

UPDATED REVIEW OF CHARGING PRACTICES FOR THE MINIMUM ACCESS PACKAGE IN EUROPE

11-12 November 2015

Introductory remarks

*This updated review on charging practices for the minimum access package covers the following countries, members of IRG-Rail: **Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Luxemburg, Netherlands, Norway, Poland, Slovenia, Spain, Sweden and United Kingdom.***

*The IRG-Rail charging working group intends to review this document when appropriate as further information becomes available from other members or other regulatory bodies. In addition the working group would like to underline that this document is an **interpretation of the common charging principles as they stand rather than stating what the charging principles 'should' consist of.** In other words, the document only provides a description on the charging system designed by national infrastructure managers.*

IRG-Rail is the network of independent rail regulatory bodies from 26 European countries. The overall aim of IRG-Rail is to facilitate the creation of a single, competitive, efficient and sustainable internal railways market in Europe. IRG-Rail acts as a platform for cooperation, sharing of best practice on regulatory issues and promotion of a consistent application of the European regulatory framework.

This IRG-Rail paper is published on the responsibility of the IRG-Rail plenary. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the governments of its Member States.

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1. General objectives of the document

The Directive 2012/34/EU was due to be implemented by the Member States before June 16th, 2015. As many Member States have implemented it only recently or have not implemented it yet, charging principles for the minimum access package are still based in some countries on the principles outlined in the former directive (Directive 2001/14/EC). It is thus possible that some charging schemes will evolve in the coming months as a consequence of the Directive's transposition.

The 2012/34/EU Directive is considered to be the legal basis for establishing the principles governing rail charging systems in Europe. This Directive requires Member States to establish charging frameworks that meets the management independence initially laid down in Directive 91/440/EC, and sets out in particular the principles of accounting, legal, organisation and decision making separation between railway companies and the state, and between infrastructure managers (IMs) and railway undertakings. A regulatory body, independent from the IM, has to be implemented in order to guarantee fairness and transparency.

This framework is crucial for a successful functioning of the European railway market. As a result, Member States are now moving towards more transparent capacity allocation and charging systems.

The charging system can provide several desirable outcomes. It obviously provides a mechanism for the IM to recover costs. However it can also be used to incentivise the optimal use and provision of the infrastructure. For example, charges based on cost provide signals to operators and funders to only use the infrastructure where the benefits of use exceed this cost. Furthermore, it can incentivise them to find ways to reduce the costs they place on the network by, for example, investing in less damaging trains.

The purpose of this document is to present an overview of the charging approaches for the minimum access package in the Member States which are part of the IRG-Rail charging working group.

IRG-Rail intends to expand this overview report and would like to invite other IRG-Rail members and European rail regulatory bodies to participate and submit information on their charging systems when available. **The present version is the first update of the overview published in October 2012. It provides an addendum (section 3) that explains the regulatory bodies' roles in charging issues.** The IRG-Rail charging working group will update the report as necessary.

The review of charging systems should allow the IRG-Rail charging working group to:

1. Obtain a common understanding of charging principles in rail in Europe;
2. Explore a common framework for the review of charging principles given by Directive 2012/34/EU;

3. Refine and/or expand activities considered in the working programme of the working group.

2. Charging characteristics: review of charging principles in IRG-Rail Member States

According to Directive 2012/34/EU, the charges specified in the network statements should cover the items included in the minimum access package which are:

- Right to utilise capacity which is granted;
- Train control including signaling regulation, dispatching and the communication and provision of information;
- Use of running track points and junctions;
- Handling of requests for infrastructure capacity;
- All other information required to implement or operate the service for which capacity has been granted.

The main charging principles laid down in Directive 2012/34/EU provide that:

- Charges for the use of rail infrastructure must be paid to the IM and be used to fund its activities;
- Charges must be set at the “*cost that is directly incurred as a result of operating the train service*” (article 31.3 of Directive 2012/34/EU). This principle applies to the minimum access package (the methodology for the calculation of the cost that is directly incurred is given by the European Commission Regulation 2015/909 of June 2015);
- There are exceptions to these charging principles :
 - IMs are allowed to levy a mark-up if the market can bear it and provided that market segments have been defined (article 32.1 of Directive 2012/34/EU). Under this exception, the level of charges must not exclude the use of infrastructure by market segments which can pay at least the cost that is directly incurred as a result of operating a railway service, plus a rate of return that the market can bear;
 - Besides, for specific future investment projects, or specific investment projects that have been completed after 1988, the IM may set or continue to set higher charges on the basis of the long-term costs of such projects if they increase efficiency or cost-effectiveness or both and could not otherwise be or have been undertaken (article 32.3 of Directive 2012/34/EU).
- Charges can also be levied to reflect scarcity of capacity of an identifiable segment of the infrastructure during periods of congestion (article 31.4 of Directive 2012/34/EU) or take account of environmental effects (article 31.5 of Directive 2012/34/EU);

- Infrastructure charging schemes must also encourage railway undertakings and the IM to minimise disruption and improve the performance of the railway network through a performance scheme.

The table below (compiled by the working group) provides an overview of application of charges for the minimum access package in IRG-Rail members. The table is based on the assessment of charging practices in countries detailed in annex (pp. 25-48)¹. It provides information on the following charging characteristics:

- **Charge(s) reflecting direct costs according article 31.3 of Directive 2012/34/EU :** *“[w]ithout prejudice to paragraph 4 or 5 of this Article or to Article 32, the charges for the minimum access package and for access to infrastructure connecting service facilities shall be set at the cost that is directly incurred as a result of operating the train service”;*
- **Mark-ups and market segmentation according article 32.1 of Directive 2012/34/EU :** *“[i]n order to obtain full recovery of the costs incurred by the infrastructure manager a Member State may, if the market can bear this, levy mark-ups on the basis of efficient, transparent and non-discriminatory principles, while guaranteeing optimal competitiveness of rail market segments. The charging system shall respect the productivity increases achieved by railway undertakings”;*
- **Annual prices :** the table indicates whether charges are set every year or not ;
- **Charge(s) under article 32.3 of Directive 2012/34/EU (long term costs):** *“[f]or specific future investment projects, or specific investment projects that have been completed after 1988, the infrastructure manager may set or continue to set higher charges on the basis of the long-term costs of such projects if they increase efficiency or cost-effectiveness or both and could not otherwise be or have been undertaken. Such a charging arrangement may also incorporate agreements on the sharing of the risk associated with new investments”;*
- **Discounts under article 33.3 of Directive 2012/34/EU :** *“[i]nfrastructure managers may introduce schemes available to all users of the infrastructure, for specified traffic flows, granting time-limited discounts to encourage the development of new rail services, or discounts encouraging the use of considerably underutilised lines”;*
- **Charges for the impact of public service operation contract under article 12 of directive 2012/34/EU :** *“[m]ember States may, under the conditions laid down in this Article, authorise the authority responsible for rail passenger transport to impose a levy on railway undertakings providing passenger services for the operation of routes which fall within the*

¹ Note: this table only refers to the mainline network of the incumbent. In some countries, this excludes high-speed lines where high speed trains (generally speed ≥ 200 km/h) are the only ones allowed. Other countries have a mixed usage of their whole network.

jurisdiction of that authority and which are operated between two stations in that Member State”;

- **Incentives under articles 30.1 of Directive 2012/34/EU :** “[i]nfrastructure managers shall, with due regard to safety and to maintaining and improving the quality of the infrastructure service, be given incentives to reduce the costs of providing infrastructure and the level of access charges”.

