

Termination rates at European level

January 2021

Table of contents

1. Executive Summary	2
2. Fixed networks – voice interconnection	6
2.1. Assumptions made for the benchmarking	6
2.2. FTR benchmark	6
2.3. Short term evolution of fixed incumbents' FTRs (from July 2020 to January 2021)	9
2.4. FTR regulatory model implemented and symmetry overview.....	12
2.5. Number of lines and market shares	13
3. Mobile networks – voice interconnection	14
3.1. Assumptions made for the benchmarking	14
3.2. Average MTR per country: rates per voice minute (as of January 2021)	15
3.3. Average MTR per operator	18
3.4. Average MTR: Time series of simple average and weighted average at European level.....	19
3.5. Regulatory model implemented and glide paths for MTRs	22
Annex	23
Annex 1 Fixed termination rates as of 1 January 2021.....	23
Annex 2 FTR regulatory cost accounting model implemented.....	28
Annex 3 FTR symmetry	33
Annex 4 Number of active fixed telephony lines and Market shares.....	35
Annex 5 Average MTR per operator as of 1 January 2021	40
Annex 6 Regulatory model implemented to calculate MTRs.....	47
Annex 7 Abbreviations and Exchange rates	51
Annex 8 Glossary	52

1. Executive Summary

This document is an updated version of the benchmark of fixed and mobile Termination Rates (TRs) across Europe prepared by the BEREC Office in cooperation with the BEREC Statistics and Indicators Working Group. Fixed and mobile termination services in Europe have been subject to price regulation since many years now. The report aims to offer a picture of the regulated rates for fixed and mobile interconnection services in Europe, as well as their evolution over time.

The 2014 European Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation (Recommendation 2014/710/EU) identified, among others, the following two markets as relevant:

- wholesale call termination on individual public telephone networks provided at a fixed location (market 1);
- wholesale voice call termination on individual mobile networks (market 2).

Because of the structure of these two markets, in general each network operator has an SMP position (i.e. a monopoly) for termination on its own network and, therefore, its termination rates are regulated.

According to the provisions of Article 75 of the EU Directive 2018/1972 establishing the European Electronic Communications Code, on the 22nd of April 2021, the Delegated Regulation (EU) 2021/654 setting a single maximum Union-wide mobile voice termination rate and a single maximum Union-wide fixed termination rate¹ was adopted, to be applied directly uniformly across the EU Member States. The Eurorates will start applying on the first of July 2021. In the light of this approach, the latest European Commission Recommendation (EU) 2020/2245 on relevant markets does not list anymore the wholesale markets for the provision of fixed and mobile voice calls termination services as susceptible to ex ante regulation².

However, taking due account of the implementation of the provisions of the Delegated Regulation, which temporarily allows for differences in national rates in some cases, and the relevance of regulation of the termination rates in the non-EU countries/participants, BEREC considers that in 2021 it is still important to keep monitoring the evolution of termination rates throughout Europe.

The present overview of TRs is based upon the results of a request for information sent to all NRAs in January 2021, referring – if not differently indicated – to data as of 1st

¹Commission Delegated Regulation (EU) 2021/654: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0654>

² The main competition problem in the market (i.e. the ability of terminating operators to set excessive termination charges) is already addressed by setting the maximum EU-wide termination rates, together with the necessary adjustments, in certain cases. Thus, these two markets would fail the three criteria test.

January 2021. It includes rates from the thirty seven (37) BEREC participants, for which NRAs³ provided responses to the corresponding request for information.

As of January 2021, the situation regarding TRs in Europe can briefly be described as follows (see also Figures 1-2):

- The simple average of the lowest regulated fixed termination rates (FTRs) of incumbents at the European level (all 37 countries/participants, Avg (S)) stands at 0.2446 eurocent per minute.
- The simple average of the lowest regulated FTRs of European Union incumbents (only EU member states, Avg EU27(S)) stands at 0.1973 eurocent per minute.
- The simple average of mobile termination rates (MTRs) at the European level (all 37 countries/participants, Avg (S)) stands at 0.7460 eurocent per minute, whereas the weighted average⁴ (Avg (W)) at European level is 0.6234 eurocent per minute.
- The simple average of MTRs at the EU level (only EU member states, EU Avg (S)) stands at 0.6704 eurocent per minute, whereas the weighted average at EU level (EU Avg (W)) is 0.7179 eurocent per minute.

