiatives brought forward by Infrastructure Managers and Railway Undertakings in terms of subsystems specific architectures. .

### - IP3

As in the previous years, this IP suffered of an uneven progress between TDs. On average IP3 has reached 89% of the estimated work planned in 2019, but TDs 3.1 to 3.5 have suffered in 2019 with the full implementation of their expected activities. Switches and crossings, track and bridges and tunnels activities are therefore showing a delay in their overall implementation, estimated in average at 30% (instead of a theoretical 50%). The S2R JU is asking related projects to implement mitigation measures and there is confidence that as with some additional efforts in 2020 the gap could be closed. In general, all R&I is moving towards the operational environment demonstrators, with very good progress showed by the Asset Management activities (TDs 3.6 to 3.8), Energy management (TDs 3.9 and 3.10) and the Future Stations (TD3.11), all of which reached their milestone of being half-way through their overall implementation.

### - IP4

Moderate progress has been made on all TDs that on average have reached 85% of the estimated work planned in 2019. IP4 shows good progress towards the final demonstrations. IP4 has a dedicated ITD which is integrating all technologies coming from the TDs and it is already testing functionalities with an agile approach. In 2019, IP4 fully embraced the Mobility as a Service Functionality, evolving its original concept of passenger information system focusing more and more towards cities concerns. A significant number of testing activities in real cities has been planned and work is made to ensure a timely delivery of the technology. The S2R JU is addressing with the Members an acceleration of the technological progress in order to avoid that real-life testing activities would not happen because of implementation delay.

### - IP5

In 2019, the TDs reached an average implementation rate of 67%, including some key results, such as the first CBM-dashboards streaming live data from the locomotive fleet, a demonstrator for intelligent video gates, and the testing of distributed power in push-pull operations of a commercial freight train. The running projects (AWP2015 to AWP2018) consume less than 50 % of the overall IP5 budget, with a defined scope largely on analysis, requirements and technology specifications. Consequently, the 50% milestone of overall progress has not been reached, yet. Nevertheless, some impressive IP5 demonstrators will already follow in 2020, based on additional funding expected in the remainder of Shift2Rail.

Great expectations are built especially on TD 5.1, considering the work to be performed on freight ATO in coordination with IP2, in view of the upcoming TRL7 demonstrator in Switzerland, additional CBM innovations and the prototype development of a standard European digital automatic coupler. The reorganization of IP5 introduced in the new MAAP Part B promotes a more consistent approach to innovative solutions for rail freight, resulting in a combination of digitalization-driven developments and migration plans, which may pave the way for a substantial change in the business. Nevertheless, the acceleration in some of key aspects of IP5 may require additional resources to achieve market impact - resources not yet available for rail freight in the S2R Programme.



- **CCA**

The Cross-Cutting Activities were able to catch up the slower pace showed in 2018, with an average of 93% of implementation of planned activities for 2019. Several Work Areas are close to successful completion and the two point of attentions are the virtual coupling and Integrated mobility management activities which overall implementation falls behind the others.

The work performed on the Key Performance Indicators demonstrates that the approach through Releases provides opportunity for monitoring the progress of the Programme, while assessing the different contributions of the TDs and their relations. Nevertheless, the progress achieved might be at risk if the efforts are not duly matched by the continuation contributions of the TDs as well as scenario beyond the usual “comfort zones”.

- **IPX**

The activities implemented around IPX have provided some initial results in 2019 but they are still at their early implementation stage. Some issue were encountered in the recruitment of some PhDs, which now has been solved. Activities around the system of system approach have started with Linux4Rail which is supposed to deliver a draft version of the first railway Functional System Architecture by mid 2020.

### ***Programme Management and MAAP***

In terms of Programme Management, the S2R JU took some corrective measures for the synchronisation of the Programme, resulting in the acceptance of few deliverables submission delays that will not, in principle, affect the overall Programme results. During this process, it clearly appeared that there is not a continuous internal communication process within the Other Members’ entities.

During the year, the Other Members, in coordination with the JU, continued to update the MAAP Part B, to align it with the vision set in the MAAP Executive View Part A, to take stock of the results of the ongoing Projects, of new technologies/businesses emerging in view of future demonstrations paving the way to future deployment activities. During the 22<sup>nd</sup> GB meeting of 14 November 2019, the MAAP Part B was adopted.

The S2R JU Multi-Annual Action Plan therefore consists of two parts:

- Part A – Executive View, adopted by the S2R JU Governing Board on 27 October 2017 by Decision N°7/2017;
- Part B – Technical Content, annexed to the Decision of the GB N° 9/2019;

the original MAAP of 2015 will be maintained as a reference document.