	Charge(s) reflecting direct costs (article 31.3 of directive 2012/34/EU)	Charge(s) under article 32.3 of directive 2012/34/EU (long term costs)	Annual prices?	Market segments? (article 32.1 of directive 2012/34/EU)	Mark-ups "if the market can bear this" (article 32.1 of directive 2012/34/EU)	Discounts (article 33.3 of directive 2012/34/EU)	Charges for the impact of PSO contracts (article 12 of directive 2012/34/EU)	Incentives under article 30.1 of directive 2012/34/EU
Austria	✓	✗	✓	✓	✗	n/a	n/a	n/a
Croatia	✓	✗	✗	✗	✗	✗	✗	✗
Denmark	(✓) <i>(The charging scheme is currently based on direct costs but the current level of charges does not reflect direct cost. It is foreseen to be based in 2016)</i>	(✗) <i>(The train kilometer charge is as of 2016 foreseen to be based on direct cost through a 12-year period : 2009-2020)</i>	✓	✗	✗	✗	✗	✓
Finland	✓	✓ <i>(One track section)</i>	✗	✗	✗	✗	✗	✗
France	✓	✗	✓	✓	✓	✗	✗	✗

	Charge(s) reflecting direct costs (article 31.3 of directive 2012/34/EU)	Charge(s) under article 32.3 of directive 2012/34/EU (long term costs)	Annual prices?	Market segments? (article 32.1 of directive 2012/34/EU)	Mark-ups "if the market can bear this" (article 32.1 of directive 2012/34/EU)	Discounts (article 33.3 of directive 2012/34/EU)	Charges for the impact of PSO contracts (article 12 of directive 2012/34/EU)	Incentives under article 30.1 of directive 2012/34/EU
Germany	✓ <i>The German law foresees that on basis of the MC a surcharge for full cost recovery is levied (A part of the costs can be born by subsidies).</i>	✗ <i>(but legally possible for specific investments)</i>	✓	<i>Currently under examination by BNetzA. Introduction presumably in 2017</i>	<i>Currently under examination by the BNetzA. Introduction presumably in 2017</i>	✓	✗	<i>Currently under examination within the implementation process</i>
Greece	<i>The Greek IM gradually applies the implementing regulation</i>	✗	✓	✗	✗	✗	✗	✗
Hungary	✓	✗	✓	✓	✓	✓	✓	n/a
Italy	✓ <i>(partially)</i>	✗	✗	✗	✗	✗	✗	✗
Latvia	✓	✗	✓ <i>(based on a current year cost analysis and a forecast of future costs)</i>	✓	✗	n/a	n/a	n/a

	Charge(s) reflecting direct costs (article 31.3 of directive 2012/34/EU)	Charge(s) under article 32.3 of directive 2012/34/EU (long term costs)	Annual prices?	Market segments? (article 32.1 of directive 2012/34/EU)	Mark-ups "if the market can bear this" (article 32.1 of directive 2012/34/EU)	Discounts (article 33.3 of directive 2012/34/EU)	Charges for the impact of PSO contracts (article 12 of directive 2012/34/EU)	Incentives under article 30.1 of directive 2012/34/EU
Luxemburg	✓	✗	✓	✗	✗	n/a	n/a	n/a
Netherlands	✓	✗	✓	✓	✓ <i>Only on lines designated by Transport Ministry (currently: high speed -only)</i>	✗	✗	✗
Poland	✓	✓	✓	✓ <i>Currently under examination.</i>	✗ <i>Currently under examination.</i>	✓	✗	✓
Slovenia	✓	✓	✗	✓	✗	✗	✓	✓
Spain²	✗	✗	✓	✓	✗	n/a	n/a	n/a
Sweden	✓	✓	✓	✗	✓	n/a	n/a	n/a
UK	✓	✗ <i>(Although High Speed 1 has this and there may be more examples in the future)</i>	✗ <i>Periodic review, 5 years</i>	✓	✓	✗	✗	✗

² Current access charges design is transitory as a new railway Law has been promulgated in September 2015. This law transposes the Recast Directive and foresees a direct cost approach.

Findings of this charging review show that:

- In most countries, the charging models are based (at least partly) on the principle of **marginal cost pricing**, although the methods by which marginal cost is estimated and the charges' design vary between countries. In Italy, for example, the actual access charges include in a unique figure both direct costs and other components that, following the principles set in the Recast, would be possibly covered through mark-ups³;
- Most countries have a **multi-part charging structure**;
- There is a trend to take into account external effects. **Sweden**, for instance, incorporates an emission charge levied on combustion engine-driven vehicles into its charging regime. Similar approaches are considered in other countries such as **Switzerland**, which expects to adopt a new rail charging structure for 2017, and **Germany** that introduced a noise differentiated charge for freight trains in June 2013.

In contrast to these areas where a broad commonality of approaches exists, there are several important differences in the approach when regulating IMs in IRG-Rail Member states. These include:

- **Mark-ups** and **market segmentation** are not applied in all countries and, when applied, it appears to differ across countries;
- There are also key differences in the **periodicity of access charges reviews**. In the UK charges are reviewed every five years, whereas for example in France and Poland this is done on an annual basis.

Depending on the number of IMs in each country, **charging practices may also differ within an individual IRG-Rail Member state**. Our analysis has only focused on general trends for the main line network within each Member state and does not address charging systems of local passenger or freight networks or separate high speed lines.

In addition to the access charge reflecting direct costs incurred for the use of the network targeted by article 31(3) of Directive 2012/34/EU, most of national charging systems consider further other charges. In order to avoid confusion, common understandings of these additional charges are detailed below:

³ All the aspects are under revision according to a Consultation process to be finalized by the end of 2015.

- **Congestion and scarcity charges⁴**

The issue of scarcity and congestion is addressed in Article 31 (4) of Directive 2012/34/EU. It states that *“the infrastructure charge may include a charge which reflects the scarcity of capacity of the identifiable section of the infrastructure during periods of congestion.”*

A table setting out whether national infrastructure managers include scarcity charge within their pricing schemes is included below.

- **Environmental charges**

Directive 2012/34/EU states, under Article 31(5), that *“[t]he infrastructure charge may be modified to take account of the cost of the environmental effects caused by the operation of the train.”* It as well stresses that *“[s]uch a modification shall be differentiated according to the magnitude of the effect caused.”*

Some countries have decided to put more emphasis on environmental externalities and promote clean transport modes like rail. Germany uses an integrated system of bonus and malus: bonus for those wagons using retrofitted brake blocks, a malus for all not retrofitted wagons. Environmental charges are used to create a level-playing field across all modes based on impacts on the environment. IRG-Rail considers that all modes should be charged in a way that prevents one mode from being at a disadvantage compared to others.

- **Performance:**

Directive 2012/34/EU states, under article 35.1, that *“[i]nfrastructure charging schemes shall encourage railway undertakings and the infrastructure manager to minimise disruption and improve the performance of the railway network through a performance scheme. This scheme may include penalties for actions which disrupt the operation of the network, compensation for undertakings which suffer from disruption and bonuses that reward better-than-planned performance”.*

- **Reservation charge :**

Directive 2012/34/EU states, under article 36 that *“[i]nfrastructure managers may levy an appropriate charge for capacity that is allocated but not used. That non-usage charge shall provide incentives for efficient use of capacity. The levy of such a charge on applicants that were allocated a train path shall be mandatory in the event of their regular failure to use allocated paths or part of them. For the imposition of this charge, the infrastructure managers shall publish in their*

⁴ It is worth noting that, in November 2014, IRG-Rail has adopted a position paper providing a common initial approach to capacity charging.

network statement the criteria to determine such failure to use. The regulatory body referred to in Article 55 shall control such criteria in accordance with Article 56. Payments for this charge shall be made by either the applicant or the railway undertaking appointed in accordance with Article 41(1). The infrastructure manager shall always be able to inform any interested party of the infrastructure capacity which has already been allocated to user railway undertakings.”

In some countries this charge is introduced as a cancellation charge that applies, when one or several train running days on a train path or part of a train path are withdrawn by the ordering railway undertaking.

A summary of how these various charges are applied in IRG-Rail members is given in the table below.

