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**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND
THE COUNCIL**

**Eighth monitoring report on the development of the rail market under Article 15(4) of
Directive 2012/34/EU of the European Parliament and of the Council**

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1. 1. Rail and sustainability

Covered in part 1

2. 2. The state of the EU's railway network

Covered in part 1

3. 3. The evolution of rail services

Covered in part 1

4. 4. The evolution of services supplied to railway undertakings

Covered in part 1

5. The evolution of framework conditions in the rail sector

5.1 Harmonisation

5.1.1 EU legislation

Overview of EU legislative elements

Following Directive 91/440/EEC, effective from 1 January 1993, the Commission has adopted four railway packages:

- In 2001, the First Railway Package ('rail infrastructure package') allowed rail operators to access the trans-European network on a non-discriminatory basis for the purpose of operating international freight services.
- In 2004, the Second Railway Package liberalised the rail freight market from 1 January 2007, introduced common procedures for investigating accidents, and established safety authorities in the Member States.
- In 2007, the Third Railway Package introduced open access rights for international rail passenger services and a European train driver licence, and strengthened rail passengers' rights.
- In 2016, the Fourth Railway Package was adopted, opening the market for domestic passenger transport services by rail and thus completing the single market for rail services¹.

The technical pillar of the Fourth Railway Package, adopted in April 2016, focused on interoperability, safety and a renewed role for the European Rail Agency. It included:

- Regulation (EU) 2016/796 on the EU Agency for Railways and repealing Regulation (EC) 881/2004;
- Directive (EU) 2016/797 on the interoperability of the rail system within the EU (Recast of Directive 2008/57/EC); and
- Directive (EU) 2016/798 on railway safety (Recast of Directive 2004/49/EC).

The market pillar of the Fourth Railway Package, adopted in December 2016, completed the process of market opening that had begun with the First Railway Package. It laid down rules to improve impartiality in the governance of railway infrastructure, and introduced the principle of mandatory tendering for public service contracts in the railway sector. Enhanced competition in rail passenger service markets encourages railway operators to improve the quality of their services, and their cost effectiveness. The market pillar comprises two Regulations and a Directive.

- Regulation (EU) 2016/2338 amending Regulation (EC) 1370/2007, dealing with the award of public service contracts for domestic passenger transport services by rail;
- Directive 2016/2370/EU amending Directive 2012/34/EU, dealing with the opening of the market of domestic passenger transport services by rail and the governance of the railway infrastructure;
- Regulation (EU) 2016/2337 repealing Regulation (EEC) 1192/69 on the normalisation of the accounts of railway undertakings.

The two key features of the market pillar are:

¹ EU legislative measures are accompanied by a number of implementing and delegated acts which are available on the DG MOVE website https://ec.europa.eu/transport/home_en.

- ‘Competitive tendering’ as the standard choice for awarding public service contracts: This principle will fully apply from 3 December 2019. The unconditional possibility of directly awarding public service contracts is allowed until 24 December 2023. After that date, the direct award procedure will only be allowed in limited and well-defined circumstances².
- ‘Open access’ from the 2021 timetable: Member States may limit rights of access only if the exercise of these rights would compromise the economic equilibrium of one or more public service contracts.

5.2 5.2 Licensing of railway undertakings

5.2.1 5.2.1 Active licences

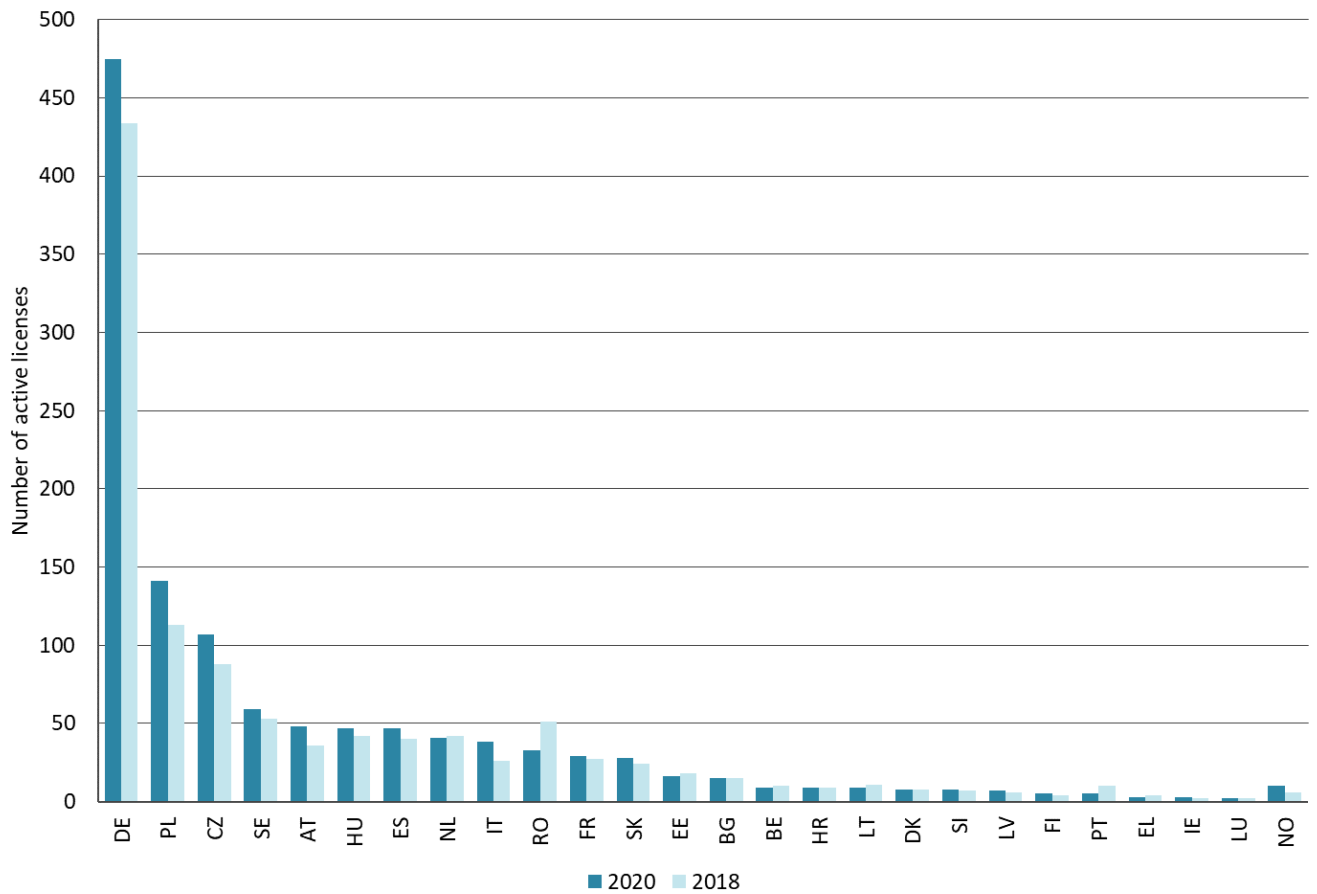
Licences of railway undertakings can be active or passive:

- **Active licence:** a licence granted to a railway undertaking that has *started* and *not ceased* operations within the periods fixed by the Member State in accordance with Article 24(4) of Directive 2012/34/EU.
- **Passive licence:** a licence granted to a railway undertaking that has *not started* or has *ceased* operations within the periods fixed by the Member State in accordance with Article 24(4) of Directive 2012/34/EU, and licences which have been suspended or revoked.

The number of active licences reported in the RMMS is showed in Figure .

² <https://ec.europa.eu/transport/sites/transport/files/workshops/2018-pso-workshop-proceedings.pdf>

Figure 52: Number of active railway licences per country



Source: RMMS, 2020, 2022.

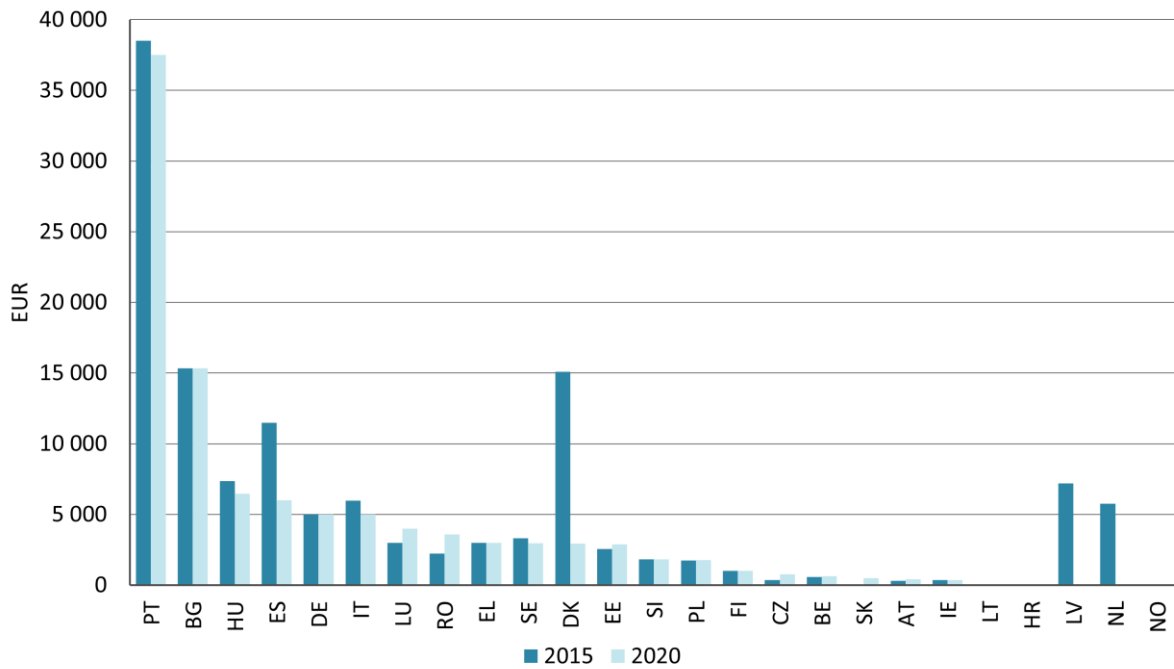
In total, 1,192 active licences were reported in the EU27 in 2020, representing an increase compared to the 1,082 active licences reported in 2018.

In 2020, Germany reported the highest number of licensed railway undertakings (475), together with Poland (141) and Czechia (107). Luxembourg reported the lowest number of active licences (2).

5.2.2 5.2.2 Average fee to obtain a licence

Figure 53 shows the reported average fees to obtain a licence in 2015 and 2020 in each country.

Figure 53: Average fee to obtain a licence by country (EUR, 2015 and 2020)



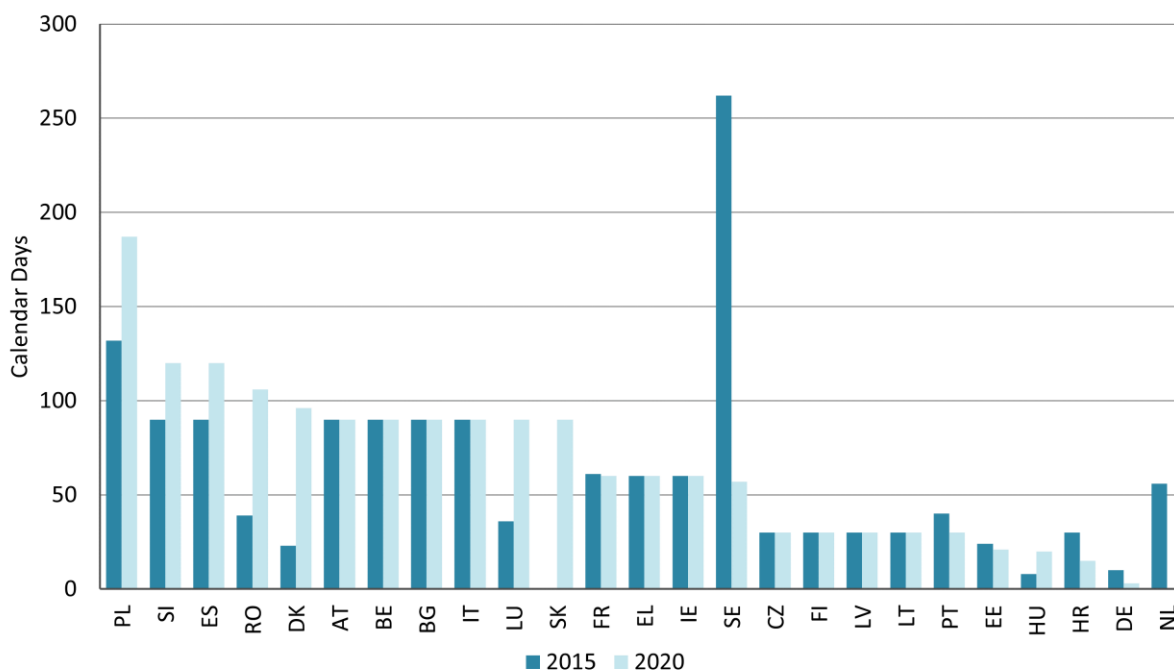
Source: RMMS, 2022. FR and NO and NL (only 2020) reported that licence costs are zero. In LV the charge is a state duty, not a licence fee. SK 2015 not available.

Portugal reported the highest fee level for 2020 (EUR 37,500) followed by Bulgaria and Hungary, whereas Croatia reported the lowest fee (EUR 5) and in France and Norway licences appear to be obtained for free. The Netherlands also reported that costs were zero in 2020. Fees significantly decreased between 2015 and 2020 in Denmark and Spain, whereas only Czechia reported a significant increase in the same period. In Latvia, the payment is a state duty rather than a licence fee and was reduced to zero in 2020.

5.2.3 5.2.3 Average time to obtain a licence

Figure 54 shows the reported average number of calendar days to obtain a licence in 2015 and 2020 in different countries.

Figure 54: Average time to obtain a licence by country (calendar days, 2015 and 2020)



Source: RMMS, 2022. SK 2015, NL 2020 and NO not available.

Most Member States reported an average time to obtain a licence of 90, 60 or 30 calendar days. Poland reported the longest average time for 2020 (187 days), followed by Slovenia (120) and Spain (120). In Germany, the reported average time to obtain a licence was only 3 calendar days. Denmark reported the highest increase with 73 days, followed by Romania (67), Poland (55) and Luxembourg (54). Sweden shows the most remarkable change, with a reduction by 205 days from 2015 to 2020.

5.3 5.3 Charging principles for the infrastructure

Infrastructure managers recover the cost related to the provision of infrastructure for train operations with infrastructure charges. The basic principle is that the charges should cover at least the 'direct' costs of the train run, referring to the costs incurred by a train run over the network, i.e. the costs of the interaction of train and infrastructure.

To incentivise the optimal use of their infrastructure, infrastructure managers can additionally apply other charging components:

- to improve environmental performance, charges can reflect noise emissions or the usage of diesel/electric locomotives;
- an effective use of infrastructure capacity can be incentivised through mechanisms such as a scarcity charge, a reservation charge or discounts to specific traffic flows;
- the costs of specific investment projects can be recovered by charges based on long-term costs; and
- a performance scheme can enhance operational performance through penalties/rewards linked to the occurrence/avoidance of service disruptions, applicable to both railway undertakings and infrastructure managers.

In addition, Member States may make provision for mark-ups to be applied on top of the direct cost charges in market segments that are able to pay such higher charges. Nevertheless, market segments

that can at least pay the direct costs and a rate of return must not be excluded from the use of the rail infrastructure. The overall level of cost recovery through infrastructure charges is interdependent with the level of government contribution; Member States may require different levels of cost recovery.

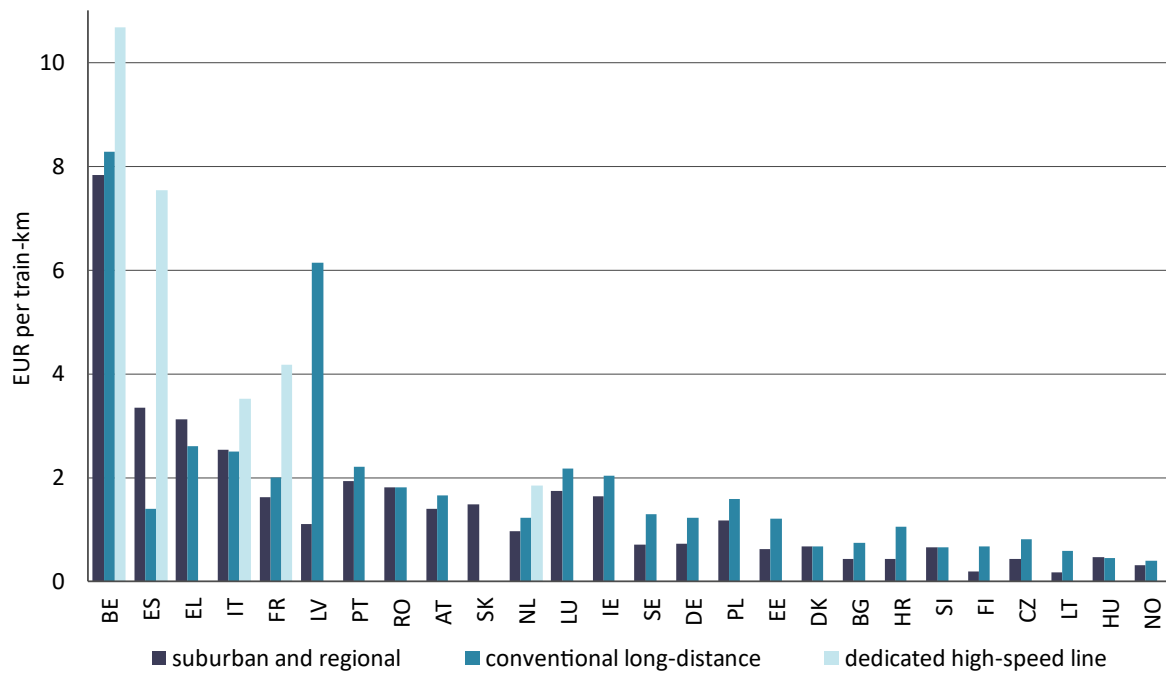
Currently the RMMS does not allow the possibility to distinguish between the various charging elements used by each Member State. Therefore, while comparing the level of charges reported by Member States, the results need to be interpreted with caution.

5.4 5.4 Access charges for different categories of passenger trains

As explained in paragraph 5.3, the RMMS does not allow the possibility to distinguish between the various elements of charging applied across infrastructure managers and Member States. Figures also exclude mark-ups, which however cause a big part of the difference in level of charges between Member States. Therefore, while comparing the level of charges as reported in the following pages, the results need to be interpreted with caution.

Figure 55 compares estimates of typical access charges (excluding mark-ups) per country in 2022, measured in EUR per train kilometre, for three different types of passenger trains.

Figure 55: Access charges (excluding markups) for different categories of passenger trains, by country (EUR per train-km, 2020)

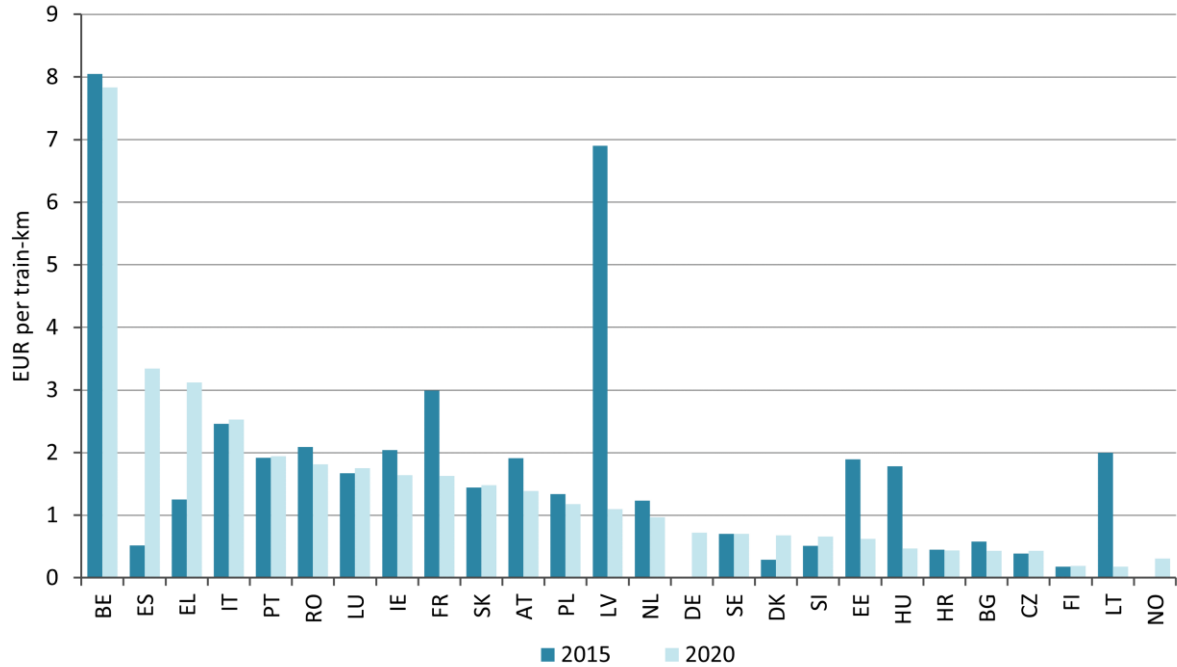


Source: RMMS, 2022.

Overall, Belgium reported the highest level of track access charges in 2020, while Lithuania and Hungary reported the lowest. Spain applied very high track access charges for dedicated high-speed lines, whereas Latvia applied comparably high track access charges for conventional long-distance lines.

Figure 56 shows access charges (excluding mark-ups) for suburban and regional passenger trains per country for 2015 and 2020, measured in EUR per train kilometre.

Figure 56: Access charges (excluding mark-ups) for suburban and regional passenger trains by country, (EUR per train-km, 2015 and 2020)

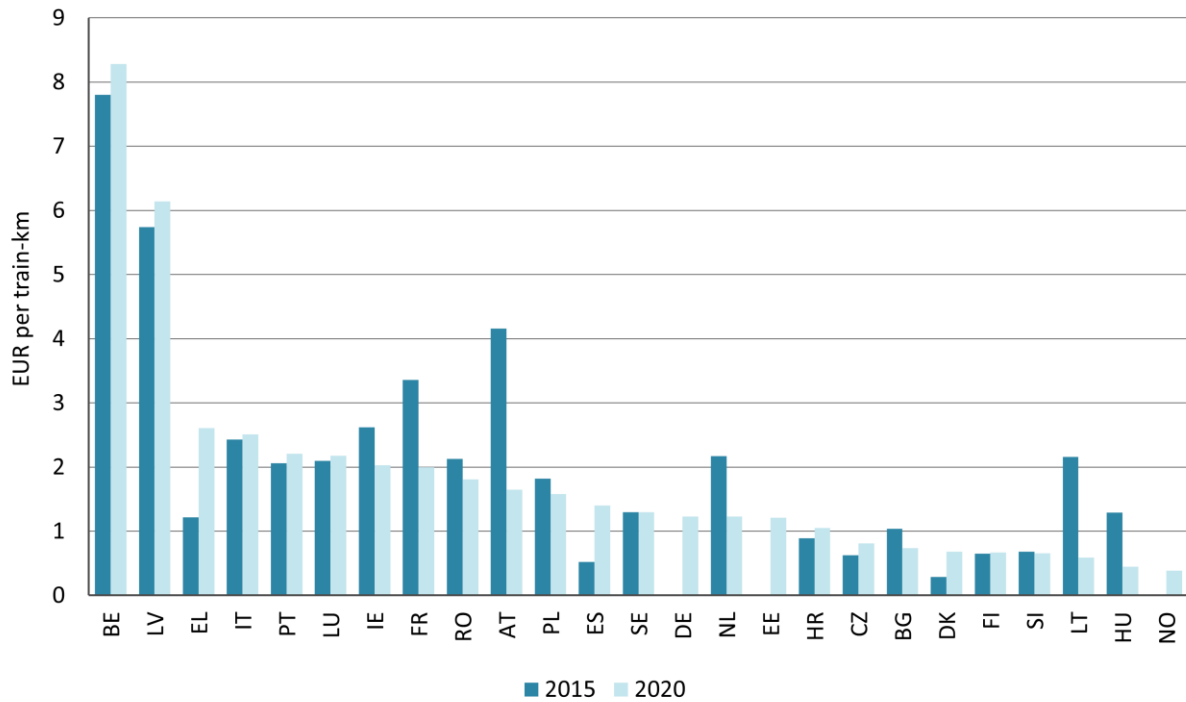


Source: RMMS, 2022. DE 2015 and NO 2015 not available. EL, HU 2015 estimated.

In general, Belgium reported the highest access charges for suburban and regional passenger trains. Latvia shows the most notable decrease, while Spain registered the highest increase from 2015 to 2020.

Figure 57 shows access charges (excluding mark-ups) for conventional long-distance passenger trains per country for 2015 and 2020, measured in EUR per train kilometre.

Figure 57: Access charges (excluding mark-ups) for conventional long-distance passenger trains by country, (EUR per train-km, 2015 and 2020)

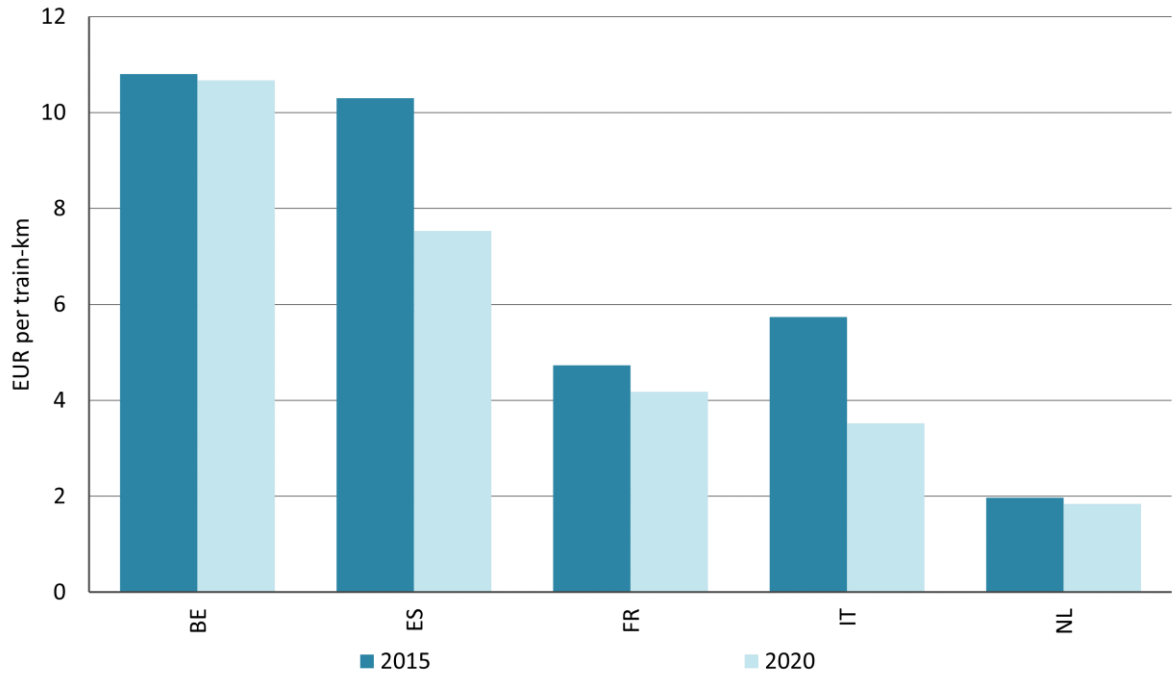


Source: RMMS, 2020. DE, EE, NO 2015 and SK not available. EL, HU 2015 estimated.

The figure shows how charges have changed in several Member States, most notably Spain and Greece (increasing) and Austria, the Netherlands, Lithuania, and Hungary (decreasing).

Figure 58 shows access charges (excluding mark-ups) for high-speed passenger trains per country for 2015 and 2020, measured in EUR per train kilometre³.

Figure 58: Access charges (excluding mark-ups) for high-speed passenger trains by country (EUR per train-km, 2015 and 2020)



Source: RMMS, 2022. NL 2015 estimated.

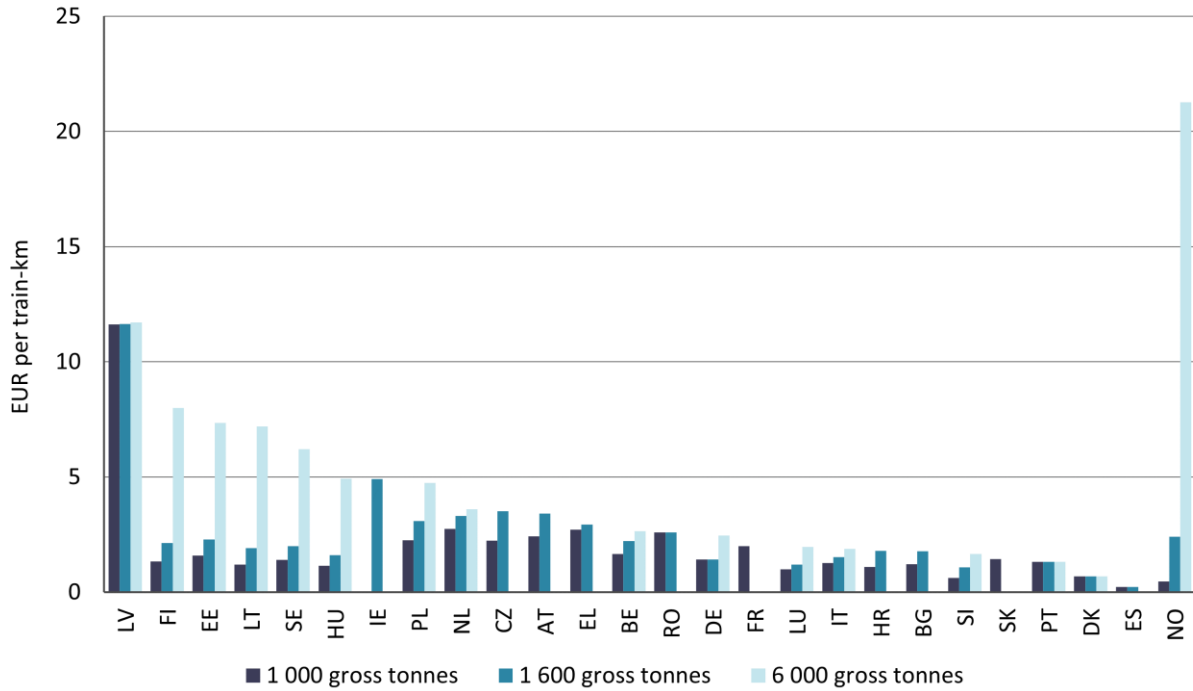
All countries with track access charges for high-speed rail (excluding mark-ups), reported higher values than for other passenger charges. However, in all Member States, the access charges were lower in 2020 than in 2015, most remarkably in Italy.

³ The RMMS asks more precisely for track access charge, excluding mark-ups, for 'passenger trains providing high-speed services on dedicated high-speed lines'.

5.5 5.5 Access charges for different categories of freight trains

Figure 59 compares estimates of typical access charges (excluding mark-ups) per country in 2020, measured in EUR per train kilometre, for freight trains of three different maximum gross tonnages.

Figure 59: Access charges (excluding mark-ups) for different categories of freight trains, by country (EUR per train-km, 2020)



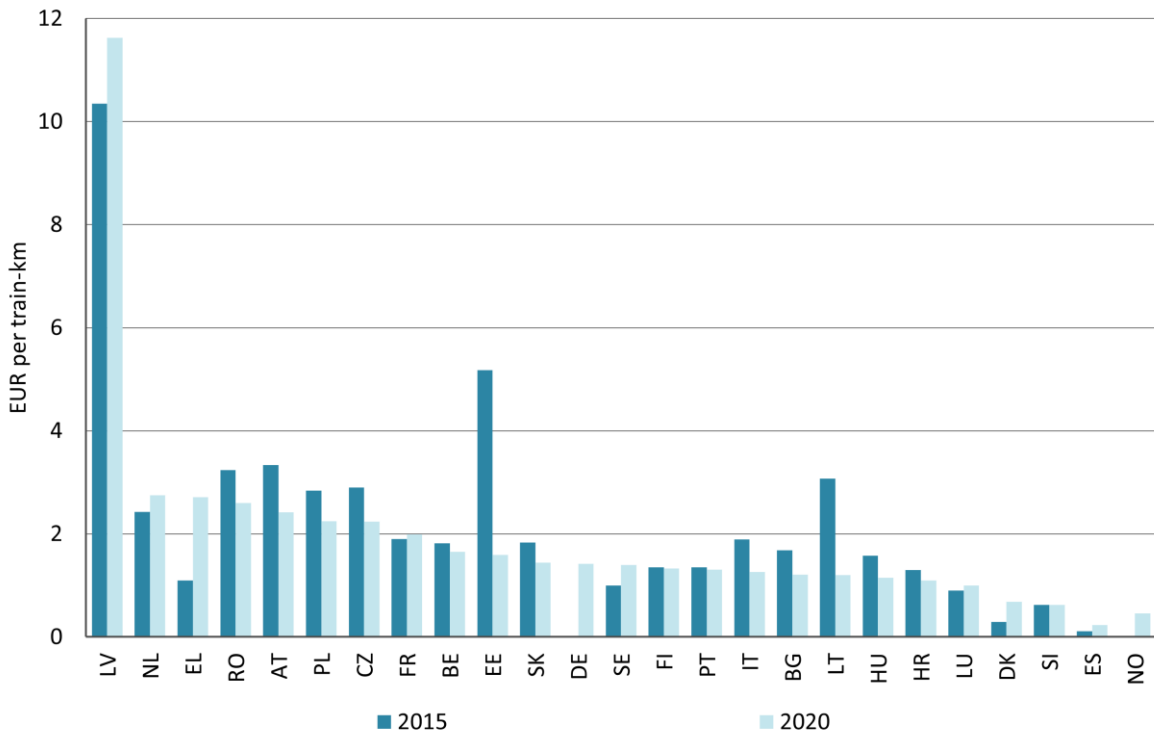
Source: RMMS, 2022.

Overall, highest track access charges are reported in the Baltic States. Unusually high track access charges are achieved for 6 000 gross tonne freight trains in Norway⁴.

⁴ Average track access charges for the 6 000 gross tonne freight category can be influenced from the tonnage of trains running the network, which can be significantly higher than 6 000 gross tonne (ex. in Norway for example where full load trains up to 8 500 gross tonne can run through the network).

Figure 60 shows access charges (excluding mark-ups) for 1,000 gross tonne freight trains per country for 2015 and 2020, measured in EUR per train kilometre.