With a holistic approach, the role of the S2R JU is also to ensure that interactions between the various IPs are adequately considered and managed, as technological developments in one part of the system could lead to changes in performance, or even create barriers, in other parts. In addition, cross cutting activities include research on long-term economic and societal trends such as customer needs and human capital and skills, which must be taken into account by the different IPs.

In this respect, at the end of 2019, in agreement with the GB, the ED adopted a decision establishing a renewed Programme Governance and Change Management to foster the integration of innovations and subsystems making use of a new functional (or better service-oriented) system architecture. The renewed Programme Governance and Change Management will support the integration within the S2R Programme of new concepts, ideas, solutions, etc. compared to the MAAP and its AWP.

The aforementioned ED Decision includes also the establishment of a formal advisory support to the ED in the form of a new ED Programme Board.

### ***R&I activities launched in 2018 and prepared for 2019***

In September 2019, the S2R JU awarded 17 grants as a result of the 2019 Call launched on 15 January 2019 based on the amended Annual Work Plan (AWP) 2019. One topic has not been covered (equating to 2 Million Euros unspent from the call).

17 grant agreements were signed between September and December 2019, allowing the timely start of the projects. In total, the grants will co-fund Research and Innovation activities up to EUR 74,8 million against a total value of EUR 148,6 millions. The CFM part of the Call was implemented through the Lump Sum approach with start demonstrating its benefits.

As in the case of the previous years and for the full duration of the Programme, the Other Members of the S2R JU agreed to a funding rate of maximum 44.44% (this would mean a net 41.44% for an Other Member after having considered its obligations), demonstrating a strong commitment to deliver the most ambitious Railway R&I Programme for a major transformation to rail systems, once deployed.

203 entities, of which 40 SMEs (20.0%), were retained for funding in the 2019 Call. The participants represented 25 countries, of which 17 EU Member States and 2 Countries Associated to the Horizon 2020 Framework Programme (See Annex C for details).

To facilitate a future stronger participation from the EU-13 Member States, feedbacks received by the S2R JU suggests that it will be important to integrate successful S2R R&I results with longer-term demonstration activities, encompassing a wider geographical sector involvement and impact across Europe, to bridge the way towards future deployment.

In December 2019, the S2R JU started the process for the preparation of the 2020 Call that was finally published on 7 Jan 2020 in the Horizon 2020 Funding & tender opportunities portal and based on the original version of the AWP 2020 adopted by the S2R JU GB on 14 November 2019. This lengthy process includes the key contribution of the S2R Members, the review and advice at different points of the SC, SRG, ERA and UR-ID and the adoption by the S2R GB, after the overall work was finalized under the responsibility of the Executive Director.

### ***Other activities***

In order to provide administrative support to the Programme execution, the JU has progressed in the recruitment of staff filling budgetary open positions; at the end of the year, 24 positions were filled, including 3 SNEs. The JU is subject to high turnover mostly due to the fact that other Union JUs and Agencies are in the position to offer Temporary Agent posts (TA) instead of Contractual Agent posts (CA). In fact, contrary to almost all other Union Institutions, Agencies and JUs, the S2R JU has a Staff

Establishment Plan with 25% TAs positions and 75% CAs positions; in almost all other cases, these percentages are reversed!

With regard to communication and dissemination activities, the S2R JU further reinforced its communication and dissemination activities. In 2019, the first edition of Shift2Rail's Catalogue of Solutions was published, illustrating successful R&I results in the form of possible stand-alone and integrated products. It highlights the benefits of Shift2Rail solutions for final users, operators, infrastructure managers and/or suppliers, as well as specifying delivery dates.

The catalogue of solutions was presented by the JU at the [World Congress on Railway Research](#) in Tokyo. In addition to participating in flagship international events such as WCRR and Digital Transport Days, Shift2Rail also supported a number of regional Info Days to continue raising the awareness of the programme and to mobilise rail stakeholders at local level, encouraging cooperation.

In order to increase cooperation in Member States, the S2R JU signed a Memorandum of Understanding (MoU) with the Czech Republic on 4 January 2019; and with ETSI on 14 May 2019. In January 2020, a MoU was signed with the Basque Region.

In addition to the efforts on stakeholder involvement, the JU further continued improving its internal organisation as to provide continuous support to its Members and beneficiaries. By implementing its internal control system, performing defined control activities as well as assessing and managing risks, the JU has ensured the sound financial management of EU funds.

With regard to the Discharge in respect of the implementation of the Budget of the S2R JU for the financial year 2018 and the European Parliament resolution, the present report provides in its different sections the answers requested by the Budgetary Authority. All actions stemming from audit recommendations have been implemented without delay, thus reinforcing the internal management and control system of the S2R JU.

