APPENDIX 5.1.2

PRINCIPLES FOR THE CHARGES RELATED TO THE USE OF ELECTRIC TRACTION

The purpose of this Appendix is to describe the method and rules for drawing up the scales for the following charges, related to the use of electric traction by trains running on the national rail network:

	Charge status	Costs covered	Network Statement Appendix in which the scale appears
RCE (charge for use of electric traction facilities)[1]	Minimum service	Use of electric traction facilities (in particular the maintenance and renewal of the catenary system)	Appendix 5.2
RCTE-component A (charge for transmission and distribution of electric power)	Minimum service	Losses suffered by the electrical systems from substations up to train capture points	Appendix 5.2
RCTE-component B (charge for transmission and distribution of electric power)	Ancillary service	Transmission and distribution of traction power over the electricity networks and associated expenses	Appendix 5.4
RFE (charge for supply of traction current)	Additional unregulated service	Supply of traction current	Appendix 5.4

1. REGULATORY FRAMEWORK AND CHARGING PRINCIPLES

Directive 2012/34/EU[2] (Appendix II), which defines the services to be provided to railway undertakings by infrastructure managers, is transposed into French law by Decree No. 2003-194 of 7 March 2003. This was amended by Decree No. 2015-1040 of 20 August 2015, in particular to revise the legal framework applicable to the electricity transmission and distribution service.

Therefore, on the one hand, point I of Article 3 of the French Decree No. 2003-194 on **minimum services**, stipulates that the infrastructure manager shall "*provide […] with use of the rail system for supplying electrical power for traction current* [which corresponds to the **RCE** at SNCF Réseau] *in addition to covering electrical systems losses from the substations to the train capture points* [which corresponds to the **RCTE-component A** at SNCF Réseau]". In this respect and without possible prejudice to the future introduction of mark-ups particularly intended to cover all or part of the fixed costs linked to the electrical facilities, the charges perceived for supplying these services are "*equal to the cost that is directly incurred as a result of operating the train service*" (Article 30 of French Decree 2003-194).

On the other hand, paragraph VI of Article 3 of the aforementioned Decree stipulates that "*the use of the electrical railway system for traction current stipulated in paragraph I shall also give rise to the payment by the railway undertaking to the infrastructure manager of the transmission and distribution costs paid by the latter to the electricity transmission or distribution network operators.*" This service,

[1] The charge for the use of electric traction facilities (RCE) currently covers marginal costs for maintenance and renewal of the electric facilities and is based on the SNCF Réseau costs model. It is calculated as per the method described in Appendix 5.1.1 on the charging principles for the minimum services.
[2] Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area.

qualified as an "**ancillary service**" in the Network Statement, corresponds to the **RCTE-component B** and "*gives rise to re-invoicing to the nearest Euro by the infrastructure manager of these costs, increased by other expenses incurred*".

Finally, under the **additional services** described in paragraph V of Article 3 of the aforementioned Decree, SNCF Réseau also proposes the supply of traction current, charged under the **RFE**. Given that SNCF Réseau is not the sole provider of this service, this additional service is **not regulated** by the provisions of the French Decree No. 2012-70.

2. RCTE-COMPONENT A

The RCTE-component A is designed to cover the charges incurred by the electrical system losses from the substations to the train capture point, which include the CSPE tax (see §2.2) applied to each unit consumed.

The losses more specifically correspond to the losses suffered by the substations, catenary system, transformation facilities and as a result of the return of traction current. In practice, for each unit of electricity consumed, a part of this is lost over the rail network. This phenomenon, known as the Joule effect (for a part of the facilities concerned), is inherent to electrical physics.

2.1. Principles for calculating the RCTE-component A

The RCTE-component A rate is calculated by a marginalistic approach that consists of applying the loss factor to the price of the power purchased by SNCF Réseau to cover the need linked to the electrical losses. In this way, SNCF Réseau charges users directly for losses linked to consumption due to their traffic

The RCTE-component A is determined as follows:

RCTE A tariff (in €/kWh) = (*contractual price* per kWh including capacity + CSPE) (in €/kWh) x loss factor / (1 - loss factor)

2.2. Charges included in the RCTE-component A

- Loss factor

The volume of losses is defined as the difference between the volume of electricity injected into the national railway network measured at the substations and the total consumption for electric traction, measured by the on-board meters via DECOFER or estimated via ORES for unequipped vehicles. The loss factor corresponds to the volume of losses in relation to the total volume of electricity injected into the network.