Figure 60: Access charges (excluding mark-ups) for 1 000 tonne freight trains by country (EUR per train-km, 2015 and 2020)

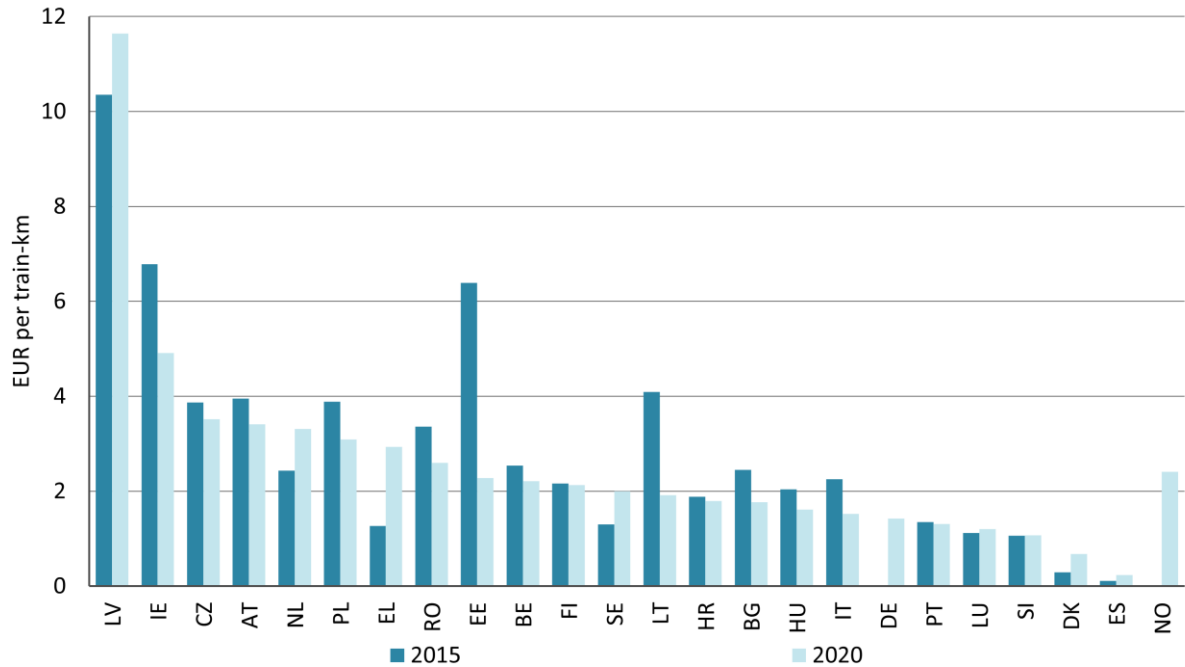


Source: RMMS, 2022. HU 2015 estimated. IE not available. DE, NO 2015 not available.

The figure shows how charges have changed in several Member States, most notably Latvia and Greece (increasing) and Estonia and Lithuania (decreasing).

Figure 61 shows access charges (excluding mark-ups) for 1,600 gross tonne freight trains per country for 2015 and 2020, measured in EUR per train kilometre.

Figure 61: Access charges (excluding mark-ups) for 1 600 tonne freight trains by country (EUR per train-km, 2015 and 2020)

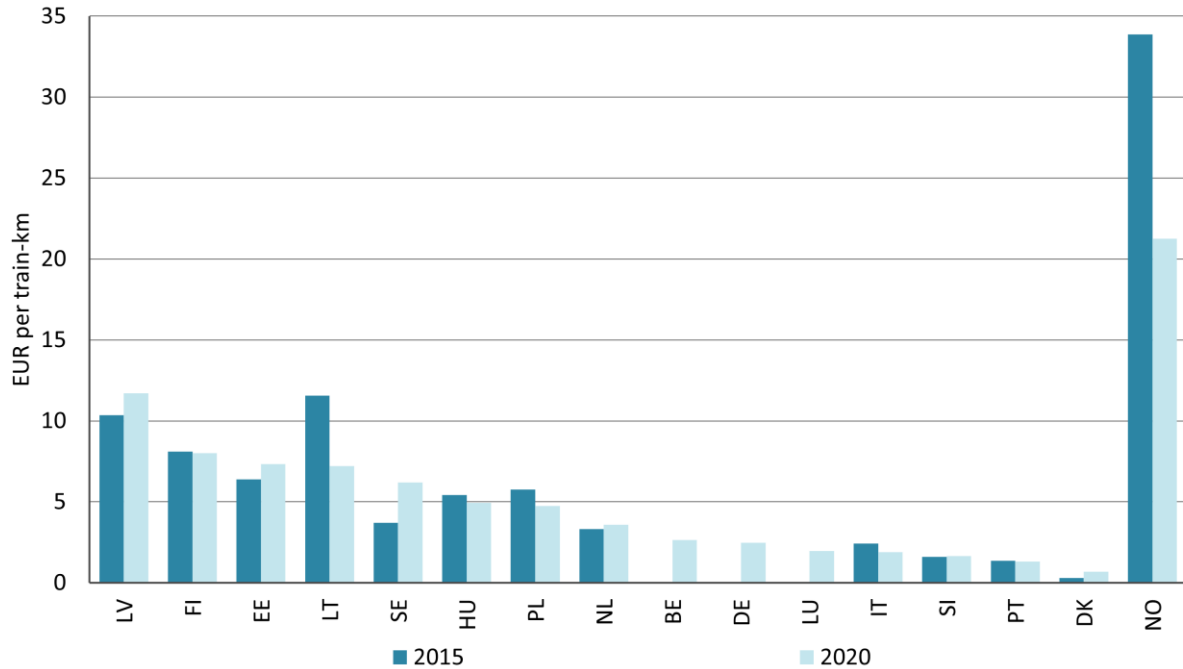


Source: RMMS, 2022. LU, HU 2015 estimated. DE, NO 2015 not available and FR, SK not available.

The figure shows how access charges for 1,600 tonne freight trains have changed in several Member States, most notably Greece and Latvia (increasing), and Estonia and Ireland (decreasing).

Figure 62 shows access charges (excluding mark-ups) for 6,000 gross tonne freight trains per country for 2015 and 2020, measured in EUR per train kilometre.

Figure 62: Access charges (excluding mark-ups) for 6 000 tonne freight trains by country (EUR per train-km, 2015 and 2020)



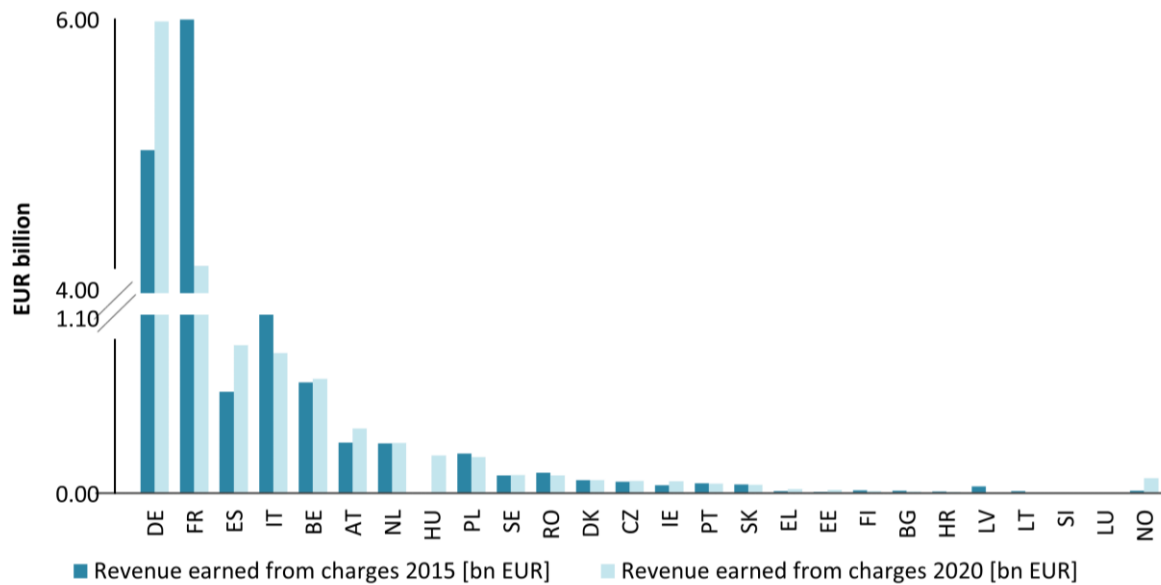
Source: RMMS, 2022. HU 2015 estimated. BE, DE, LU, CZ, IE 2015 and ES, SK 2020 not available.

The figure shows how access charges for 6,000 gross tonne freight trains have changed in several countries, most notably Sweden (increasing), and Norway and Lithuania (decreasing).

5.6 5.6 Infrastructure managers' revenue calculated for passenger and freight trains

Figure 63 shows the infrastructure managers' reported revenues from passenger trains through track access charges, station charges and other charges per country for 2015 and 2020. In the RMMS, only charges collected by the infrastructure managers need to be reported. These therefore include charges for station facilities only if owned or managed by infrastructure managers.

Figure 63: Infrastructure managers' revenue earned from charges (TACs, station charges and other charges) paid by passenger trains, per country (EUR billion, 2015 and 2020)



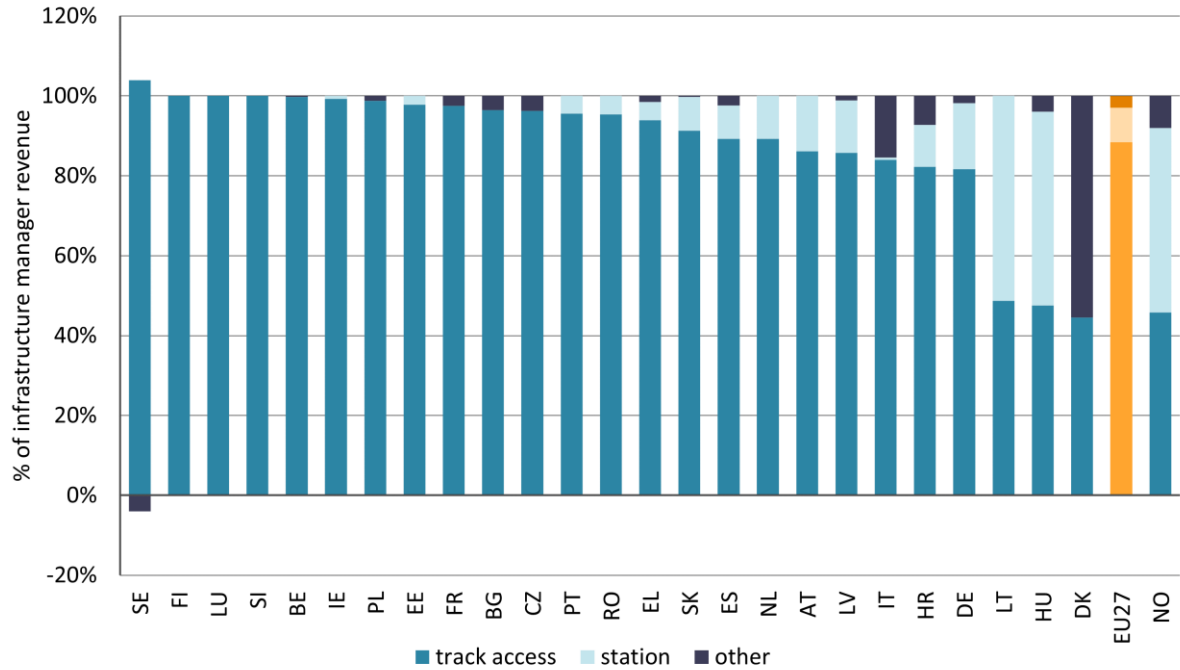
Source: RMMS, 2022. Revenues from TACs not available for HU, NL and LU 2015. Revenues from station charges not available for BG and SE for both years, for HU, LV, LT, LU, PT and RO 2015 and DK and SI 2020.

Overall, the highest revenues from passenger services' charges in 2020 were achieved in Germany and France. The lowest revenues (almost zero) were reported in Luxemburg and Slovenia⁵.

⁵ In Slovenia before the change of timetable in December 2019, trains which operated under PSO contract were exempted from the obligation of paying TAC.

Figure 64 shows the infrastructure managers' share of track access, station and other charges in total revenues from passenger trains per country in 2020.

Figure 64: Proportion of infrastructure managers' revenue earned from TACs, station charges and other charges on total charges paid by passenger trains, per country (% in 2020)

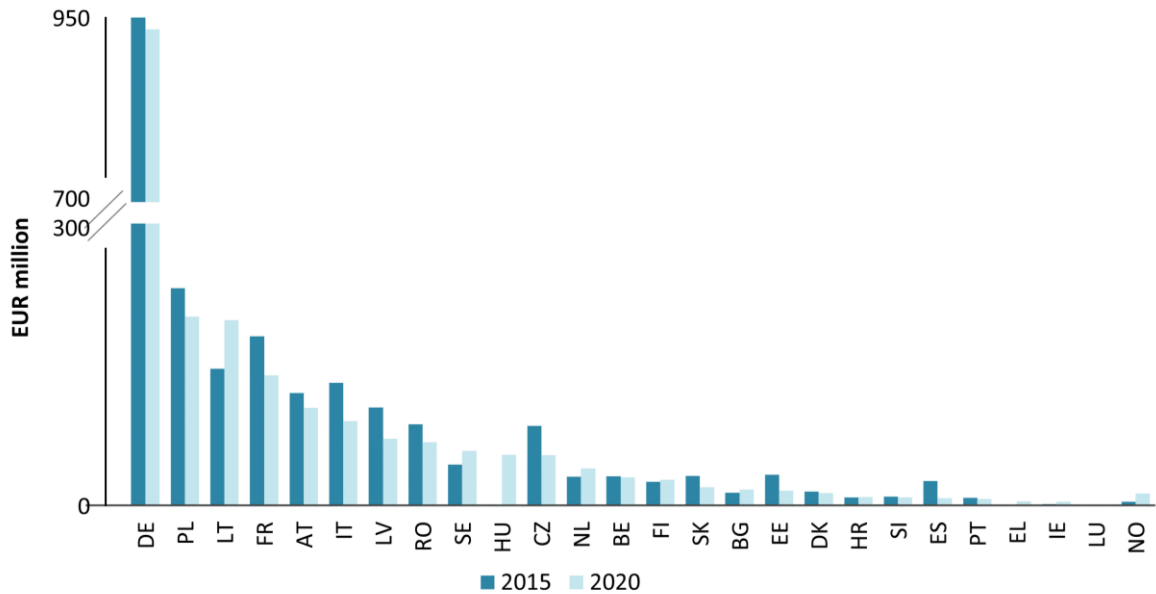


Source: RMMS, 2022. SE reported consolidated figures for TACs and station charges, so it is not possible to represent their respective weight on the total charges.

In 2020, track access charges represented on average 88% of the infrastructure managers' revenues from passenger trains in the EU27. Denmark reported the lowest share of track access charges on total infrastructure managers' revenues from passenger services (45%). Station charges can make up to 49% of the total, as reported by Hungary. Sweden reported negative revenues from other charges due to quality fees paid by the infrastructure manager.

Figure 65 shows infrastructure managers' reported revenues from freight trains through track access charges, freight terminals charges and other charges per country for 2015 and 2020. In the RMMS, only charges collected by the infrastructure managers need to be reported. These therefore include charges for freight terminals only if owned or managed by infrastructure managers.

Figure 65: Infrastructure managers' revenue earned from charges (TACs, freight terminals charges and other charges) paid by freight trains, per country (EUR million, 2015 and 2020)



Source: RMMS, 2022. Revenues from TACs not available for HU and LU 2015, Revenues from freight terminals not available for AT, BE, DK, LV, RO, SI for both years, for EL (only 2015) and EE, HU, IE, LU and PT (only 2020). Revenues from other charges are not available for AT and SI (both years), and for EE, EL, HU, LV, LT, LU, PL, RO in 2015.

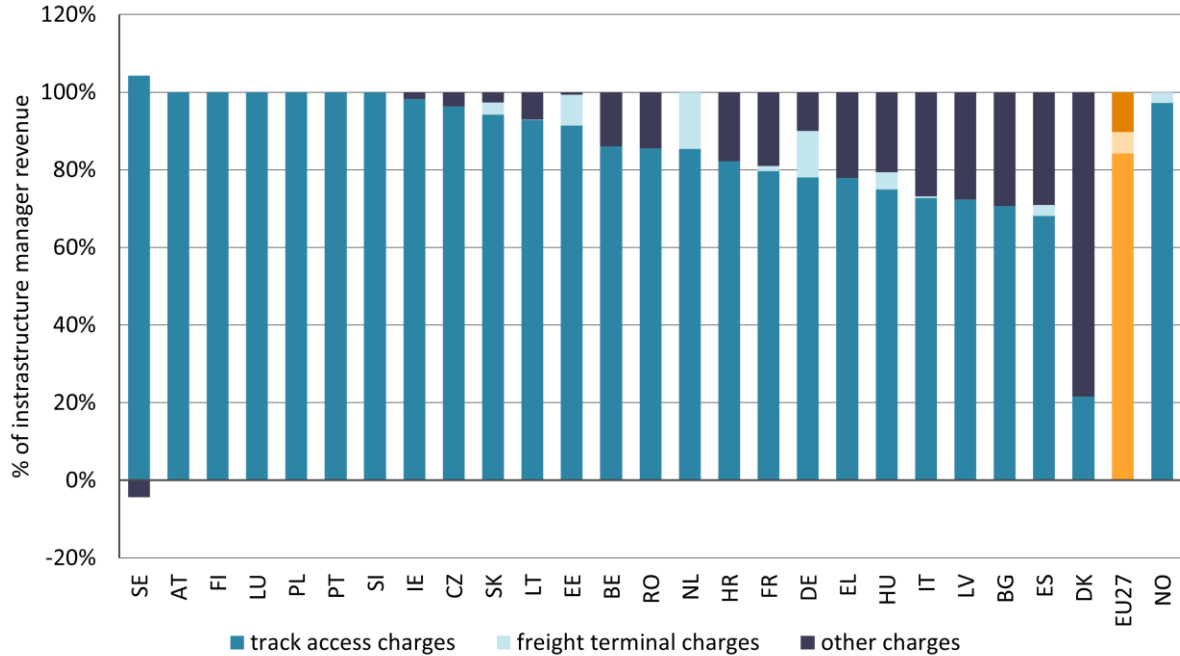
Germany reported the highest revenues of infrastructure managers from freight services in 2020, while Luxemburg reported the lowest revenues. Regulation (EU) 2020/1429 of the European Parliament and of the Council of 7 October 2020 establishing measures for a sustainable rail market in view of the COVID-19 outbreak⁶ introduced the possibility not to invoice the charges for the use of rail infrastructure. Luxemburg, Germany, Austria, Italy and Denmark notified the Commission about the use of this provision over different periods in the course of 2020.

In Denmark a new charging system for TACs was introduced in 2016.

⁶ <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32020R1429>

Figure 66 shows infrastructure managers' share of track access, freight terminals and other charges in total revenues from freight trains per country in 2020.

Figure 66: Proportion of infrastructure managers' revenue earned from TACs, freight terminals charges and other charges on total charges paid by freight trains, per country (% , 2020)

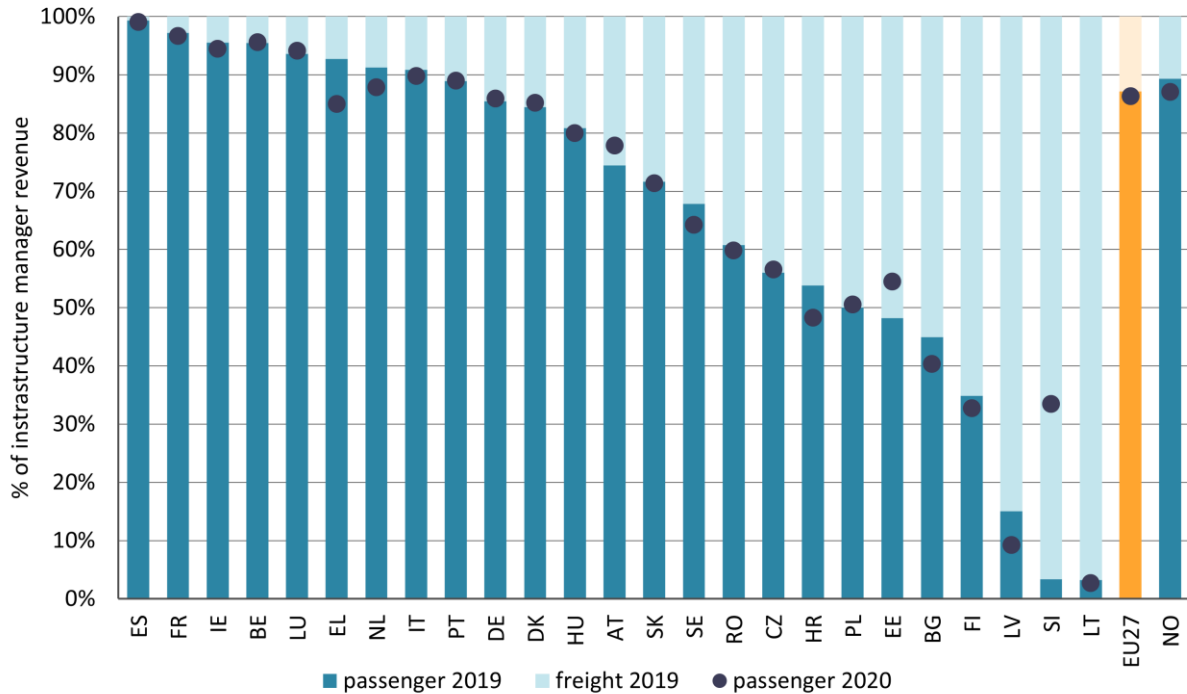


Source: RMMS, 2022. In 2020 revenues from freight terminals were not available for AT, BE, DK, EL, LV, RO, and SI. Revenues for other charges not available for AT and SI in 2020.

In 2020, track access charges represented on average 84% of the infrastructure managers' revenues from freight trains in the EU27. Denmark reported the lowest share of track access charges on total revenues of infrastructure managers from freight services (22%). Freight terminal charges can make up to 15% of the total as reported by the Netherlands. Sweden reported negative revenue from other charges.

Figure 67 shows the share of passenger and freight charges in total revenues of infrastructure managers' revenues from trains per country in 2019 and 2020.

Figure 67: Share of passenger and freight charges on infrastructure managers' total revenues earned from trains, per country (% , 2019 and 2020)



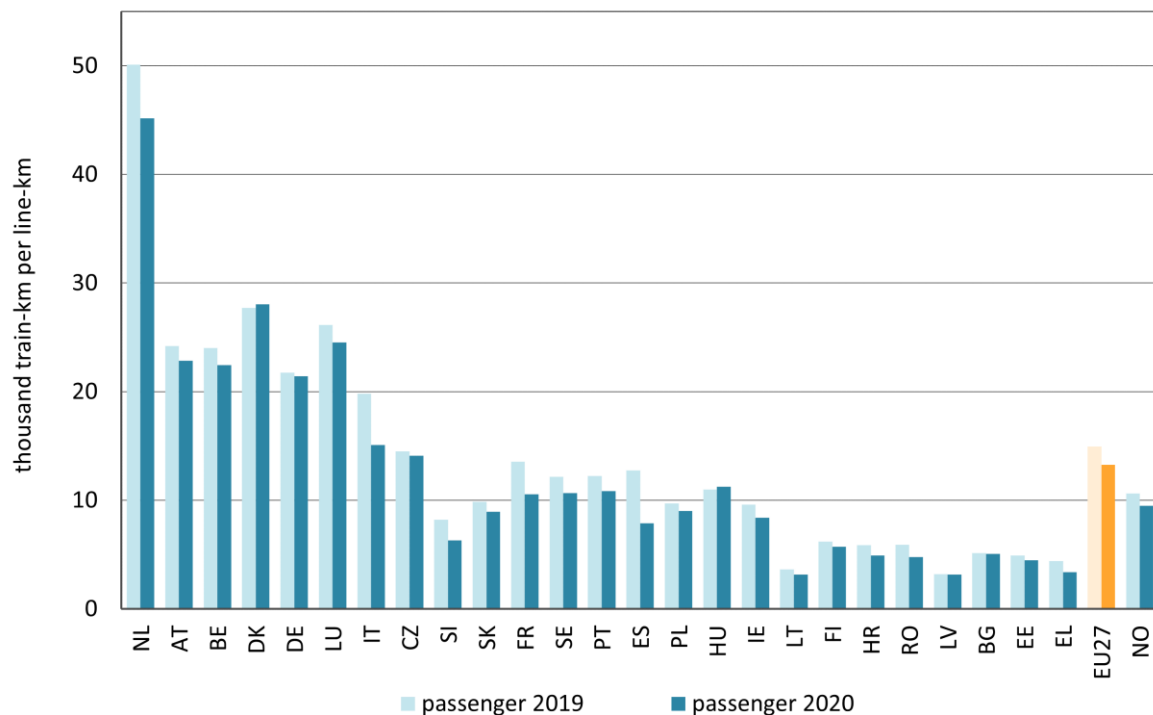
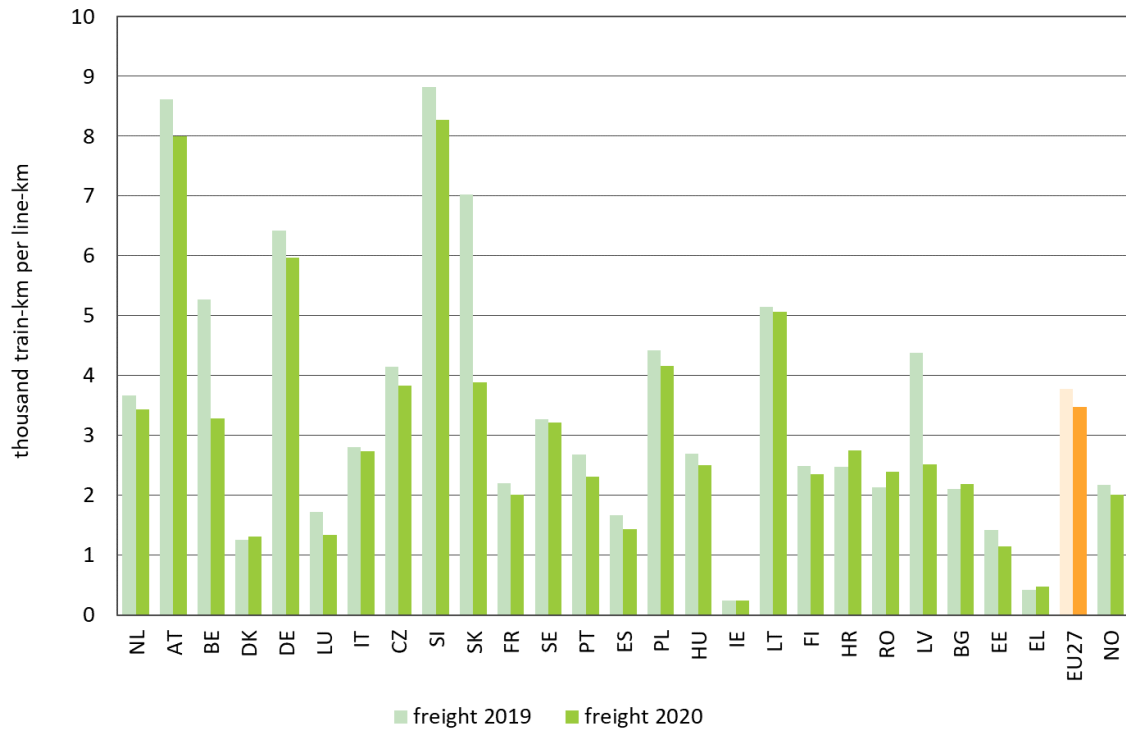
Source: RMMS, 2022.

In 2020, passenger services represented on average 86% of the total revenues of infrastructure managers from trains in the EU27. Spain reported the highest share (99%), Lithuania the lowest (3%). Compared to 2019, in most countries the share of passenger service revenues decreased in 2020. In contrast, in Slovenia the share of passenger service revenues increased from 3% to 33%.

5.7 5.7 Capacity allocation and congestion

Figure 68 shows the reported average network utilisation separately for passenger and freight trains measured in train kilometres per line kilometre in 2020 per country, as well as the evolution compared to 2019. Despite the fact that these broad national averages say nothing about the emptiest parts of the network, they can provide some indications about which networks are on average busier than others.

Figure 68: Network utilisation per country (thousand train-km per line-km, 2019 and 2020)



Source: RMMS, 2022, Statistical pocketbook, 2022. PT 2020: Correction of error of magnitude for total volume of passenger services.

In 2020, the EU27 network had a total combined intensity of use (freight and passenger trains) of 16.73 thousand train kilometres per line kilometre. This is significantly less than in the years previous due to

the COVID-19 pandemic (18.7 in 2019). The most intensively used networks in 2020 were still those of Western Europe, in particular in the Netherlands, with an intensity of use of 45.2 thousand train kilometres per line kilometre for passenger trains. Greece appears to have the lowest intensity of use with only 3.4 thousand train kilometres per line kilometre for passenger trains. In terms of segments, 79% of the intensity of use in the EU27 on average was due to passenger trains (13.25 thousand train kilometres per line kilometre).

5.7.1 5.7.1 Allocating capacity

Successful and rejected path allocations for scheduled and ad hoc train paths

Timetables structure and organise the use of railway infrastructure in the form of ‘train paths’: train paths determine the train (by number), the time of use and the individual trajectory of the train. The basis for building timetables are path requests by railway undertakings and other applicants⁷. With this, infrastructure managers create a usage plan, i.e. the timetable, which reconciles all path requests in the best possible way, given the available infrastructure capacity. Path requests can be either submitted under the yearly working timetable (designed for planned traffic and on a more long-term basis) and as ad hoc requests for spot traffic at shorter notice. Path allocation requests may be accepted or rejected by an infrastructure manager to resolve conflicting applications for infrastructure capacity.

Member States are required to follow the path coordination processes set out in Article 46(1) of Directive 2012/34/EU. Annex VII to the same Directive⁸ specifies a mandatory timeline for establishing the yearly timetable and introduces coordination and consultation processes between infrastructure managers and applicants.

Despite EU path coordination rules having been in place for a long time, the timetabling procedures have evolved nationally and lack Europe-wide harmonisation, which creates barriers for a smooth cross-border traffic.

Further to this, the current timetabling process does not really fit the business model of rail freight in particular. A significant part of the demand is volatile and cannot be planned long in advance, so ad hoc requests for train paths are in principle the most appropriate method to accommodate capacity needs. However, rail freight path requests are also made within the annual timetable process (**scheduled paths**), to avoid the risk of not receiving **ad hoc train paths** of suitable quality (or even none at all) at a later stage.

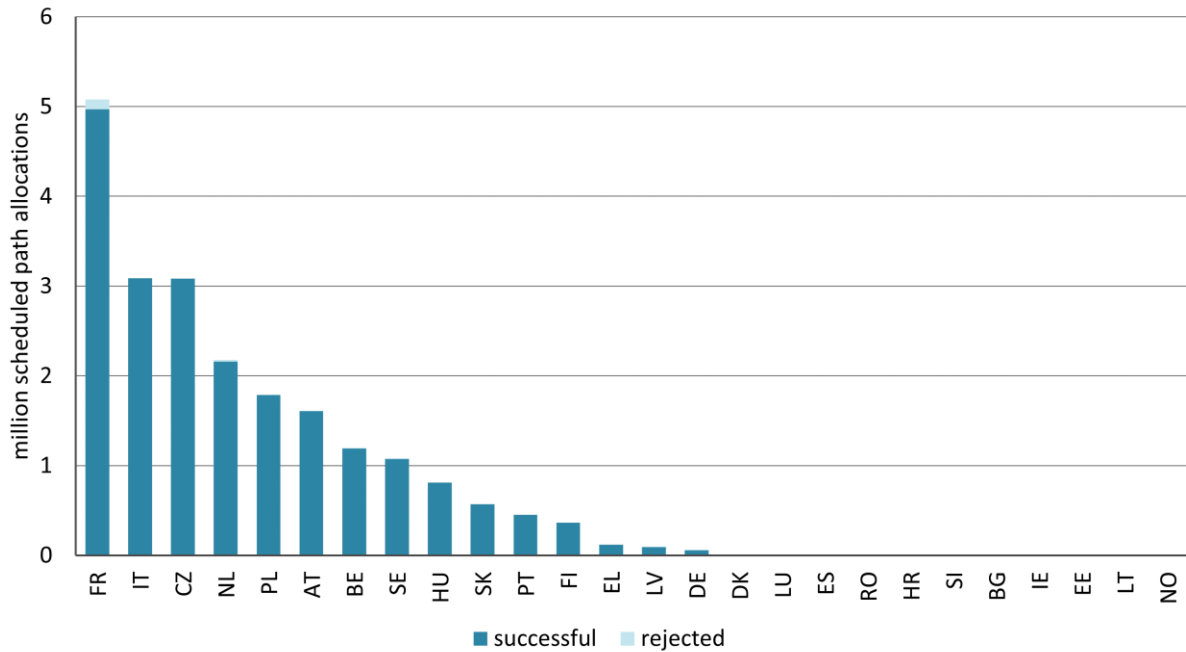
This often leads to suboptimal ordering behaviour and thus to a suboptimal management of infrastructure capacity, resulting in a waste of resources. In fact, train paths often need to be modified or even cancelled at a later stage, when the actual capacity needs materialise.

⁷ In addition to railway undertakings, the term ‘applicants’ includes other persons or legal entities with an interest in procuring infrastructure capacity, such as shippers, freight forwarders or combined transport operators.

⁸ As replaced by Commission Delegated Decision (EU) 2017/2075 of 4 September 2017 replacing Annex VII to Directive 2012/34/EU of the European Parliament and of the Council establishing a single European railway area (https://eur-lex.europa.eu/eli/dec_del/2017/2075/oj).

Figure 69 shows the reported number of successful and rejected scheduled path allocations in 2020 per country.

Figure 69: Successful and rejected path allocations for scheduled path allocations per country (million path allocations, 2020)



Source: RMMS, 2022.