Suggestions from the SRG and the SC to improve the present report have been taken into account.

It can be concluded that, thanks to the commitment of both Members and Programme Office, 2019 has seen the S2R JU accelerating its progress towards delivering the Programme with a clear final users focused approach.

### ***United Nations Sustainable Development Goals (UN SDG)***

The R&I work performed by the S2R JU contributes to, at least, 6 out of 17 UN SDG. In particular, the S2R Programme contributes to

- building resilient infrastructure,
- promoting inclusive and sustainable industrialization processes – at manufacturing or operational levels,
- fostering innovation at all levels of the value chain,
- promoting inclusive and sustainable economic growth, tackling also aspects related to human capital opportunities and impact of new technologies on future skills and competences,
- new mobility and transport models towards smart and sustainable cities and regions, connecting people and providing new socio-economic opportunities,
- the urgent actions taken at Union level to combat climate change and its impacts,
- promoting gender equality at all its levels.

During the last three years of activities and more in 2019, S2R shifted from being technology driven to a mission oriented Programme, designed to meet passengers and shippers needs, contributing to achieve sustainable mobility and transport, where railway offers an integrating platform in a multimodal approach, enabled by new technologies, in particular digitalization, automation, telecoms and satellite services.

S2R remains strongly delivery oriented while coupling the need of further exploring new solutions to harvest their full benefits.

## 4 REVENUE

### 4.1 Nature of Budgeted Revenue

In the Budget 2019, the S2R JU foresaw a total revenue of kEUR 81 257, including the re-activated appropriations from previous years. A majority of this related to the payments towards the S2R Operational Expenditure.

#### **Contribution from the Union to the Administrative Costs**

In accordance with Article 16.2 of the S2R Statutes, the Administrative Costs of the S2R JU are covered through financial contributions divided equally between the Union and the Other Members. This contribution corresponds to 50% of the administrative costs of the S2R JU which shall not exceed EUR 27 million up to 2024.

In accordance with the S2R Regulation, the S2R JU shall request an equal amount of Commitment and Payment Appropriations towards its administrative expenditure from the Union and from its Other Members.

#### **Contribution from the Union to the Operational Costs**

This refers to the Union contribution towards the Operational Activities of the S2R JU, as indicated in the Introduction. In the budget 2019, the S2R JU used the Union contribution in majority to ensure the pre-financing payments in relation to the Grant Agreements signed in the same year, for an amount of **kEUR 34 501** (out of a Union revenue contribution of kEUR 61 205) **against a legal commitment in terms of R&I of the Other Members and additional Open Calls of kEUR 148 551.**

#### **Contribution from the Other Members to the Administrative Costs**

As already indicated for the Union, each year, the JU shall send out debit notes to its Other Members to receive their respective contributions to the 50% of its running costs.

#### **Un-used Appropriation from previous years**

In accordance with the Article 6 of the S2R JU Financial Rules: *“Given the needs of S2R JU, the unused appropriations may be entered in the estimate of revenue and expenditure of up to the following three financial years. These appropriations must be used first”*. The appropriations recorded in this paragraph represent the contribution received in previous years and re-activated in the respective budget

#### **Other items to be noted**

The S2R JU has raised recovery orders to complete amount realised in 2019, of which majority were due by the end of 2019. As a consequence, at year-end, only the total amount of kEUR 53 was outstanding.

# IMPLEMENTATION OF BUDGET REVENUE

EUR '000

		Income appropriations		Entitlements established			Revenue			Out-standing	
		Initial budget	Final budget	Current year	Carried over	Total	On entitlements of current year	On entitlements carried over	Total		%
Item		1	2	3	4	5=3+4	6	7	8=6+7	9=8/2	10=5-8
900	Contribution from EU administrative	1 662	1 662	1 662	–	1 662	1 662	–	1 662	100 %	–
901	Contribution from EU operational	61 205	61 205	61 205	–	61 205	61 205	–	61 205	100 %	–
902	Contribution from the industry	1 662	1 662	1 662	1 255	2 917	1 609	1 255	2 864	172 %	53
Total Chapter 90		64 529	64 529	64 529	1 255	65 784	64 476	1 255	65 731	102 %	53
910	Recoveries from FMS	–	–	259	–	259	259	–	259	-	–
911	Recoveries from AMS	–	–	46	–	46	46	–	46	-	–
912	Recoveries from non MS	–	–	1	–	1	1	–	1	-	–
Total Chapter 91		–	–	306	–	306	306	–	306	-	–
Total Title 9		64 529	64 529	64 835	1 255	66 089	64 782	1 255	66 037	102 %	53
GRAND TOTAL		64 529	64 529	64 835	1 255	66 089	64 782	1 255	66 037	102 %	53

## 4.2 In-kind contributions

In accordance with article 4(3) of the S2R Regulation, *“the members of the S2R Joint Undertaking other than the Union shall report by 31 January each year to the Governing Board of the S2R JU on the value of the contributions referred to in paragraph 2 made in each of the previous financial years”*.