Historically, the overall network loss factor is of 8.5 %, which is taken as a reference by SNCF Réseau.

As of 1 January 2024, a change in the calculation of SNCF Réseau's consumption will lead to the abandon of the fixed 8.5% loss factor. This change in the calculation method does not allow to use a fixed loss factor any more, since SNCF Réseau's consumption will depend on how the consumptions of the railway undertakings will be distributed over the NRN, knowing that the level of loss varies according the electrical characteristics of the network (size of the catenaries, number of substations making up the line, etc.), the network configuration and the electrification type (1500 V, 25 000 V).

For each year, SNCF Réseau will apply an estimated loss factor to calculate the RCTE-component A scale, based on the loss factor recorded over the period from July Y-2 to August Y-1. For 2024, this estimated loss factor will be set at 13.6%.

The downward difference between the estimated loss factor used in the scales for year Y and the loss factor actually recorded for year Y will be adjusted at the end of the first quarter Y+1.

However, the loss factor for year Y may be adjusted at a later date, in the event that the factor observed is lower than the estimated factor used in the scales for year Y, at the latest at the beginning of Y+2, following the republication of consumption data to RTE in accordance with the "Rules relating to the Balancing Mechanism and the Balance Responsible System". In all cases, no adjustment will be made in the event of an upward difference between the estimated factor used in the scales for year Y and the factor actually recorded in year Y.

The following table summarises the estimated and actual loss rates to date, starting from 2024:

Year	2024	2025	2026
Estimated loss rate	13,6%	12,8%	13,4%
Recorded loss rate	12,24%		

- Electricity purchase price

In response to a request from ARAFER, but also to follow developments in the price of electricity as closely as possible, SNCF Réseau adapted its purchasing strategy by using different purchase dates spread over a 12-month period preceding supply.

For each period and with the purchase volume fixed for this period, SNCF Réseau enters into a contract with a supplier setting a fixed purchase price per megawatt-hour of electricity determined according to the principle below.

Firstly, a call for tenders is used to select the possible suppliers based on technical criteria; secondly, then those selected are placed in competition through a request issued by SNCF Réseau for a tender covering all of its needs fixed for this period.

This purchase price, which corresponds to the average purchase price calculated over all the purchase periods, is that taken into account to calculate the rate of the RCTE-component A, as described above, as well as to calculate the RFE (see § 4).

For the 2024--2026 period, the charging for the RCTE A corresponds to the price set for the year 2024 (published in December 2023), which may be updated, if appropriate for year Y, in December Y-1, of the contractual price for year Y with the SNCF Réseau supplier, depending, on the one hand, on the market prices for electricity and the volume permitted by the ARENH mechanism(or the one that will replace it in 2026) to SNCF Réseau and the adjustment of the capacity mechanism cost on the other, and the estimated loss factor for year Y mentioned in the previous §.

Given the above, the electricity purchase price will be known in November 2024 for the supply of electricity over the 2025 calendar year. The RCTE A price scale is therefore set on publication of the 2025 Network Statement in December 2024.

- Capacity mechanism

Since 01 January 2017, in application of a ministerial order of 29 November 2016, the price per megawatt-hour must include the costs incurred as a result of the capacity mechanism, laid down by the French Decree No. 2012-1445. The purpose of this regulatory provision is to guarantee the security of the French electrical system. The principle of the capacity mechanism is founded on the obligation, for all electricity suppliers, to cover, by way of capacity guarantees, its customers' consumption during

electricity consumption peaks. In practice, the application of this mechanism results in higher production costs for the energy provider, which are then passed on to the end customer.

Given that the capacity cost depends on the actual consumption of the customer and on the selection of the peak period by the RTE electricity transmission network operator, it can only be determined *ex post*, at the end of the delivery year. Therefore, the additional cost incorporated by the energy provider at the time of entering into the contract only corresponds to an estimate; the RCTE-component A rate may therefore be subsequently adjusted, the conditions for which are explained below.