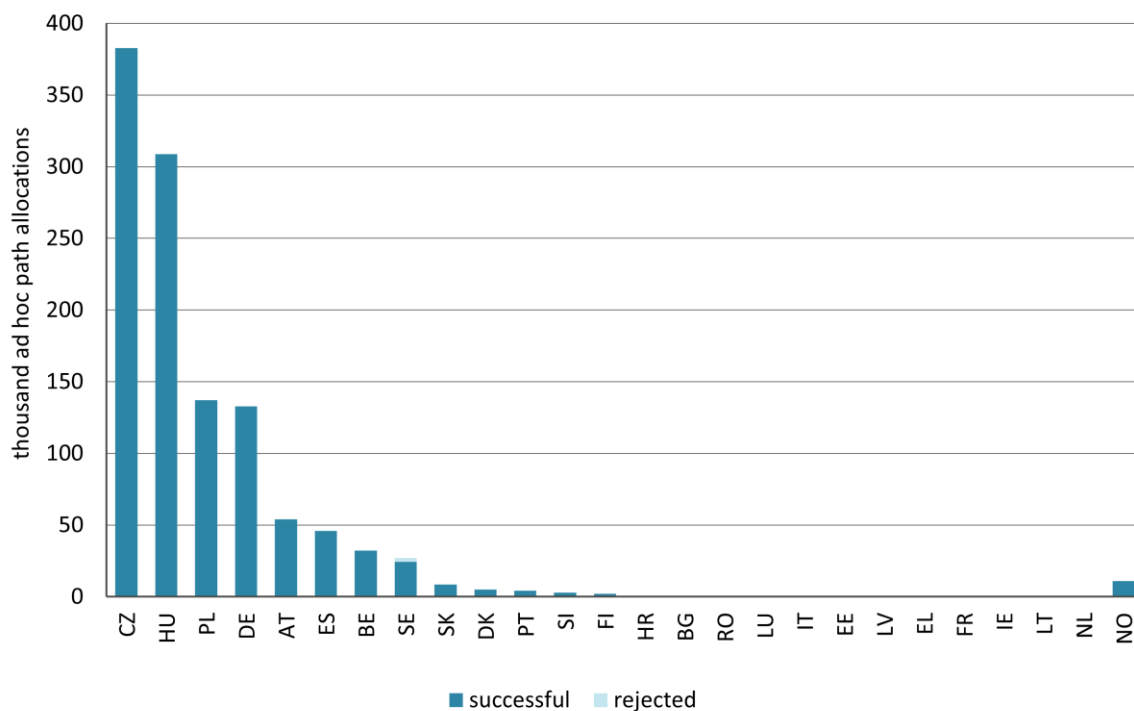
According to RMMS data, 21.44 million path allocations were successfully scheduled in 2020 in the EU27 and just 0.14 million (0.6% of total requested path allocation) rejected.

Likewise for ad hoc path allocation (shown in Figure 70), in 2020 about 1.1 million ad hoc paths were successfully allocated in the EU27, with just 2 838 (0.3% of total requested path allocation) rejected.

The number of ad hoc path allocation requests in 2020 was significantly lower than in 2018⁹, possibly due to the pandemic. In comparison, the number of scheduled path allocations in 2020 is nearly identical to the number of scheduled path allocations in 2018.

⁹ RMMS 7th edition, 2020.

Figure 70: Successful and rejected path allocations for ad hoc path allocations per country (million path allocations, 2020)



Source: RMMS, 2022.

Framework agreements between infrastructure managers and railway undertakings

Article 42 of Directive 2012/34/EU allows the conclusions of framework agreements for the use of the infrastructure for longer than one working timetable period. To provide railway undertakings and new entrants with fair access to the railway infrastructure and to optimise the use of infrastructure, the Commission adopted in 2016 Implementing Regulation 2016/545¹⁰ on procedures and criteria relating to framework agreements for the allocation of railway infrastructure.

As of June 2022, framework agreements were applied by the infrastructure managers of Spain (3), France (5), Italy (many) and Norway (1). In Germany framework agreements will likely be reintroduced for the working timetable 2024.

5.7.2 5.7.2 Managing capacity shortages

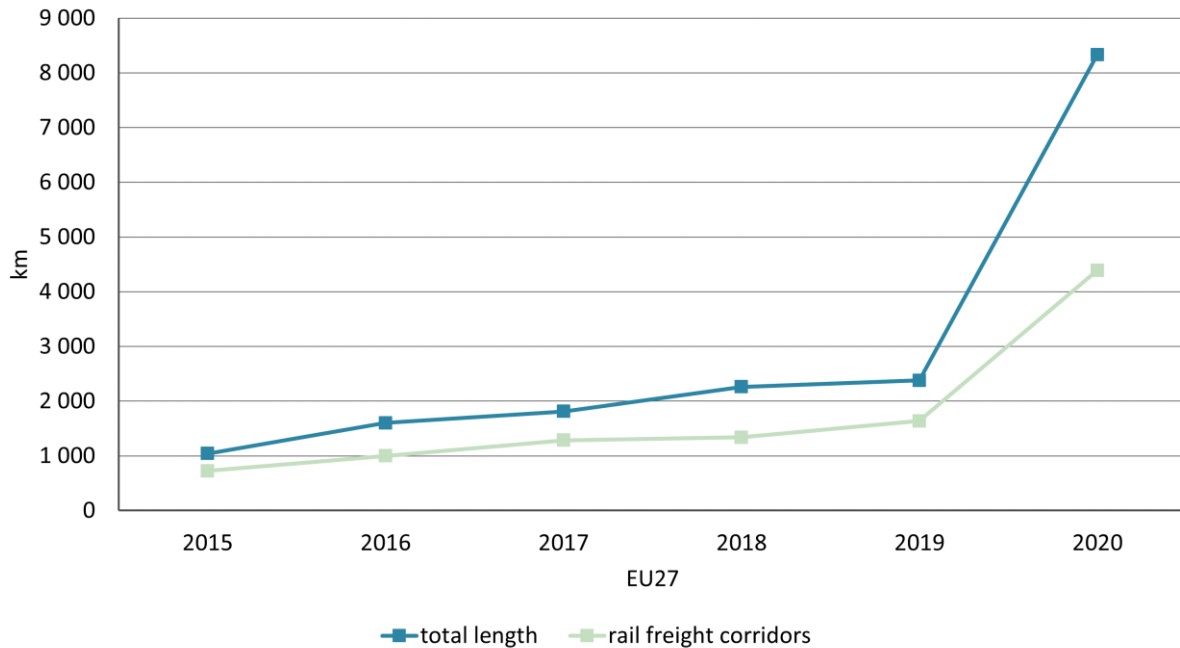
According to EU legislative provisions, infrastructure managers must survey the usage of infrastructure capacity and to meet all capacity requests in a fair and non-discriminatory manner. In case of capacity constraints, they must identify the reasons behind it and the measures to be taken in the medium to long term to satisfy additional requests. If, after coordination and consultation, train path demand cannot be matched, the relevant section of infrastructure must be declared congested.

¹⁰ Commission Implementing Regulation (EU) 2016/545 of 7 April 2016 on procedures and criteria concerning framework agreements for the allocation of rail infrastructure capacity (Text with EEA relevance) C/2016/1954, OJ L 94, 8.4.2016, p. 1–11.

Sections and nodes declared congested

Figure 71 shows the trends in the total length of track declared congested over the period 2015 to 2020 in the EU27. The congested tracks belonging to rail freight corridors, which are already included in the total congested tracks, are also reported separately in the chart for more clarity.

Figure 71: Total length of track declared congested (total and freight corridors) (km, 2015-2020)



Source: RMMS, 2022.

The total length of track declared congested in the EU27 has constantly risen since 2015 and increased sharply in 2020, reaching 8,332 kilometres, including 4,88 kilometres of rail freight corridors. Although an increase is observed in most Member States throughout the period, the impressive increase in the length of congested tracks (more than eight times the 2015 level, almost quadruple for parts included in rail freight corridors) is largely due to a change in the criteria used to declare a section congested in Italy¹¹ (see below). In addition, it is possible that congestion is underreported because declaration triggers several obligations.

Table shows the distribution by country of total length of track declared congested over the period 2015-2020.

¹¹ The choice of the methodology to define congestion is left to the national reporting authorities.

Table 5: Track declared to be congested (total including freight corridors) per country, (km, 2015-2020)

	2015	2016	2017	2018	2019	2020
AT	12	12	12	12	12	12
DE	507	681	731	731	798	821
DK	84	84	42	42	42	42
HU	0	58	58	0	0	0
IE	12	12	12	4	4	4
IT	163	387	152	240	221	5294
LT	0	0	293	591	591	758
NO	71	71	150	171	171	171
PL	4	4	0	0	0	0
RO	260	363	346	329	321	431
SE			165	267	345	650
SI	0	0	0	45	45	45

Source: RMMS, 2022.

The network with the greatest length of declared congested track is that of Italy. However, the sudden increase in congested sections in Italy is due to a change in reporting reflecting the new criteria imposed by the Italian rail regulator ART to declare a section of the network saturated. Until 2019 Italy reported in the RMMS the routes declared saturated ex-post, i.e. after the coordination of the path requests introduced by railway undertakings. This meant very few pieces of the network ended up in being actually declared saturated.

After the intervention of the regulator – i.e. from data 2020 – Italian authorities reported in the RMMS the routes declared saturated ex-ante, i.e. before the coordination process of capacity allocation. They explained that according to ART a section should now be considered saturated even if it exceeds the hourly saturation threshold (85% of capacity) just for one hour per day.

Besides Italy, Germany, Lithuania and Sweden were the countries reporting the highest number of kilometres of freight corridors congested (821, 758 and 650 respectively in 2020).

Only Italy declared 60 and 349 kilometres of a high-speed line as congested in 2019 and 2020 respectively, although this break in the series is also due to the new regulator's decision.

Table 6 shows the number of nodes declared congested according to Article 47.

Table 6: Nodes declared to be congested per country, (km, 2015-2020)

	2015	2016	2017	2018	2019	2020
DE	2	2	2	2	2	2
DK	1	1	1	1	1	1
EE	0	1	1	1	1	0
ES	0	0	0	0	3	3
HU	0	2	2	0	0	0
IE	2	2	3	2	2	2
IT	0	1	0	0	0	0
LT	0	0	2	4	4	6
LV		2	0	0	0	0
NL	0	1	0	0	3	2
NO	2	2	2	2	2	2
PL	1	1	0	0	0	0
RO	9		2	1	4	6
SE	6	4	5	6	5	19

Source: RMMS, 2022.

By far, Sweden reported the highest number of nodes (19) congested for 2020.

Principles for dealing with congestion

After a section of infrastructure has been declared congested, a new capacity enhancement plan needs to be developed or an existing one needs to be applied. For a new plan, the infrastructure manager must carry out a capacity analysis within 6 months, which results in the respective capacity enhancement plan within a further six months. Such plans must provide the reasons for the congestion, the likely future development of traffic, any constraints on infrastructure development as well as the options and costs for capacity enhancement, including likely changes to access charges. This forms the basis to take a decision to remediate the congestion. The users of the relevant congested infrastructure are to be consulted on the plan and its measures.

According to Article 31 of Directive 2012/34/EU, infrastructure managers may levy a charge which reflects the scarcity of capacity of the identifiable section of the infrastructure during periods of congestion. The declaration of congestion for the identified section of infrastructure is therefore a prerequisite for levying such a charge.

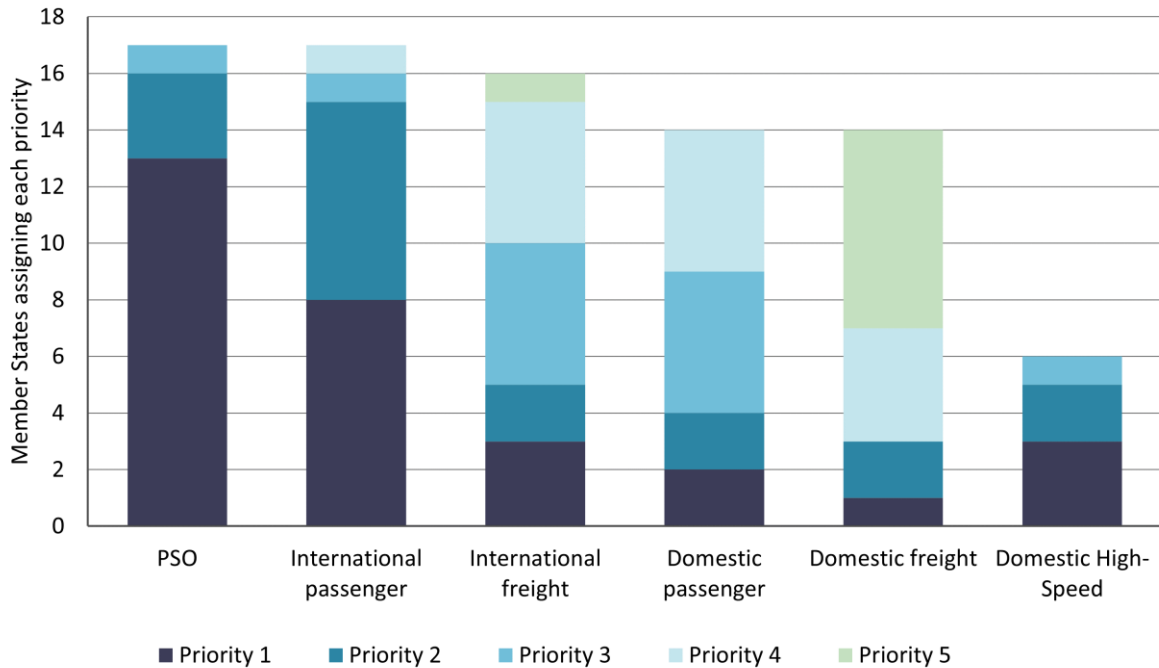
The infrastructure manager must cease levying any charges for the use of the relevant infrastructure if no capacity enhancement plan is produced or if no progress with the measures agreed in the plan is made. Otherwise, if the plan cannot be realised, or if the measures in the plan prove not to be viable, the infrastructure manager may continue to levy the charge in agreement with the regulatory body.

The infrastructure manager may also employ priority criteria to allocate infrastructure capacity, if scarcity charges are not levied, or have not achieved a change in traffic demand behaviour. The criteria need to reflect the importance of a service to society relative to any other service, which will consequently be excluded. The importance of transport services under public service requirements and of national or international rail freight have to be taken into consideration. Compensation to infrastructure managers for loss of revenues due to the capacity allocation to certain services may be granted, even including effects related to the exclusion of a service in another Member State. Procedures and criteria have to be described in the network statement.

Priority rules and priority services

Article 45 of Directive 2012/34/EU permits the infrastructure manager to give priority to specific services within the scheduling and coordination process, but only as set out in Articles 47 and 49 (congested and specialised infrastructure). Many infrastructure managers make use of priority rules, and the principal types of service given priority – as they have been reported in the RMMS – are summarised in Figure 72.

Figure 72: Principal types of services prioritised by infrastructure managers (number of MS assigning each priority level, 2020)



Source: RMMS, 2022.

Passenger services under PSO appear to be given the highest priority in a significant number of countries (13) whereas international passenger services are given the highest priority in 8 countries. Interestingly, only 4 countries reported giving the highest priority to freight (3 to international and 1 to domestic freight services).

Capacity restrictions due to infrastructure works

Infrastructure works are necessary to develop and maintain railway infrastructure, but at the same time they restrict available infrastructure capacity. The impact of capacity restrictions on international rail freight traffic appears to be particularly severe. This is because infrastructure managers usually prioritise the much faster and more punctual passenger trains, which leaves limited access to rail infrastructure for freight trains.

EU legislation¹² lays down rules to ensure there is a predictable schedule for and at least some level of coordination of infrastructure works across Member States. The purpose is to limit the impact of works on international rail traffic. Infrastructure works are subject to coordination rules, in particular along the rail freight corridors. However, coordination can only be effective if works are planned and executed in a timely manner.

The coordination of capacity restrictions across networks is challenging due to significant differences in the way infrastructure works are planned, financed, and executed in different networks. Sound planning and execution of infrastructure works by infrastructure managers require a reliable financial framework and appropriate incentives to improve performance. As most infrastructure managers are

¹² In particular Article 12 of Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight, OJ L 276, 20.10.2010, p. 22–32, and Annex VII point 8 of Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area, OJ L 343, 14.12.2012, p. 32–77.

dependent on public funding for at least part of maintenance and renewal expenditure, Member States have an important role to play.

EU legislation requires Member States to have contractual agreements¹³ between their competent authorities and infrastructure managers, among other things to ensure sound financing of infrastructure works.

5.8 5.8 Rail transport services covered by public service contracts

Where a competent authority wishes to put at the disposal of its citizens, in the general interest, rail services that an operator would not assume to the same extent or under the same conditions without a reward, it can impose public service obligations.

The notion of public service obligations and the conditions under which competent authorities may provide compensation for the discharge of such obligation are laid down in Regulation (EC) 1370/2007.

Where a competent authority decides to grant the operator of its choice an exclusive right and/or compensation in return for the discharge of public service obligations, it must do so within the framework of a public service contract, i.e. a legally binding act confirming the agreement between the authority and the operator.

Regulation (EC) 1370/2007 lays down the principle that, for land transport, public service contracts must be awarded based on a competitive award procedure. Since the adoption of the Fourth Railway Package, this principle applies also to rail, with some limited exceptions. In several Member States rail public service contracts are already competitively tendered. However, during a transitional period that ends on 24 December 2023, Member States may still award rail public service contracts directly.

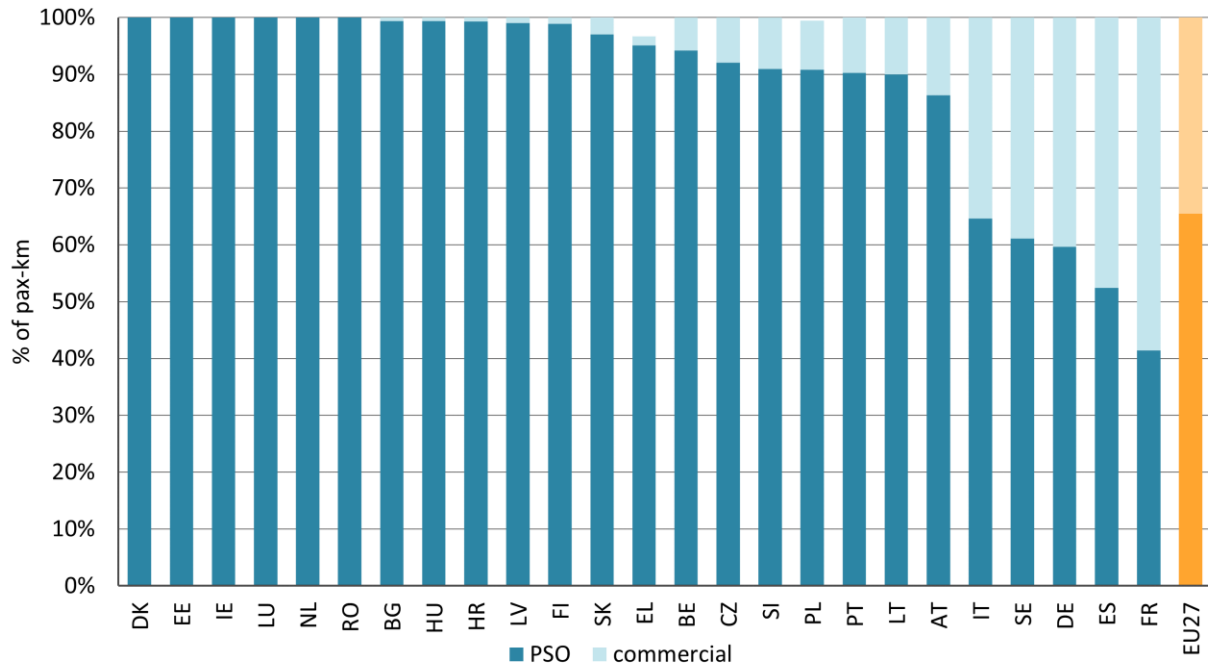
Each competent authority is required to publish once a year an aggregated report on: (i) the public service obligations for which it is responsible; (ii) the selected public service operators; and (iii) the compensation payments and exclusive rights granted.

¹³ Article 30(2) of Directive 2012/34/EU.

5.8.1 5.8.1 PSO scope

Figure 73 shows the share of passenger kilometres offered respectively under a PSO and commercial rail services per country in 2020.

Figure 73: Share of passenger traffic offered respectively under a PSO and commercial rail services per country (% of pax-km, 2020)



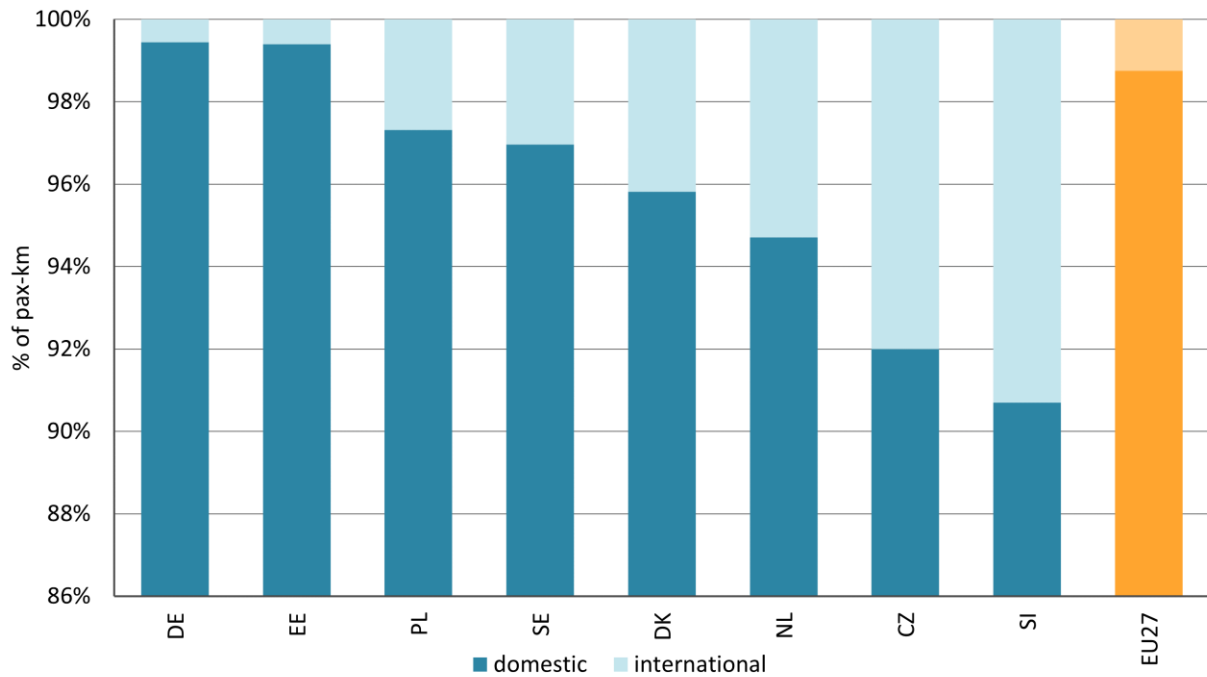
Source: RMMS, 2022. The data for BE, PT, EL and FR are estimates. RO not available.

In 2020, PSO passenger services represented on average 64% of the total passenger kilometres in the EU27, an increase compared to the average 60% reported for 2019. The rise in the share of passenger services provided under PSOs can be attributed to a more than proportional drop in the number of passenger-km in commercial services in the context of the pandemic.

According to RMMS data, all passenger traffic was covered by a PSO in Denmark, Estonia, Ireland, Luxemburg and the Netherlands. Many countries reported a PSO share of almost 100%. Over 30% of passenger kilometres are on commercially operated services in Italy, Sweden, Germany, Spain and France.

Services on a commercial basis without a PSO are typically provided in domestic long-distance and interurban markets. International services appear to be rarely provided under a PSO. Figure 74 shows the share of PSO passenger services offered respectively for domestic and international traffic per country in 2020, as reported in the RMMS by countries declaring to have international PSOs.

Figure 74: Share of PSO passenger services offered respectively for domestic and international traffic per country (% of pax-km, 2020)



Source: RMMS, 2022.

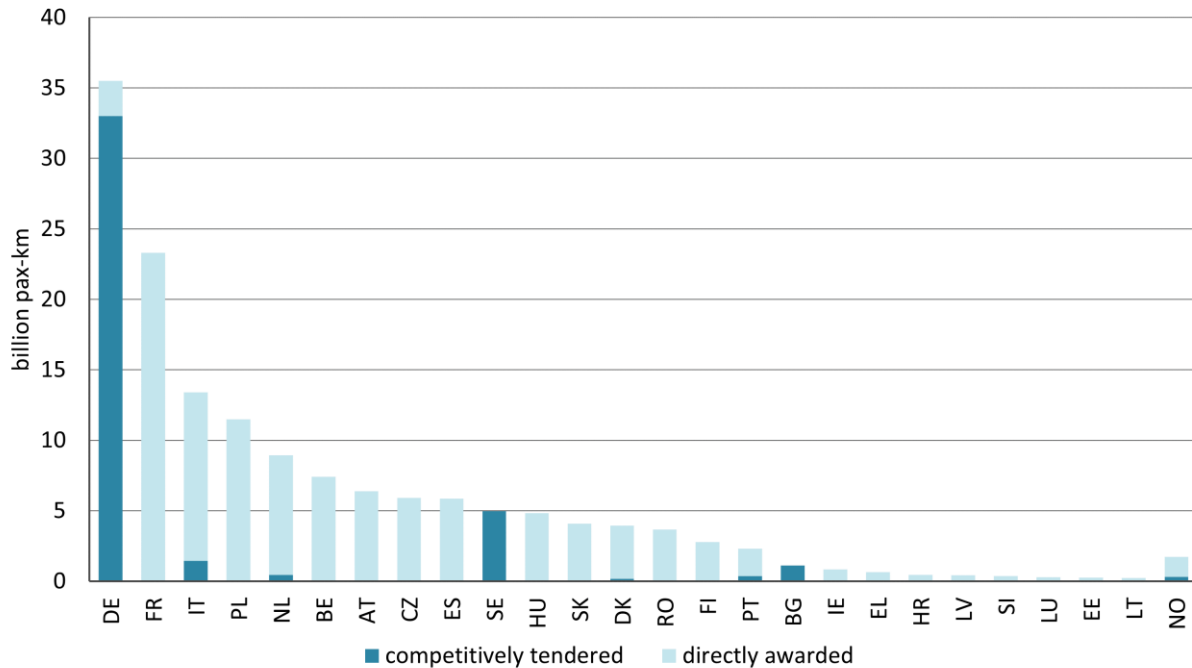
On average, in 2020, domestic passenger services represented 98.7% of the total PSO passenger kilometres in the EU27. Among countries that reported having international PSO services, Slovenia (9%), Czechia (8%) and the Netherlands (5%) had the highest share of international PSO services on total PSO services, whereas Germany and Estonia (0,6% respectively) had the smallest.

5.8.2 5.8.2 PSO award

Direct award versus tendering

Figure 75 shows the proportion of PSO services, measured in passenger kilometres, which were competitively tendered or directly awarded in 2020 per country.

Figure 75: PSOs competitively tendered and directly awarded per country (billion pax-km, 2020)



Source: RMMS, 2022.

Of the 149 million PSO passenger kilometres in the EU27 in 2020, 28% were on services which had been competitively tendered. This is a 2% increase compared to the 26% of PSO services tendered in 2018. The highest amount of competitively tendered volumes was in Germany with 93%. Similarly to 2018, in relative terms 92% of all the EU27 competitive tendering in 2020 occurred in the two Member States which liberalised their services early (80% in Germany and 12% in Sweden). According to RMMS data, limited competitive tendering was also introduced in Italy, Bulgaria, Portugal, Denmark and Norway.

Overview of PSO contracts awarded during the reported period

The RMMS collects information related to the size of PSO contracts (if any) awarded during any reference year. Figure 75 shows the size of directly awarded and competitively tendered contracts measured in train kilometres in 2020 per country:

- The numbers on the horizontal axis show the number of contracts awarded, where this is more than one.
- The length of the bars on the figure shows the range between the smallest and largest contract of each type awarded in each state.

Member state	Number of PSOs competitively tendered 2020	Smallest PSO contract competitively tendered 2020 [m train-km]	Largest PSO contract competitively tendered 2020 [m train-km]	Number of PSOs directly awarded 2020	Smallest PSO contract directly awarded 2020 [m train-km]	Largest PSO contract directly awarded 2020 [m train-km]
SE	5	1701.00	7500.00			
IT	2	2.13	10.88	19	0.27	35.53
DE	9	0.26	5.72	7	0.22	20.70
AT				8	0.29	40.73
HR				1	0.00	12.82
CZ				7	0.05	3.32
DK				2	0.79	2.22
EE				2	0.03	5.18
FR				2	16.80	46.50
EL				18	0.11	8.27
HU				2	5.29	73.51
LV				2	0.05	5.72
LT				1	0.00	5.96
PL				12	2.43	47.76
PT				1	0.00	25.00
SI				1	0.00	10.59

Source: RMMS, 2022. Correction of error of magnitude for Largest PSO contract directly awarded in PL 2020.

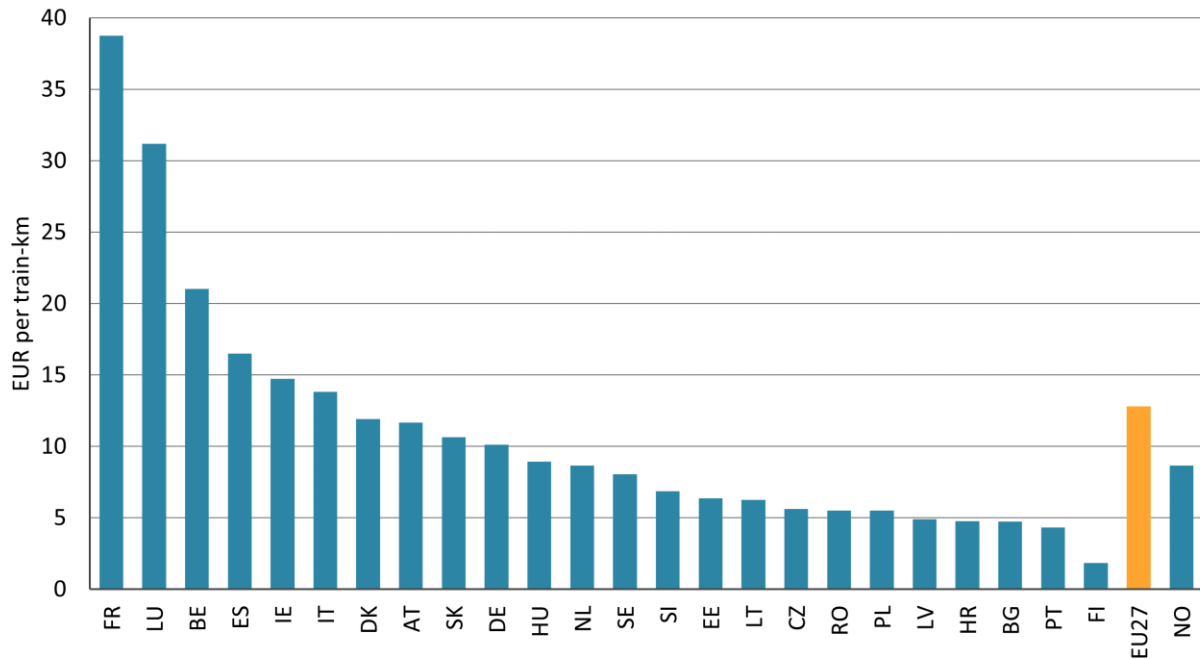
Sweden reported both the largest and smallest PSO contract competitively tendered in 2020. The second largest competitively tendered PSO contract was reported by Italy, covering more than 10 million train kilometres. The largest directly awarded PSO contract was reported by Hungary, covering 73 million train kilometres. A few countries have several directly awarded PSO contracts of remarkable size (Italy, Germany, Austria, Czechia, Greece, and Poland); others reported just one or two contracts.

5.8.3 5.8.3 PSO compensation

Apparent levels of PSO compensation

Figure 76 shows the apparent average levels of PSO compensation measured in EUR per train kilometre in 2020 per country.

Figure 76: Apparent average PSO compensation per country (EUR per train-km, 2020)



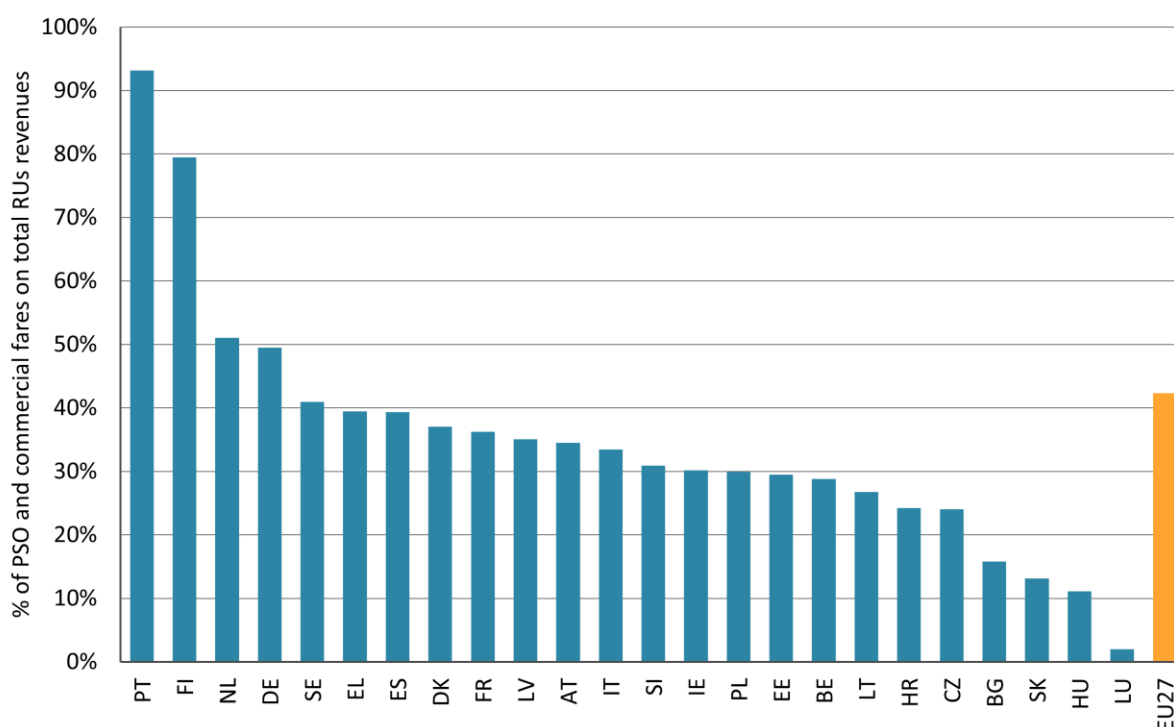
Source: RMMS, 2022. SK 2020 estimated, EL 2020 unavailable.

Total revenues from passenger services are composed by fare revenues from commercial services, fare revenues from PSO services and PSO compensation. In 2020, the apparent average PSO compensation in the EU27 was EUR 12.81 per train kilometre, a sizeable increase compared to the average EUR 10.51 reported for 2018. France and Luxembourg have the highest apparent average PSO compensation (EUR 38.75 and EUR 31.20 per train kilometre respectively); in contrast, Finland reported the lowest compensation (EUR 1.83).

Share of PSO and commercial fares on total revenues of railway undertakings

Figure 77 shows the share of PSO and commercial fares in the total revenues of railway undertakings in 2020 per country. Total revenues include PSO fares, commercial fares and PSO compensation, but exclude PSO operators' revenue from other sources, such as catering, car parking and concessions on stations.

Figure 77: Share of PSO and commercial fares on total revenues of railway undertakings (% in 2020)



Source: RMMS, 2022. Norway declared data as confidential. PT 2020 is an EC estimate, RO 2020 unavailable.

In 2020, the share of PSO and commercial fares in the total revenues of railway undertakings in the EU27 was on average 41%, compared to 47% in 2018. In Portugal, PSO and commercial revenues account for more than 90% of total operator revenues, whereas Luxembourg shows the lowest coverage (2%).

5.9 5.9 Degree of market opening and utilisation of access rights

EU legislation has provided for an incremental opening of the rail market gradually over the years.