For non-EUR countries/participants, the average exchange rate for the last quarter of the year (Q4 2020) was used for the calculation of FTRs and MTRs. The exchange rates used are reported in [Annex 7](#).

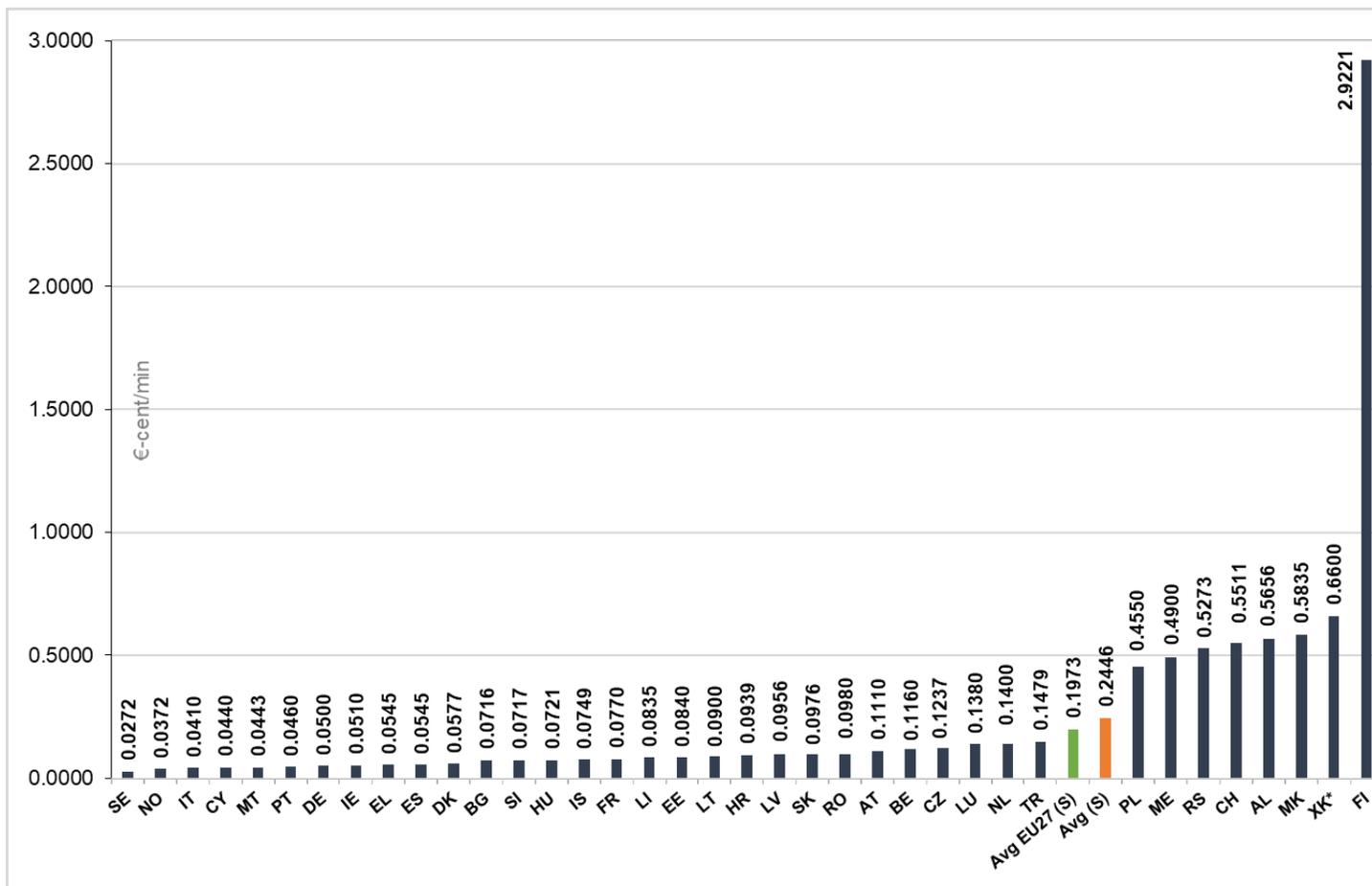
³ 27 EU member states and 5 countries candidates (Albania, Montenegro, North Macedonia, Serbia, Turkey) as well as a potential candidate – Kosovo*, plus 4 EFTA states (Switzerland, Iceland, Norway and Liechtenstein). The United Kingdom withdrew from the European Union on 31 January 2020. Since the January 2021 UK data are not available to BEREC, those are not reported in this TR Report.