Article 4(2) of the S2R Regulation establishes that the total contribution to be provided by the Other Members<sup>7</sup> and totalling EUR 470 million shall consist of:

- **IKOP<sup>8</sup> (in-kind operational)**: at least EUR 350 million, including at least EUR 200 million from the founding members other than the Union and their affiliated entities, and at least EUR 150 million from Associated Members and their affiliated entities. In accordance with Article 16(3)b of the S2R Statutes, IKOP consists *“of the costs incurred by them [the Other Members] in implementing indirect actions less the contribution of the S2R JU and any other Union contribution to those costs”*.
- **IKAA (in-kind other activities)**: at least EUR 120 million, of which at least EUR 70 million from the Founding Members other than the Union and their affiliated entities, and at least EUR 50 million from Associated Members and their affiliated entities. These contributions shall consist of the costs incurred by them in implementing additional activities outside the work plan of the S2R Joint Undertaking, which are complementary to this work plan and contribute to the objectives of the S2R Master Plan. Other Union funding programmes may support those costs in compliance with the applicable rules and procedures. In such cases, Union financing shall not substitute for the in-kind contributions from the members other than the Union or their affiliated entities.

The aforementioned In-Kind Contributions, which consist of financial expenditure executed by the Members – salaries, assets, operations, etc. – to achieve the S2R Programme and its Projects, are in addition to the cash contribution of the Other Members to the 50% of the running costs of the JU.

### Other Members' reporting for 2019

The Other Members of S2R submitted their reporting on IKOP and IKAA to the JU by 31 January 2020. All Members provided their reporting.

The Lighthouse projects are excluded from this reporting as assimilated to open calls and within the administrative management of the European Commission.

This report covers IKOP related R&I activities as from Sept 2016 till Dec 2019; while in terms of IKAA the activities are considered eligible as from the date of acceptance by the Other Members of the S2R JU Statutes, by means of their respective letters of endorsement.

In accordance with Article 4(4) of the S2R Regulation, the Other Members shall have the costs related to IKOP and IKAA certified by an independent external auditor appointed by the entity concerned.

### IKOP and IKAA Certification

By 30 April 2019, the Other Members have provided the JU with audit certificates on the Total Project Costs (and consequently IKOP) and IKAA costs declared for the year 2017. After due examination of

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<sup>7</sup> The “Other Members” consist of the Founding Members of the JU, with the exclusion of the Union, and the Associated Members.

<sup>8</sup> As laid down in Article 16(2) and Article 16(3)(b) of the Statutes.

the relevant certification and, in particular, the audit standards applied to the issuance of the “audit certificates”, the acceptable corresponding IKOP contributions have been “validated” by the Executive Director in 2018. They will therefore be accounted towards the obligation set in Article 4(2) of S2R Regulation to the Other Members as well as recorded as Net Assets of the Joint Undertaking in the Annual Accounts 2018.

By the deadline of 31 January, none of the Other Members was in the position to have its costs related to 2019 IKOP and IKAA certified. Nonetheless, this is in line with Commission position communicated officially in July 2016, which clarifies that the certification of costs (based on which IKOP is calculated) should be annual and it should be transmitted to the relevant JU by its members by 30 April. This is also essential for the preparation of the Final Annual Accounts of the JU to avoid an external auditor’s qualified opinion on them.

With regard to the Provisional Accounts of S2R, considering that:

- no audit certificate on 2019 IKOP/IKAA was received,
- the validation of IKOP by the JU will be part of and performed once the Projects will submit their cost statements by the end of February 2020,
- non-validated IKOP contributions will be accounted for as “to be validated”. The relevant values may be adjusted in view of the S2R JU Final Annual Accounts, based on any relevant additional information that will be contained in the aforementioned audit certificates.