- In 2001, the First Railway Package granted access to international freight services on the Trans-European Rail Freight Network as of 1 January 2003;
- In 2004, the Second Railway Package liberalised international and domestic rail freight services as of 1 January 2007;
- In 2007, the Third Railway Package liberalised international passenger services including cabotage as of 1 January 2010;
- In 2016, the Fourth Railway Package, through Directive 2016/2370/EU and Regulation (EU) 2016/2338, liberalised the remaining domestic passenger services as of 2021¹⁴, subject to measures to protect PSOs.

Some Member States, however, opened their rail markets in advance of the creation of a formal right of entry through EU liberalisation. On the other hand, in other cases, legal market opening has not resulted in any significant market entry by competitors.

¹⁴ More precisely, the new rules apply from 1 January 2019 in time for the working timetable starting on 14 December 2020.

5.9.1 5.9.1 Opening of the freight market

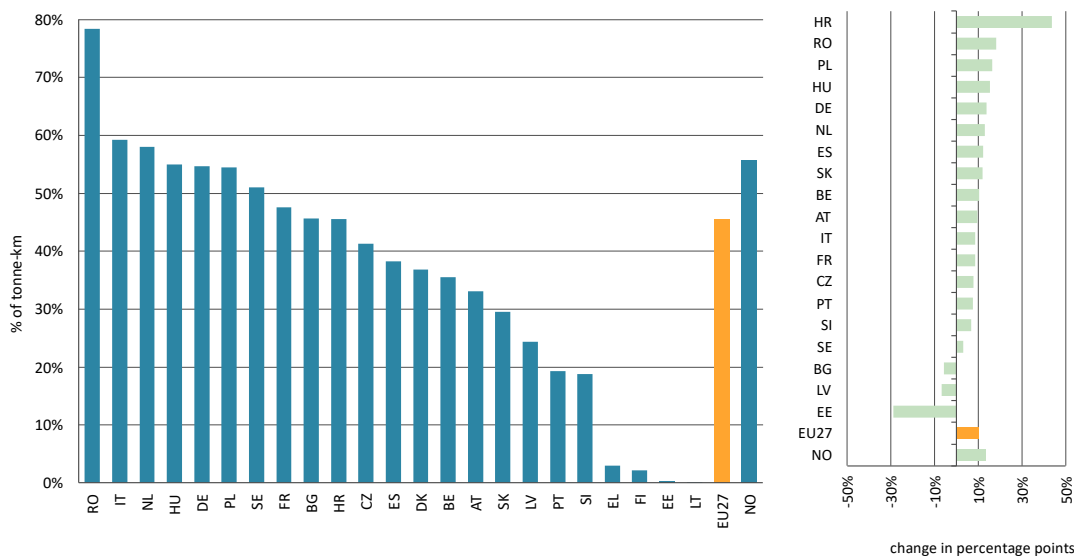
The following paragraphs provide an overview of the competitive environment at the end of 2020, 14 years after the liberalisation of rail freight services in the EU in 2007.

Evolution of competitors' market share in the freight market

The competitors' average market share in the EU27 rail freight market increased from 35% to 46% between 2015 and 2020.

Figure 78 shows the shares of the domestic freight markets, as measured in tonne kilometres, which are not served by the historic incumbent operator. The chart on the right shows the change in percentage points of the competitors' market share between 2015 and 2020.

Figure 78: Competitors' market share in the rail freight market per country (% in 2020) and change in percentage points (2015-2020)



Source: RMMS, 2022. NL 2015 adjusted. RO 2015, LV 2020 and PL 2020 estimated. DK, FI, EL, IE, LV, LT and LU for 2015 not available.

Competitors have the largest market share in Romania (78%), and the smallest in Estonia and Lithuania (0.2% and 0.1% respectively). The highest growth between 2015 and 2020 was reported for Croatia (44 percentage points), whereas a major decline was reported in Estonia (29 percentage points).

5.9.2 5.9.2 Opening of the passenger market

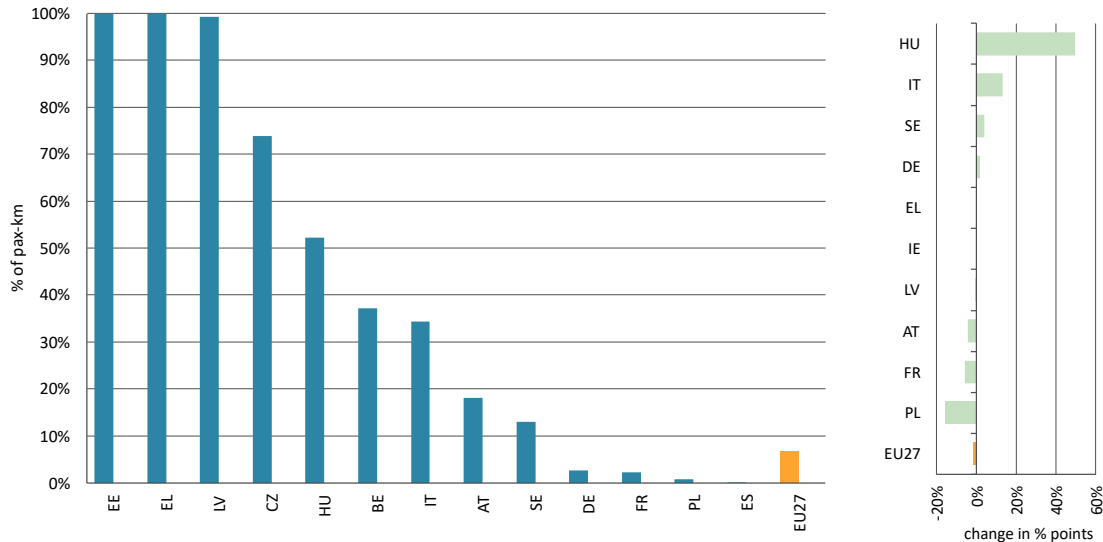
The following paragraphs provide an overview of the competitive environment existing both in the commercial and in the PSO rail passenger services at the end of 2020. This means that the domestic market opening imposed by the Fourth Railway Package cannot yet be reflected in the data; the presence of alternative operators depends on whether and how far a country decided to open its passenger market before the date imposed by the EU legislation.

Evolution of competitors' market share in the commercial passenger market

On average, competitors had a 6.6% market share in national commercial passenger markets in the EU27 in 2020, a decrease of 1.9 percentage points compared to 2015.

Figure 79 shows the shares of the commercial (non-PSO) passenger market, as measured in passenger kilometres, which are not served by the historic incumbent operator. The chart on the right shows the change in percentage points of the competitors' market share between 2015 and 2020.

Figure 79: Competitors' market share in the commercial passenger market per country (% in 2020) and change in percentage points (2015-2020)



Source: RMMS, 2022. NO declared data as confidential. BG, DK, FI, HR, LT, PT and SI reported no competitors in commercial services with a market share of 1% or more for 2020. There were no commercial passenger services in IE and RO. No data were available for NL, LU and SK.

Competitors dominate the commercial passenger market in Estonia, Greece and Latvia. Poland and Spain reported the lowest competitors' market shares in the segment (0.7% and 0.1% respectively)¹⁵, with Poland having reported also the largest drop since 2015 (-16 percentage points).

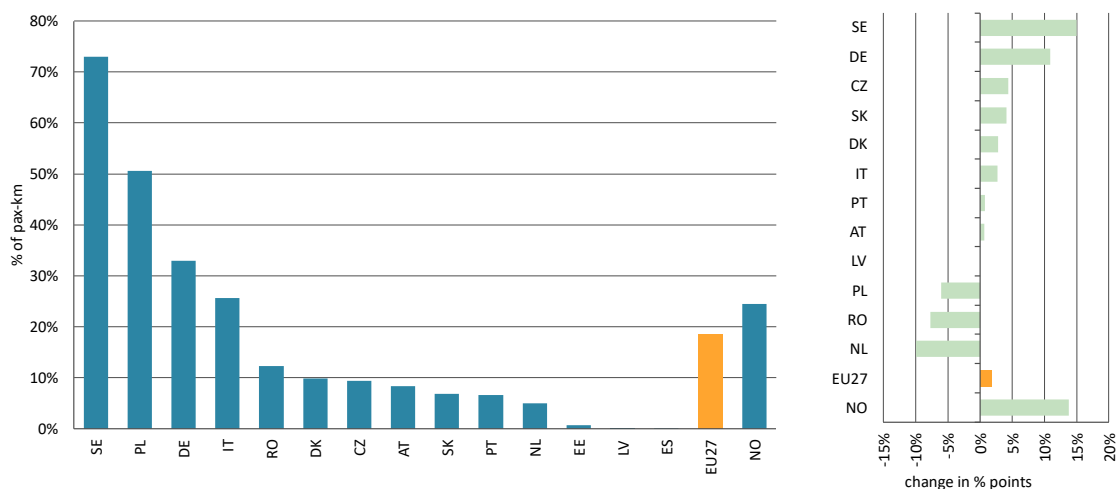
Evolution of competitors' market share in the PSO passenger market

On average, competitors had a 18.5% market share on national PSO passenger markets in the EU27 in 2020. This level increased slightly compared to 2015 (+ 1.9 percentage points).

Figure 81 shows the shares of the PSO passenger market, as measured in passenger kilometres, which are not served by the historic incumbent operator. The chart on the right shows the change in percentage points of the competitors' market share between 2015 and 2020.

¹⁵ In general. Volumes of commercial services in these markets are relatively low.

Figure 81: Competitors' market share in the PSO passenger market per country (% in 2020) and change in percentage points (2015-2020)



Source: RMMS, 2022. The data for PT 2015 represent an estimate. No competitors in the PSO passenger market were reported by BE, BG, HR, EE, FI, FR, EL, HU, IE, LT, LU, SI and ES.

In 2020, competitors had the highest market shares of the PSO passenger market in Sweden (73%) and Poland (50,6%). In Latvia and Spain, by contrast, only 0.1% were in the hands of competitors. The highest growth of competitors' market shares was reported by Sweden (+ 15 percentage points between 2015 and 2020), whereas a major decline was reported for the Netherlands (-10 percentage points).

Scope for regulatory bodies to limit open access in the passenger market

The Fourth Railway Package opened domestic passenger markets to competition in all Member States¹⁶. Railway undertakings must be granted the right of access to railway infrastructure in all Member States for the purpose of operating rail passenger services under equitable, non-discriminatory and transparent conditions.

The EU legislator, however, put in place mechanisms to balance the objective of effectively opening up the market for domestic 'open access' rail passenger services with the need to protect the economic equilibrium of services provided under an existing public service contract. Member States can therefore restrict open access to their rail infrastructure where the national rail regulatory body decides, on the basis of an objective economic analysis, that the new service would cause substantial damage to the economic equilibrium of the existing public service contract in terms of profitability of the services or higher net cost to the competent authority.

In November 2018, the Commission adopted Implementing Regulation (EU) 2018/1795 laying down the procedure and criteria for the application of the economic equilibrium test (EET) adapted to a rail market fully open to competition¹⁷. The regulation covers:

- rules for notification of a planned new rail passenger service to infrastructure managers and regulatory bodies;
- the deadline for requesting the economic equilibrium test;

¹⁶ See in particular Directive 2016/2370 amending Directive 2012/34/EU.

¹⁷ Commission Implementing Regulation (EU) 2018/1795 of 20 November 2018 laying down procedure and criteria for the application of the economic equilibrium test pursuant to Article 11 of Directive 2012/34/EU of the European Parliament and of the Council, OJ L 294, 21.11.2018, p. 5–14.

- information requirements and procedure for the economic equilibrium test;
- contents of the economic equilibrium test and assessment criteria; and
- cooperation between regulatory bodies competent for a proposed new international passenger service.

A number of regulators published on their websites further details on the methodology they follow when implementing the economic equilibrium test.

Several economic equilibrium tests have been required and performed in Member States, now also under the new Regulation. A non-exhaustive list is set out below:

- **Request for an economic equilibrium test rejected**
 - FR: request of Région Hauts-de-France concerning new international service by Flixbus, 2020
 - CZ: request of Ministry of Transport concerning new international rail passenger service by Leo Express, 2019
 - FR: request of French State concerning new domestic service by Flixbus, 2019
 - PL: Leo Express, withdrew request for entry before a decision was taken, 2017
- **Economic equilibrium test performed, positive decision for the new service**
 - FR: request of competent authority of Normandie concerning two new domestic services by Railcoop, 2021
 - FR: request of competent authority of Bourgogne-Franche-Comté concerning two new domestic services by SNCF Voyageurs and Railcoop, 2021
 - FR: request of Régions Bourgogne-FrancheComté et Auvergne-Rhône-Alpes concerning new domestic service by Flixbus, 2020
 - FR: request of Région Occitanie concerning new domestic service by Flixbus, 2020
 - ES: request of RENFE Viajeros concerning a new international service by Arriva Spain Rail, 2018
 - PL: five cases about new domestic services by Arriva, 2017
 - FR: request of Region Provence-Alpes-Côte d’Azur concerning new international service by Thello, 2013
- **Economic equilibrium test performed, negative decision for the new service**
 - PL: one case about new domestic service by Arriva, 2017.

The decisions are usually available on the respective regulator’s website.

5.9.3 5.9.3 Challenges of market opening

Interoperability

Technical aspects can have a major impact on the capacity of operators to provide their rail transport services across borders and in different countries.

Differences in track gauges and electric current available for traction (presented in Table 7) mean that the same locomotives and wagons cannot be used in all countries. An expansion of activities across borders could imply in some cases that the railway undertaking must arrange for new rolling stock and new traction vehicles.

Table 7: Main railway gauge and electric current used per country (2020)

	Track gauge	Electric current		
	Mm	dc volts	ac volts	
BE	1 435	3 000	25 000	50 HZ
BG	1 435		25 000	50 HZ
CZ	1 435	3 000	25 000	50 HZ
DK	1 435	3 000	25 000	50 HZ
DE	1 435	800-1 200 (contact rail)	15 000	16.7 Hz
EE	1 520	3 000		
IE	1 600	1 500		
EL	600			
	1 000			
	1 435		25 000	50 HZ
ES*	1 000	1 500		
	1 435		25 000	50 HZ
	1 668	3 000		
FR	1 000	750-850 (contact rail)		
	1 435	1 500	25 000	50 HZ
HR	1 435	3 000	25 000	50 HZ
IT	1 435	3 000	25 000	50 HZ
CY	-	-	-	-
LV	1 520	3 000		
LT	1 520		25 000	50 HZ
LU	1 435		25 000	50 HZ
HU	1 435		25 000	50 HZ
MT	-	-	-	-
NL	1 435	1 500		
AT	1 435		15 000	16.7 Hz
PL	1 435	3 000		
PT	1 000			
	1 668		25 000	50 HZ
RO	1 435		25 000	50 HZ
SI	1 435	3 000		
SK	1 435	3 000	25 000	50 HZ
FI	1 524		25 000	50 HZ
SE	1 435		15 000	16.7 Hz

Source: Union Internationale des Chemins de Fer, railway companies

Notes: 1 435 mm = standard gauge

* ES: new lines have a gauge of 1 435 mm and an electric current of 25 000 volts, 50 Hz

Source: Statistical pocketbook 2022.

Rolling stock and traction market

Smooth and non-discriminatory access to rolling stock is fundamental for alternative rail operators to enter new markets or to extend their service offer.

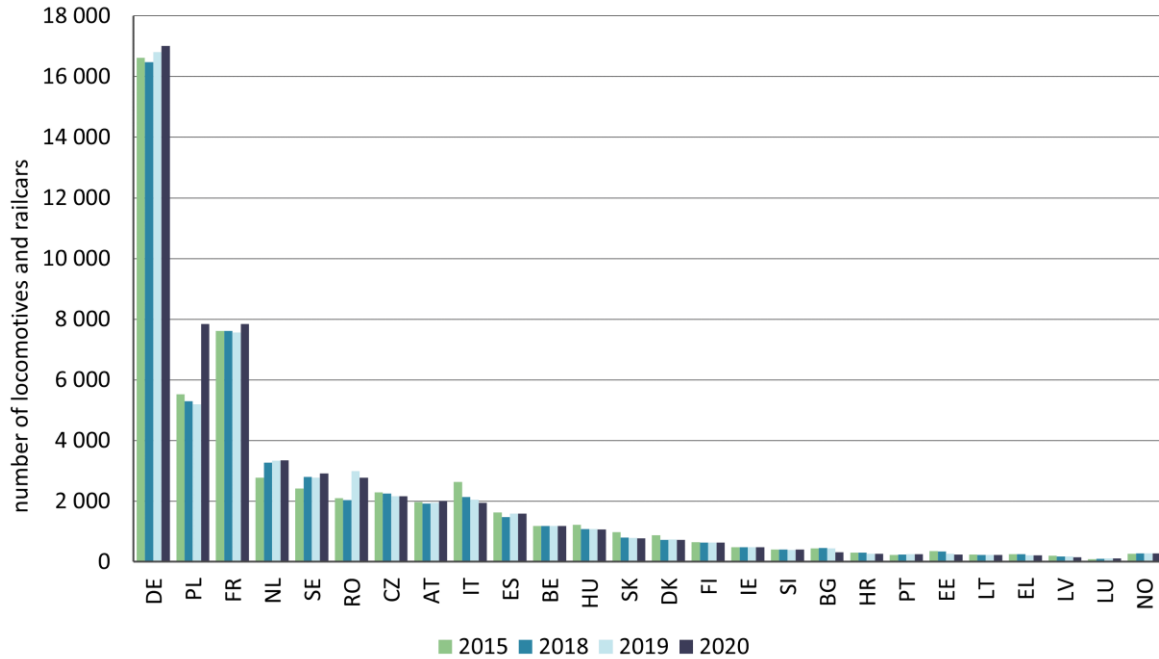
Alternative, smaller passenger operators, in particular, sometimes lack the appropriate financial resources to engage in significant investments to buy new rolling stock in order to enter a new domestic market in open access or to compete for bigger PSO contracts. Further to this, the secondary and leasing markets for rolling stock can be very limited, making it harder for new entrants to access rail markets.

Adequacy of the rolling stock also can be a significant deterrent for market entry in terms of compatibility with the technical specifications of the infrastructure.

Locomotives must be compatible with the infrastructure on which they are to be operated, with compatibility determined by track gauge, structure gauge, coupling and signalling equipment and, if electrified, the electrification system (which may use trackside rails or overhead catenary supplying power at several different voltages).

Figure 82 shows the number of locomotives and railcars by country in 2015 and from 2018 to 2020.

Figure 82: Stock of locomotives and railcars (number per country, 2015 and 2018-2020)

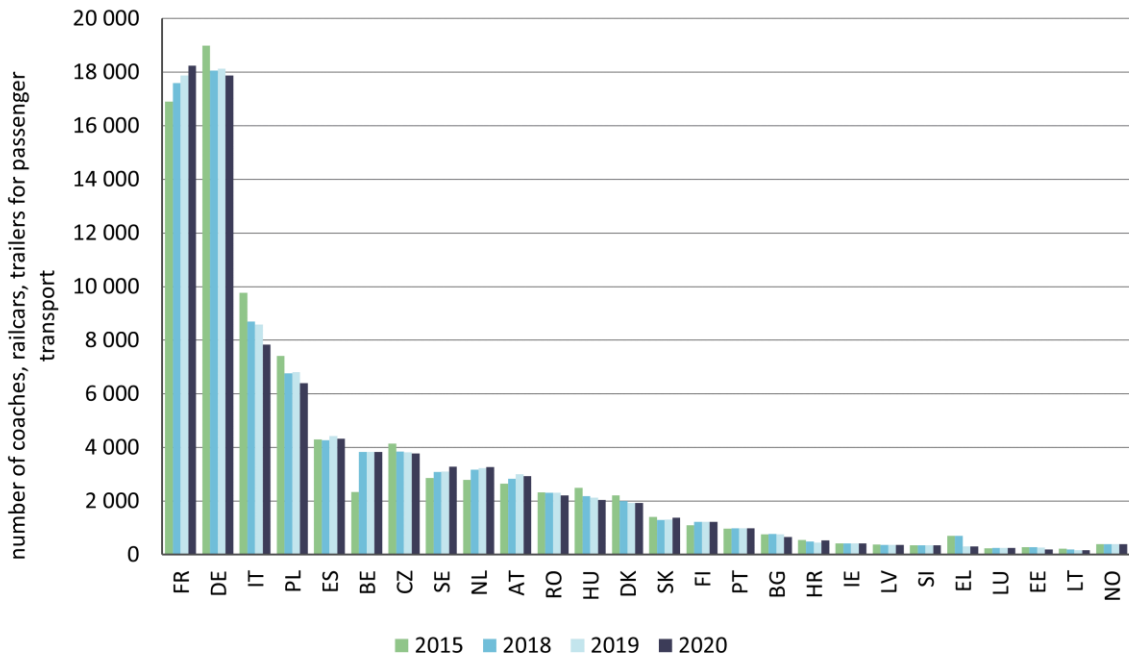


Source: Statistical pocketbook 2022.

The fleet size ranges from 119 locomotives and railcars in Luxemburg up to 17 010 in Germany. Among countries with the biggest fleets (Germany, Poland, France, the Netherlands, Sweden), fleets have increased in size between 2015 and 2020, whereas in countries with smaller fleets the opposite trend is observed (smaller fleets in 2020 than in 2015).

Figure 83 shows the number of coaches, railcars, trailers for passenger transport by country in 2015 and from 2018 to 2020.

Figure 83: Stock of coaches, railcars, trailers for passenger transport (number per country, 2015 and 2018-2020)

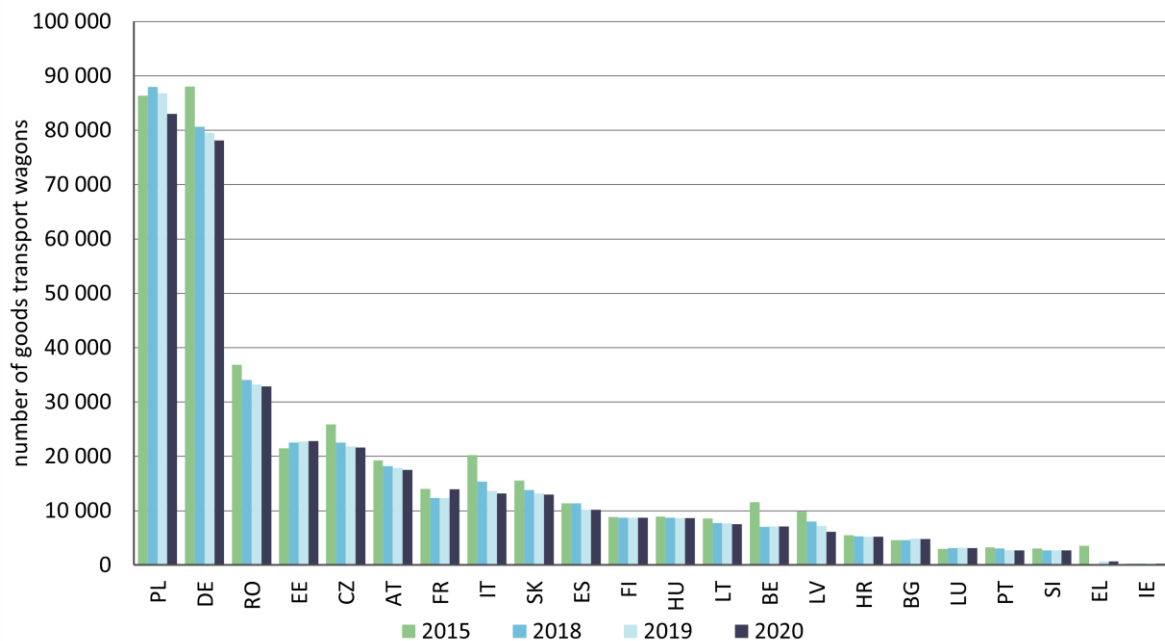


Source: Statistical pocketbook 2022.

The fleet size ranges from 165 coaches, railcars, and trailers for passenger transport in Lithuania up to 18 246 in France. Compared to 2015, increases can be observed notably for France and decreases, among others, in Germany, Italy and Poland).

Figure 84 shows the number of goods transport wagons by country in 2015 and from 2018 to 2020.

Figure 84: Stock of goods transport wagons (number per country, 2015 and 2018-2020)



Source: Statistical pocketbook 2022. Data missing for DK, NL, SE, and NO.

The fleet size ranges from 254 goods transport wagons in Ireland up to 83 011 in Poland. Compared to 2015, a decrease in fleet numbers can be observed in most countries.

Ticketing

The choice for consumers to purchase cross-border/cross-operator rail tickets is rather restricted today. This situation strongly reduces the possibility to aggregate different travel options and combine separate tickets or even buy a single ticket covering the entire journey (through-ticketing), especially when multiple train operators are involved. This harms passengers' choice and hinders fair competition between different rail transport providers.

In 2023, the Commission intends to propose legislation on multimodal digital mobility services. It aims to promote competition and innovation in the development of digital mobility platforms which facilitate passenger's ability to compare and buy tickets and mobility products, within and across transport modes. At the same time, the proposed revision of Delegated Regulation 2017/1926 on the provision of EU-wide multimodal travel information services and the proposed revision of the Technical Specifications for Interoperability on telematics applications for passenger services will support the availability of data which is essential to offer ticketing and digital mobility services.

Removing the barriers to ticket distribution will ensure a truly level playing field among operators and across Member States, help open the market, better integrate rail into the wider transport system and benefit consumers.

5.10 5.10 State aid

Public funding represents a significant part of rail sector financing, not only to build and maintain railway infrastructure, but also to fund unprofitable passenger transport services.

Specific Commission guidelines¹⁸ concern the implementation of Articles 93 and 107 of the Treaty on the Functioning of the European Union (TFEU) clarifying the rules governing public funding for railway undertakings. However, these guidelines date back to 2008 and they are no more fit to be applied to the current regulatory framework of the rail market.

The revision of the Railway Guidelines also envisages the parallel adoption of a new legal instrument ("Block exemption Regulation") that would allow the Commission to exempt from prior notification under State aid rules public financing which is historically not problematic. In July 2022, the Commission adopted a Proposal for a Council Enabling Regulation. The regulation was adopted on 19/12/2022¹⁹.

Table 8 provides a list of the State aid cases for which a decision was taken between 2019 and 2020 (the list of decisions from 2015 to 2018 is available on the 7th RMMS report).

¹⁸ The Commission guidelines provide guidance on the compatibility with the TFEU of State aid to railway undertakings (Communication from the Commission — Community guidelines on State aid for railway undertakings, OJ C 184, 22.7.2008, p. 13–31 available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52008XC0722%2804%29>)

¹⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32022R2586>

Table 8: State aid decisions 2019-2020

Case number	Working title	Member state	Decision date	Decision document/link
SA.52499	Extension of the Integrated Transport Scheme in the Province of Trento, Italy	Italy	06.03.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_52499
SA.51613	Luxembourg/Aide transport combiné	Luxembourg	08.07.2019	https://ec.europa.eu/competition/state_aid/cases1/201934/280856_2090072_126_3.pdf
SA.52898	Financial measure to stimulate rail freight	Netherlands	08.07.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_52898
SA.51559	Prolongation de l'aide au service transitoire d'autoroute ferroviaire alpine	France	02.08.2019	https://ec.europa.eu/competition/state_aid/cases1/201946/281308_2108674_126_2.pdf
SA.51714	proroga dell'aiuto al servizio transitorio di Autostrada Ferroviaria Alpina	Italy	02.08.2019	https://ec.europa.eu/competition/state_aid/cases1/201946/275707_2108676_133_2.pdf
SA.55443	Aid for the implementation of projects to reduce noise emissions by freight wagons	Poland	02.10.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55443
SA.54860	Mode Shift Revenue Support (MSRS) scheme	United Kingdom	18.10.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_54860
SA.55353	Programme to support innovation in rail freight transport	Germany	18.10.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55353
SA.53158	Aide à l'exploitation de services réguliers de transport combiné de marchandises alternatifs au mode tout routier pour la période 2018-2022	France	29.10.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_53158
SA.55451	Nederland - Support for ERTMS-upgrade	Netherlands	05.11.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55451
SA.55025	Norma merci - misure di supporto al trasporto ferroviario delle merci in Italia per gli anni 2020 - 2021 - 2022	Italy	15.11.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55025
SA.55443	Aid for the implementation of projects to reduce noise emissions by freight wagons	Poland	16.12.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55443
SA.55507	Aid for the provision of rail freight services in the context of the rolling highway	Austria	16.12.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55507
SA.55606	Prolongation of the State aid scheme supporting combined transport in the Province of Bolzano	Italy	16.12.2019	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_55606
SA.56001	Individual aid measures to support rail freight transport infrastructure in Saxony-Anhalt	Germany	17.02.2020	https://ec.europa.eu/competition/state_aid/cases1/202026/283912_2166990_64_2.pdf
SA.54102	Scheme to support rail infrastructure related to freight transport in Saxony-Anhalt	Germany	17.02.2020	https://ec.europa.eu/competition/state_aid/cases1/202026/283912_2166990_64_2.pdf
SA.39078	Financing of the construction of the Fehmarn Belt fixed link	Denmark	20.03.2020	http://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_39078
SA.39078	Financing of the Fehmarn Belt Fixed Link project	Denmark	20.03.2020	https://ec.europa.eu/competition/state_aid/cases1/202016/280910_2147483_492_2.pdf
SA.52716	Construction of TREEDEN GROUP transshipment terminal at the PKP LHS Station in Wola Baranowska	Poland	31.03.2020	https://ec.europa.eu/competition/state_aid/cases1/202026/277604_2166265_148_2.pdf
SA.56718	Incentives for rail transport	Italy	24.04.2020	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_56718
SA.53615	Interventions in favour of the city of Genoa - modification of the Ferrobonus measure	Italy	15.05.2020	https://ec.europa.eu/competition/elojade/iseif/case_details.cfm?proc_code=3_SA_53615

Case number	Working title	Member state	Decision date	Decision document/link
SA.57271	Prolongation of the Funding Guidelines for noise reduction measures on freight wagons	Germany	06.07.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_57271
SA.57675	COVID-19 - scheme for regional and local public passenger transport	Germany	07.08.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_57675
SA.57809	Prolongation and amendment of the scheme for the support of ERTMS equipment	Denmark	07.09.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_57809
SA.57556	Prolongation du régime de promotion du transport combiné ferroviaire et du trafic diffus pour 2021.	Belgium	11.09.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_57556
SA.57886	Environmental compensation for rail freight transport	Sweden	12.10.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_57886
SA.58738	COVID-19 - Support for regional and long-distance public passenger transport	Netherlands	03.11.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_58738
SA.57371	COVID-19 - Support for rail freight sector	Austria	25.11.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_57371
SA.58046	Support for services provided to rail freight (single wagon)	Germany	04.01.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_58046
SA.55912	Prolongation of the aid scheme for combined transport in the Province of Trento	Italy	10.01.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_55912
SA.59747	COVID-19: Damage compensation to operators of rail passenger services that concluded net-cost public service contracts	Denmark	21.12.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_59747
SA.43127	Restructuring of the Polish Regional Railways	Poland	23-01-2018 20-04-2021	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_43127
SA.55861	CZ ERTMS Prolongation	Czechia	27.02.2020	https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_55861

Source: DG COMP, 2022.

5.11 5.11 Regulatory bodies

Under Directive 2012/34/EU, regulatory bodies have the power to act, of their own accord or in response to a complaint, to:

- prevent/redress discrimination;
- check access to the network and service facilities, charging, capacity allocation;
- monitor the competitive situation;
- adopt non-binding opinions on the infrastructure managers' business plans, contractual agreements with the Member States on infrastructure financing, capacity enhancement plans;
- audit the accounts of railway undertakings, operators of service facilities and infrastructure managers to check accounting separation;
- draw conclusions from the accounts on State aid, informing competent authorities; and
- perform the economic equilibrium test.

The Fourth Railway Package further extended the scope of regulatory bodies' powers to check:

- discrimination in traffic management, infrastructure renewals, maintenance;
- compliance with separation requirements; and
- conflicts of interest.

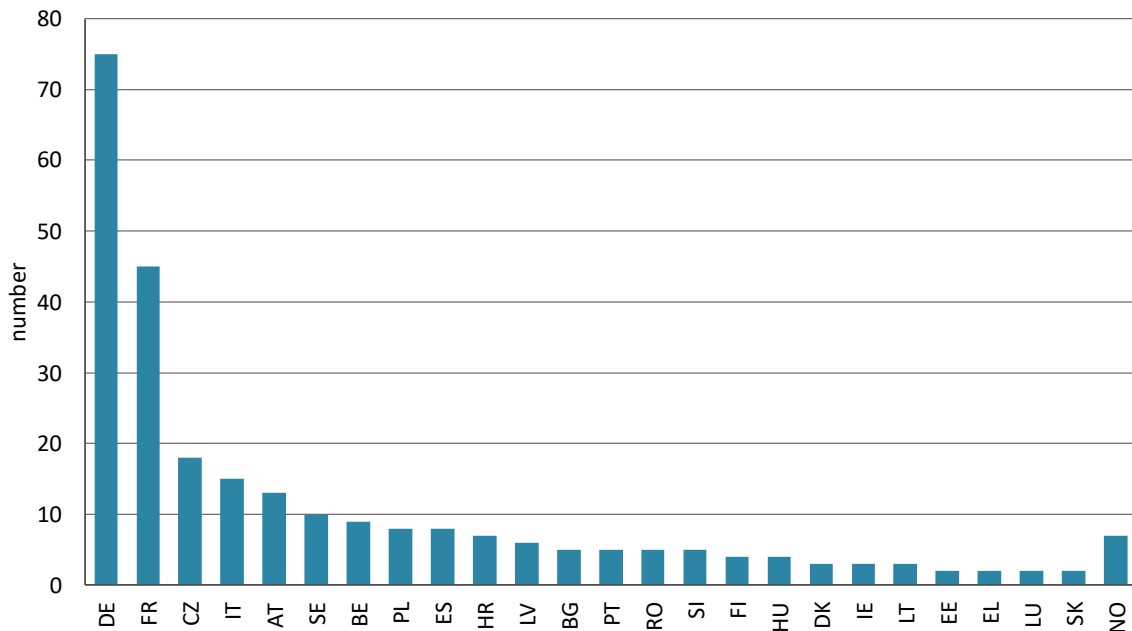
To comply with their duties, EU law gives regulators the power to request information, including data for market monitoring, from all actors and to impose penalties and fines if there is no reply. Regulatory bodies' decisions, which must be published, should be immediately binding and not subject to control by another administrative instance (judicial review).

Directive 2012/34/EU (Article 57) requires national regulatory bodies to cooperate among themselves and with other authorities. Regulatory bodies must exchange information on decision-making principles and practice and on the problems of interpreting transposed EU railway law; in order to do so, they have to participate and work together in a network that convenes at regular intervals, i.e. the European Network of Rail Regulatory Bodies (ENRRB).

Directive 2012/34/EU requires Member States to staff and manage their regulatory bodies in a way that guarantees their independence.

Figure 85 shows the reported numbers of staff in the regulatory bodies per country.