* This designation is without prejudice to positions on status, and it is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence. This footnote applies throughout the report.

⁴ The weighted averages weigh each country's average rate with the share of the country's subscribers (total subscribers per country / total subscribers in all countries).

Overview of incumbents' lowest regulated fixed termination rates per country – January 2021 (eurocent per minute of service)

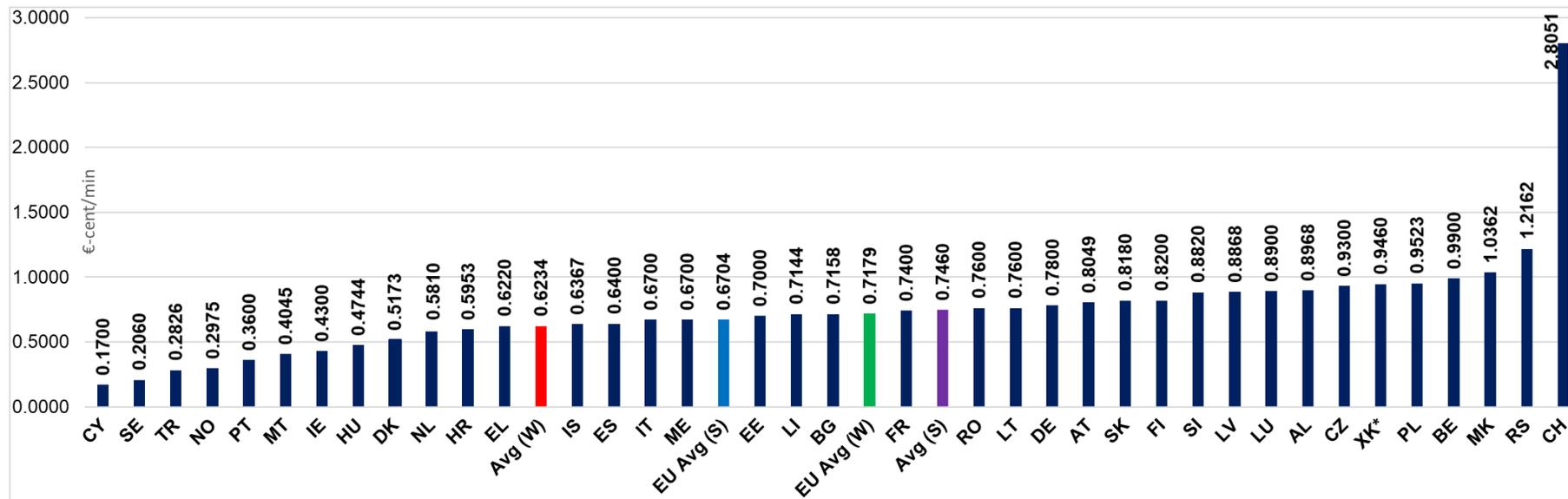
Figure 1 FTRs



Source: NRAs, BEREC

MTR per country – January 2021 (eurocent per minute of service)

Figure 2 MTRs



Source: NRAs, BEREC

2. Fixed networks – voice interconnection

The regulation of FTRs has been harmonized by the Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC). However, some differences can be found across the national regulatory regimes, as highlighted below:

- 1) In some cases, the termination rate is a two-part tariff, i.e. composed of a variable part (to be paid for each minute of a call) plus a set-up or fixed part (to be paid for each call). In other cases, termination prices consist only of the variable part.
- 2) Interconnection services in fixed networks are provided at different levels in the hierarchy of the incumbents' networks, called layers. Even though some peculiarities in specific countries/participants are present, in general three main layers for interconnection are defined:
 - i) layer 1⁵, or local level service provision,
 - ii) layer 2, or regional level service provision (single transit), and
 - iii) layer 3, national level service provision (or double transit).

Due to increasing symmetry and decreasing relevance of layers, the report features a ranking of the lowest regulated rates, as well as a weighted average of peak and off-peak rates in the table of [Annex 1](#).