- CSPE tax

The CSPE mechanism (or contribution to the public electricity service) was incorporated into the inland tax scheme on the final electricity consumption (TICFE) on 01 January 2016. The tax rate is annually reviewed by the Energy Regulation Commission (CRE).

However, for persons engaged in the transport of persons and goods by train, metro, tramway, cable and trolleybus, the rate of the tax applicable to final electricity consumption, a specific rate is applied, in accordance with the provisions of C of 8 of Article 266d C of the Customs Code.

2.3. Cost allocation base for invoicing the RCTE-component A

From 2024, SNCF Réseau will use the kilowatt-hour as its billing unit, replacing the electric train-kilometre historically used.

Consumption figures in kilowatt hours are taken from the DECOFER rail billing process, operated by RTE (electricity transmission network operator), for the measured part of the consumption, and from the ORES consumption estimation tool for the estimated part of the consumption.

2.4. RCTE-component A payment method

The RCTE-component A is subject to the following payment method:

The price of the power stipulated in the contract taken out by SNCF Réseau may be revised as a result of the capacity mechanism. By way of example, lower consumption levels (with regard to the estimates) during a peak period will result in reduced charges with the supplier. Conversely, overconsumption will result in an increase to these charges.

Therefore, SNCF Réseau shall apply the following adjustment mechanism:
i) for the year Y, the rate for the RCTE-component A includes the additional cost generated by the capacity mechanism as known at the date of creation of the scale of charges;
ii) as soon as the final adjustment has been made to the capacity mechanism (during the calendar year Y+1) by the electricity provider (reductions or increases), SNCF Réseau shall make adjustments at the same proportions with its customers;
iii) the customers are informed and receive an adjusted invoice, calculated according to the difference between the rate displayed in the Network Statement and the rate that includes the final additional cost of the capacity mechanism.

In addition, SNCF Réseau reserves the right to make subsequent adjustments to the RCTE-component A in the event that capping the volume under ARENH leads to a change in the contractual tariff. Customers shall be informed should this apply.

Furthermore, in the event of a downward difference between the estimated loss rate used in the scales for year Y and the loss rate actually recorded for year Y, the RCTE-component A is adjusted at the end of the first quarter Y+1, taking into account the actual loss rate for year Y.

Lastly, the RCTE-component A may be adjusted up to the beginning of Y+2 following the re-publication of the consumption data to RTE in accordance with the "Rules relating to the Balancing Mechanism and the Balance Responsible System". Customers shall be informed should this apply.

3. RCTE-COMPONENT B

The purpose of the RCTE-component B is, on the one hand to cover the charges specific to power transmission (transmission and distribution of electricity by the electricity networks as far as the substations of the national rail network), and on the other hand to cover the ancillary fees incurred.

3.1. Principles for calculating the RCTE-component B

The rate for the RCTE-component B corresponds to the estimated charges base described below, correlated with the forecast volume of consumption. The forecast volume of consumption is drawn up according to the consumption recorded for the period between October Y-2 and September Y-1.

The RCTE-component B is determined as follows:

RCTE B tariff (in €/kWh) forecast charges (in €) / forecast traction power consumption (in kWh)

3.2. Charges included in the RCTE-component B

The cost base is broken down into electricity transmission charges paid by the electricity network operators (nearly 98%), charges for the metering of traction power on the RFN, and ancillary costs.

- Transmission charges

The electricity transmission charges (electricity transmission network access contract (CART) and electricity distribution network access contract (CARD)) correspond to the actual charges incurred by SNCF Réseau between October Y-2 and September Y-1, to which may be applied adjustment factors designed to take into account the revaluation of the public electricity network usage rate (TURPE)[3]. These adjustment factors are set by the Energy Regulation Commission (CRE) and are applicable from the 1st of August of each year.