Figure 85: Regulatory bodies staff dealing with rail market access (number, as available to the Commission in June 2022)



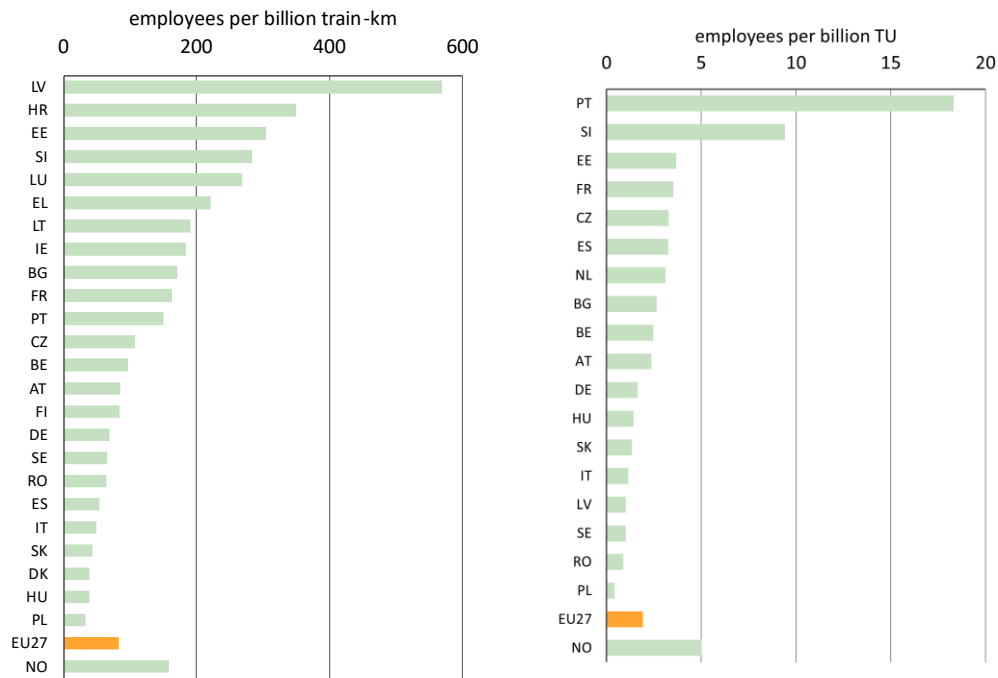
Source: DG MOVE, 2022. NL declared data confidential.

In the EU27, there are 279 employees of regulatory bodies dealing with rail market access, which is quite a significant increase compared to 2020 data (+ 23%)²⁰.

Figure 86 shows the number of each regulatory body's employees in relation to the total passenger and freight train kilometres, as a measure of the market within their remit.

²⁰ 7th RMMS report, 2020.

Figure 86: Regulatory bodies staff dealing with rail market access (employees, as available to the Commission in June 2022, per billion train-km and per billion transport units²¹, 2020)



Source: DG MOVE, 2022. PT 2020 total volume passenger services was corrected due to an error of magnitude. NL declared data confidential. No data on employees per billion TU for HR, CY, DK, HU, IE, LT, LU.

5.12 5.12 Development of employment and social conditions in the rail market

5.12.1 5.12.1 Employment in rail

In 2020, over 910,000 staff were reported as employed in the EU27 railway sector, about 523,000 of them by railway undertakings (both main and alternative operators) and 387,000 by infrastructure managers²².

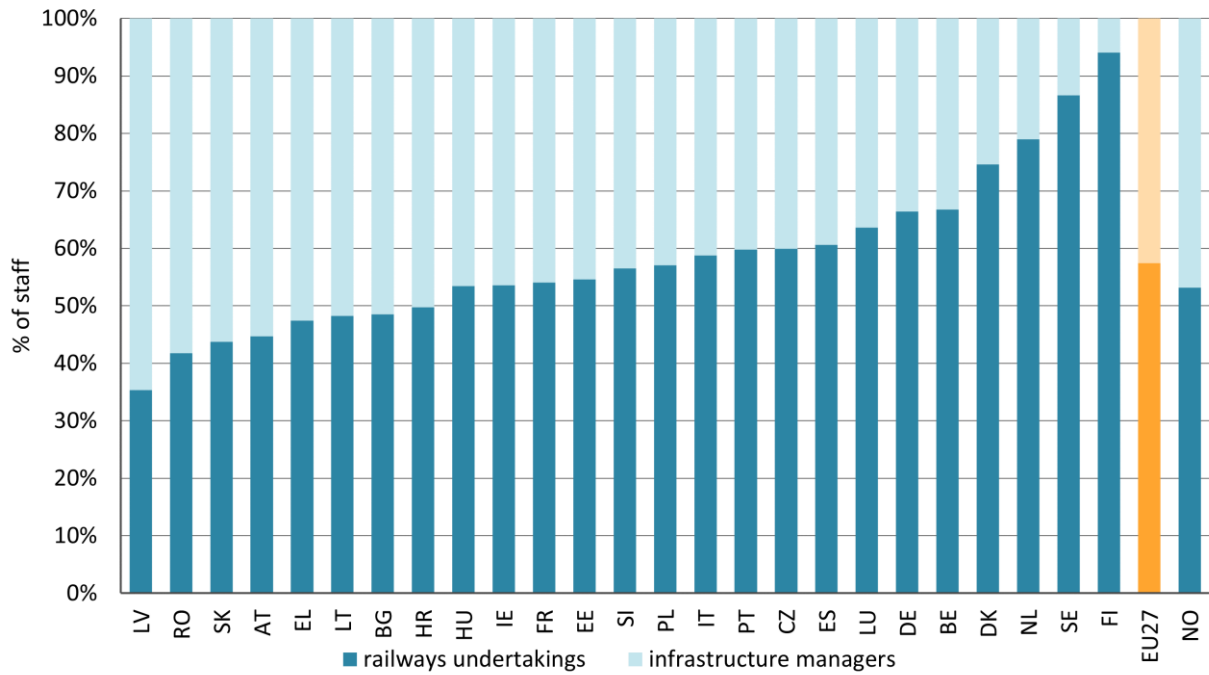
Labour force of the rail market (infrastructure managers and railway undertakings)

Figure 87 shows the reported distribution of railway employees between infrastructure managers and railway undertakings per country in 2020.

²¹ Transport units defined here as the sum of all passenger kilometres and all tonne kilometres.

²² Total employment data reported in the RMMS are not directly comparable with the Statistical pocketbook. This is because the Statistical pocketbook's figures are based on Eurostat data, plus estimates, and refer only to railway undertakings' staff.

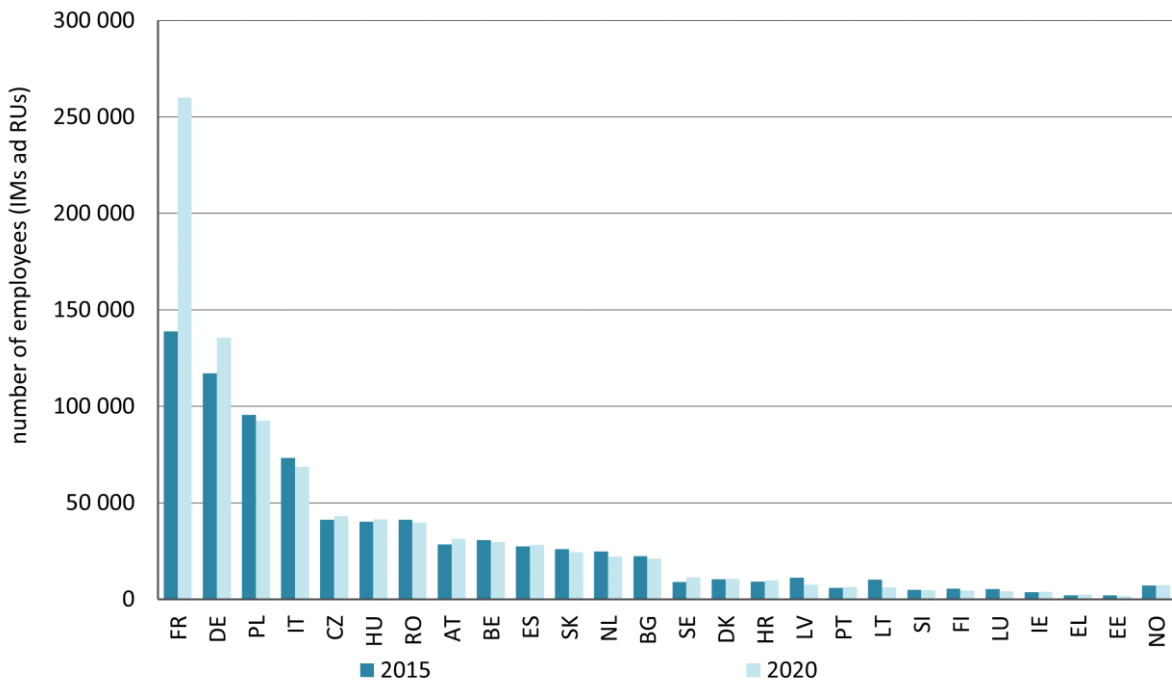
Figure 87: Distribution of employees between infrastructure managers and railway undertakings per country, (% in 2020)



Source: RMMS, 2022. SK 2020 estimated.

In the EU27, on average railway undertakings employed 57% of all railway staff. The proportion of the railway undertakings' staff of total rail staff appears to be the highest in Finland (94%) and the lowest in Latvia (35%).

Figure 88: Total number of employees in the rail market (infrastructure managers plus railway undertakings) per country (number, 2015 and 2020)



Source: RMMS, 2022. Series break for FR between 2015 and 2020. SK 2020 estimated.

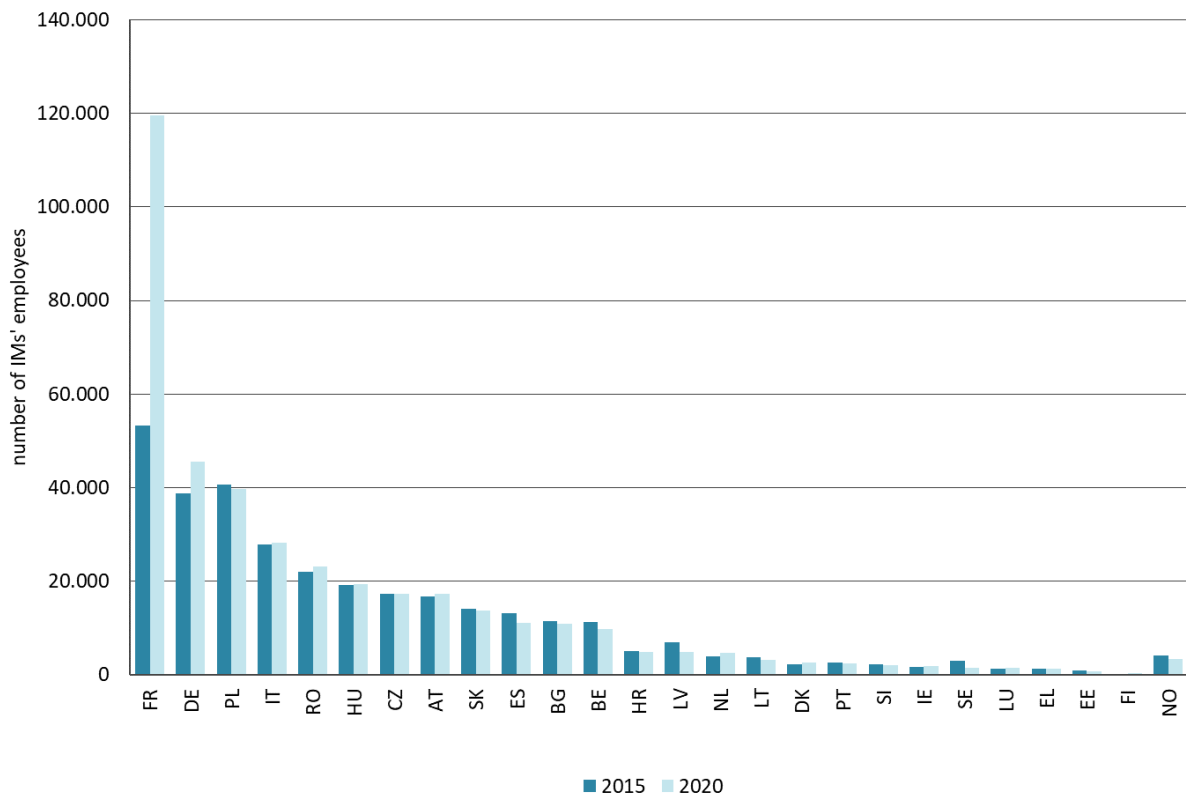
Apart from France, for which the break in the employment time series reported from 2016 onward remains unexplained, Germany, Poland and Italy are the countries with most staff (all have more than 65,000 employees).

Greece and Estonia have the fewest rail staff (with 2,383 and 1,668 employees respectively). Excluding again France, the country where the number of staff increased most between 2015 and 2020 is Germany with 18,300 more staff. In Italy staff numbers decreased over the same period by slightly more than 4,722 employees.

Labour force of the rail infrastructure managers

Figure 89 compares how the absolute number of staff of the infrastructure managers (both incumbents and competitors – if any) evolved between 2015 and 2020 in each country.

Figure 89: Total number of employees (full-time equivalents) of the infrastructure managers per country (number, 2015 and 2020)



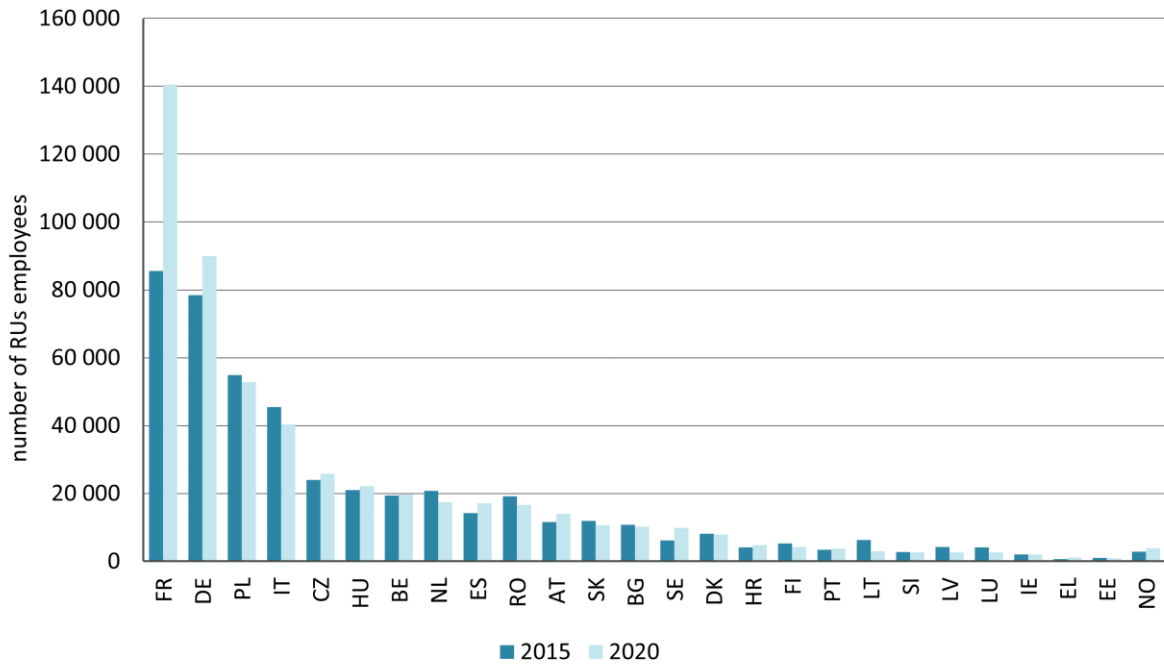
Source: RMMS, 2022. Series break for FR between 2015 and 2020. FI 2015 estimated.

Apart from France, the largest number of employees of infrastructure managers in 2020 were reported by Germany and Poland (with 45,500 and 39,769 employees respectively), whereas Finland and Estonia reported less than 1,000 employees. Based on RMMS data, excluding France, Germany reported the highest increase in the number of infrastructure managers' staff (adding 6,800 employees over the surveyed period), whereas Spain and Latvia reported a decrease of more than 2,000 employees each.

Labour force of the railway undertakings

Figure 90 compares changes in the absolute number of staff of the railway undertakings (irrespective of whether they are incumbents or alternative operators) between 2015 and 2020 in each country.

Figure 90: Total number of employees of the railway undertakings per country (number, 2015 and 2020)

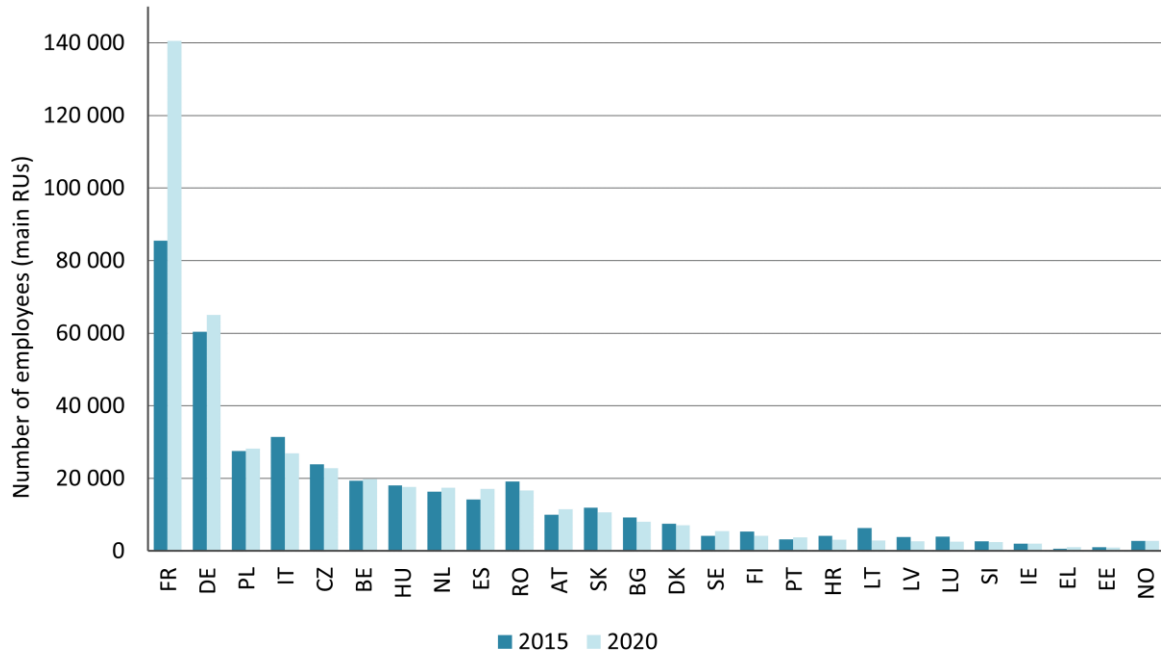


Source: RMMS, 2022. Number of Full Time Equivalent of other RUs for BE 2015 not available, Number of Full Time Equivalent of main RU for SK 2020 estimated, Series break for FR between 2015 and 2020.

Apart from France, the highest number of staff for railway undertakings was reported by Germany, Poland and Italy (all with more than 40,000 employees). The smallest number of railway undertakings' employees is Estonia, with 911 employees. Based on RMMS data (and excluding France), the highest increase in railway undertakings' staff between 2015 and 2020 was reported by Germany with 11,500 employees. In Italy staff decreased by more than 5,000 employees.

Figure 91 shows the reported total number of employees of the incumbent or other main railway undertakings for 2015 and 2020 per country.

Figure 91: Number of employees of the main railway undertaking per country (number, 2015 and 2020)

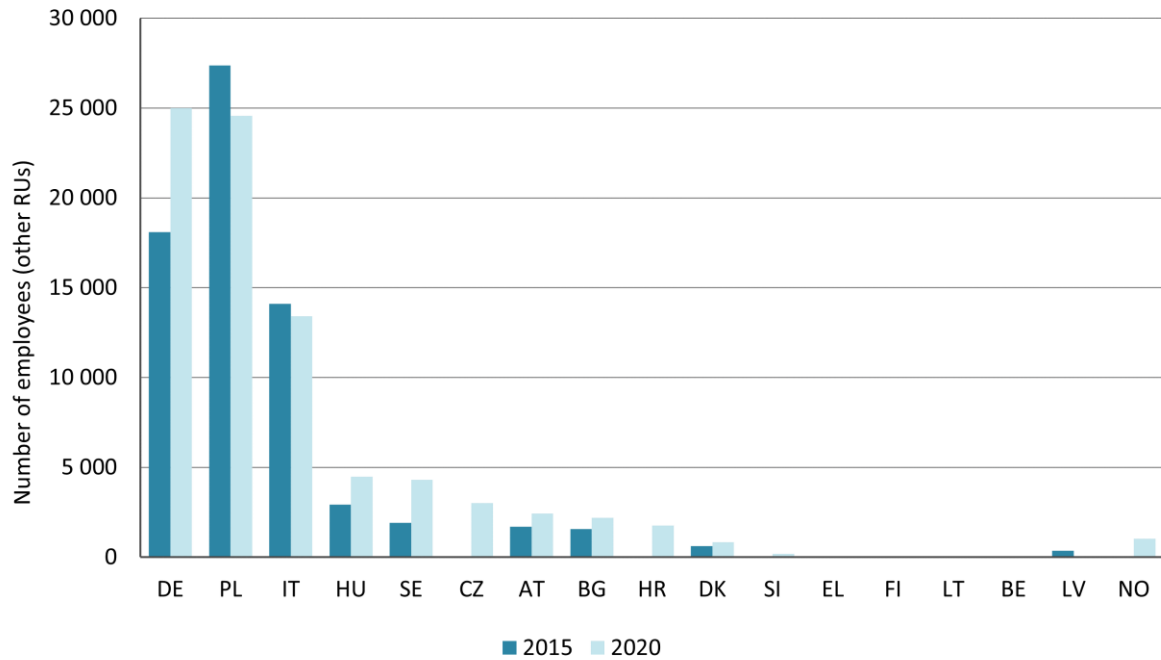


Source: RMMS, 2022. SK 2020 estimated.

Apart from France, the largest number of employees of the main railway undertaking in 2020 was reported in Germany with 65,000 employees, whereas Estonia reported less than 1,000 employees. RMMS data suggests that apart from France, the largest increase in staff of the main railway undertaking between 2015 and 2020 was in Germany (4,600 employees), whereas Italy recorded a significant decrease (more than 4,500 employees less than in 2015).

Figure 92 shows the reported total number of employees of other railway undertakings (competitors) for 2015 and 2020 per country.

Figure 92: Number of employees of other railway undertakings per country (number, 2015 and 2020)



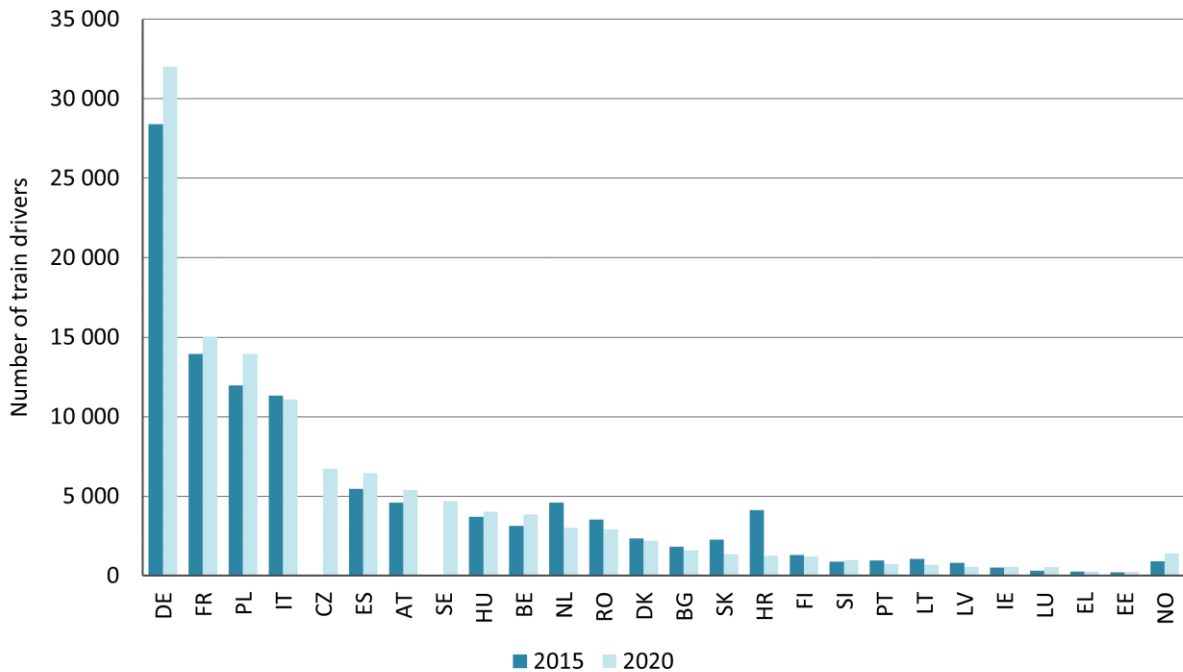
Source: RMMS, 2022. CZ 2015 not available.

Germany and Poland reported around 25,000 employees working for operators other than the incumbent in 2020. In contrast, Latvia reported less than 30 employees working for alternative operators. Based on available data, between 2015 and 2020 the staff working for alternative operators increased most in Germany with more than 6,900 additional employees. The most significant decrease was reported in Poland, where more than 2,800 employees were lost in these undertakings.

Train drivers

Figure 93 shows the reported total number of train drivers employed by main and other railway undertakings for 2015 and 2020 per country.

Figure 93: Number of train drivers of main and other railway undertakings per country (number, 2015 and 2020)



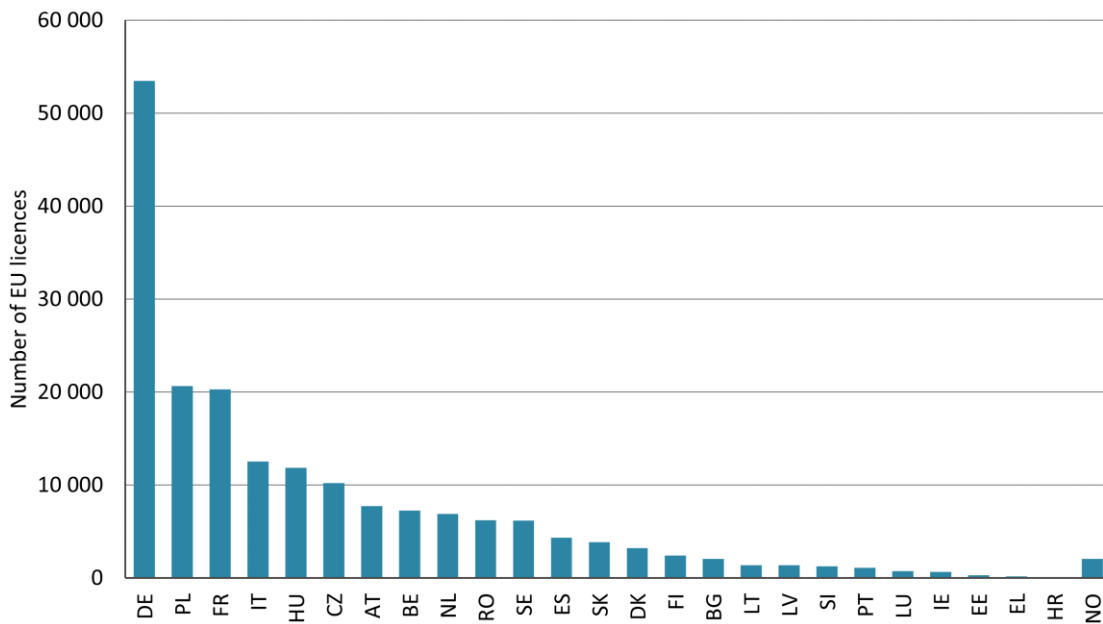
Source: RMMS, 2022. CZ and SE 2015 not available.

In Germany, Poland, France, and Italy, more than 10,000 train drivers were working for railway undertakings. Estonia reported the lowest number of employed train drivers in 2020 (232). Germany has significantly increased the number of train drivers, with an increase of 3,600 between 2015 and 2020. A significant decrease of more than 2,800 train drivers has been reported for Croatia. The total number of train drivers in the EU27 plus Norway exceeds 122 000.

The RMMS collects information about the number of employees working for railway undertakings as train drivers. However, not necessarily all staff that have a train driver licence are in active employment as a train driver. It is interesting therefore to look at the number of train driver licences, as this could provide a rough idea of available resources in case of a shortage of such a specialised and skilled function.

Directive 2007/59/EC introduced an EU certification scheme for train drivers including the issuing of European train driver licences by the national safety authorities and harmonised complementary certificates by the employer. All train drivers should hold a European licence from October 2018 onwards. Figure 94 shows the reported total number of valid EU train driver licences in 2020 per country, as collected by ERA from the national safety authorities.

Figure 94: Number of valid EU train driver licences, (2020)



Source: European Union Agency for Railways (ERA), 2022.

By far the highest number of valid train driver licences is found in Germany (53 481), followed by Poland, France, Italy, and Hungary (all more than 10,000 licences). Croatia reported the lowest number, with 90 valid EU train driver licenses. The total number of valid train driver licences in the EU27 plus Norway exceeds 186 000.

5.12.2 Socio-demographic structure of the rail labour market

Traditionally the rail sector has been characterised by an ageing workforce and a predominance of male workers. Technological developments and digitalisation play also a major role with regard to the sector's employment structure and characteristics.

Structure by gender

The EU rail sector also remains rigorously male-dominated, with women representing only around 22% of the EU27 railway workforce. Balance is lacking especially as regards technical positions such as drivers or technicians and managerial positions. This inability to attract women personnel is all the more concerning as the railway sector is faced with an ageing workforce and an overall shortage of staff. In the last years, there have, however, been some positive developments to make the rail sector a more balanced, diverse and attractive working place:

- The Women in Transport – EU Platform for change²³, launched on 27 November 2017, continues to provide an active forum for transport stakeholders with the aim to strengthen women's employment and equal opportunities for women and men in the transport sector. Several EU associations from the rail sector have joined the platform, as well as the European Union Agency

²³ https://transport.ec.europa.eu/transport-themes/social-issues/women-transport/women-transport-eu-platform-change_en

for Railways and Europe's Rail (previously Shift2Rail Joint Undertaking). The EU associations may directly bring actions to the platform or channel actions from their members: 21 actions had been shared by June 2022, out of which eight are from the rail sector. The website of the platform contains a declaration (signed by a number of rail actors) to ensure equal opportunities for women and men in the transport sector, an online module to exchange good practices and examples of measures that can be taken at company level to improve gender balance. The platform meets 3 times per year and uses a wiki as a cooperation tool.

- On 5 November 2021, the sectoral social partners represented by the Community of European Railway and Infrastructure Companies (CER), representing railway sector employers, and the European Transport Workers' Federation (ETF), representing railway workers seized the opportunity of the 'European Year of Rail 2021', to sign the 'Women in Rail autonomous agreement' aimed at promoting employment of women in the sector. The agreement, which was the fruit of more than 3 years of negotiations, aims to attract more women to the rail sector, give women better protection and guarantee equal treatment in the workplace thanks to measures agreed under a general gender equality policy, which covers areas such as concrete targets in terms of the share of women employed in the rail sector, how to attract more women to the sector, reconciling professional and private life, promotion and career development, equal pay, health and safety at work and prevention of sexual harassment and sexism. Information on the agreement can be found on the websites <https://www.etf-europe.org/women-in-rail-agreement-signed-and-ready-for-implementation/> and <https://cer.be/publications/latest-publications/european-social-partner-agreement-women-rail>.
- The Commission's 'Women in Transport – Platform for Change' together with the railway sector used the momentum of the European Year of Rail 2021 to highlight the cause of women in rail through a 'Women in Rail Award' in four different categories ('best employer', 'best initiative against harassment', 'best improvement of inclusion in the workplace', and a 'rising star' award). More than 50 companies from the rail sector presented applications for the awards. The award ceremony took place on 8 March 2022, International Women's Day. More information on the award, the winners, and the ceremony can be found under https://transport.ec.europa.eu/news/european-commission-announces-winners-women-rail-award-2022-03-08_en.
- In the Sustainable and Smart Mobility Strategy, Action 70, the Commission has committed to 'launch initiatives to increase the attractiveness of the transport sector' to make it more resilient and competitive. In addition to the above-mentioned initiatives, the Commission has published several studies, notably to help the sector in the transition to automation and digitalisation²⁴ and to improve the work-life balance of transport workers in all modes through good practice examples for staff scheduling and rostering schemes²⁵. As awareness raising cannot start early enough, the Commission has also published 'Educational toolkits to help fight gender stereotypes'²⁶ for primary and secondary school children, based on examples from the transport sector. The Commission is also about to launch a network of Diversity Ambassadors in Transport with the objective to promote diversity, equality and inclusion in the transport sector for workers as well as for transport users.

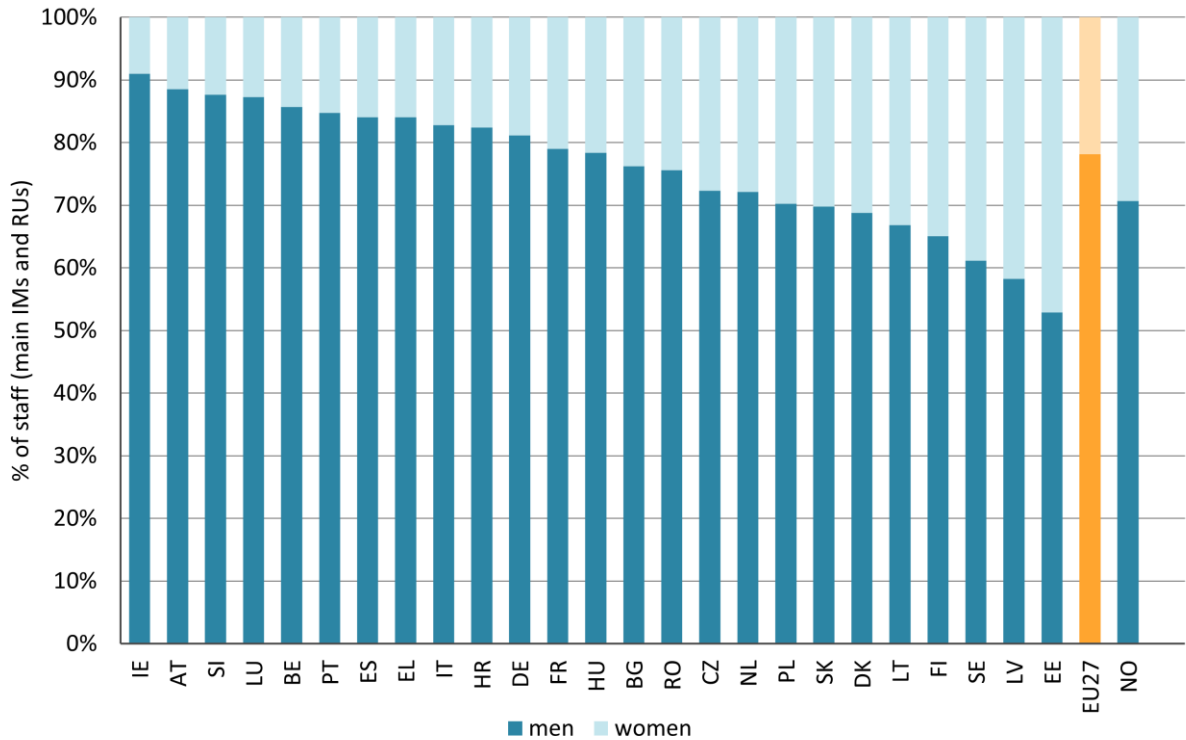
²⁴ <https://op.europa.eu/en/publication-detail/-/publication/596d2d1a-4049-11ec-89db-01aa75ed71a1/language-en/format-PDF/source-search>

²⁵ <https://op.europa.eu/en/publication-detail/-/publication/21a9b75a-315e-11ec-bd8e-01aa75ed71a1/language-en>

²⁶ https://transport.ec.europa.eu/transport-themes/social-issues/women-transport/attractiveness-transport-sector/educational-toolkits-help-fight-gender-stereotypes_en

Figure 95 shows the gender mix of railway staff (main infrastructure managers and railway undertakings) per country in 2020, as reported in the RMMS.