Country	Congestion / Scarcity	Performance	Environmental	Reservation or Cancellation charge
Austria	✓	✓	✗	✓ (Only for passenger services)
Croatia	✗	✓	✗	✓ (Late cancellation or non-use fees. Depends on cancellation time)
Denmark	✗ (According to Danish Railway Law, congestion is regulated by capacity allocation schemes of the IM. Current charging scheme contains a capacity charge. It is foreseen that the charge will not be levied anymore after 2016)	✓	✗	✓
Finland	✗	✓	✗	✗
France	✓	✓	✗	✓ (Charge combined with mark-ups levied under article 32.1 of Directive 2012/34/EU)
Germany	✗	✓	✓ (Noise differentiated track access charges for freight trains)	✓ (Cancellation fee referring to the withdrawal of one or several train running days on a train path or part of a train path)

Country	Congestion / Scarcity	Performance	Environmental	Reservation or Cancellation charge
Greece	✗	✗	✗	✗
Hungary	✗	✓	✗	✓
Italy	✓ <i>(Access charges are modulated according to time slots)</i>	✓	✗	✓
Latvia	✗	✗	✗	✗
Luxemburg	✓ <i>(Set to 0 in 2012)</i>	✓	✗	✓ <i>(A reservation fee is invoiced to avoid abusive reservations)</i>
Netherlands	✓	✓ <i>(Noise-related and path quality related (both optiona))</i>	✗ <i>(Noise only)</i>	✓ <i>(Late cancellation or non-use fees. Depends on cancellation time)</i>
Poland	✓ <i>(Implemented but not used yet)</i>	✓ <i>(Compensation or penalties)</i>	✓ <i>(Implemented but not used yet)</i>	✓
Slovenia	✓	✓	✗	✓ <i>(Late cancellation or non-use fees. Depends on cancellation time)</i>
Spain ⁵	✗	✗	✗	✗
Sweden	✓	✓ <i>(Quality charge)</i>	✓	✓
UK	✗	✓	✗	✗ <i>(There is only a reservation charge on the High Speed 1)</i>

The review of charging approaches highlights that Member States apply different pricing components to address additional charging possibilities. This may be a consequence of different political preferences, structural differences, different traffic patterns as well as different approaches to regulating the broader transportation sector. It is worth noting that the environmental charge is only applied in few countries (e.g. Germany, Poland, and Sweden)

⁵ Current access charges design is transitory as a new Railway Law has been promulgated in September. This law transposes the Recast Directive and foresees a direct cost approach.

The table below provides information on the main charging units used by Member States. It highlights that the train.km is the most commonly used charging unit (few Member States currently use the tonne.km).

Country	Main charging units
Austria	Train.km and gross-tonne.km
Croatia	Train.km
Denmark	Train.km and DKK/train
Finland	Gross-tonne.km
France	Path.km, train.km and €/year
Germany	Path.km
Greece	Train.km
Hungary	Train.km and number of paths
Italy	Path.km / node and train.km/minute
Latvia	Train.km
Luxemburg	Path.km
Netherlands	Train.km
Poland	Train.km
Slovenia	Train.km
Spain	Path.km, seats.train.km and train.km
Sweden	Gross tonne.km, train.km and €/minute
UK	Thousand gross tonne vehicle .mile, vehicle.mile, train.mile and billing period

3. Roles of regulatory bodies in charging issues

The IRG-Rail Charging working group is currently working on reviewing and understanding the role of regulatory bodies in the context of charging review in the different Member States. Most regulatory bodies are involved in the review of access charging. However, their roles and degree of involvement appear to diverge significantly from one country to another.

In this context, the IRG-Rail Charging working group has produced a questionnaire to map the roles of regulatory body in respect of charging. The questionnaire aims at establishing what the general approaches to charging in various Member States are and exploring in further details some aspects of charging issues.

The following paragraphs present a summary of the main results of the questionnaire, organized by section, *i.e.* (1) general regulatory issues, (2) charging review, (3) charging principles and cost model, (4) investment and subsidies, (5) earnings and cost of capital, (6) efficiency, (7) market segments, (8) performance regime / performance scheme, (9) complaints and (10) traffic forecasts.

3.1 General regulatory issues

- *Scope of regulatory bodies' mission*

Although most railway regulatory bodies (*e.g.* the Danish, Norwegian, Finnish and Polish regulatory bodies) are only responsible for the regulation of the railway market, some members have a wider spectrum of responsibilities in the transport sector and can regulate airports (or even the whole aviation sector), or all the liberalized public transport markets. For example, the Belgium regulatory body also regulates Brussels Airport Operations. In Italy, the *Autorità di Regolazione dei Trasporti* (ART) is in charge of airports, highways, local public transport (buses and, under some respects, taxi) and ports. The Swedish Transport Agency is the regulatory body for rail, roads, maritime routes, and the whole aviation sector. The French regulatory body is in charge of the rail, road and coach sector regulation, while the UK regulator has a monitoring function for roads too.

A few regulatory bodies are also responsible for the regulation of other network industries such as telecommunications and postal services as in Slovenia, the Netherlands or Germany. For the latter, the energy sector (electricity and gas), postal services and energy grid expansion are also part of the regulatory body's competencies. The Spanish Regulatory Body is also in charge of more general competition-related issues.

Within the railway sector, IRG-Rail members can also be responsible for issues other than economic regulation such as licensing in Greece, passenger complaints in Austria, Slovenia and

Italy. Both in the UK and Poland, the regulatory body is responsible for economic rail market regulation, licensing, safety regulation and passenger rights. The Swedish Transport Agency is also the National Safety Agency (NSA) in charge of licensing and safety regulation. In Hungary, the regulatory body is also in charge for licensing and passengers' rights, and operates within the Hungarian Transport Authority that is responsible for rail safety regulation and road, shipping and aviation issues as well.

- *Regulation regime for charges foreseen by national law*

In most countries, the regulatory regime for charges intended by national law is based on a direct cost regime. Most IRG-Rail members have a multi-part charging structure. However, the approach to mark-ups on direct costs differs among IRG-rail countries. In fact, mark-ups are not applied in many countries and, when implemented, they appear to diverge across countries. This is also related to the choices as to public investment in the railway network that vary across countries.

Depending on the number of infrastructure managers in each country, charging practices may also differ within an individual IRG-Rail Member state. For instance, when the Directive 2012/34/EU is fully implemented within the UK, several infrastructure managers will be in scope and different mechanisms will apply for each of these in order to deliver the requirements of the Directive.

3.2 Charging review

- *Review of charging principles and the level of charges*

All regulatory bodies are required to review charging principles and/or the level of charges⁶. In some cases such as Finland, Denmark, or Sweden, the regulatory body has to date performed a high level review or no review at all for the main IM's access charges; an extensive review having yet to be undertaken. In Italy, a consultation process concerning a new access charging system has just been concluded and a new regulatory framework is due to be adopted by mid November 2015.

Other IRG-Rail members, namely Norway and the Netherlands, review charges predominantly when dealing with complaints related to the level of charges, or when supervising negotiations, as in the Dutch and the Spanish cases.

Austria, Croatia, Greece, Finland, Hungary, the Netherlands, Norway and Sweden do not have the power of *ex ante* control of charging principles.

Only the French, UK and Polish regulators approve the charges. In France and Poland, all rail infrastructure managers' charges are approved every year, prior to their entry into force. In

⁶ For some regulatory bodies, the legal basis for this mission could be different from the transposition of the Directive 2001/14/EC or the Directive 2012/34/EU.

Germany all IMs submit their charges to BNetzA, who has the right to object to amendments. In Austria, Finland and Norway the Ministry is also involved in the approval of charges. In the UK the regulatory body approves the charges every five years. In Denmark both the charging principles and the level of charges are laid down by national statutory orders from the Ministry of Transport and Rail Net Denmark respectively.

- *Documents examined in the charges review*

When reviewing the charges, the regulatory bodies examine a variety of documents. As a matter of fact, in addition to the network statement, some regulators look into accounts and regulatory statements. Depending on the country, other specific documents are examined. These range from studies or technical reports that the IMs are obliged to prepare to business plans, cost models and charging methodologies, contracts with the State and with railway undertakings, and the opinions of stakeholders on charges. In Poland, IMs must submit applications for approval of unit rates of charges with the calculation of costs. Disparities are due to the existence of many national legal frameworks, different obligations to IMs and railway undertakings and different processes of establishing charges. In Hungary for instance, in addition to the annual charging document, the regulatory body examines the charging methodology set for five years period.

Regarding the collection of cost data, some countries, such as France and Germany, declare having difficulties to obtain this information. Sometimes, this can be explained by the IM's lack of a proper information system (this is the case in Spain where the IM is adjusting the cost accounting model to the new charging framework). In other cases, the cost data is provided at an aggregated level, even though the IM may possess more detailed data. In the Netherlands, the regulatory body has powers to enforce power of imposing pecuniary penalties to constrain companies to provide information.

Only a small number of regulators have reported that they organise public consultations, prior to the issue of their decision on charges. This is the case of UK, France, Italy and Poland, for example.