On 31 January 2020, based on the audit certificates received and the Projects’ cost statements, the situation of IKOP and IKAA is as following:



	TPC/IKOP REPORTING												
	TOTAL PROJECT COST				CO-FUNDING			IKOP					
Other Members	AAR 2016 - AAR 2018	Declarations CT 2019	TOTAL	of which CERTIFIED	AAR 2016 - AAR 2018	Draft AAR 2019	TOTAL	AAR 2016 - AAR 2018	Draft AAR 2019	TOTAL	Validated as Net Assets	To be validated	Deviance as per MA Art 2(2)
Alstom	18,657,659	15,653,406	34,311,065	18,639,214	7,850,589	6,856,949	14,707,538	10,807,070	8,796,456	19,603,527	10,808,514	8,795,012	42.87%
Hitachi / Ansaldo STS	11,713,055	6,155,626	17,868,682	11,713,055	5,200,594	2,735,560	7,936,154	6,512,462	3,420,066	9,932,527	6,512,462	3,420,066	44.41%
Bombardier Transportation	11,310,426	7,716,671	19,027,098	11,221,202	4,589,102	3,190,458	7,779,560	6,721,325	4,526,213	11,247,538	6,570,523	4,677,014	40.89%
CAF	12,580,202	7,688,404	20,268,607	18,679,022	5,475,646	3,396,698	8,872,344	7,104,556	4,291,706	11,396,262	7,104,586	4,291,676	43.77%
Network Rail	4,370,084	3,388,608	7,758,692	3,630,860	2,301,770	1,649,043	3,950,813	2,068,314	1,739,566	3,807,879	1,659,126	2,148,754	50.92%
Siemens	12,936,037	7,383,461	20,319,498	12,723,651	5,669,782	3,385,716	9,055,499	7,266,255	3,997,745	11,263,999	6,196,061	5,067,939	44.57%
Thales	9,247,061	4,839,858	14,086,918	3,564,996	4,148,873	2,150,826	6,299,699	5,098,188	2,689,032	7,787,219	726,210	7,061,010	44.72%
Trafikverket	9,077,058	6,211,327	15,288,385	3,417,937	2,780,916	2,852,223	5,633,139	6,296,142	3,359,104	9,655,246	2,736,609	6,918,637	36.85%
Founding Members	89,891,583	59,037,361	148,928,944	83,589,936	38,017,272	26,217,474	64,234,746	51,874,311	32,819,887	84,694,198	42,314,090	42,380,108	
Aerfitec	1,476,573	1,426,518	2,903,091	1,255,726	656,189	633,944	1,290,133	820,384	792,573	1,612,957	464,344	1,148,613	44.44%
Amadeus	18,155	1,932,746	1,950,901	65,185	17,478	453,264	470,742	677	1,479,482	1,480,159	-	1,480,159	24.13%
AZD Praha	2,027,738	1,090,379	3,118,116	2,027,738	883,646	494,150	1,377,796	1,144,092	596,228	1,740,320	1,144,092	596,228	44.19%
Competitive Freight Wagon	1,968,902	868,387	2,837,289	291,340	890,526	385,911	1,276,437	1,078,376	482,476	1,560,852	-	1,560,852	44.99%
Deutsche Bahn AG	14,456,536	6,620,131	21,076,667	14,456,536	4,735,525	1,503,754	6,239,278	9,721,011	5,116,378	14,837,389	9,708,472	5,128,917	29.60%
Diginext	1,880,357	882,794	2,763,151	1,880,357	835,631	392,313	1,227,944	1,044,726	490,480	1,535,207	1,044,726	490,480	44.44%
EUROC	1,119,561	1,094,081	2,213,642	-	493,211	468,335	961,547	626,349	625,746	1,252,095	-	1,252,095	43.44%
Faiveley - Wabtec	3,991,431	3,817,141	7,808,572	3,663,639	1,713,279	1,592,312	3,305,591	2,278,152	2,224,829	4,502,981	1,919,229	2,583,753	42.33%
Hacon	4,262,423	2,202,677	6,465,099	4,262,423	1,889,206	978,870	2,868,075	2,373,217	1,223,807	3,597,024	2,373,207	1,223,817	44.36%
Indra	6,125,438	3,669,411	9,794,849	6,135,010	2,724,260	1,632,498	4,356,758	3,401,178	2,036,912	5,438,090	3,310,294	2,127,797	44.48%
Kontron - Kapsch	3,025,976	1,375,162	4,401,138	3,025,976	1,344,743	611,122	1,955,865	1,681,233	764,040	2,445,273	1,681,233	764,040	44.44%
KnorrBremse	2,044,614	2,602,255	4,646,869	1,999,090	904,739	1,156,442	2,061,181	1,139,875	1,445,813	2,585,688	1,089,400	1,496,288	44.36%
MerMec	1,645,351	1,916,976	3,562,328	1,645,351	730,643	851,801	1,582,444	914,708	1,065,175	1,979,884	914,708	1,065,175	44.42%
SmartDeMain	2,944,302	1,506,728	4,451,030	1,467,199	1,355,605	718,640	2,074,245	1,588,697	788,088	2,376,784	117,658	2,259,127	46.60%
SmartRaCon	2,692,390	1,556,250	4,248,640	941,245	1,001,931	689,900	1,691,831	1,690,459	866,350	2,556,809	-	2,556,809	39.82%
SNCF	2,165,521	724,361	2,889,882	849,976	1,065,913	321,906	1,387,819	1,099,608	402,455	1,502,063	-	1,502,063	48.02%
SWITRACKEN	646,312	493,019	1,139,331	21,016	276,600	218,681	495,281	369,712	274,338	644,049	5,742	638,307	43.47%
Talgo	765,071	1,495,231	2,260,302	765,071	336,597	664,481	1,001,078	428,474	830,750	1,259,225	425,073	834,151	44.29%
Virtual Vehicle Austria Consortium VVAC+	3,889,150	2,830,685	6,719,835	3,659,267	1,745,403	1,189,675	2,935,077	2,143,747	1,641,011	3,784,758	2,132,314	1,652,443	43.68%
Associated Members	57,145,800	38,104,931	95,250,731	48,412,145	23,601,124	14,958,000	38,559,124	33,544,676	23,146,931	56,691,607	26,330,492	30,361,115	
Total	147,037,383	97,142,293	244,179,675	132,002,081	61,618,396	41,175,474	102,793,870	85,418,987	55,966,818	141,385,805	68,644,583	72,741,223	42.10%