The "lowest regulated rate" refers to the lowest of the rates of an operator. For operators that have more than one regulated rate or interconnection layers, these are ranked in ascending order (first lowest, second lowest, etc.). If there is a single regulated rate, it is considered as "the lowest regulated rate".

2.1. Assumptions made for the benchmarking

The following assumptions have been made in order to make tariffs comparable:

- In order to obtain a homogeneous comparison of average prices per minute across operators, a 3-minute average call duration has been assumed, using the standard formula: $(\text{fixed set-up charge} + \text{price per minute} \times 3) / 3$.
- Nominal tariffs are reported only when the NRA has set out the maximum price per minute that operators may charge each other.
- For those countries which have not set a single tariff and which apply distinct rates for the peak/off-peak period (DK, HR and PL), an average price has been calculated taking into account the traffic distribution between peak and off-peak time in each case. When this distribution has not been made available, a 50/50 distribution has been assumed.

2.2. FTR benchmark

In [Annex 1](#) the interconnection prices of operators listed by countries/participants are presented. For each country, the NRA has provided information on the incumbent and some

⁵ Layer 1 is defined as the closest possible interconnection level to the network termination point.

alternative operators offering interconnection services. In the last column, a weighted average of peak/off-peak prices is provided.

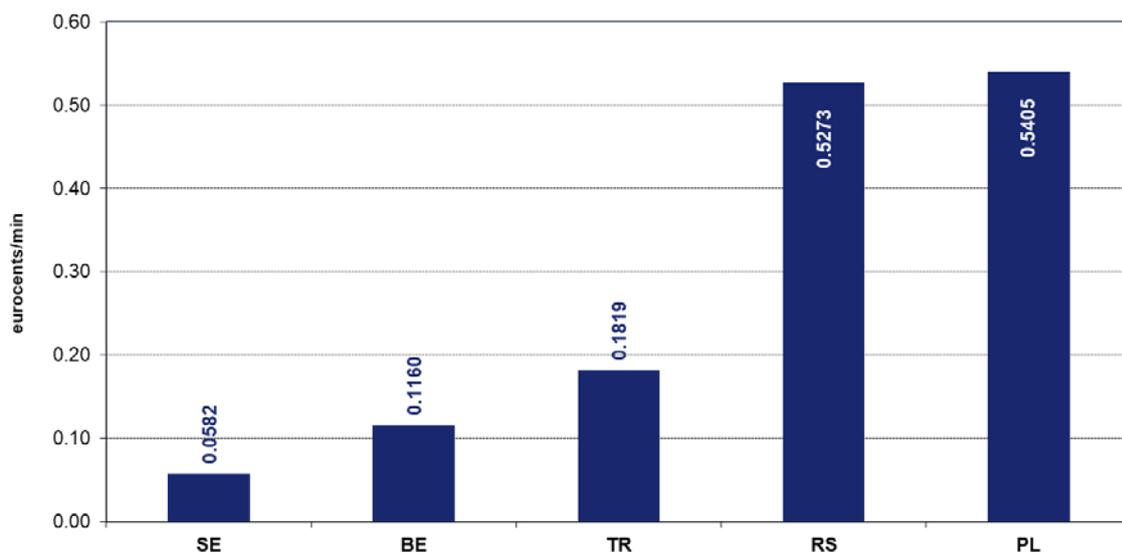
The lowest regulated rate is the rate applied by the operator at the level of interconnection that is closest to the network termination point. The second and third lowest regulated rates apply only to operators that have more than one regulated rate/interconnection layer.

Five (5) countries out of 37 countries/participants maintain interconnection services in fixed networks at two different levels in the hierarchy of the incumbents' networks and another three (3) countries have three layers of interconnection.