- *Frequency of charging reviews*

While many regulatory bodies review the charging principles on a regular basis, a few have no regular schedule for doing so. This is the case of Denmark, Finland, the Netherlands or Sweden. In general, periodic reviewing is annual -for example Poland, Belgium and France- but it can be more or less frequent. In Hungary and in the UK, the regulatory period extends to five years. Charges are reviewed every month in Slovenia, though the charging model is only reviewed when subject to changes. In the case of Sweden, the frequency of reviewing is approximately four years but it can vary across IMs and yearly plans. In The Netherlands, charges are reviewed when there has been a complaint. In Italy, the new system foresees a five years regulatory period of 5 years. To date there is no review of charges.

Modifications within the regulatory period can also be subject to reviewing as in Germany or Hungary for example.

- *Time span of the reviewing process*

There is no common trend across IRG-Rail members regarding how long it takes to review or control charges. Regulators that perform annual reviews carry them out in a time span ranging from one month to a whole year. In France for instance, the formal review process takes two months. In Poland, the procedure for approval of unit rates of charges should last one month and, in the case of particularly complicated cases, two months. As for countries in which the regulatory period exceeds one year, more time is needed to perform the charging review. This requires approximately six months in Hungary and significantly longer in the UK.

Where the statutory time span for *ex ante* review may be short in some cases, for *ex post* controls, timescales, if any, may be less limited. For instance, the German regulator has one month for *ex ante* reviews but no time limit for *ex post* reviews. In Slovenia, the regulatory body examines the fees on a monthly basis. Yet in the case of an appeal, it makes its decision within two months. In the Netherlands, the regulatory body has a maximum deadline of nine to ten months for a review upon complaint and five years for *ex officio* reviews.

- *Publication of the review*

Not all IRG-Rail members publish the result of their charging reviews. Some members systematically publish the review and some never have so far but intend to as is the case for the Swedish regulator. The German regulatory body only has a legal obligation to publish an annual report and an activities report; however it issues press releases and voluntarily publishes some selected decisions. In Poland, all decisions on charges for access and use of rail infrastructure are published as required under Polish law where decisions of public administrations (such as the Office of Rail Transport) are public information. The Spanish regulatory body has a legal obligation to publish the charging review as well as an annual activities report. Every citizen should have access to the text of decision. Other members only publish reviews based on complaints or *ex officio* investigations; this is the case in Denmark, Finland or Slovenia. The UK regulatory body publishes its final decision, together with any relevant consultation documentation or reports produced in the course of the five-year review.

Most regulatory bodies pay attention to the confidentiality issue regarding any sensitive information that may be contained in their published decisions or reviews. For instance, in Poland and Germany some parts of the decisions are not published if they are considered as a secret of the IM.

3.3 Charging principles and costs model

- *Charging principles and regulatory bodies' review of cost assessment*

In most countries, the charging models are based (at least partly) on the principle of marginal cost pricing. In the case of Finland or Sweden charging systems are solely based on marginal costs. While some of the governments support IMs through a subsidy, others require the IM to recover some of its fixed costs through the charging framework in the form of mark-ups, as in France, Germany, Italy, the Netherlands (for one high speed line only), Norway and the UK.

In most countries, a multi-annual contract approved by the infrastructure manager and the government, states, among other things, the amount of public subsidy for maintaining the infrastructure and a range of defined quality standards. In the UK, statutory arrangements play this role. There are no contracts per se.

Most regulatory bodies are involved in the review of access charging. However, their roles and degree of involvement appear to diverge significantly from one country to another. All members are required to review charging principles, even though in some few cases, the regulatory body is not involved in determining the charges in any way, such as in Norway where the Government budget process determines the charges. Regulatory bodies in France, Germany and in the UK carry out an *ex ante* review of the methodology of charges calculation and cost assessment. The ORR requires Network Rail to consult the rail industry on its methodology for calculating each charge. In addition, the ORR reviews the methodology and, for some work, appoints independent experts to subject the methodology to scrutiny and audit.

- *Costs model*

In some IRG-Rail countries the regulatory body uses cost models to review the calculation of costs.

As stated before, the charging models are, in most countries, based on the principle of marginal cost pricing, although the methods by which the marginal cost is estimated varies between countries.

Top-down econometric approaches are already implemented by some IMs, as in Belgium, Finland, France, Netherlands, Norway and Sweden. In addition, IRG-Rail recommends the use of bottom-up engineering methods too, as they are also able to provide robust estimates of direct costs. French, Dutch, and UK IMs already resort to such engineering and modelling calculations. Beyond that, the Swedish Transport Agency and the ORR have developed and implemented their own top-down econometric models (and bottom-up ones for the ORR).

There is no common trend across IRG-Rail members regarding how long it takes to review the calculation of costs. Regulatory bodies that perform annual reviews (*e.g.* France, Germany, Poland or Sweden) carry them out in a time span ranging from one month to a whole year. The ORR and Network Rail recalculate costs, for each periodic review process, every five years.

Finally, the period of time considered when calculating charges significantly differs among IRG-Rail members and according to the nature of costs (operating, maintenance and renewal).

- *Costs drivers*

In their review of charging principles most regulatory bodies consider cost drivers. Most regulatory bodies interpret the cost directly incurred as a short-run marginal cost that should include operating costs (*e.g.* signaling), maintenance costs (*e.g.* wear and tear costs), and renewal costs. IRG-Rail members consider that examples of costs that are not costs directly incurred may be the cost of capital.

For most member states, marginal cost based charges are only differentiated by freight and passenger traffic. Essentially, they are not broken down into smaller market segments. In general, direct costs charges do not vary by market segment.

3.4 Investment and subsidies

- *Review of the IM's investment programmes*

Only the three regulatory bodies of France, Germany and the UK have the task of reviewing the investment programmes of the IMs. In the case of France, the regulatory body only reviews the investment programmes of new investments of more than 200 million euros. In Germany, the regulatory body checks how the investments are reflected in the charging scheme. In the UK, the rail regulatory body has a legal role in reviewing the enhancements of the network specified by the Department for Transport as a part of its High Level Output Specification (HLOS).

- *Financing of the IM's investment programmes (replacement, expansion and maintenance investments)*

The IMs are largely financed either by governments (subsidies), railway undertakings (infrastructure charges) or the European Union (European funds). Some infrastructure managers also receive other income as in UK for example, where Network Rail receives income from property. For all IRG-Rail members, the IMs receive subsidies to finance its investment programs. In Norway, for example, the IM is fully financed by the Ministry of Transport. In other countries, public grants represent a high percentage in terms of the costs that are covered. This percentage may change depending on the type of investment (replacement, expansion and maintenance). For example, in Finland approximately 90% of the IM's expenses (including expansion investments) are funded by the State budget. The rest is covered by track access charges. In Greece, no less than 70% of the total costs are subsidized by the State. In Italy, State provides funds for investments in the conventional network (fully covered) and High Speed Network (partially); renewals and maintenance are financed by the State.

Investment programmes can also be cofounded by European Union funds. This is the case for example in Denmark, Hungary, Greece, Croatia, Italy and Poland. In Hungary, for example, the major renewal and upgrading works are mainly funded by EU funds. The maintenance cost, on the other hand, is financed using the IMs' incomes.

In some countries, such as the Netherlands, Sweden, and Poland new infrastructure projects (expansion investments) are generally financed by the State, whereas renewals, expansions and upgrades of the existent infrastructure are financed by the IM. The IM also receives government subsidies to finance these expenses. In the Netherlands, for example, about 75-80% of the operation and maintenance costs incurred by the IM are financed by subsidies. In Sweden this percentage rises up to 85%.

In contrast with this subsidy allocation depending on the type of expense, the UK IM receives a grant from the relevant governments which is not allocated towards a particular category of expenditure although the governments have specified what enhancements should be delivered within the same five year period of time.

In France, new investments are mainly financed by public subsidies and private funds (private funds are predominant in the case of concessions). The national legislation states that the investments incurred by the IM should not result in "bad" debt.

3.5 Earnings and cost of capital

- *The cost of capital*

Only a few regulators review the cost of capital included in the pricing of the infrastructure. This is the case of Austria, France, Germany, Hungary and the UK. The methodology that prevails when determining this cost of capital is a CAPM/WACC approach.

In France and Germany, the cost of capital is considered as a fixed cost. In Hungary the cost of capital is divided into direct and indirect costs.