IKAA REPORTING				
Other Members	In-Kind Additional Activities as at 1 June 2019	In-Kind Additional Activities as at 31 January 2020	TOTAL	<i>of which Certified as at 1 June 2019*</i>
Alstom	11,912,418	-	11,912,418	11,912,418
Hitachi / Ansaldo STS	3,710,942	1,351,330	5,062,272	3,710,942
Bombardier Transportation	15,688,168	-	15,688,168	15,688,168
CAF	8,946,296	-	8,946,296	8,946,296
Network Rail	2,220,203	-	2,220,203	-
Siemens	8,100,000	-	8,100,000	8,100,000
Thales	7,865,106	-	7,865,106	7,865,106
Trafikverket	25,159,312	-	25,159,312	-
<b>Founding Members</b>	<b>83,602,444</b>	<b>1,351,330</b>	<b>84,953,774</b>	<b>56,222,930</b>
Aerfitec	1,424,635	921,967	2,346,602	-
Amadeus	2,750,000	5,315,377	8,065,377	-
AZD Praha	1,000,901	599,657	1,600,558	1,000,901
Competitive Freight Wagon	631,132	-	631,132	-
Deutsche Bahn AG	28,931,113	700,000	29,631,113	28,931,113
Diginext	810,000	180,000	990,000	530,000
EUROC	2,126,240	1,000,000	3,126,240	-
Faiveley - Wabtec	4,375,267	187,672	4,562,939	4,375,267
Hacon	7,557,668	6,435,198	13,992,866	7,557,668
Indra	1,802,045	1,200,000	3,002,045	1,708,045
Kontron - Kapsch	2,138,345	1,515,534	3,653,879	2,138,345
KnorrBremse	7,387,546	1,894,246	9,281,792	4,791,972
MerMec	1,796,244	450,000	2,246,244	1,796,244
SmartDeMain	3,293,830	208,726	3,502,555	1,706,180
SmartRaCon	992,452	-	992,452	-
SNCF	934,632	-	934,632	-
SWITRACKEN	211,892	-	211,892	2,461
Talgo	2,806,984	85,784	2,892,768	2,806,984
Virtual Vehicle Austria Consortium VVAC+	5,866,379	20,448	5,886,827	5,383,267
<b>Associated Members</b>	<b>76,837,306</b>	<b>20,714,609</b>	<b>97,551,916</b>	<b>62,728,447</b>
<b>Total</b>	<b>160,439,751</b>	<b>22,065,939</b>	<b>182,505,690</b>	<b>118,951,377</b>

## IKOP

The progress and acceleration realized since the end of 2016 is confirmed and is well in line with the usual Programme Management S-Curve (with 40% of linear time consumed since September 2016 and with 41.5% of the IKOP objective reported).

As indicated under the definition of IKOP, these costs represent the difference between the Total Project Value and the S2R JU co-funding (or estimated).