- Traction energy metering management charges

SNCF Réseau uses specific tools to consolidate the energy consumption data for electrical traction. This consumption data is issued both by meters installed in the substations as well as meters placed onboard the traction engines, and they supply the SATURNE tool for the substations and ORES tool to compile the train movements with the engine consumptions. The charges related to the use of this consumption data by SNCF Réseau fit into the railway metering system DECOFER, operated by RTE (the power transmission network manager). These charges break down as follows:

[3]The public electricity network usage rate (TURPE), which is used to pay electricity transmission and distribution network operators (ENEDIS, ELD and RTE). The TURPE's formula is revised approximately every 4 years with annual revaluation of the prices on the 1st of August according to a calculation drawn up by the Energy Regulation Commission (CRE) to take into account inflation and the evolution of the actual charges incurred by RTE and ENEDIS. TURPE 6 (HVB & HVA/LV) is in force since 2021, replacing TURPE 5.

- costs incurred by the operators in charge of managing the electrical hook-up contracts for the substations;
- costs incurred by the business line operators assigned to managing the metering data from the substations and the consumption data of RUs;
- maintenance cost for SATURNE (remote reading of substation meters) and ORES (train movements log) tools to maintain these in working conditions;
- maintenance costs for the GSM-R location management tool.

- Ancillary fees

The other ancillary fees can be broken down into the following:

- financial costs (expenses resulting from cash advances);
- costs of drawing up consumption forecasts;
- costs related to energy exchange at borders;
- procurement assistance fees which represent the fees for consulting, training and support services provided to purchasers and experts of SNCF Réseau.

3.3. Cost allocation base for invoicing the RCTE-component B

In the same way as for the RCTE-component A, SNCF Réseau has chosen the kilowatt-hour as the billing unit for the RCTE-component B.

Consumption figures in kilowatt hours are taken from the DECOFER rail billing process, operated by RTE (electricity transmission network operator), for the measured part of the consumption, and from the ORES consumption estimation tool for the estimated part of the consumption.

3.4. RCTE-component B payment method

In accordance with the provisions of the French Decree No. 2003-194, the RCTE-component B "*gives rise to re-invoicing to the nearest euro by the infrastructure manager of these costs*".

Therefore, if the evolution of the charges for energy transmission and distribution deviates from the selected forecasts, SNCF Réseau shall apply an adjustment process that affects its customers. Where relevant, the customers will be informed and will receive an adjusted invoice during year Y+1 for year Y.

It should also be noted that after any adjustment is made by Réseau de Transport d'Electricité (RTE, the power transmission network manager), according to the rules in effect for RTE at the date of publication of this Network Statement, twelve months at the latest after the end of the financial year, the amount of the RCTE-component B may be subject to further adjustment at the beginning of year Y+1.

Customers shall be informed should this apply.

Lastly, the RCTE-component A may be adjusted up to the beginning of Y+2 following the re-publication of the consumption data to RTE in accordance with the "Rules relating to the Balancing Mechanism and the Balance Responsible System". Customers shall be informed should this apply.

4. RFE

The rate for the RFE is based on the electricity price that SNCF Réseau has agreed to pay through the contract with its supplier(s), which includes the CSPE applied to each unit consumed, the cost of the capacity mechanism (see § 2.2), the management fees (financial fees and staff costs for staff involved

in the process), the proportionate share of the fees incurred to draw up the consumption forecasts, and the proportionate share of the electricity procurement support fees.

4.1. Principles for calculating the RFE

The RFE is determined as follows:

RFE tariff (in €/kWh) = (price per kWh of which additional cost linked to capacity + €/kWh) (in €/kWh) + forecast costs (in €) / forecast traction power consumption (in kWh)

4.2. Cost allocation base for invoicing the RFE

In the same way as for the RCTE-component A, SNCF Réseau has chosen the kilowatt-hour as the billing unit for the RFE.

Consumption figures in kilowatt hours are taken from the DECOFER rail billing process, operated by RTE (electricity transmission network operator), for the measured part of the consumption, and from the ORES consumption estimation tool for the estimated part of the consumption.

4.3. RFE payment method

The payment principle applied to the RCTE-component A within the scope of the capacity mechanism (see § 2.4) is also valid for the RFE.

Moreover, SNCF Réseau reserves the right to adjust the RFE subsequently in case of an impact of capping of the volume within the framework of the ARENH, leading to a modification of the contractual rate.
Customers shall be informed should this apply.

Lastly, the RFE may be adjusted up to the beginning of Y+2 following the re-publication of the consumption data to RTE in accordance with the "Rules relating to the Balancing Mechanism and the Balance Responsible System". Customers shall be informed should this apply.