- *Definition of complete cost*

The only country with a national legislation that provides a definition for the complete cost of the infrastructure is France. Article L. 2111-10 of the transport code states that the complete cost corresponds to all the charges borne by the IM related to construction, operation, maintenance and renewal of the infrastructure, including the amortization of investments and the remuneration of the capital invested by the IM.

- *Charges based on article 32.3 of the Directive 2012/34/EU*

Four IRG-members reported that the IMs base their charges on article 32.3 of Directive 2012/34/EU (recovery of long term cost). This is the case for the Dialbolo project in Belgium, for

the single rail line between Kerava and Lahti in Finland, for the high speed line Amsterdam-Breda-Belgian border in the Netherlands, for the high speed line Turin-Milan-Rome-Naples in Italy and for the rail line between Stockholm and The Arlanda airport in Sweden.

- *The regulatory asset base*

In three IRG-Rail members a regulatory asset base is determined for charging purposes. This is the case of Croatia, Germany and the United Kingdom. In Germany and the United Kingdom the calculation is based on both internal data (cost data) and external data (annual report). In Croatia the estimation is only based on internal data.

- *Valuation of assets*

Only a few regulators reported having a national law or a practice for valuing assets for consideration within the calculation of charges. In Austria, Croatia and Finland use an historic value approach for the value of assets. Instead, the Netherlands estimate forward looking maintenance and renewal costs. Germany uses the historic costs based on the balance sheets, but corrections are made considering important changes in current costs.

3.6 Efficiency

Some regulatory bodies review the efficiency of the infrastructure manager. The ORR reviews the regulatory accounts and produces an annual efficiency and finance assessment of Network Rail. The ORR's *final determination* sets the complete costs of Network Rail with respect to some efficiency assumptions on costs that allow reaching the outputs set by railway funders. Then, the assumptions ORR has made on the level of Network Rail's maintenance and renewals expenditure will be reflected in the level of charges that operators pay, given that charges are set to be cost reflective. Those assumptions are made *ex ante* for the five year control period.

The French and the Dutch IMs also include efficiency targets within the annual evolution of (some) charges. Nevertheless, those efficiency evaluations remain far less sophisticated than the British ones. The latter involve top-down and bottom-up efficiency assessments.

3.7 Market segments

Regulatory bodies are responsible for controlling the list of market segments that are listed in the network statement of the infrastructure manager (article 32.1 of Directive 2012/34/EU).

There are several important differences in the approach used with regard to mark-ups and market segmentation. The latter are not applied in all countries and, when applied, they appear to differ across countries.

French, German and UK IMs for example, consider market segments when calculating charges. In general, market segmentation differentiates passenger services from freight traffic. Some sub segments may complete the freight segmentation, as it does in Germany and the UK.

3.8 Performance regime

Almost all member of the IRG-Rail have a performance regime included in their national legal framework. In Denmark there is a performance regime on the payment for the use of the state owned rail network and on the environmental subsidy to freight transport. In the Netherlands, there is a performance regime included in the Network Statement and it is agreed with railway undertakings in their access agreements. A performance regime can also be tailored to fit for a particular railway undertaking.

3.9 Complaints

Some regulatory bodies declared having received complaints on charging issues. Some of them, as Croatia, Denmark and the Netherlands have received a reduced number of complaints (one for the case of Croatia, two and a court case for the case of Denmark and three for the Netherlands). In Denmark, two complaints have been received on charging issues. The first complaint concerns the charging principles of a previous ton-kilometre charge for freight trains (case JN34-00006). The second one, from the same freight operator, lies in the continuity of the first one: this complaint (case JN34-00018) focuses on the calculation of the level of charges resulting from the decision of the Danish RB in case JN34-00006. The Danish rail Regulatory Body was also summoned by the Court in a court case issued by a freight operator upon Rail Net Denmark as a consequence of JN34-00018. In the Netherlands, one complaint was related to the costs included in the minimum usage charge proposal for 2010, which included some fixed costs. Other countries such as Poland and Germany receive complaints on a more regular basis. For example, the Polish regulatory body states that the most common complaints are from rail carriers regarding the method and accuracy of the IM's calculation of charges for basic service for the minimum access to the infrastructure. The German regulatory body has received complaints on diverse topics, such as the level of price, price discrimination, performance regimes, billing errors and network statements. In Italy, complaints to the regulatory body concerned access charges for high speed lines.

3.10 Traffic forecasts

Only three regulators challenge the traffic forecasts made by the IM as part of the examination of charges. In the Netherlands, the charges are corrected by the IM *ex ante* on the basis of capacity applied for and extrapolations of volumes in previous years. In Poland, the regulatory body examines the forecast for operational work of the IM for each category of lines and weight. In case of a significant difference with the charge of the last timetable, the regulatory body asks the IM to provide a justification.

In the UK, the majority of charges are not that sensitive to demand forecasts, because they are calculated per unit of traffic. However, when traffic forecasts do affect the level of charges, they are challenged *ex ante*.

4. Annex: Summary of charging systems by IRG-Rail members

4.1. Austria

In Austria there are two charges for the minimum access package:

- the basic charge 1 is based on train-km and is different between three different market segments and between five different route categories;
- the basic charge 2 is charged on gross-tonne km and this shall cover the cost for repair and renewal. Incentives and mark-ups are added to the basic charges.

Charge	Unit	Differentiation	Cost covered
Basic Charge 1	€/train-km	Route category (5) Market segmentation (traffic) (3)	Marginal cost and part of fixed costs
Basic Charge 2	€/gross-ton km	No market segmentation	Cost for repair and renewal
Incentives and Mark-ups	€/train-km	Incentive for capacity optimisation (1) Corridor-specific Freight Traffic Incentive (2) Engine classification (3) Congestion charge (1)	
Performance regime	€/min delay	To reduce disturbance in the rail network, a charge will be levied for each additional minute of delay on selected trains if the delays are attributable to causes which can be influenced. Unit is by delay in minute (capped) attributable to IM or RU.	

4.2. Denmark

Charges for 2015 are levied as laid down in Danish Railway Act n° 686 of 27 May 2015 § 21 point 1, a national statutory order from the Transport Ministry n° 1384 of 15 December 2014 on payment of use of the state owned rail network and on environmental subsidy to freight transport on railway and a national statutory order from Rail Net Denmark n° 1433 of 17 December 2014 on infrastructure charges for the state owned rail network. The charging scheme is based on direct costs. In 2015 the charging scheme consists of three types of charges:

- DKK per train-km (for both passenger and freight services. The charge can either be similar for both types of services or can be differentiated between passenger and freight);
- A capacity charge (DKK per train);
- A bridge charge (for passage of Storebaelt and Oeresund).

There is no mark-up but a cancellation penalty of 50% of the charges on the allocated channel is levied if the operator cancels less than 49 days prior the first scheduled transport. There is a 100% charge for cancelling less than 8 days prior. The charge is inflated on an annual basis by a price index. The charging system includes no discounts or specific charges for PSO contracts. Incentives are given for performance in terms of capacity but no charge is levied for congestion/scarcity. Under specific circumstances, a cancellation charge can be levied.

As of 2016, the level of charges will be based on direct costs. The charging system will include a uniform charge (in train.km) for both passenger and freight trains and a bridge charge.

Charge	Unit	Differentiation	Cost covered
Charge	DKK/train.km	No market segmentation, but some kinds of transportation are free of charge	Direct costs
Incentives and Mark-ups	DKK/train.km	Incentives for capacity optimization No mark-up is levied	
Performance regime	DKK/min delay	To reduce disturbances on the rail network, a capacity charge is levied for delayed trains. The IM has to pay a charge to the railway company for delays attributable to him and under different circumstances.	

4.3. Finland

Track access charges include three components: basic charge, infrastructure tax and, for a single rail line, investment tax.

Charge	Unit	Differentiation	Cost covered
Basic Charge	€/gross tonne.km	Passenger and freight traffic	Marginal cost
Infrastructure tax	€/gross tonne.km	Passenger traffic, freight traffic (electricity) and freight traffic (diesel) Currently not charged for freight traffic. For passenger traffic this component is small (< 10 % of the basic charge)	Origin in environmental and accident costs
Investment tax	€/gross tonne.km	No	Charge based on article 32.3 of directive 2012/34/EU Charged for a single rail line: Kerava – Lahti
Performance regime		A rail operator shall compensate the Finnish Transport Agency (IM) if the operation of the rail operator essentially differs from the rail capacity allocated to it for a reason due to the operator, and such a deviation impedes the functioning of the railway system. The Finnish Transport Agency shall compensate a rail operator if, for reasons due to the Finnish Transport Agency, the availability of the rail network essentially differs from the rail capacity allocated to the operator, and such a deviation impedes the functioning of the railway system.	