The 2019 IKOP is the cumulative result of the activities awarded by the S2R JU to the Other Members:

	EUR million	R&I activities			%	
		awarded and signed	realized			
			Sept 16 - Dec 19	2019		Sept 16 - Dec 19
Total Value		489,9	97,1	244,2	49,8%	
S2R co-funding		216,7	41,2	102,8	47,4%	
IKOP		273,2	56,0	141,4	51,8%	

In order to allow the S2R JU to be in the position to sign the relevant grant agreements, the Union provided the necessary Commitment Appropriations to match the S2R co-funding of EUR 216.7 million above (excluding OC), against the Other Members' commitment of EUR 489.9 million. In terms of Union Payment Appropriations, they were used to provide the pre-financing up to 45% of the estimated co-funding in accordance with the relevant provisions of the grant agreements.

It should be noted that the estimated requested co-funding included in the 2019 Other Members' declarations is within the limits of the provision of the relevant Membership Agreements. In fact, Article 2.2 of each Other Member's Membership Agreement signed with the S2R JU establishes that *"the Member agrees to limit its reimbursement request in indirect actions funded under Article 3(1)(a) of the S2R JU Regulation to an amount not exceeding 44.44% of the Member's total eligible costs in implementing indirect actions. In case of research and innovation activities delivering the expected results through a series of intertwined actions throughout successive S2R JU Annual Work Plans, and without prejudice to the provisions concerning co-funding rates established in the S2R JU Annual Work Plans, this 44,44% threshold shall be applied cumulatively taking into account the final amount of reimbursement requested at the end of the last action implementing the specific intertwined research and innovation activities"*.

The percentage resulting from the cumulative declarations in 2019 is 42.10%, within the maximum level of 44.44%.

However, it is to be noted that the intermediary reports of the following Members show the most important deviation with respect to an IKOP rate below 55.56%: Network Rail, SmartDomain and SNCF.

This will be followed up by the S2R JU in 2020 and in any case will result in a grant final payment which will correspond in a cumulative rate not exceeding<sup>9</sup> 44.44% rate.

#### **IKAA**

In terms of IKAA, the total expected contribution by the end of the S2R Programme is estimated at EUR 169 million (minimum EUR 120 million in accordance with the S2R Regulation). It should be highlighted that the cumulative IKAA declared in this 2019 report amount to EUR 182.5 million, therefore exceeding the objective. However, this should be further confirmed with the certification by the end of April 2020.

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<sup>9</sup> In this respect, the Governing Board adopted Decision 16/2018 amending the Other Members' model Membership Agreement.

## ***4.3 Synergies with the Union Programmes/ Funds and national funded R&I***

During the first months since its autonomy, the S2R JU started some activities and participated to Regional events organized by the Committee of the Regions and European Economic and Social Committee to consider how to make use of activities planned in other Union Programmes and Funds in relation with the Railway sector, in particular EFSI, Regional and Cohesion Fund. This work stream further developed during 2019.

In terms of national funded R&I activities in the Railway sector, the S2R JU invites the relevant Member States to present their programmes and projects in the context of the meetings of the SRG. This allows discussion on ways to interconnect the different activities and ensure that resources are leveraged to achieve the best results. This is an ongoing process, which becomes increasingly relevant in view of standardization processes and market uptake.

In this respect, the S2R JU signed

- a cooperation agreement with the SEESARI initiative on 18 September 2018,
- a MoU with the Czech Republic on 4 January 2019
- and with ETSI on 14 May 2019.

The JU continued contacts with the Rail Baltica Project covering the Baltic States and Poland: the objective is to ensure that rail R&I and, in particular, S2R innovative solutions are embedded in new rail projects.

During 2019, the ongoing work on collaboration agreements, in the form of a Memorandum of Understanding (MoU) or cooperation agreement, which the S2R JU may sign with various European regions and Member States, European and international organizations and bodies was pursued.

In particular, the negotiations with the Basque Region were successfully concluded and a MoU was signed on 22 January 2020.

The collaboration with the Fuel Cell and Hydrogen (FCH) Joint Undertaking started in 2018, with the co-tendering of a Study on the use of Fuel Cells and Hydrogen in the Railway Environment. This resulted in three reports being jointly presented and published on the respective websites<sup>10</sup>. Furthermore, because of this identified synergy and following the study recommendations for R&I, FCH JU inserted in their AWP2020 a R&I call on Extending the use cases for FC trains through innovative designs and streamlined administrative framework, as Innovation Action with a funding of maximum 10 million euros.

The S2R JU enhanced its collaboration with the SESAR JU on the matters related to traffic management and functional system architecture.

In terms of synergies with other Union Programmes, the S2R JU works closely with the other Joint Undertakings sharing the same building, infrastructure, etc. maximising the opportunity for collaboration in terms of administrative and operational activities.