Figure 95: Total employees (main infrastructure managers plus railway undertakings) by gender structure, (% in 2020)

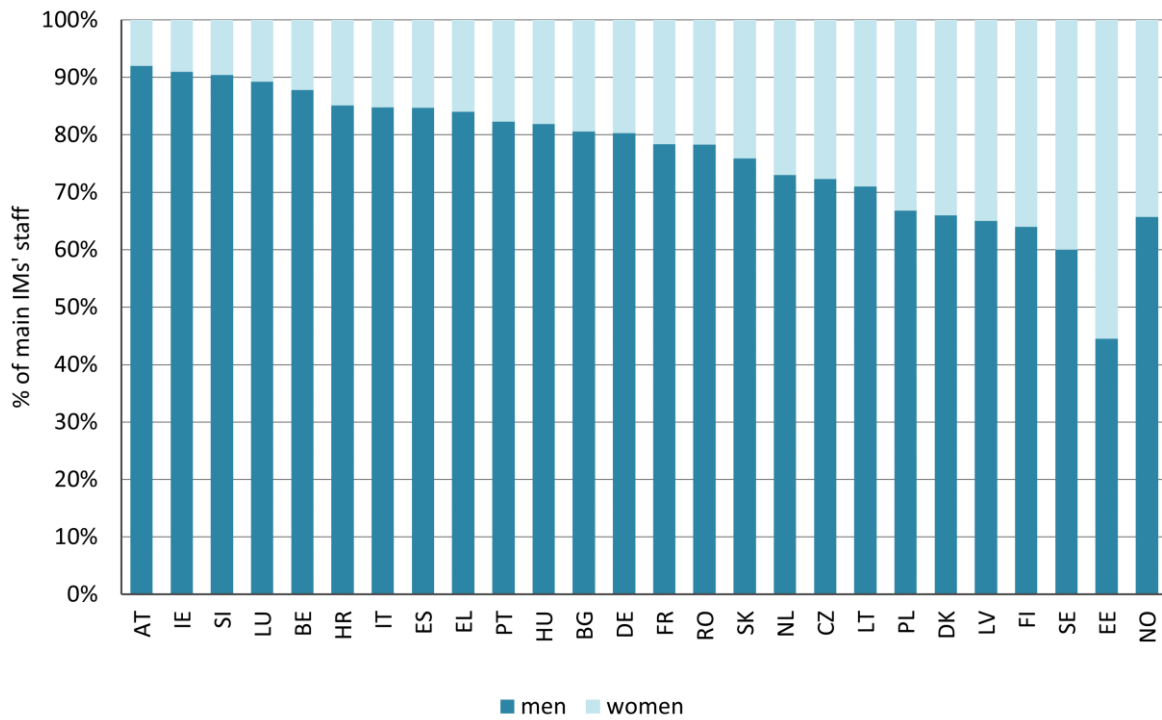


Source: RMMS, 2022.

The highest share of women on the total workforce was reported by Estonia (47%) followed by other Baltic and northern countries such as Latvia, Sweden, Finland, and Lithuania. Ireland reported the lowest share (9%).

The RMMS collects information on the gender mix, also distinguishing between employees of main infrastructure managers and railway undertakings. Figure 96 shows the gender mix of main infrastructure managers' staff per country in 2020.

Figure 96: Main infrastructure managers' employees by gender structure (% in 2020)

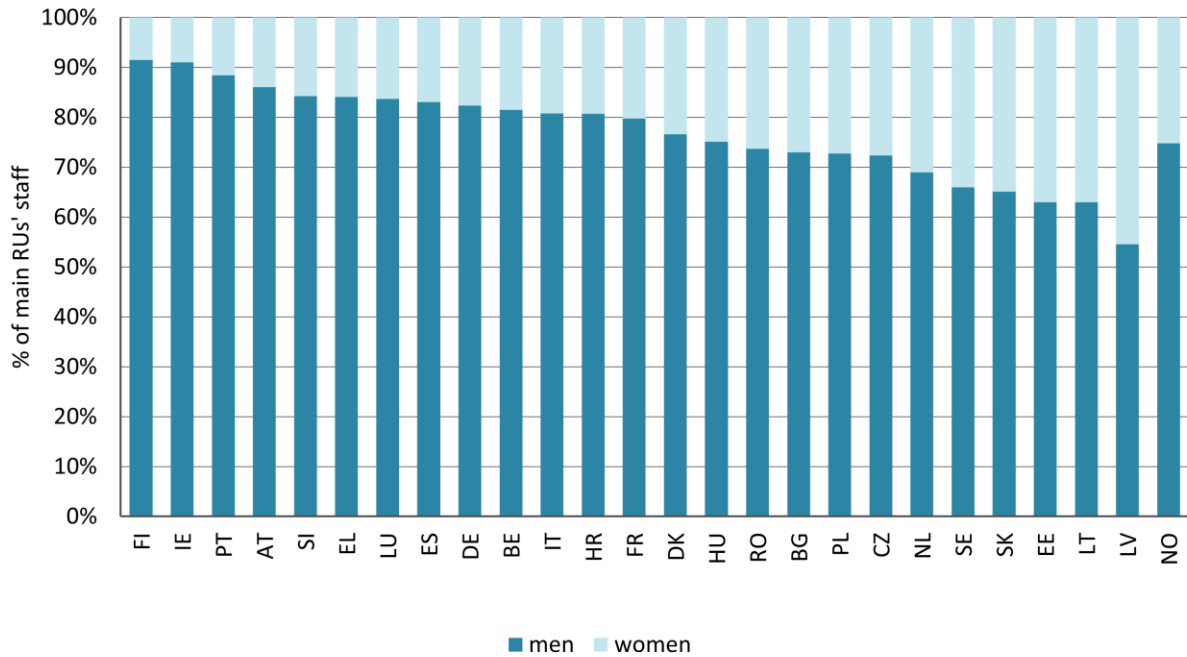


Source: RMMS, 2022.

Estonia is the country with the largest share of women among infrastructure managers' staff (55%), and the only one in which there are more women employees than men. For infrastructure managers the lowest share has been reported by Austria and Slovenia (8% and 9% respectively).

Figure 97 shows the gender mix for the main railway undertakings' staff in 2020 by country.

Figure 97: Main railway undertakings' employees by gender structure (% in 2020)



Source: RMMS, 2022.

Latvia reported the highest share of women (45%), whereas Finland reported the lowest (8.5%).

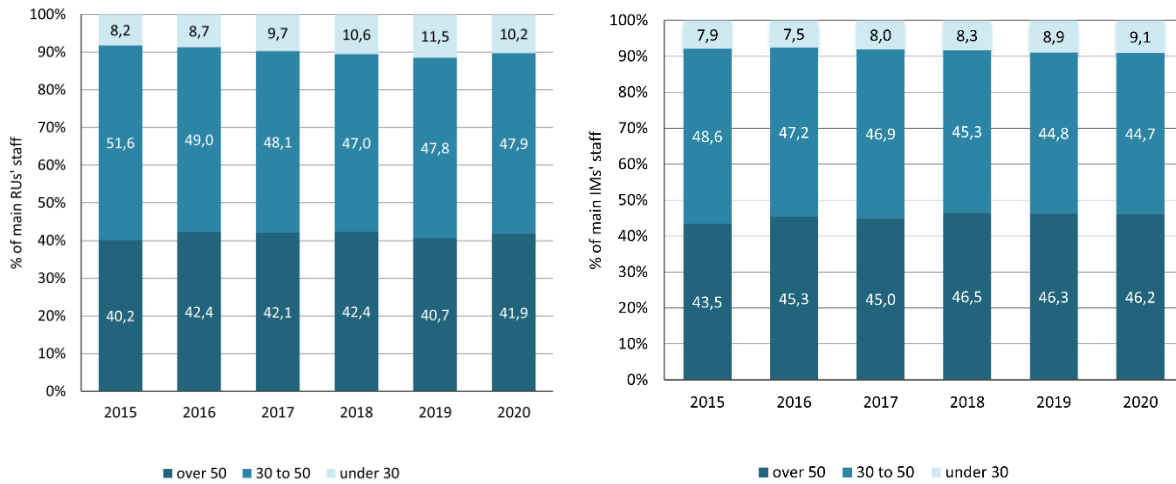
Structure by age

An ageing workforce continues to be a concern for the sector, given the risk of losing specialised skills in the medium term.

Figure 98 shows that in 2020 in the EU27 on average 41.9% of the staff of railway undertakings was older than 50 years. This is an increase of 1.7 percentage points compared to the 40.2% of 2015. However, the share of younger employees (below 30 years) working for railway undertakings has also increased in the EU27: from 8.2% in 2015 to 10.2% in 2020.

Infrastructure managers tend to have an older workforce, but their share of younger employees also increased between 2015 and 2020: from 7.9% to 9.1% in the EU27 (Figure 98).

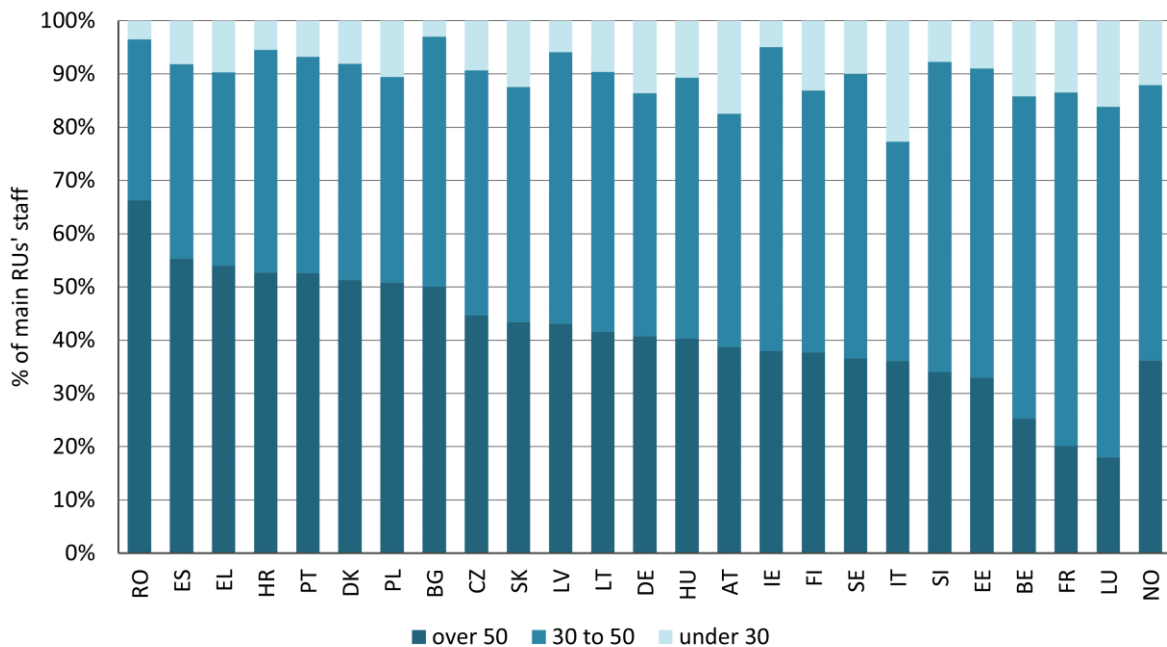
Figure 98: Employees by age group, main railway undertakings and infrastructure managers (% , 2015-2020)



Source: RMMS, 2022. 2015 data not available for RUs in LV, LU, ES and SE; 2020 data not available for RU in NL; 2015 data not available for IMs in ES, LU and LV.

Looking at the distribution of main railway undertakings’ staff by age group per country (Figure 99), the proportion of more aged workforce is largest in Romania and Spain where over 55% of the workforce was over 50 in 2020. Italy is the only country to have reported a proportion of workers under 30 higher than 20%, while Luxemburg is the only country with a proportion of workers under 50 lower than 20%.

Figure 99: Main railway undertakings’ employees by age group and country, (% in 2020)

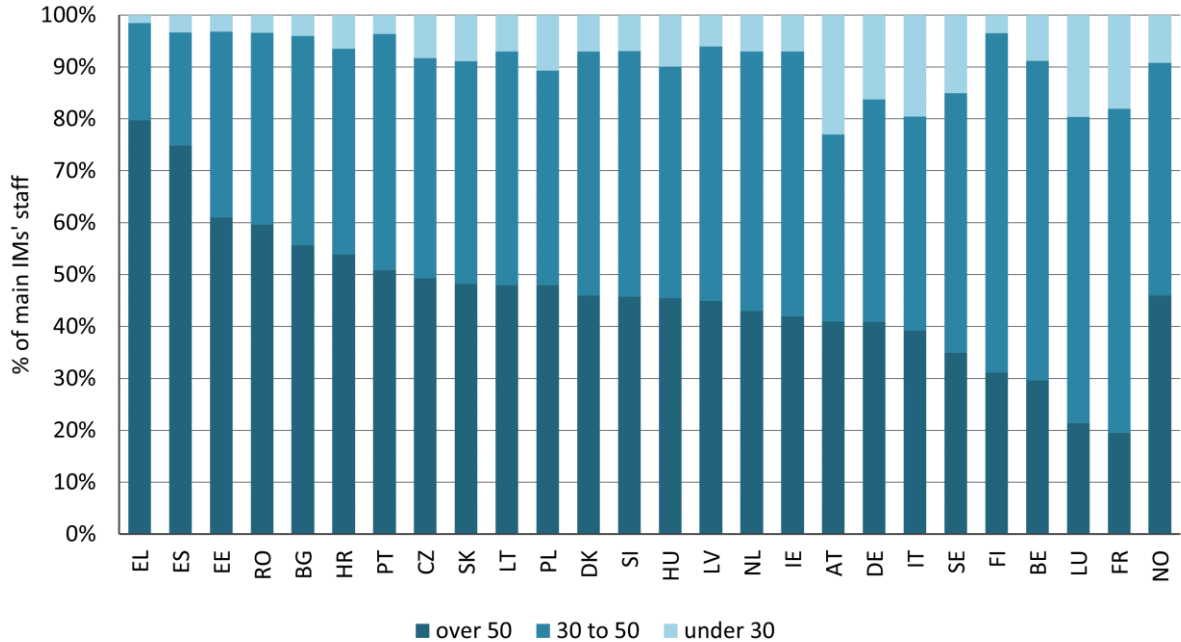


Source: RMMS, 2022. No data for NL.

With respect to the distribution of main infrastructure managers’ staff by age group per country (Figure 100), the proportion of more aged workforce is greatest in Greece, Spain Estonia, Romania and Bulgaria where over 55% of the workforce was older than 50 years in 2020. In contrast, less than 30%

of the workforce were over 50 in France and Luxembourg. Austria is the only country to have reported a proportion of employees under 30 higher than 20%.

Figure 100: Main infrastructure managers' employees by age group and country, (% in 2020)



Structure by contract type

The RMMS also collects information on three aspects of employment contracts, both for the main infrastructure manager and for the incumbent/other main railway undertakings:

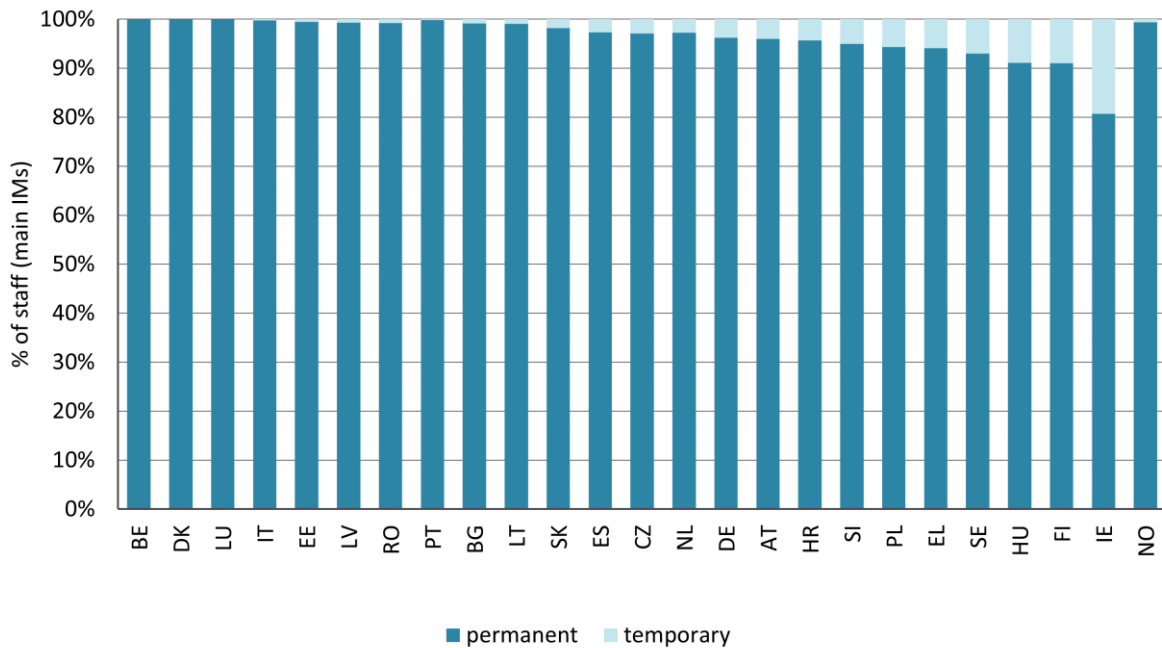
- permanent or temporary contracts;
- full-time or part-time working hours; and
- apprenticeships/training.

Figure 101 and Source: RMMS, 2022. FR 2020 not available.

All employees of infrastructure managers appear to have permanent contracts in Belgium, Denmark and Luxembourg, whereas in Ireland only 80.7% of them do.

Figure 102 show the proportions of temporary and permanent employees of the main infrastructure manager and the incumbent/other main railway undertakings respectively, per country in 2020.

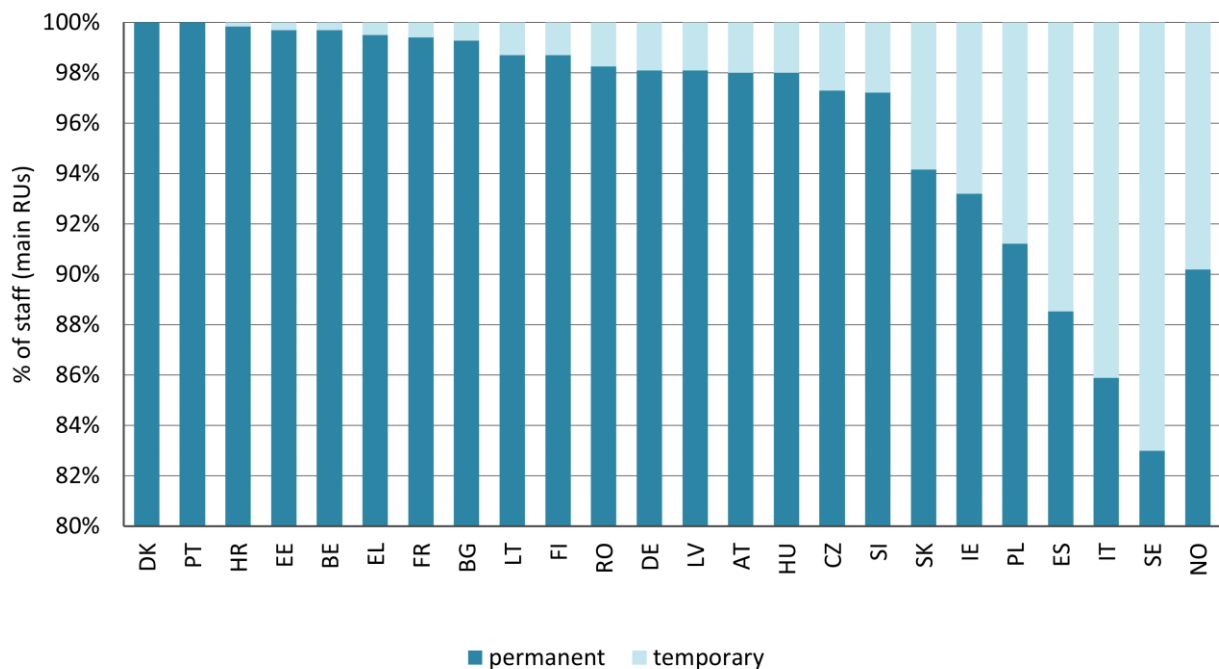
Figure 101: Employees of main infrastructure manager by contract type (permanent or temporary) per country, (% in 2020)



Source: RMMS, 2022. FR 2020 not available.

All employees of infrastructure managers appear to have permanent contracts in Belgium, Denmark and Luxembourg, whereas in Ireland only 80.7% of them do.

Figure 102: Employees of main railway undertaking by contract type (permanent or temporary) per country, (% in 2020)



Source: RMMS, 2022. No data for LU and NL.

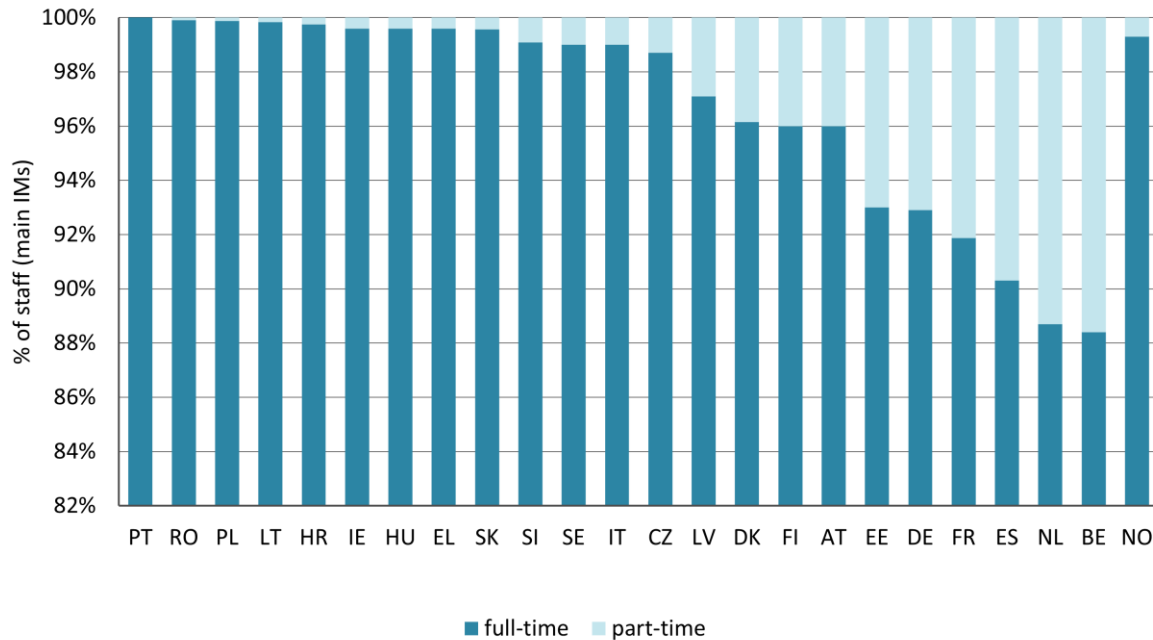
All employees of railway undertakings appear to have permanent contracts in Denmark, and Portugal, but in general the proportion is high in most countries. Only Slovakia, Ireland, Poland, Spain, Italy, Sweden, and Norway have a proportion of railway undertakings' employees with permanent contracts lower than 95%.

Looking at contracts from the point of view of working hours, Figure 103 and Source: RMMS, 2022. No data for LU and BG.

Portugal reported that all infrastructure manager's employees have full-time contracts. The lowest share of full-time contracts can be found in the Netherlands (88.7%) and Belgium (88.4%).

Figure 104 show the proportions of full-time and part-time employees per country in 2020 for the main infrastructure managers and the main railway undertakings respectively.

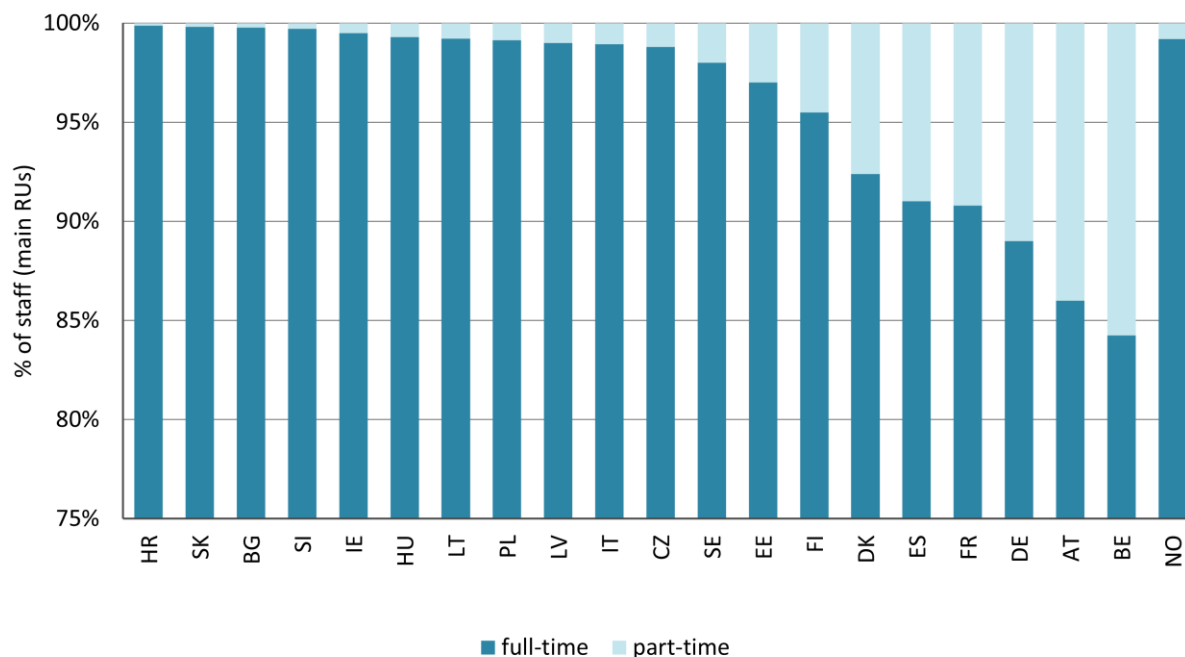
Figure 103: Employees of main infrastructure manager by contract type (full-time or part-time) per country, (% in 2020)



Source: RMMS, 2022. No data for LU and BG.

Portugal reported that all infrastructure manager's employees have full-time contracts. The lowest share of full-time contracts can be found in the Netherlands (88.7%) and Belgium (88.4%).

Figure 104: Employees of main railway undertaking by contract type (full-time or part-time) per country, (% in 2020)



Source: RMMS, 2022. No data for EL, LU, NL, PT, RO.

As for the main railway undertakings, almost all employees appear to have full-time contracts in Croatia, Slovakia, Bulgaria, Slovenia, Ireland, Hungary, Lithuania, and Poland. The lowest share of full-time contracts was reported in Belgium (84%).

Training needs are a fundamental aspect of employment in the railway sector, given increased digitalisation, the development of mobility as a service and the age structure of the staff.

The [STAFFER Blueprint](https://www.railstaffer.eu/)²⁷ is an EU-funded framework for strategic cooperation between key businesses, trade unions, education and vocational training stakeholders and public authorities. The aim is to support an overall sectoral skills strategy and develop concrete actions to address short- and medium-term skills needs. After several months of preparation, 32 partners submitted their proposal for a European project in February 2020. The Commission announced during the summer of 2020 that the project – Skill Training Alliance For the Future European Rail system (STAFFER) – had been approved to be the future Blueprint for the sector.

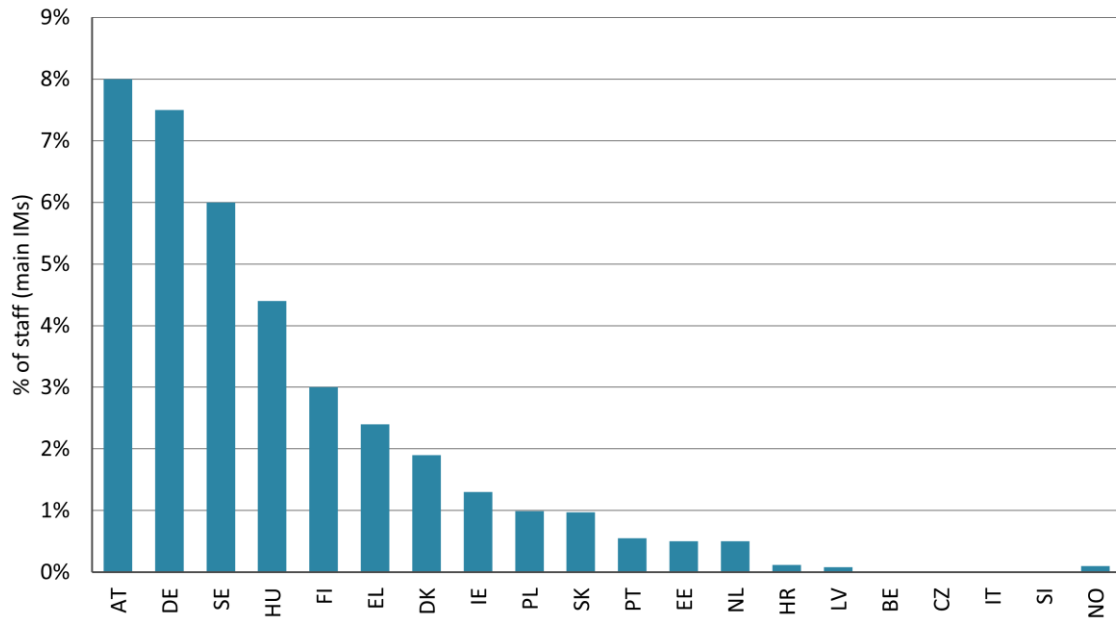
Coordinated by the University of Genoa, the alliance officially started on 1 November 2020 and will last for 4 years. Its objective is to help identify the main existing skill gaps and assess the future needs in our industry, Vocational & Education Training (VET) institutions and technical universities to propose adaptations to curricula, training and educational programmes so as to address new technological developments and trends. The ultimate result of STAFFER will be the establishment of a rail stakeholder partnership, the Sector Skill Alliance, to develop a holistic Blueprint strategy to recognise present and new skill needs. Such a strategy will allow to overcome the fragmentation of the rail sector, and help rail industry and VET institutions to design and realise concrete actions to satisfy skill needs, going beyond the project's lifetime and beyond the organisations involved in the Alliance.

²⁷ <https://www.railstaffer.eu/>

Figure 105 and Source: RMMS, 2022. No data for BG, FR, LT, LU, RO and ES.

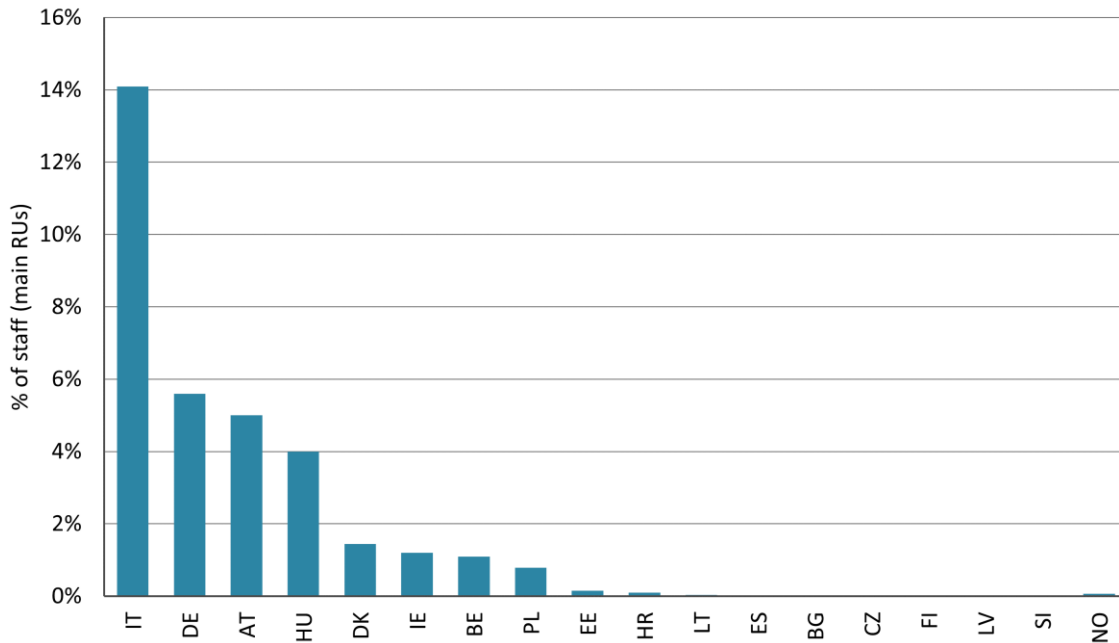
Figure 106 show the proportions of staff of the main infrastructure manager and the incumbent/other main railway undertaking respectively who are currently in an apprenticeship or other training.

Figure 105: Employees of main infrastructure manager in training per country, (% in 2020)



Source: RMMS, 2022. No data for BG, FR, LT, LU, RO and ES.

Figure 106: Employees of main railway undertaking in training per country, (% in 2020)



Source: RMMS, 2022. No data for FR, EL, LU, NL, PT, RO, SK and SE.

5.13 Digitalisation

A wider implementation of digital solutions is a key enabler for enhancing railways' performance, benefitting customers and businesses alike. Digital loopholes and asymmetric implementation instead can generate technical market access barriers and foreclose a smooth rail transport across borders.

ERTMS

The European Rail Traffic Management System (ERTMS) has several advantages in comparison to class-B systems²⁸. In addition to cross-border interoperability, ERTMS allows for higher safety, capacity and reliability, and a potential reduction in maintenance costs.