4.4. France

In France, the charging system implemented by SNCF Réseau⁷ is based on a three-part tariff regime for activities under a public contract (e.g. regional trains) and a two-part tariff for the other activities (e.g. high speed trains).

As defined in the French Decree No. 97-446 of 5 May 1997(amended), the current charging system includes running charges, reservation charges and access charges (only for activities under a public contract).

Charge	Unit	Differentiation (as implemented by SNCF Réseau in the Network Statement for 2015)	Cost covered (as laid down in Decree No. 97-446 of 5 May 1997)
Running charge	€/train.km	Type of service/train The charge is issued only if the reserved path is run	Variable costs for operating, maintenance and renewal
Access charge	€/year	Only for activities under a public contract (TER, Transilien and TET)	Fixed costs for operating, maintenance and renewal
Reservation Charge	€/ path.km	Period of the day Route category Crossing Paris area or not on high speed lines Regional routes on high speed lines Speed (freight) High speed trains where the origin (destination) is or not Switzerland	0-100% of the cost of capital Mark-ups “if the market can bear this” Costs related to capacity constraints

⁷ The other infrastructure managers regulated by ARAFER are not considered here.

4.5. Germany

The charging system for the minimum access package is composed of an user-dependent component (route category, train path product), a service-dependent component (incentive system and deviation from minimum speed), a noise differentiated component and other components (load component, offer charge etc.). The charging unit is the train path kilometer.

Charge ⁸	Unit	Differentiation	Cost covered
Basic price	€ / train-path.km	12 route categories	Sum of revenues should cover the costs of the IM (full costs - meaning total cost – minus public payments and plus return on investment)
Train path product factor	Factor (x 0.5 up to x 1.8)	7 product factors (4 for freight trains, 4 for passenger trains)	
Minimum speed	Factor (x 1.5)	Where a minimum speed of 50 km/h is not achieved on long distance routes and urban rapid transit routes	
Performance regime	10 ct / delay minute, capped attributable to IM or RU	To reduce disturbance in the rail network, a charge of 10 cents will be levied for each additional minute of delay on selected trains if the delays are attributable to causes which can be influenced. Passenger transport ≥ 6 min, freight transport ≥ 31 min.	
Load component	0,98 € / train-path km	For trains > 3000 tonnes	
Charge for preparing an offer	80 € / offer	Charge in case a train path ordered is not taken up (a processing fee per train path is charged for not accepting a train path offer)	
Cancellation charge	€ / train. path (offer)	A minimum cancellation fee is to be paid for a cancellation amounting to the fee required for preparing the offer. In addition, a percentage-based cancellation fee will be levied depending on when the cancellation was made and the standard fee for the cancelled train path or cancelled part of the train path. The cancellation fee will not exceed the equivalent of the foregone access charge for the cancelled train path.	
Noise differentiated track access charge (NDTAC)	Malus in percent of the basic price; bonus in cents per axle-km	NDTAC addresses only RUs and consists of two components. Loud freight trains have to pay a noise-based surcharge on top of their train access charge. The surcharge amounts to 2 per cent. Furthermore, RUs receive a bonus amounting to 0.5 cents per axle-kilometres	

⁸ Figures are copied from DB Netz AG (2014), The Train Path Pricing System 2015 of DB Netz AG.

		<p>(maximum 211 EUR per axle) for the use of retrofitted freight wagons based on the mileage generated. Quiet freight trains are excluded from paying the surcharge if they submit appropriate documentation. A train is defined as quiet if it consists of at least 90% of quiet wagons.</p>	
<p>Further components</p>		<p><i>e.g.</i> diminution of track charges due to bad infrastructure quality. (Reduced charge if the condition of the track infrastructure does not comply with the terms of the contract: If the condition of the track infrastructure, the related command and control technology and/or the facilities for the supply of traction current do not comply with the terms of the contract, DB Netz AG will reduce the infrastructure usage charges upon own initiative or upon advice).</p> <p>On-demand train path (last minute request): RUs can apply for a maximum of 15% (calculated on the basis of the train path kilometres) of their total number of registered train paths as on-demand train paths. If the on-demand train path is used, the corresponding train path price is to be paid. If the on-demand train path is not or only partly used, a reservation charge for the unused part of the train path will be levied. The reservation charge amounts to 10 % of the cost of the unused on-demand train path.</p> <p>Pre-designed train path: for the promotion of the use of lines with a low level of utilisation, the IM offer free capacity on such lines in the form of pre-designed paths after the drafting of the working timetable. Pre-designed train paths are offered at a discount of 10 % on the regular usage charge. The discount is only granted if train paths are ordered in unaltered and complete form; no entitlement to the provision of pre-designed train paths.</p> <p>Alternative Routes: On lines with a low level of utilisation, the IM grants limited-period discount. These are designed to act as an incentive to use alternative routes with a low level of utilisation. (Actually one line and discount of 40%).</p> <p>Discounts for new services: As a means of promotion for new train services, the IM grants all Access Parties limited period discounts in the form of a percentage discount on the regular usage charge on certain line sections (10% on train path charge).</p>	

4.6. Greece

The infrastructure management charging system is constituted of a basic cost which includes the cost of track maintenance and operational services. Where appropriate, it also includes additional charges such as electrification and special costs.

There are two basic charges, each per train.km, one concerning operation services (0.65 euros per train.km) and the other concerning track maintenance (0.40 euros per train.km). Each one of these charges is to be multiplied by two factors. The first factor for the operation services (for the first quantity) has to do with the relation of the day time period of the route with the peak one and ranges between 0.7 and 1.2 and the second factor for the operation services (for the first quantity) has to do with the relation of the whole time of the route in the timetable in relation with the ideal minimum time that a typical fast train can operate this route without intermediate stops and ranges roughly between 1 and 1.5. The first factor for the track maintenance (for the second quantity) is related to the quality of the track and ranges between 0.53 and 0.90, while the second factor for the track maintenance (for the second quantity) is related to the axial load, the total load and the speed of the train and ranges between 1.0 and 9.61 . The sum of the two quantities gives the charge per train.km.

Charge		Unit	Differentiation	Cost covered
Basic cost	Operation	€ / train.km	Categorization of routes based on peak periods Burdening line capacity	≤ 30% of the actual cost (accrued expenditure) of maintenance and operating
	Maintenance		Maximum speed The train's composition (number of axes) The mean axial load Quality of infrastructure provided	
Additional costs	Electrification	€ / train.km	Whenever using a route which operates under electrification	
	Additional charges depending on the case	No charge per unit : charging on a case-by-case basis	Special- dangerous consignments	

4.7. Hungary

The Hungarian State Railway (MAV Co.) was established in 1992. In 2000, an internal separation of accounts occurred. Different entities were created in order to manage the main activities. In 2003 the first Hungarian Network Statement was released and opened the way to foreign RUs on the network in 2004 (4 freight companies at the end of the year). The same year, the independent Rail Capacity Allocation Body was created. In 2006, the Hungarian Railway Authority was set up. The Hungarian network has a total length of 7700km. It is owned and managed by the Infrastructure Management Business Unit that is a separate organisational entity, however still part of MAV Co.

The Győr-Sopron-Ebenfurti Vasúti Co. (GYSEV Co.) was founded in 1872 and is owned mainly (94%) by the Hungarian and the Austrian State. The company operates in the North-Western region of Hungary and Austria. In Hungary GYSEV provides IM (in its geographical area) passenger and traction services and is considered as one of the two national PSO companies and also has a freight company (GYSEV Cargo) legally separated since 2010. The GYSEV network has a total length of more than 400km.

The main principles of the access charge are the following:

- no discrimination between RUs should take place;
- prices set by the IMs must reflect the total justified costs;
- differentiation of the pricing system;
- bottom-up (engineering) approach;
- long term orders are preferred.