Incumbents' fixed termination rates per lowest regulated rate and country

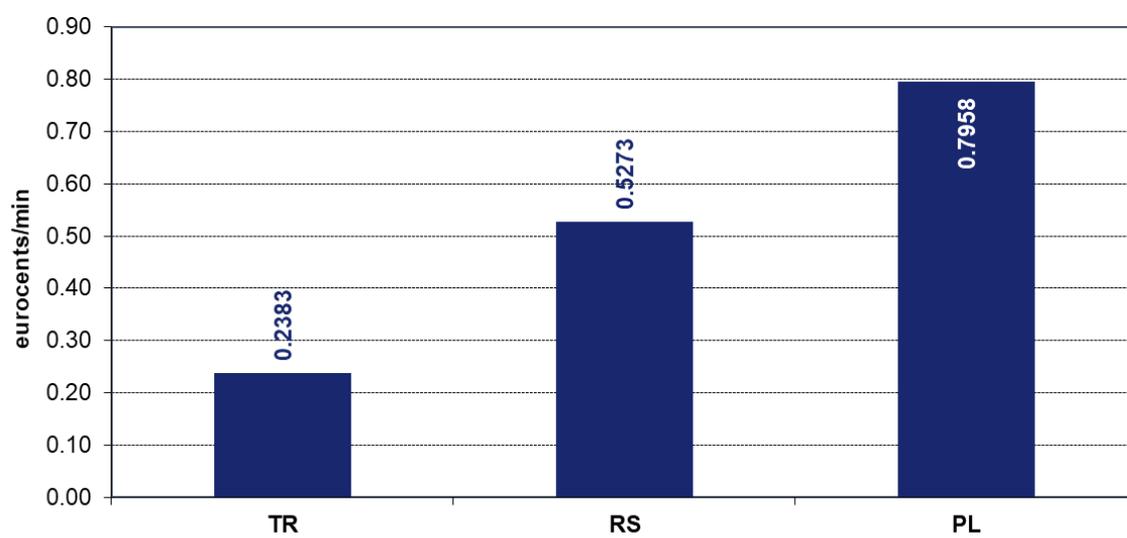
Figures 3 and 4 show the incumbents' second and third lowest regulated fixed termination rate per country. For more information on the individual lowest rates of respective incumbents, please refer to Figure 1 and respectively [Annex 1](#).

Figure 3 Incumbents' second lowest regulated fixed termination rate per country (eurocent per minute)



Source: NRAs, BEREC

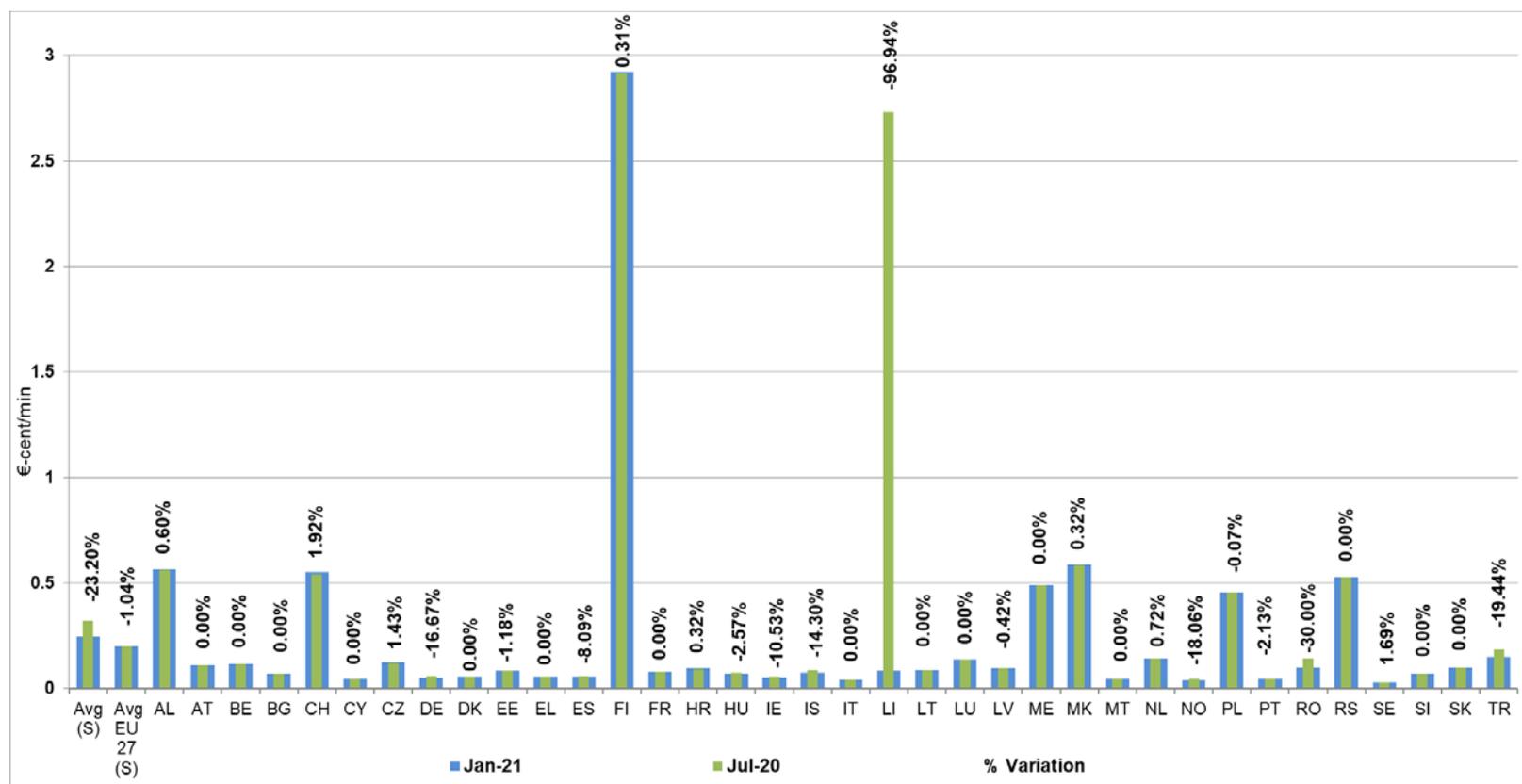
Figure 4 Incumbents' third lowest regulated fixed termination rate per country (eurocent per minute)