ERTMS is set out in the technical specification for interoperability relating to the control-command and signalling subsystems of the rail system in the European Union (CCS-TSI)²⁹. CCS TSI is in the process of revision. The review will introduce technical specifications for automated train operations (ATO) up to grade of automation 2 and will also enable Future Railway Mobile Communication System (FRMCS) readiness. The current review will also include specifications for modularity reducing the risk of vendor

²⁸ Class-B systems are national legacy signalling systems. In some countries, they co-exist with ERTMS. They make the ERTMS installations more complex and expensive to realise.

²⁹ Commission Regulation (EU) 2016/919 of 27 May 2016 on the technical specification for interoperability relating to the control-command and signalling subsystems of the rail system in the European Union (consolidated version) available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02016R0919-20200311>.

lock-in. Future updates of the regulation will include full specifications for FRMCS, for advanced train positioning and for ATO up to grade of automation 4.

The current TEN-T Regulation³⁰ establishes ERTMS as one of the priorities for railway infrastructure development and sets out a deadline for its deployment on the Core Network by 2030 and on the Comprehensive Network by 2050.

On 14 December 2021, the European Commission adopted a legislative proposal for the revised TEN-T Regulation. The revised TEN-T Regulation introduces a number of new or reinforced rail infrastructure requirements, including regarding ERTMS. Without an accelerated deployment of ERTMS, achieving the Green Deal and the objectives under the Sustainable and Smart Mobility Strategy will not be possible. The proposed new Article 17 therefore sets out an obligation for Member States to deploy ERTMS on the core network, including access routes and last-mile rail connections to multimodal freight terminals, by 31 December 2030. As regards the extended core network and the comprehensive network, the new deployment deadline is set for 31 December 2040. Furthermore, Class B systems on the entire TEN-T network should be decommissioned by 31 December 2040.

Member States should also ensure that as of 31 December 2025, only radio-based ERTMS should be deployed on new lines or in the context of signalling system upgrades, and the entire TEN-T network should be equipped with radio-based ERTMS by 31 December 2050.

As to governance, the role of the European Coordinator for ERTMS should be enhanced as she or he will receive the prerogative to establish and chair a consultative forum grouping all key stakeholders. Each Member State will designate a national coordinator for ERTMS to attend the consultative Forum for ERTMS. The national coordinator for ERTMS should become an ERTMS one-stop-shop in each Member State, i.e. a direct discussion partner both for the European Coordinator and for coordinators from other countries, who currently often lack information on neighbouring projects. The new approach should allow an enhanced, coordinated and synchronised deployment of ERTMS, both on-board and trackside. The national coordinator should manage the deployment of ERTMS, including coordination of national stakeholders, supervising drafting of the National Implementation Plan, early identification of problems and ways of addressing them, also in collaboration with other national coordinators. Finally, the Commission proposal foresees that the European Coordinator for ERTMS should closely cooperate with the European Union Agency for Railways and EU Rail Joint Undertaking.

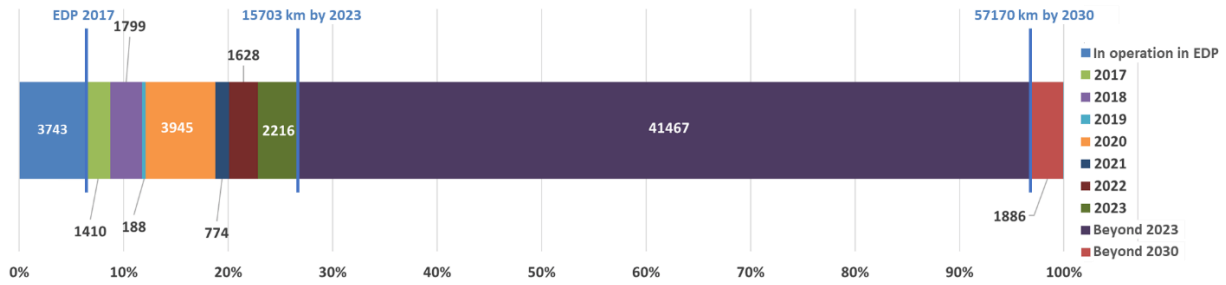
The proposal is now being negotiated with the European Parliament and the Council for a possible entry into force of the revised TEN-T Regulation in the course of 2023.

Following adoption of the amended TEN-T Regulation, the current 2017 European Deployment Plan (EDP) will also be revised.

2017 EDP sets out deadlines for deploying ERTMS on some sections of the Core Network Corridors (CNC) covering the 2017-2023 period. The number of km planned for each year in the EDP and the TEN-T Guidelines for the CNC are shown in Figure 107.

³⁰ Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network

Figure 107: Indicative number of CNC km for each year according to the EDP and the TEN-T Guidelines and corresponding state of advancement towards completion



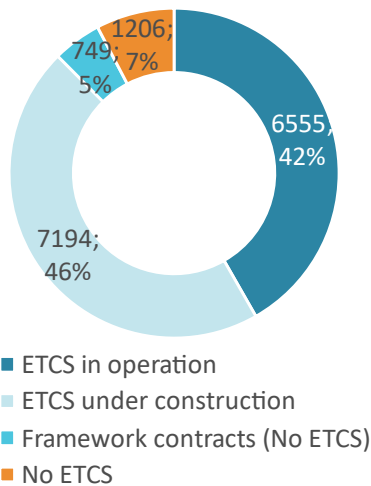
Source: DG MOVE, 2022. Note: Indicative number of km for each year in the EDP. The bar shows the overall obligations by 2030 and the breakdown by years in the period from 2017 to 2023. The percentages show the state of advancement towards completion.

Overall, it can be ascertained that 49% of the length planned in the EDP by the end of 2022 (i.e. 13 487 km) had been already achieved by end-June 2022. At the same time, 42% (or 6 555 km) of the 15 700 km planned to be put in operation by 2023, according to the EDP, have been already commissioned.

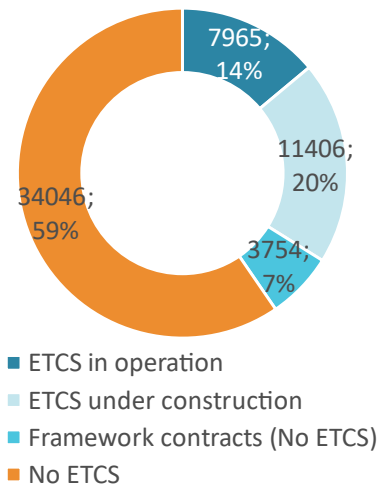
In July 2021, the CEF 2 Regulation³¹ extended the CNC by 9 680 km. At the end of June 2022, 14% of the revised CNC network (i.e. 59 055km) was in operation with ETCS (i.e. 7 965km) and 60% with GSM-R. The following charts indicate the current ETCS status of the CNC sections, expected according to the EDP by 2023 (15 700 km) and the TEN-T Guidelines by 2030 (57 170 km), including CEF 2 extension and excluding UK sections, and taking into consideration exemptions (see Figure 108).

Figure 108: ETCS current status of CNC lengths expected according to TEN-T Guidelines and EDP by 2023 and by 2030

ETCS current status of 2023 EDP CNC sections



ETCS current status of 2030 CNC sections



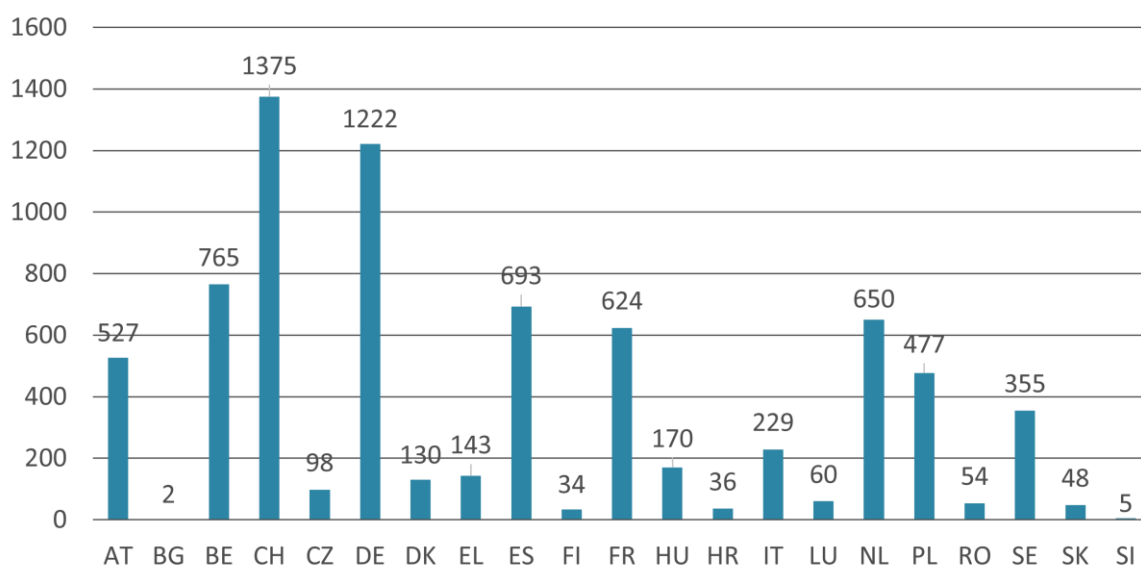
Source: DG MOVE, 2022.

³¹ Regulation (EU) 2021/1153 of the European Parliament and of the Council of 7 July 2021 establishing the Connecting Europe Facility and repealing Regulations (EU) No 1316/2013 and (EU) No 283/2014

Even if the trackside ERTMS deployment is suffering from delays in the short-term, the mid and especially long-term perspective is rather positive: by 2040, some 70% of the whole EU27 plus Norway plus Switzerland TEN-T network is expected to be equipped, and less than 20% of the TEN-T network will still require Class B systems on-board to run.

ERTMS, as a system, requires a synchronised deployment both trackside and on-board and crucial system benefits only occur when both trains and trackside are equipped. Therefore, rolling stock deployment is essential. Based on the data collected³² between 2015 and 2019, around 5 700 vehicles were equipped with ERTMS, and at the end of 2020, more than 7 150 vehicles were equipped with ERTMS on a total of 41 665 vehicles in operation (see Figure 109).

Figure 109: Number of vehicles equipped with ERTMS per country



Source: DG MOVE, 2022.

In the EU27, Germany is the country with most vehicles (1,222) equipped with ERTMS, followed by Belgium, Spain, and the Netherlands. Slovakia and Bulgaria have only equipped 5 and 2 vehicles respectively.

Approximately 40% of the 5,700 vehicles equipped between 2015 and 2019 were new, and 60% were retrofitted vehicles³³. Accordingly, only around 2 300 new vehicles with ERTMS have been put in operation in Europe between 2015 and 2019.

Based mostly on information from the contracts signed, at least 16,223 (7,176 existing plus 9 047 to be renewed or retrofitted) vehicles will be equipped with ERTMS by 2030. This conservative estimate contrasts with the figure of 27,600 to 34 600 vehicles needed for operations on the CNC as described above. However, some Member States have announced network-wide deployment plans or even decommissioning of their class B systems, which should lead to additional orders for additional vehicles equipped with ERTMS in the coming years.

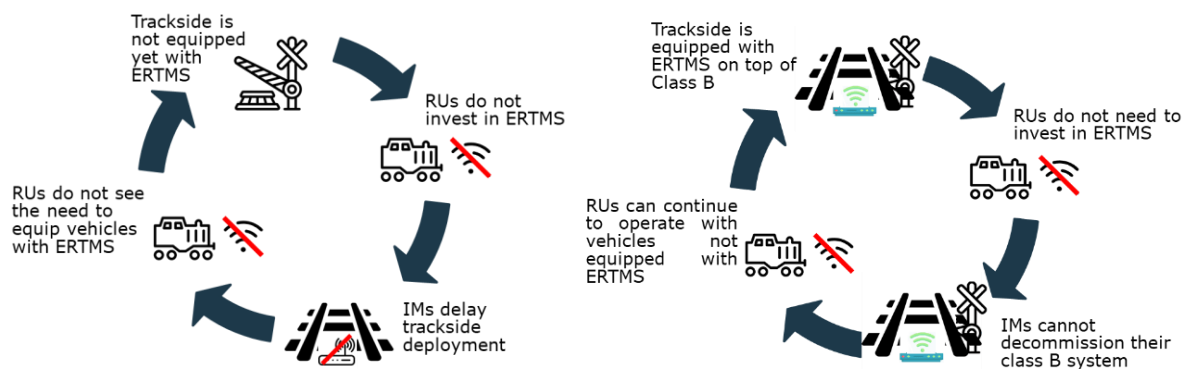
³² Data for on-board equipment have been collected from multiple sources to assess the current status of on-board deployment, i.e., data from interviews carried out by Deployment Management Team with railway undertakings, data collected by UNIFE, data collected by ERA and additional desk research.

³³ Source: UNIFE

Findings on ERTMS on-board deployment show that despite the current TSI requirements, between 2015 and 2019, the majority of new vehicles were not equipped with ERTMS. Thus, the pace of on-board deployment is slower than what was initially expected by the EU and the Member States.

Operators do not equip all their new purchased fleet since they do not see the need to invest in ERTMS as most of the lines in their area of operation are not yet equipped with ERTMS, and/or they can still use Class B systems. At the same time, some infrastructure managers delay deployment as no ERTMS-equipped rolling stock is available, which leads the industry into a vicious circle. This situation might jeopardize trackside deployment or force infrastructure managers to keep two trackside systems for a longer time than initially planned. Some impacts on the initial deployment schedule have been already noted, for instance, in Sweden.

Figure 110: Vicious circle of ERTMS deployment



Source: DG MOVE, 2022.

A continuation of this approach means that it will not be possible to reap the expected benefits from the ERTMS deployment. As the ERTMS business case³⁴ showed, ERTMS can only bring the expected benefits if both trackside and on-board are deployed in a coordinated way. A dual on-board strategy, which consists in equipping the whole fleet with ERTMS on top of the legacy system, is the best migration strategy. This would allow keeping only one system trackside once ERTMS is deployed on a given line. However, the decommissioning of the Class B systems trackside is only possible if almost the entire fleet is equipped with ERTMS³⁵.

Therefore, if a significant share of the new rolling stock is not being fitted with ERTMS, this situation will adversely impact the business case for ERTMS and the ERTMS deployment overall, as it will lead to additional costs in the short and medium-term (retrofitting costs) and will prevent infrastructure managers from decommissioning their Class B systems and thus achieving the expected savings on maintenance.

In 2020, the Commission published a report on on-board and infrastructure deployment strategies.³⁶ The report analyses the impact of growing ERTMS deployment on operators, specifically on international freight operations. The main conclusions of that study are the following:

- In the coming years, a significant network change will occur with a move from isolated “ERTMS islands” to commercially significant networks equipped with ERTMS within and between

³⁴ DG Move EC. 2019. ERTMS business case on the 9 core network corridors – Second Release

³⁵ The threshold was set at 90% of the fleet equipped in the ERTMS business case analysis.

³⁶ European Commission, Directorate-General for Mobility and Transport (2020). Deployment of ERTMS on core and comprehensive networks: on-board and infrastructure deployment strategies: final report

countries. For example, in one of the freight networks analysed, the number of kilometres not equipped with ERTMS will decrease from 70% in 2020 to only 15% in 2025.

- Given the decommissioning plans in countries covered by the study, ERTMS should now be standard equipment of the rolling stock for any international rail freight operator.
- Meaningful freight operation using ERTMS will be achieved, and international freight operators will benefit from using ERTMS to significantly increase their commercial range. ERTMS will become a replacement for class B systems rather than an additional system. For example, in 2028, on one of the freight networks analysed, it will be possible to provide 94% of the international rail freight on the routes examined with an ERTMS and just one class B system on-board.
- Prioritisation of ERTMS deployment in specific sections would result in significant benefits for international freight operations. By 2025, for example, a train will be able to reach the North of Italy from the North Sea ports (i.e. more than 1 000 km) with ERTMS-only locomotives or by 2023, from the North of Italy to Hungary. The usage of locomotives equipped only with class B systems is going to be reduced significantly, as national systems will be progressively removed from critical parts of the network. Equipping the fleet will be necessary to enter some key sections of the EU network.

5.14 5.14 External dimension of rail transport policy

This section presents developments (both within and after the reporting period) having an impact on the external dimensions of framework conditions in the rail sector.

The implementation of the EU rail *acquis* by **Switzerland and EEA Countries** ensures a level of harmonisation and interoperability for the rail industries, as the basis for free market access. The bilateral Land Transport Agreement ensures cooperation between Switzerland and the EU in rail matters, providing for reciprocal opening of land transport and complementing the Free Trade Agreement. Through the implementation provisions to the Railway Ordinance, Switzerland applies the European technical specifications for interoperability (TSIs) as accepted standards and rules of diligence.

The Commission provides support to the **candidate countries and potential candidates** for EU membership, on the development and financing of the rail component of trans-European transport networks, and on the transposition and implementation of the EU rail transport *acquis*. On 23 June 2022, Moldova and Ukraine were granted candidate status by unanimous agreement of the EU Member States. Candidate status was granted on the understanding that these countries take some key steps. The Commission will monitor their progress in fulfilling these steps. The European Union Agency for Railways provides technical assistance to the beneficiaries of the instrument for pre-accession assistance (IPA). In December 2019, ERA and the Commission's Directorate-General for Neighbourhood and Enlargement Negotiations signed a new grant agreement for the period 2020-2022. This agreement was extended in 2023.

In the **Western Balkans region**, the Commission is also active through the Stabilisation and Association Agreement and through the Transport Community Treaty (TCT)³⁷. The Commission continued in particular to support the implementation of the Regional Rail Strategy and of Rail Action Plan in the Western Balkans. In November 2022, the Permanent Secretariat of the TCT published the second annual progress report of the Actions Plans. For rail, the progress was moderate during the reporting

³⁷ Treaty establishing the Transport Community, OJ L 278, 27.10.2017, p. 3.

period: Montenegro established an institutional framework and granted independence to the Railway Directorate (National Safety Body and Rail Regulatory Agency). Albania drafted all the necessary legal documents for implementing the new institutional framework and started publishing the Network Statement for the service facility for the port of Vlore. Serbia has published the Network Statement 2023, and a service-facility description for ports. North Macedonia has done preparatory work on establishing a National Register of Vehicles. Kosovo has drafted a multiannual maintenance contract and given it to the relevant authorities for approval (approval is pending). Bosnia and Herzegovina (entity of Republic of Srpska) has published three bylaws regarding the transposition of EU rail legislation. Bosnia and Herzegovina and North Macedonia have not progressed on measures for the opening of the rail market at the domestic level. However, North Macedonia has initiated activities (ongoing) related to the drafting of the necessary legislation. All regional partners actively contributed to activities related to the start of operations of the Regional Network of Infrastructure Managers (IMs). Moreover, IMs contributed to the first regional project – “Safety Improvement of Level Crossings”, a project supported and managed by the TCT and JASPERS.

In October 2020, the Commission adopted the Communication “An Economic and Investment Plan for the Western Balkans”. It proposes to mobilise up to €9 billion for the period 2021-2027 primarily through investments and support to competitiveness and growth, sustainable connectivity, and green and digital transitions. Several flagship investment are planned in rail transport. The aid will be implemented through the Instrument for Pre-Accession assistance (IPA) and the Western Balkans Investment Framework (WBIF). The new IPA worth 14.2 billion euro was adopted on 15 September 2021 (Regulation (EU) 2021/1529) and will support the implementation of reforms and projects over the period 2021-2027 in Albania, Bosnia and Herzegovina, Kosovo³⁸, Montenegro, North Macedonia, Serbia, and Turkey.

The development of southern rail transport connectivity involves close cooperation with **Turkey**. EU cooperation and technical assistance in the rail sector also extends further towards the neighbouring countries, notably in the Mediterranean and in the southern and eastern regions.

Solidarity Lanes (already referred to in section 3.3.1 on Rail freight policy developments above) play a crucial role in the European Union’s solidarity response in the transport sector to Russia’s war of aggression in Ukraine. The initiative covers both the short term need to keep Ukraine integrated in global supply chains and the medium to long-term challenge to strengthen connectivity and interoperability of transport systems of the European Union and Ukraine.

At international level, the Commission continues to coordinate EU positions and represent the EU in the **Intergovernmental Organisation for International Carriage by Rail (OTIF)**. The EU participates in the activities of all OTIF bodies. The European Union acceded to the Convention concerning International Carriage by Rail (COTIF³⁹) in July 2011 and became a member of OTIF with the status of ‘regional economic integration organisation’. OTIF develops uniform legal regimes for international rail transport as regards technical interoperability, dangerous goods, and railway contract law. OTIF and the European Commission, assisted by the European Union Agency for Railways, cooperate to maintain equivalence between EU and OTIF legislation concerning railway interoperability and safety to the extent necessary for international rail traffic, in order to facilitate rail transport services between the EU Member States and non-EU OTIF Contracting States.

³⁸ This designation is without prejudice to positions on status and is in line with UNSCR 1244 (1999) and the ICJ Opinion on the Kosovo declaration of independence.

³⁹ Council Decision 2013/103/EU of 16 June 2011 on the signing and conclusion of the Agreement between the European Union and the Intergovernmental Organisation for International Carriage by Rail on the Accession of the European Union to the Convention concerning International Carriage by Rail (COTIF) of 9 May 1980, as amended by the Vilnius Protocol of 3 June 1999, OJ L 51, 23.2.2013, p. 1.

The **Organization for Cooperation between Railways (OSJD)** is a platform for rail cooperation at ministerial level and between railway companies. The OSJD brings together 29 countries (including nine EU Member States), with a view to creating a common rail transport space in Eurasia. Before Russia's unprovoked war of aggression in Ukraine, the Commission, with the assistance of ERA, contributed to OSJD work through its participation, coordination and active role in relevant initiatives, including important developments regarding the ongoing reform process to adapt OSJD to the current administrative, legal and economic situation in the rail sector. Cooperation with OSJD has been put on hold for the time-being.

The Commission and several EU Member States also participate in the activities of the Unified Rail Law (URL) initiative within the **United Nations Economic Commission for Europe (UNECE)**. In February 2013, 37 member countries of the UNECE signed the Joint Declaration on the promotion of Euro-Asian rail transport and activities towards unified railway law. In April 2019, the Commission submitted a working document⁴⁰ stressing the opportunity of creating a single legal and liability regime for Euro-Asia rail freight traffic, through the adoption of an "interface law" convention. At the November 2022 session, the UNECE Working Party on Rail Transport decided to follow a step-by-step approach for the development of URL, and decided, as a first step to finalise an interface law convention on contract for international carriage of goods applicable on Euro-Asian corridor, to fill a gap in the international regulations when neither OTIF nor OSJD rules apply over the entire journey (traffic between Europe and Asia). The process of finalisation will take place in 2023 with the view to present a final text for adoption at the next session in November 2023.

The EU rail transport sector can benefit from increased engagement with strategic partners and high-growth economies beyond the direct neighbourhood. A significant example is the Platform of the Rail Regulatory Bodies. The Commission (lead by DG MOVE) and ERA invite the main rail regulatory bodies across the world (US Federal Railroad Administration, Australia, GCC, India, etc.). The last meeting took place in September 2022 in the context of InnoTrans in Berlin.

Work is also progressing on dialogue and cooperation with the ASEAN region in particular on signalling issues.

⁴⁰ Commission Staff Working Document SWD(2019) 152 final, 27.3.2019 'Contribution to the 19th session of the UN ECE Group of Experts towards Unified Railways Law: Options available for converting URL into a legally binding instrument – URL as contract of carriage's convention'.

6. 6. The quality of rail services

6.1 6.1 Safety

Safety remains the top priority for the development of the single European railway area.

Directive (EU) 2016/798 was included in the Fourth Railway Package as a recast of the Safety Directive (Directive 2004/49/EC). Directive (EU) 2016/798 aims to improve access to the market for rail transport services by laying down common principles for the management, regulation, and supervision of railway safety, and by providing for more effective safety certification arrangements and the migration to a single safety certificate. The Directive also provides for a framework to be put in place to ensure equal conditions for all entities in charge of vehicle maintenance through application of the same certification requirements and conditions across the EU. The purpose of this certification system is to provide a framework for harmonising requirements and methods to assess the ability of entities in charge of maintenance across the EU.

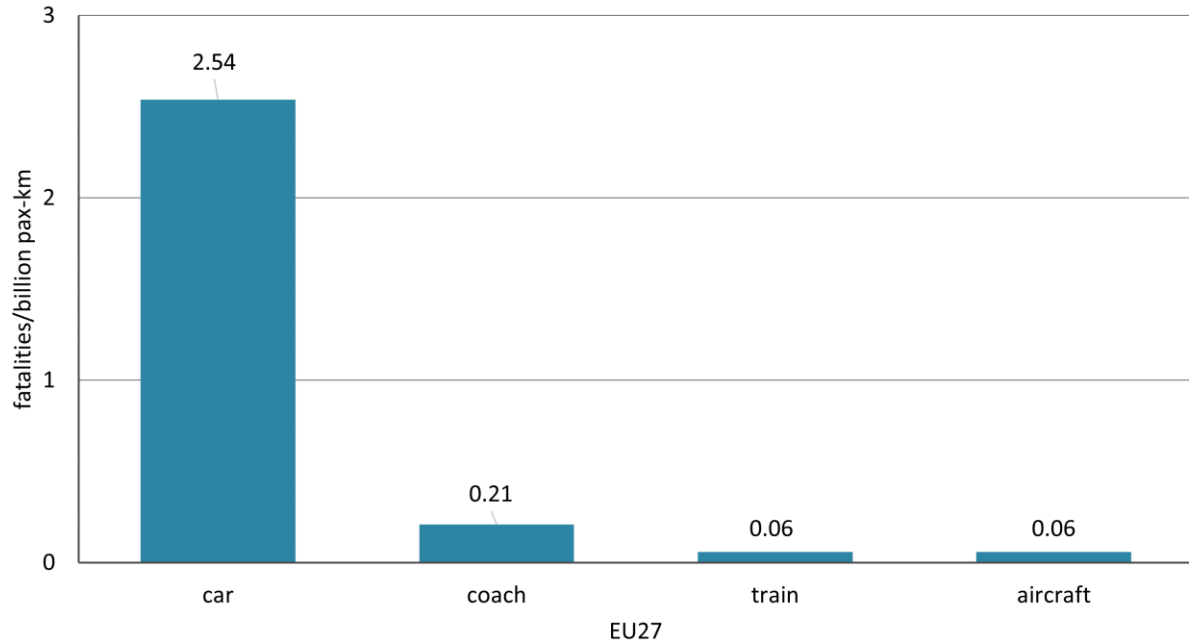
The European Union Agency for Railways has become an EU-wide authority for safety certification of railway undertakings. By the end of December 2021, ERA had issued 61 single safety certificates, including for major players in the sector. National safety authorities continue to act as the principal supervisors for railway undertakings and issue safety authorisations for infrastructure managers, although this activity is shifting gradually to ERA. ERA monitors the activities of national safety authorities (NSAs), their performance and organisation through three-year cycle audits and through heightened collaboration with the NSA network, ensuring the alignment of criteria and procedures with those used by the Agency itself. The first auditing cycle has been successfully completed and a new cycle is beginning with a more ambitious scope of auditing.

The Agency monitors the progress on safety and interoperability of the EU rail system, as mandated by Regulation (EU) 2016/796. Every two years, the Agency publishes a report on progress on safety and interoperability in the single European railway area⁴¹ together with several other technical monitoring reports. The last report was published on 16 June 2022. It highlights how European railways remain among the safest in the world, with major accidents (with five or more fatalities) becoming increasingly rare and the number of significant accidents having decreased in recent years.

⁴¹ See the *Report on Railway Safety and Interoperability in the EU 2022* available at https://www.era.europa.eu/library/corporate-publications/safety-and-interoperability-progress-reports_en.

Figure 111 shows the risk of a fatal accident per billion passenger kilometres for different modes in 2015-2020 as reported by the Agency for the EU27.

Figure 111: Fatality risks of different transport modes (fatalities per billion pax-km, 2015-2020)

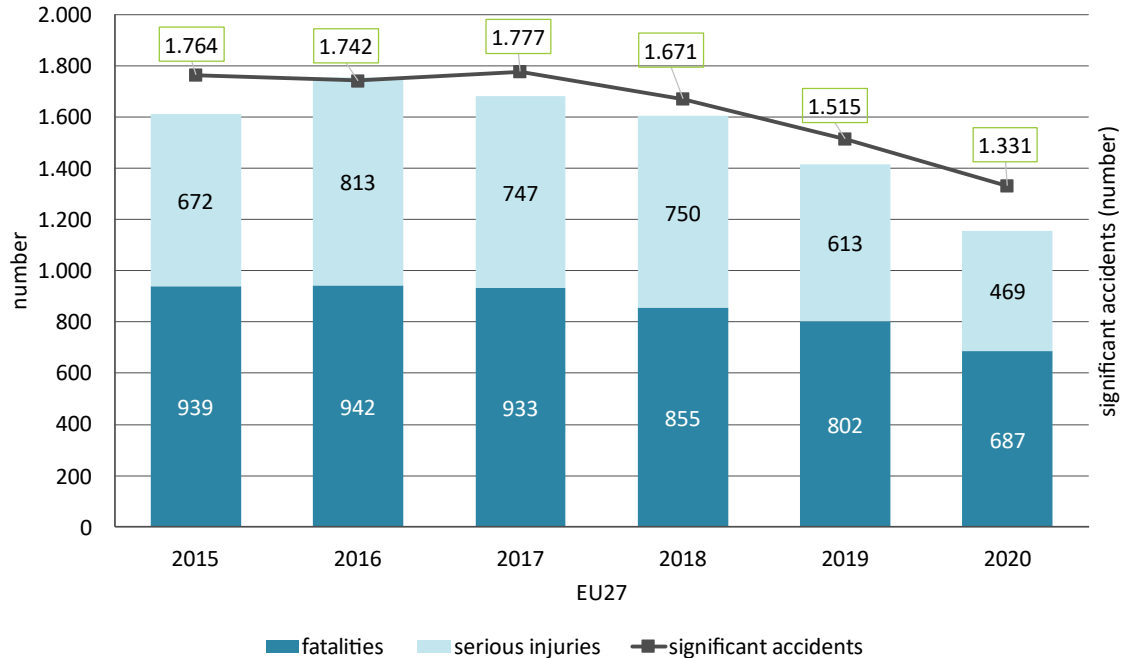


Source: European Union Agency for Railways (ERA), 2022.

The fatality risk of travelling by car is 44 times higher than travelling by train. Travelling by bus has a fatality risk more than 3 times higher than travelling by train. Aircrafts and trains are the safest means of transport, with a similar fatality risk.

Figure 112 shows the number of significant rail accidents, fatalities, and serious injuries over the period 2010 to 2020 as provided by the Agency for the EU27.

Figure 112: Significant rail accidents and resulting casualties (number, 2015-2020)



Source: European Union Agency for Railways (ERA), 2022.

Rail safety is continuously improving. The number of significant accidents decreased by 25%, serious injuries by 45% and fatalities by 21% since 2015.

Table 9 lists the most serious train accidents of the last 2 years.

Table 9: Serious accidents 2021-2022 (update 24 June 2022)

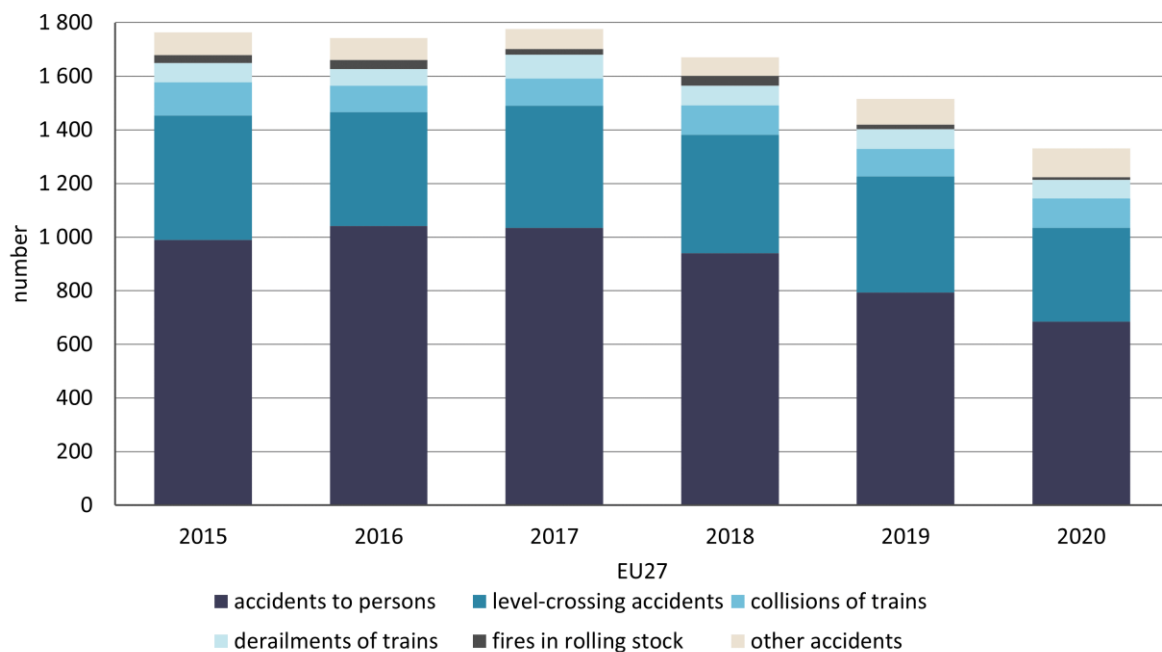
Date	Location	Description
2021		
4 Aug	Milavce (CZ)	2 persons killed when 2 trains collided. The trains that collided were an express service from Munich to Prague and a regional service.
2022 (until end of June)		
14 Feb	Area of the Ebenhausen-Schäftlarn station, Munich (DE).	A passenger was killed and at least 43 others were injured, five of them seriously, in a head-on collision between two regional passenger trains.
05 Apr	Mindszent (HU)	5 persons killed in a railway accident on a collision at level crossing between a passenger train and a pick-up truck in Hungary . The truck came onto the tracks despite functioning barriers and red lights. The impact was such that the train completely derailed and flipped over.
9 May	Münchendorf (AT)	One person killed and at least 12 injured in a railway accident when a passenger train derailed. All six carriages were derailed, with two of them ending up on their sides alongside the railway and the overhead line was torn off laying across the accident site.

16 May	Sant Boi de Llobregat near Barcelona (ES)	1 person killed and more than 80 injured in a railway collision between a freight train and a passenger train. The collision happened when the third wagon of the freight train carrying potash derailed at the entrance to the Sant Boi de Llobregat station and hit the cabin of the passenger train that was leaving the station at that time.
03 Jun	near Garmisch-Partenkirchen (DE)	Five people were killed, and many others were injured when a regional train derailed near Garmisch-Partenkirchen, several carriages overturned and partly rolled down an embankment north of the Garmisch-Partenkirchen ski resort in Bavaria.
03 Jun	between the towns of Vrútky and Varín (SK)	More than 70 people were injured after a passenger train collided with a locomotive. The passenger train had stopped near the Strecno municipality due to a defect and was hit by a locomotive which was coming to its aid.
07 Jun	near Gara Oreshets (BG)	Three people died and several were injured after a passenger train crashed into a truck at an unguarded level crossing. As a result of the collision, the first passenger carriage of the train derailed.