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<sup>10</sup> <https://shift2rail.org/publications/study-on-the-use-of-fuel-cells-and-hydrogen-in-the-railway-environment/>

## 4.4 Overview per contributors

In 2019, S2R JU was in the position to recognize both the cash contributions and validated contribution of in-kind in its provisional accounts 2019 giving the following overview in the financial statements:

On programme level

EUR '000

Programming period	2019			2018		
	Cash	in-Kind	Total	Cash	in-Kind	Total
H2020	229 926	68 645	298 570	165 397	21 673	187 070
<b>Total</b>	<b>229 926</b>	<b>68 645</b>	<b>298 570</b>	<b>165 397</b>	<b>21 673</b>	<b>187 070</b>

In line with the Horizon 2020 rules only certified in-kind contributions from the Members validated by the Executive Director of S2R JU are considered in-kind contributions to the net assets. Estimated in-kind contributions, i.e. contributions for which no certifications has been received and/or this certification has not been validated by the Executive Director are reported under other liabilities.

And on the level of the contributor

EUR '000

Member	EU	Industry Grouping		Total	
	Cash	Cash	In kind	Cash	In kind
<i>Running costs contributions at 31.12.2018<sup>11</sup></i>	4 704	6 521	–	11 224	–
<i>Current year contributions</i>	1 662	1 662	–	3 323	–
<b>Running costs contributions at 31.12.2019</b>	<b>6 365</b>	<b>8 182</b>	<b>–</b>	<b>14 547</b>	<b>–</b>
<i>Operating costs contributions at 31.12.2018</i>	154 173	–	21 673	154 173	21 673
<i>Current year contributions</i>	61 205	–	46 972	61 205	46 972
<b>Operating costs contributions at 31.12.2019</b>	<b>215 378</b>	<b>–</b>	<b>68 645</b>	<b>215 379</b>	<b>68 645</b>
<i>TOTAL contributions at 31.12.2018</i>	158 876	6 521	3 010	165 397	21 673
<b>TOTAL contributions at 31.12.2019</b>	<b>221 743</b>	<b>8 182</b>	<b>21 673</b>	<b>229 926</b>	<b>68 645</b>
<i>% of total contributions (by type)</i>	96.44%	3.56%	100.00%	100.00%	100.00%
<i>Total contribution in %</i>	74.27%	25.73%		100.00%	
<i>Voting rights %</i>	50.00%	50.00%		100.00%	

The table above summarises the contribution received from the members towards the JU taking into account the previous years. The figures here below should be interpreted taking into account that:

- Running costs contributions at 31.12.2016 reported does not take into account the contribution supplied by the Union prior to the S2R autonomy. This contribution equal into kEUR 1 817 and is not reported as part of the S2R Accounts.
- contrary to other situations, the S2R JU model is based on the concept that no co-funding can be paid unless the Other Members deliver the planned R&I activities under the provisions of

<sup>11</sup> The amounts exclude the EU Contribution of kEUR 1 817 received in 2014-2016 and used prior to the S2R JU autonomy.

their respective Membership Agreements. As already mentioned, in fact, IKOP is not a top up of the activities eligible for co-funding under H2020, but it consists of the difference between the Total Value of the R&I activities realized and the co-funding received from S2R by the Other Members. In accordance with each respective Membership Agreement, **the Other Members agreed to perform R&I activities limiting their request of co-funding up to 44.44% of their value.**

# GLOSSARY OF TERMS

GB	Governing Board
S2R JU	Shift2Rail Joint Undertaking
S2R GB	Shift2Rail Joint Undertaking Governing Board
S2R Regulation	Council Regulation (EU) No 642/2014 of 16 June 2014 establishing the Shift2Rail Joint Undertaking
Other Members	Members of the S2R JU, other than the Union

**C1:** This represents the EU budget subsidy received from the European Commission and the member contribution to the running cost for the current financial year.

**C2:** This represents the cancelled appropriations from the previous year(s) re-entered to the next financial year. In S2R JU, these can be used up to the following 3 financial years.

**C4:** This represents the appropriations which can be used again as a result of recovery orders issued by the JU (otherwise known as internal assigned revenue) and received (cashed) within the same year.

**C8:** This represents the appropriations which are automatically carried forward to meet obligations arising from previous years. For administrative expenditure and operational expenditure, only Commitment Appropriations can be carried forward and used until they are no longer needed for payment purposes. Any difference between what is carried forward and paid shall be de-committed and converted into C2 fund source for the JU (see above).

## ***Date of extraction***

The implementation data is the data as of serving as a basis for the provisional accounts at end February 2020.