Source: NRAs, BEREC

2.3. Short term evolution of fixed incumbents' FTRs (from July 2020 to January 2021)

Figure 5 Incumbents' lowest regulated rate per country (eurocent per minute)⁶



Source: NRAs, BEREC

⁶ The UK data are not included into calculation of FTRs' variation in the period from July 2020 to January 2021; UK is also excluded both from the 2020 July Avg (S)&Avg EU27(S) and 2021 January Avg (S)&Avg EU27(S).

The above chart shows the variation in percentage of the lowest regulated fixed termination rate of incumbents between July 2020 and January 2021. For easier comparison, the rates are stated in eurocents. The reported changes in FTRs in non-Euro countries/participants (Figures 5, 6 and 7) is partially due to currency exchange rate variations. The exchange rates used are reported in [Annex 7](#).

LRR Changes in FTRs in non-euro countries/participants:

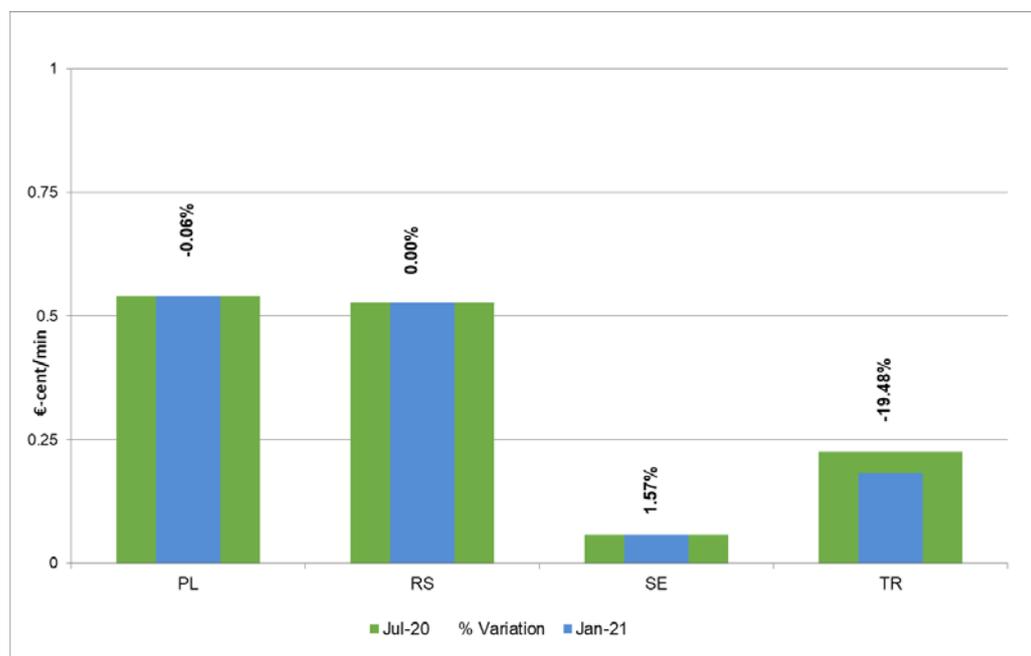
The rates (in eurocents) decreased in Hungary (by 2.57%), Iceland (by 14.30%), Liechtenstein (by 96.94%), Norway (by 18.06%), Poland (by 0.07%), Romania (by 30.00%) and Turkey (by 19.44%). An increase was reported by Albania (0.60%), Croatia (0.32%), Czech Republic (1.43%), Macedonia (0.32%), Sweden (1.69%) and Switzerland (1.92%) (Figure 5).