Source: Desk research by DG MOVE.

Figure 113 represents significant rail accidents by different types over the period 2015 to 2020, as provided by the Agency for the EU27.

Figure 113: Significant rail accidents by type of accident (number, 2015-2020)



Source: European Union Agency for Railways (ERA), 2022.

The number of rail accidents decreased during the period 2015 to 2020. Accidents to persons (currently 51% of all rail accidents) were reduced by 31%, and level-crossing accidents (currently 26% of all rail accidents) were reduced by 25% compared to 2015.

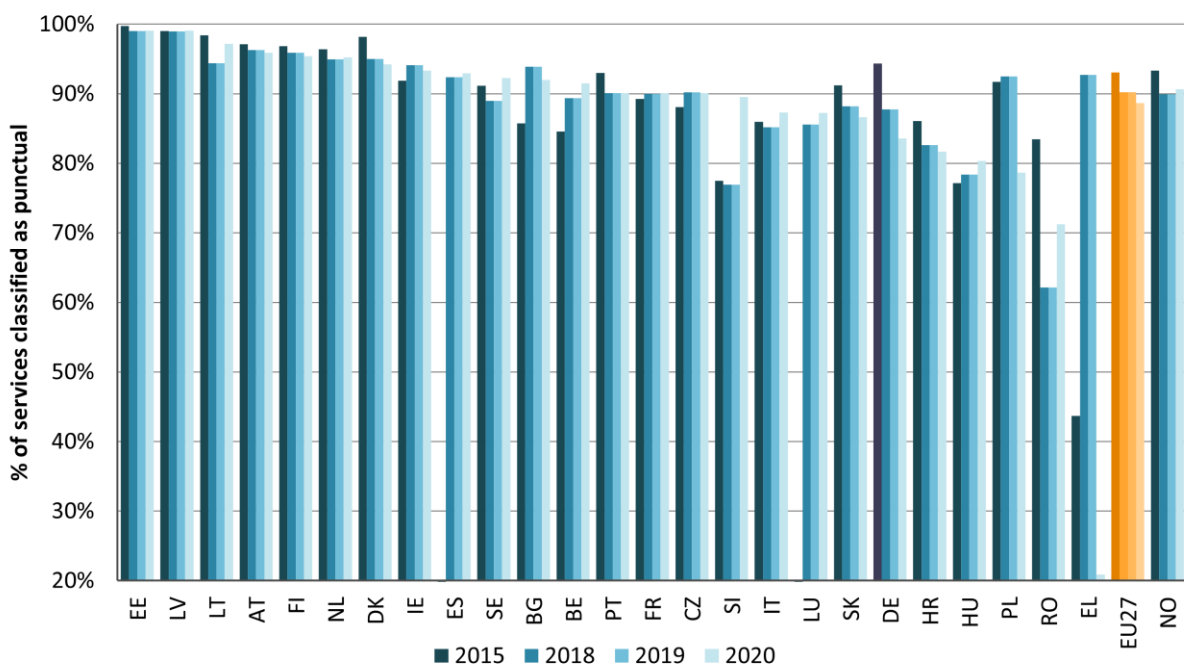
6.2 6.2 Punctuality and reliability of passenger services

6.2.1 6.2.1 Punctuality by category of passenger services

Under the RMMS, Member States are requested to report the number of passenger services arriving on time (meaning with a delay of five minutes or less). However, different definitions of punctuality applied in Member States and the variability in the quality of data provided at the beginning of the implementation of Regulation 2015/1100 make it difficult to obtain fully comparable data across countries and years⁴².

Figure 114 shows the reported punctuality of services classified as regional or local per country for the years 2015 and 2018 to 2020.

Figure 114: Punctuality of regional and local passenger services per country (% , 2015 and 2018-2020)



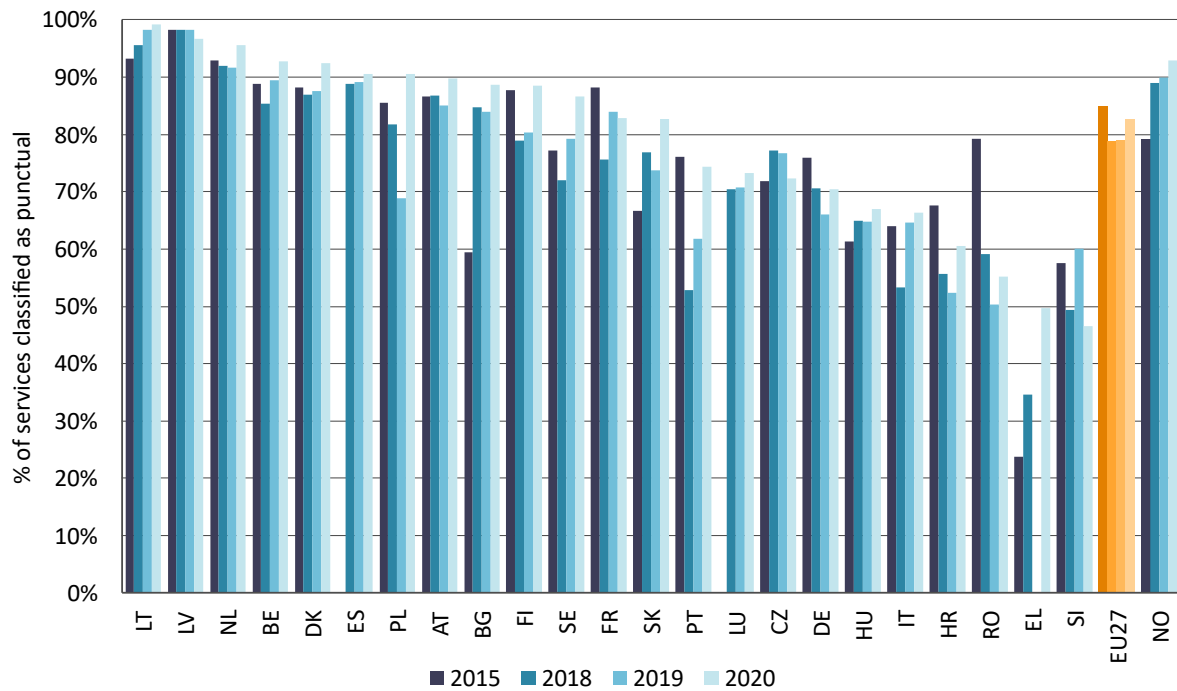
Source: RMMS, 2022. No data 2015 for ES and LU.

The EU27 average punctuality of regional and local passenger services slightly decreased from 93.1% in 2015 to 88.7% in 2020. Estonia and Latvia reported the highest punctuality level in 2020 (99.1%), whereas in Greece only 20.9% of the regional and local passenger services were on time – a significant decrease compared to previous years. Also in Germany, Poland, and Romania the punctuality decreased by more than 10 percentage points since 2015. In contrast, Slovenia improved its punctuality level from 77% in 2015 to 90% in 2020.

Figure 115 shows the reported punctuality of services classified as long-distance or high-speed per country for the years 2015 and 2018 to 2020.

⁴² This is another aspect that should be improved in the future revision of Regulation 2015/10.

Figure 115: Punctuality of long-distance and high-speed passenger services per country (% , 2015 and 2018-2020)



Source: RMMS, 2022. No 2015 data for EE, ES and LU, 2019 for EL and EE and 2020 for EE.

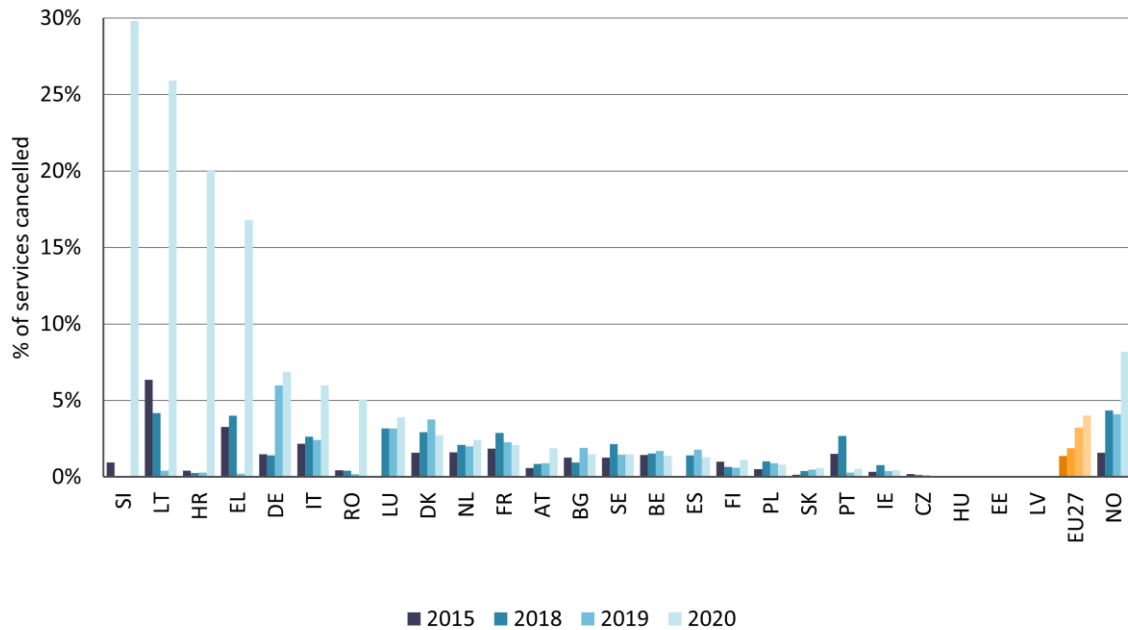
The EU27 average punctuality of long-distance and high-speed passenger services decreased from 84.9% in 2015 to 82.6% in 2020.

Lithuania reported the highest punctuality level for 2020 (99,2%), followed by Latvia with (96.6%). Punctuality in this category has significantly improved in Bulgaria, from 59.5% to 88.6%.

6.2.2 6.2.2 Reliability by category of passenger services

The EU27 average reliability of local and regional passenger services decreased between 2015 and 2020 (Figure 116), with the share of cancelled services increasing from 1.4% to 4.0%. A higher bar in the chart means a higher percentage of services cancelled on total and thus a lower reliability. The percentage of services cancelled increased sharply in 2020 in Slovakia, Lithuania, Croatia, and Greece, which is probably related to the impact of the COVID-19 pandemic. In the other countries the percentage of services cancelled remained mostly stable compared to 2019.

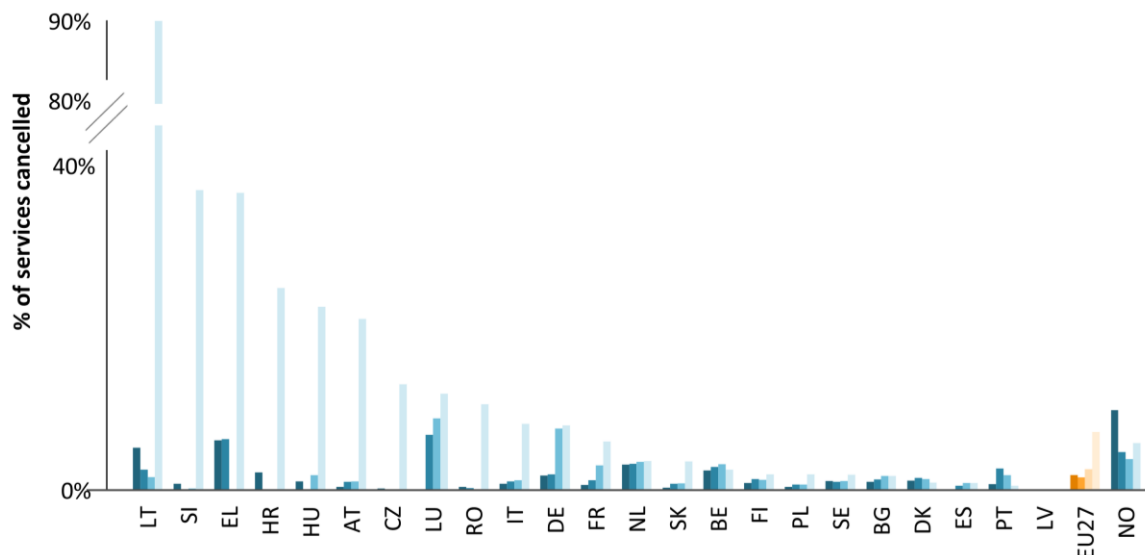
Figure 117: Reliability of regional and local passenger services per country, (% , 2015 and 2018-2020)



Source: RMMS, 2022. LU, ES and LV 2015 not available.

Figure 118 shows the reported reliability of long-distance and high-speed passenger services, measured as the share of cancelled services on total services. Here too, a higher bar in the chart means a higher percentage of services cancelled on total and thus a lower reliability.

Figure 118: Reliability of long-distance and high-speed passenger services per country (% , 2015 and 2018-2020)



Source: RMMS, 2022. No 2015 data for LU, ES and LV, and 2019 for EL and HR.

The EU27 average reliability of long-distance and high-speed passenger services decreased between 2015 and 2020, with the share of cancelled services increasing from 1.5% to 6.0%. Lithuania reported the highest share of cancellations in 2020 with 88%, whereas reliability was highest in Latvia and Portugal (5.7%).

6.3 6.3 Punctuality and reliability of freight services

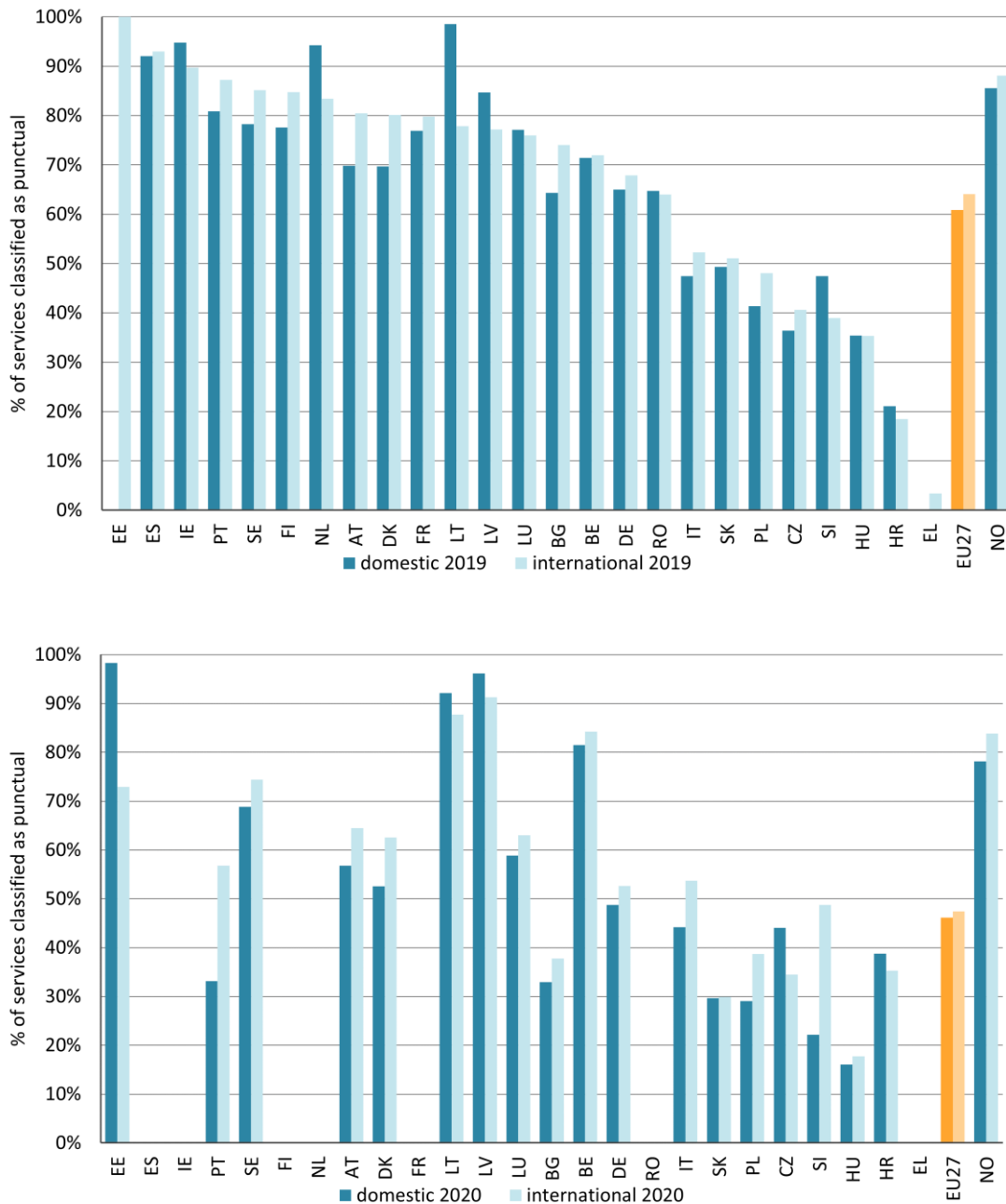
6.3.1 6.3.1 Punctuality by category of freight

Under the RMMS, Member States are requested to report the number of freight services arriving on time (defined as those having a delay of 15 minutes or less). However, different definitions of punctuality applied in Member States and the variability in quality of data provided at the beginning of the implementation of Regulation 2015/1100 make it difficult to obtain fully comparable data across countries and years⁴³.

Figure 119 shows the reported punctuality of domestic and international freight services per country in 2019 and 2020.

⁴³ This is another aspect that should be improved in the future revision of Regulation 2015/1100.

Figure 119: Punctuality of domestic and international freight services per country (% , 2019 and 2020)



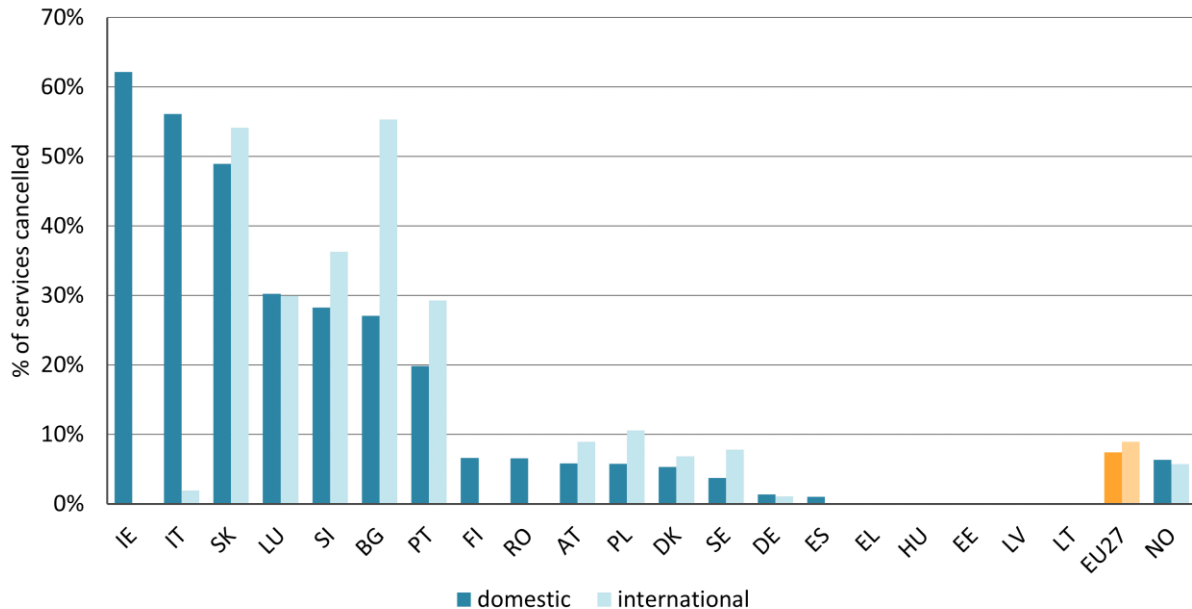
Source: RMMS, 2022. Data for ES, IE, FI, NL, FR, RO, and EL on international freight services not available. Data for 2019 on domestic freight services for EE and EL not available.

On average, the EU27 punctuality in 2020 was 64.1% for domestic and 47.4% for international freight services. From 2019 to 2020 the punctuality of domestic freight services increased by 3.2 percentage points, whereas the punctuality of international freight services increased by only 1.3 percentage points. In 2020, in Lithuania nearly all domestic freight services arrived on time, whereas Latvia reported the highest share (91.3%) of international freight services being punctual.

6.3.2 6.3.2 Reliability by category of freight

Figure 120 shows the reported reliability of domestic and international freight services, measured as the share of cancelled services on total services, for the year 2020. A higher bar in the chart means a higher percentage of services cancelled on total and thus a lower reliability.

Figure 120: Reliability of domestic and international freight services per country (% of cancellations in 2020)



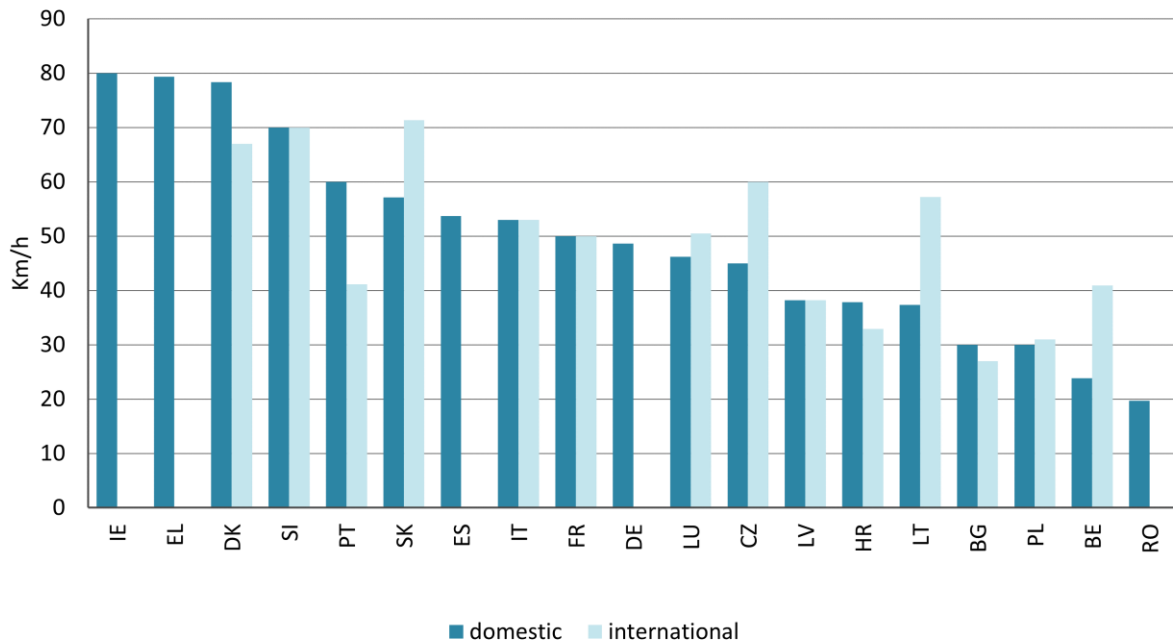
Source: RMMS, 2022. No data for BE, HR; CZ, FR and NL. No data for international freight services cancelled in 2020 in IE, FI, RO, ES and EL.

On average, in 2020 7.4% of domestic and 8.9% of international freight services were cancelled in the EU27. Ireland reported the highest domestic cancellation rate with 62.2%, and Bulgaria the highest international cancellation rate with 55%, whereas Hungary, Estonia, Latvia, and Lithuania had the most reliable freight services in 2020.

6.3.3 6.3.3 Average timetabled speed of freight services

The RMMS collects data on the average timetabled speed of both domestic and international freight services, on a voluntary basis. A majority of Member States provided this information in the RMMS (Figure 121 shows the reported figures for 2020).

Figure 121: Average timetabled speed of freight services per country, (Km/h, 2020)



Source: RMMS, 2022. No data for average timetable speed of international freight services in 2020 from IE, EL, ES, DE and RO.

The reported average timetabled speed of domestic freight services ranges from 19.7 km per hour (Romania) up to 80 km per hour (Ireland). The reported average timetabled speed of international freight services ranges from 27 km per hour (Bulgaria) up to 71.3 km per hour (Slovakia). International freight services appear to be significantly faster than domestic freight services in Slovakia, Czechia, Lithuania, and Belgium; the reverse is valid for Portugal and Denmark.

6.4 6.4 Passenger rights

Regulation (EC) No 1371/2007 on rail passengers' rights and obligations⁴⁴ establishes:

- passengers' rights to information, reservations and tickets;
- assistance, care and compensation in the event of delay or cancellation;
- free of charge assistance (for people with disabilities or reduced mobility);
- compensation in the event of an accident;
- a quick and accessible system of complaint handling; and
- full application and effective enforcement of EU law through national enforcement bodies (NEBs) designated by Member States.

On 29 April 2021, the European Parliament and the Council⁴⁵ adopted the new Regulation (EU) 2021/782 on rail passengers' rights and obligations, which will apply as of 7 June 2023.

⁴⁴ Regulation (EC) No 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers' rights and obligations, OJ L 315, 3.12.2007, p. 14–41.

⁴⁵ https://www.europarl.europa.eu/meetdocs/2014_2019/plmrep/COMMITTEES/TRAN/DV/2020/10-28/RAILPAXconsolidatedtextoftheprovisionalagreement_EN.pdf;
<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0782&from=EN>

The most important new rules include⁴⁶:

- a) a provision on real-time traffic and travel information, which makes it possible to further develop the rail ticketing market;
- b) an obligation for rail carriers belonging to one sole undertaking (100% ownership of subsidiary companies included) and performing international, long-distance domestic and regional rail services to offer such services on the basis of a single-contract ticket ('through-ticket');
- c) the reduction of the pre-notification periods (from 48 hours to 24 hours) when people with disabilities or reduced mobility request assistance, so that they can travel more spontaneously without facing obstacles to their journey;
- d) the passenger's right to self-rerouting and reimbursement of the additional public transport (rail or bus) ticket where carriers do not offer a timely solution (within 100 minutes) to continue the journey;
- e) the possibility to carry assembled bicycles on board new and major refurbished trains, which increases the options for green journeys; and
- f) the introduction of a 'force majeure' clause, exempting carriers from liability to pay compensation for delays, missed connections and cancellations in 'extraordinary circumstances'; this ensures a level playing field with other transport modes⁴⁷.

While the scope of the Regulation covers all railway services, Member States may decide to exempt urban, suburban and regional services (apart from certain mandatory requirements). As regards regional services in particular, the provisions on carriage of bicycles, through-tickets, self-rerouting and PRM protection remain mandatory, but their application could be postponed for five years, i.e. until June 2028 at the latest. Member States that currently have in place exemptions for domestic rail services may keep them until their expiry date in December 2024. Beyond that date, an exemption for domestic long-distance rail services may be granted only:

- by one of the Member States currently applying an exemption;
- from certain exhaustively listed provisions whereas all other provisions remain applicable; and
- for a period not exceeding 5 years, i.e. until December 2029 at the latest.

Where it is technically not feasible for an infrastructure manager to distribute real-time data to any railway undertaking, ticket vendor, tour operator or station manager, the respective Member State may apply an exemption from the provision on real-time information for a maximum of 9 years but will have to re-assess the technical impossibility every second year at the latest. Member States will have to notify the Commission, providing information on the reasons that made the exemption necessary and indicating the measures they envisage taking to improve the situation.

⁴⁶ Q&A on new rail passenger rights rules: https://transport.ec.europa.eu/document/download/c495999b-5847-44c1-930c-da10cb8d2df4_en?filename=2021-06-09-the_new_passenger_rights_regulation.pdf

⁴⁷ Carriers may be exempted from paying compensation, but not from other financial obligations such as reimbursement of the ticket price and re-routing to the final destination, payments for killed/injured passengers or damaged/lost luggage/mobility equipment. Strikes by rail carriers' staff and acts or omissions by other railway undertakings using the same infrastructure, or by infrastructure or station managers, cannot trigger the force majeure clause. The 'extraordinary circumstances' are events that the carrier could neither avoid nor prevent in spite of having taken the care required. The provision covers, among others, extreme weather conditions, major public health crisis and terrorist attacks.

7. 7. Conclusions

The impact of the COVID-19 pandemic was very prominent in the railway sector in 2020. Indeed, traffic volumes decreased in both freight (about 8% compared to 2019 levels) and especially in passenger transport, where volumes almost halved compared to 2019. Measures introduced at EU level, such as the Recovery and Resilience Facility and the Regulation to ease charging during the pandemic, were used to counter the effects of the pandemic on the rail sector.

Yet, as the severity of the pandemic gradually declined, containment measures put in place by Member States (including significant restrictions to the free movement of persons) were lifted to a great extent, the sector is gradually recovering and can be expected to play an increasingly important role within the EU transport system, contributing to reduce transport-related pollution and energy consumption.

Aside from the effects of the pandemic, comparing 2019 data contained in this report with data from previous issues of the report some longer-term trends can be observed.

First, rail is the only mode to have almost continuously reduced greenhouse gases emissions since 1990 while substantially increasing the volumes of traffic, mainly as the result of the electrification of the rail network and the declining carbon intensity of the EU's electricity mix.

Concerning noise, significant progress was made retrofitting freight wagons in the EU with 'silent' brake blocks. About 250 000 freight wagons were retrofitted with such technology between 2017 and 2020.

Several trends can be observed with regards to financing. On the one hand, national and EU funds for both existing and new infrastructure expenditures have been moderately but constantly increasing over the past years.

On the other hand, a more substantial raise can be observed with regard to PSO compensations, with an increase from a cumulative EUR 17 million for the EU27 in 2015 to over 28 million in 2020.

The combination of these two findings seems to point to a funding structure that, in a number of Member States, favours operational subsidies over longer-term investments that would improve the quality of the infrastructure and the framework conditions for all Railway Undertakings.

Concerning the Connecting Europe Facility, a predominant part (70%) of the 23.2 billion for the implementation of 2014-2020 financial envelope of CEF Transport was allocated to railway actions, supporting 448 projects.

Lastly, with regard to funding, an important role will be played by the Recovery and Resilience Facility (RRF), a temporary recovery instrument aiming to mitigate the economic and social impact of the coronavirus pandemic. Under the recovery and resilience plans (RRPs) submitted individually by Member States to benefit from the support of the RRF, just over EUR 50 billion is allocated to the rail sector (including ERTMS and rolling stock), representing the majority of the RRF funding benefitting the transport sector.

Revenues for Infrastructure Managers in 2020 are substantially at the same level as in 2015. However, this needs to be linked with the decline of traffic in 2020 due to COVID pandemic after a constant increase in the previous years.

Regarding research, in the period covered in this report research at EU level was carried out in the framework of Horizon 2020, the eighth EU framework programme funding research, technological development and innovation. Within Horizon Europe (2021 – 2027) – the successor programme to Horizon Europe – and, in particular, within its second pillar dedicated to global challenges and

European industrial competitiveness, EUR 15.2 billion have been allocated to cluster 5, which includes mobility.

Complementing traditional work programmes in Horizon Europe, rail research and innovation is carried out by Shift2Rail and its successor programme, the Europe's Rail Joint Undertaking (EU-Rail), established in 2021. The general aim of the partnership is to ensure a fast transition to a more attractive, user-friendly, competitive, affordable, easy to maintain, efficient and sustainable European rail system, integrated into the wider mobility system. EU-Rail supports the development of a strong and globally competitive European rail industry while contributing towards the achievement of the Single European Railway Area (SERA).

The electrification of the EU rail network progresses, albeit at different pace across Member States. With an increase in the electrification rate by 1.1% since 2015, in 2020 57% of the total EU27 rail network had been electrified. As regards the TEN-T network, rail electrification compliance of the operational network is 74% on the Core and 55.5% on the Comprehensive Network. In 2020, around 81.6% of total train-kilometres were travelled on electricity-powered trains.

The length of the high-speed network in the EU 27 increased by almost 1 500 km between 2015 and 2020, an encouraging development in relation to the targets set in the Sustainable and Smart Mobility Strategy.

A slight increase in the average time necessary for railway undertakings to obtain a licence was recorded in the period 2015 – 2020.

The length of sections declared as congested has been steadily increasing in the period 2015 – 2020. The substantial increase in 2020, however, is primarily due to a new methodology adopted by one Member State for declaring rail infrastructure congested.

Concerning opening to competition the picture is mixed. While the competitors' average share in the EU27 rail freight market increased from 35% to 46% between 2015 and 2020, for passengers a decrease of 1.9 percentage points was recorded between 2015 (8.5%) and 2020 (6.6%) in the competitors' share in national commercial passenger markets. However, the decrease seems to be linked to the peculiar conditions of the year 2020, when PSO services, mainly operated by incumbents, were affected considerably less than commercial services.

Finally, in terms of competitors' market share in the PSO passenger market, on average competitors had a 18.5% market share on national PSO passenger markets in the EU27 in 2020. This level increased slightly compared to 2015 (+ 1.9 percentage points).

In terms of traffic volumes, an increase in the demand for rail transport was recorded prior to the outbreak of the pandemics: in the period 2015-2019, traffic increased by an annual 3% on average, both for passengers and freight.

For rail passengers transport, growth was observed in absolute terms but also relatively to other modes, with the share of passengers transported by rail as a proportion of passengers transported in all land modes increasing slightly, on average by 0.45 percentage points annually.

Over the same period, however, the modal split of rail on total freight transport on land declined from 18.9% to 17.6%.

In terms of policy developments, within and immediately after the reference period for this report, specific measures were introduced to respond to external factors that have a significant impact on the rail sector:

- The Commission’s proposal allowing Member States to **reduce, waive or suspend access charges** due by railway undertakings to infrastructure managers, to counteract the negative economic effects of the COVID-19 outbreak in March 2020.
- The establishment of **Solidarity Lanes**, part of an action plan launched by the European Commission and covering both the short term need to keep Ukraine integrated in global supply chains and the medium to long-term challenge to strengthen connectivity and interoperability of transport systems of the European Union and Ukraine.

More generally – in line with the Commission’s policy priorities and strategic orientations – policies developed over the last years aim at increasing the attractiveness of rail to passengers and freight operators by fostering its customer orientation, making better use of innovation, and promoting competition as a way to improve the reliability, efficiency and affordability of the sector compared to other modes.

In this regard, the Fourth Railway Package opened access to commercial provision of rail domestic passenger services, starting with the 2021 timetable. It also introduced competitive tendering as the standard procedure for attributing public service contracts, with a transition period until December 2023. The Commission will be particularly vigilant in monitoring the correct transposition and application of the Fourth Railway Package, to ensure it achieves its full potential in the medium term.

Data presented throughout this report show that despite COVID, rail is moving forward again, generating more traffic, but also more congestion. However, the pace of progress is not proportionate to the climate change imperative and rail’s expected contribution to transport decarbonization. While it is positive that public spending on rail is growing, the fastest growth is in subsidized operations (PSOs) whereas, in terms of infrastructure, maintenance is stagnant and only the High-Speed network is growing. As such, a demand-driven transformation, enabled by EU legislation on market integration, is not yet developing clearly.