Charge	Unit	Differentiation	Cost covered
Minimum access package	Number of paths Train.km	Path allocation Train running	MAV Co. is seeking a full cost recovery without profit
Access to service facilities	Electric train.km Number of stops Train departures/destination Number of cases Number of wagons Number of wagons Number of wagons Person/hours Number of cases	Use of overhead catenaries Passenger train stops Passenger train departures/destinations Freight train start/interim/destination usage Freight wagon access to loading/unloading tracks (station usage for serving) Rail vehicle storage Access to weighting facilities Additional personnel Freight train check in	Shall relate to the cost of providing it, calculated on the basis of the actual level of use
Additional services	Number of wagons	Marshalling, shunting and consignment of freight wagons Weighting	

	Number of wagons Number of wagons Number of cases Hours	Change of axles Forwarding of dangerous and outsized goods Usage of normal gauge bogies	
Ancillary services	Number of cases	Education and examination of personnel	

4.8. Italy

In Italy, the charging system applied to the conventional lines is based on the economic and technical parameters contained in a Decree issued in 2000 (MD 43T/2000). Therein, the network is divided into slots (tracks and nodes) and each slot has a particular price computed through a fixed algorithm, where two components are identified: an access charge (specific to the node or the category of the track: fundamental or complementary) and a running charge in euro/train.km (fundamental and complementary tracks) and euro/minute (nodes). The model differentiates also for speed, density and wear (through coefficients are only applied to the running charge for the fundamental tracks) and time slots and category of station (only for nodes). This system applies to all types of traffic (passenger and freight). The access charges do include direct costs as well as other components that, following the Recast, should be included in the mark-ups.

Charge	Unit	Market segmentation	Cost covered
Access charge	€/track €/node	Depending on the track; no differentiation for nodes	A share of direct and indirect overhead relating to traffic movement, costs of traffic management and salary cost
Running charge	€/path.km €/ min	Track: - Track category - Density/frequency (3) - Speed (4) - Wear (4) Nodes: - Period of the day (3) - Station (2)	A share of direct and indirect overhead relating to traffic movement, costs of traffic management and salary cost

4.9. Latvia*

The main principles of the access charges are developed hereafter:

- the full cost of infrastructure should be covered by accumulated charges and state budget funding if it is available;
- all expenses are traced to particular train category;
- Train-kilometers and gross ton-kilometers are used as cost drivers.

Charge	Unit	Market segmentation	Cost covered
Operating	Train.km	Differentiation among: <ul style="list-style-type: none"> - Freight trains; - Passenger trains (electric); - Passenger trains (diesel); - Passenger trains with locomotive; - Narrow-gauge trains. 	1/ Costs of maintenance of railway infrastructure objects made by IM; 2/ Costs of railway infrastructure objects development (renewals, reconstruction, building) consists of capital depreciations costs (excluding capital depreciations costs of government, EU funds) and premium costs; 3/ Duties and taxes paid by IM

** In order to transpose Directive 2012/34/EU, currently responsible institutions and stakeholders in Latvia have started to develop new charging scheme. Significant changes are therefore planned.*

4.10. Luxemburg

Charge	Unit	Differentiation	Cost covered
Minimum service			Equals the cost that can be allocated directly to running the railway service and include a fee for scarcity of access to infrastructure capabilities
Access and request of path	Train path. km	Regular train path Pre-arranged extraordinary train path Tailor made extraordinary train path	
Operation of path (track wear)	Train path. km	Freight train Combined transport freight train Motor-driven passenger train Passenger train Running locomotive	
Capacity / congestion charge	Train path. km		

Note: A performance regime is applied with penalties and compensations

4.11. Netherlands

Charge	Unit	Differentiation	Cost covered
Access Variable Usage Charge	train.km / tonne.km	Differentiation between freight and passengers Freight: train km by graduated weight category Passengers: train km by graduated weight category	Covers the incremental cost of operating a train on the network. Measured by a percentage of wear and tear cost in total maintenance costs.
Electrification: use of electrical wire	€ per kWh	No segmentation, defined by km per train type/weight, train type and speed (actual usage in case gauges have been fitted)	Covers cost of transport of electricity only, wear and tear of wire not included
Access via rail to railway stations	€ per stop per train category	Six categories of stations (by size/number of passengers). Three train categories defined by percentage of stops on their total route. Category A: stops at max. 15% of stations on route Category B: stops at max. 50% of stations on route Category C: stops at 51-100% of stations on route	Recovery of ProRail's part of station maintenance; ProRail does not own the stations, but has a right of use of the tracks and passenger corridors to and from platforms. Charge covers only the costs involved with corridors (cleaning and maintenance)
Shunting and parking	€ per meter of track / day / month / year	Two categories: service areas controlled centrally/ decentrally (switch points controlled locally or centrally)	Covers incremental cost of track wear and tear measured by a percentage of maintenance cost

4.12. Norway

The domestic legislation states that charges for the minimum access package must equal the costs that are directly incurred. However, in practice, infrastructure charges are determined yearly through the Government budget process. The charge is based on direct social marginal costs. The social marginal costs of passenger railway transport is considered to be negative (because of positive externalities), hence there are no charges. To stimulate a transfer of transport to railway from other transport modes, there are no charges for freight traffic either. Only heavy freight trains (axle load above 25 tonnes) are levied a charge, which only applies to the transport of iron ore on Ofotbanen. However, with the implementation of 2012/34 and the ongoing railway reform in Norway, a charging regime in line with the legislation is foreseen.

Charge	Unit	Differentiation	Cost covered
Access Variable Usage Charge	NOK/train.km	Charge only levied for freight trains with axle load above 25 tonnes	Assumed incremental costs for maintenance and renewal as a result of running a train with axle load above 25 tonnes
Operating charge	No	n/a	None
Reservation Charge	No	n/a	None

4.13. Poland

In Poland charges for the minimum access package are based on the costs directly incurred as a result of operating the train service and they are applied on non-discriminatory terms to all rail companies.

The unit rates of these charges must be submitted, together with the calculations of their values, to the President of the Office of Rail Transport. The President of the Office of Rail Transport approves the unit rates of charges within 30 days of the receipt or refuses to approve them if there is any infringement of calculation rules.

The calculation of charges for the minimum access package takes into account the part of the costs which is directly incurred as a result of operating the train service, in particular the part of the costs of:

- maintenance and renewal;
- rail traffic management;
- depreciation, if it is determined on the basis of the actual wear of the infrastructure attributable to traffic.

The calculation of charges for the minimum access package does not include costs which are not directly incurred as a result of operating the train service, in particular:

- the administration costs;
- infrastructure safety and public order in railway area;
- the financial costs;
- the indirect costs

Charges depend on train-km and they are differentiated on the basis of five different line categories and weight categories of trains. For passenger services there are 16 weight categories of trains and for freight services - 37 weight categories of trains. The line categories are determined on the basis of traffic intensity and speed limits.

The basic charge may be increased during periods of congestion on a particular rail line or its section with insufficient capacity.

The IM may increase the basic charge, if it proves that the expenditures have been incurred in made to:

- improve insufficient capacity of a particular line, or;
- to avoid negative impact of rail traffic on the environment, provided that the increase in charges will be comparable to those used by the competing modes of transport.

The IM may grant discount on the basic charge. Discounts may be granted for a limited time and on a particular section of the infrastructure:

- to develop new rail services;
- in order to use the railways with a significant unused capacity, or;
- if the savings were made in the management of railway infrastructure by the IM.

Charge	Unit	Differentiation	Cost covered
Operating charge	PLN/ train. km	- Freight/passengers services - Weight categories of trains 16 for passengers services, 37 for freight services) - Line categories (5)	The costs directly incurred, <i>i.e.</i> the part of the costs of: - maintenance and renewal; - rail traffic management; - depreciation, if it is determined on the basis of the actual wear of the infrastructure attributable to traffic
Reservation/ Cancellation Charge	% charge		Depends on the term of cancellation
The additional charges			The additional charges shall be determined on the same basis for all carriers, so as to ensure the financing of the costs which the IM will have to bear providing the expected range of available railway infrastructure, plus a margin of not more than 10%.

The IM can levy higher charges (excluding transport for which the minimum unit rate basic charge is used and transport dependent on public funding), if the market can bear it bear it that is, on the case it has been established that the increased charge does not result in the shift to the road transport. IM undertakes 'market can bear tests' no less than once every three years, taking into account the division of the market into at least the following pairs of types of services:

- 1) passenger services/freight services;
- 2) regional passenger service/ subregional passenger services ;
- 3) trains carrying dangerous goods /other freight trains;
- 4) domestic services /international services;
- 5) combined transport / direct trains;
- 6) block trains / single wagon load trains;
- 7) regular in services / occasional train services.

4.14. Slovenia

In February 2013 the Public Agency for Railway Transport (the allocation and safety authority), who is competent for determining and collecting track access charges, implemented a new charging methodology, based on direct costs. Track access charges for the minimum access package are calculated considering:

- the number of train kilometers performed on certain line categories
- type of power car;
- weighting of the line category;
- the coefficient of the power car category;
- cost of supplement / deduction for the type of transport.

User fee for minimum access package are based on costs, which are directly incurred by train operations. The difference with full costs is subsidized by state funding. To date Slovenia has not taken the decision to introduce mark-ups.

In accordance with Railway Transport Act the allocation authority may establish higher access charges for congested infrastructure under following conditions:

- Allocation authority defines track section as congested;
- IM envisaged this situation and published in NS;
- IM prepares enhancement plan;
- RB approves higher access charge.

Charge	Unit	Differentiation	Cost covered
Access	€/train.km	<p>Line category (7):</p> <ul style="list-style-type: none"> - 3 main lines (G1-G3) - 4 regional lines (R1-R3) 	Costs directly incurred by train operations
Operating	€/train.km	<p>Factor of power car's (3): (A,B,C)</p> <p>Factor of transport type (18):</p> <ul style="list-style-type: none"> - Cargo trains up to 1000 t gross weight - Cargo trains from 1001 to 1500 t gross weight - Cargo trains from 1501 to 1750 t gross weight - Cargo trains from 1751 to 2000 t gross weight - Cargo trains more than 2000 t gross weight - Cargo trains – empty (less than 100 t net weight) - Cargo trains (circular, collecting) - Locomotive trains (empty multiple units, solely running power cars) - Tilting passenger trains - Classic passenger trains <ul style="list-style-type: none"> - Multiple units - Motorail through the Bohinj tunnel <ul style="list-style-type: none"> - Other motorails - Empty classic passenger trains <ul style="list-style-type: none"> - Heritage trains - Service trains (scheduled maintenance) - Service trains (unscheduled maintenance) <ul style="list-style-type: none"> - Other trains 	
Congestion / Scarcity	€/train.km	(In 2013 no congested lines were declared)	
Late cancellation fees	% of user charge for allocated train path	<p>Cancellation:</p> <ul style="list-style-type: none"> - up to 6 hours before scheduled time of departure – FREE 	

	<p>(+25 € for ad-hoc train paths)</p>	<ul style="list-style-type: none"> - less than 6 hours before scheduled time of departure – 50% of user charge - not cancelled / train does not run – 100% 	
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4.15. Spain

In Spain, the chosen charging system is based on a two part tariff (while the fixed part of the fee is very low).

For the rail network, the minimum access package is based on train-kilometers and includes operating charges and reservation charges. According to the new railway law, the reservation charge will provide incentives for efficient use of capacity, foreseeing a penalization for the capacity reserved and not used.

The IM’s cost accounting model is based on a *top down* fully distributed cost, because the main goal of the charging system is full “cost recovery”. However, nowadays, this objective is only feasible for high speed lines due to the operational deficit of the conventional network.

Charge	Unit	Differentiation	Cost covered
Access charge	€/year	Total Annual Train-km running	Administrative costs related to the relationship of the IM with RUs. E.g. the publication of the Network Statement, or the process of network capacity allocation.
Reservation charge	€/ path.km	Period of the day (3) Route category (4) Type of service/train (4)	Fixed cost for operating and maintenance.
Running charge	€/train.km	Route category (4) Type of service/train (4)	Variable cost for operating and maintenance.
Traffic charge	€/seats.km offered	Period of the day (3) Route category (4) Type of service/train (only HST)	Amortization and financial cost

4.16. Sweden

The charges for the minimum package of access services are based on the short-term marginal cost of operation, maintenance and reinvestments and charged according to use per kilometre, gross tonne-kilometre and passages.

The track charge is based on gross tonne-kilometres, and is imposed at varying amounts for both freight traffic and service trains, and for passenger traffic. From 2016 Track charges are levied in different amounts depending on the maximum admissible axle load (STAX) of the train. Trains with a higher STAX thus pay a higher track charge. STAX is an important parameter that reflects the wear and tear that is caused by a train. Differentiated track charges reflect variations in wear and tear between different trains.

The train path charges are levied at three levels. Passage charges are levied in three major cities during rush hours on weekdays. The emissions charge is based on the socioeconomic costs in terms of environmental and health effects. The size of the charge depends partly on the engine's environmental classification and partly on the amount of fuel consumed.

In the case of allocated capacity for train paths cancelled by railway undertakings or traffic organisers, a reservation charge is imposed.

Charge	Unit	Differentiation	Cost covered
Access & Operating Charges (marginal cost)	€/gross tonne.km	Passenger, service or freight traffic	
Track charge	From 2016: Factor 0.9-1.1 depending on maximum axle load	Freight traffic and service trains <22,5 tonne/ 22,5-25 tonne/ > 25 tonne Passenger traffic <20 tonne/>20 tonne	Maintenance, operation and reinvestment cost and socio- economical costs of environmental and health effects
Emission charge	€/litre of diesel fuel	Train type (diesel engine)	
Train path (also marginal cost)	€/train –km	Passenger, freight, service traffic Route categories (high, medium and base)	

Passage charge	per crossing	Freight traffic Öresund link Stockholm, Gothenburg and Malmö during peak hours	Special project Part of fixed cost of infra
Passage charge	per passage		
Quality charges	€/minute of additional delay	IM and railway undertakings	

4.17. United Kingdom

On the GB national network⁹, the charging regime has been developed to cover the short-run marginal costs of running on the network and thus to provide the correct incentives to operators at the margin. In addition to the charges that vary these charges, most passenger operators also pay a fixed charge and other asset usage charges to cover a proportion of the IM's fixed costs. Open access operators do not incur this fixed charge. Freight operators, carrying certain commodities are exposed to some of the IM's fixed costs where they are able to bear the cost of these, for instance some of the fixed costs of freight only lines and some of the costs that could be avoided on other lines if freight were not operating there.

⁹ All other infrastructure managers are not considered here.

Charge	Unit	Differentiation	Cost covered
Variable Usage Charge	£ per thousand gross tonne vehicle mile for freight and per vehicle mile for passenger	All services pay this charge but it varies based on the vehicles used and for freight, also the commodity carried.	Covers the maintenance and renewal costs that vary with traffic in terms of the incremental damage the service does to the track, civils and signalling infrastructure
Traction electricity charge	kWh. For services that are not metered, this is modelled per train mile for multiple units, otherwise per kgtm	Operators have option of using modelled consumption rates or metering their use of electricity	Network Rail recovers their costs of providing electricity for traction purposes.
Electrification asset usage charge	£ per vehicle mile (passenger) £ per thousand gross tonne mile (freight)	Applied to all electrically powered services a	Recovers maintenance and renewal costs of electrification assets that vary with traffic.
Coal spillage charge	£ per thousand gross tonnemiles	Only applicable to freight trains carrying coal	Recovers cost of coal spillage
Capacity charge	£ per train mile	All services pay.	Intended to allow Network Rail to recover the performance regime costs that it incurs by allowing additional traffic onto the network
Fixed Track Access Charge	Billing period	Applies to passenger services under public service contracts (franchises) only	Determined on basis of Network Rail's revenue requirement after accounting for the income received from variable track access charges, regulated station charges, other single till income and network grants.
Freight only line charge	£ per thousand gross tonne mile	Applies to freight services carrying coal for electricity generators, nuclear fuel or iron ore.	Recovers some of the fixed costs associated with freight-only lines.

<p>Freight specific charge</p>	<p>£ per thousand gross tonne mile</p>	<p>Applies to freight services carrying coal for electricity generators, nuclear fuel or iron ore.</p>	<p>Recover some infrastructure costs caused by freight operating on the network that are not currently recovered through other freight charges.</p>
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