Please note that figures mentioned are shown in euros. Therefore, in some cases, there is a change in the value in euros, despite the fact that the price remains the same in national currency, since a fluctuation of the currency exchange rate impacts directly the values.

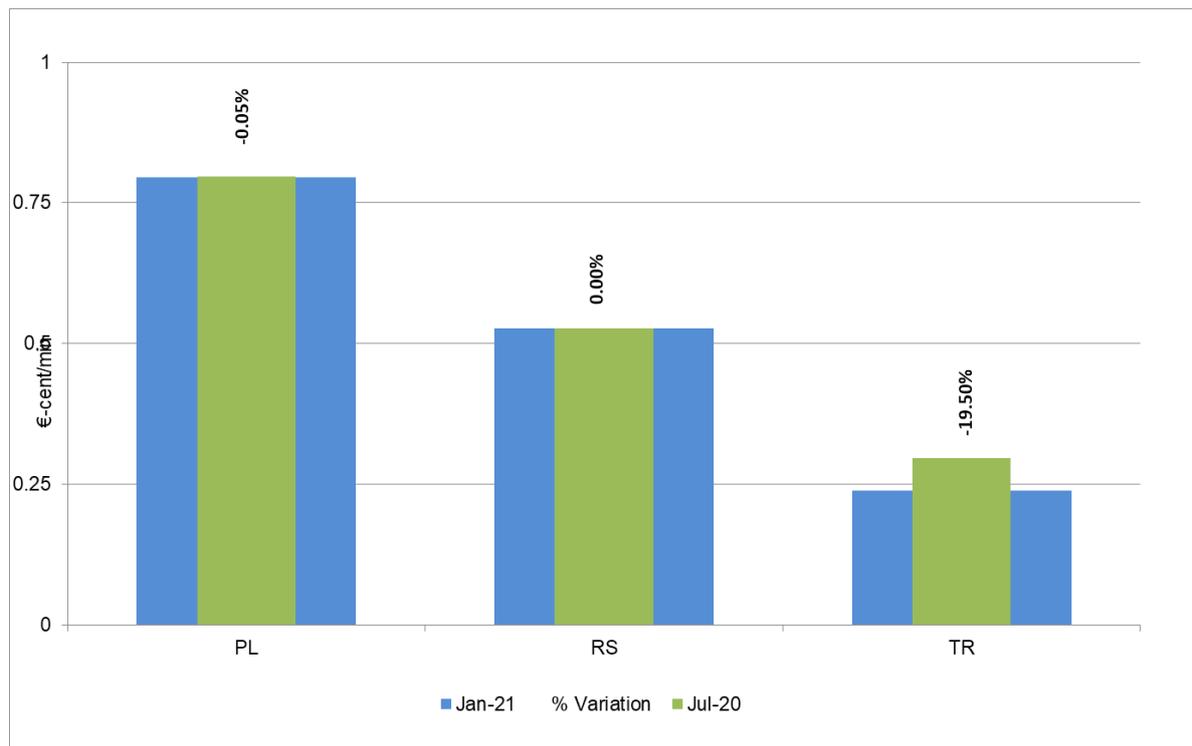
2nd LRR Changes in FTRs in non-euro countries/participants:

There have been no changes reported in the 2nd LRR of the FTRs in those countries where national currency is not euro. Thus, figure 6 shows the changes occurred because of the impact of currency exchange rate on the value provided in national currency.

Figure 6 Incumbents' second lowest regulated rate per country (eurocent per minute)



Source: NRAs, BEREC

Figure 7 Incumbents' third lowest regulated rate per country

Source: NRAs, BEREC

3rd LRR Changes in FTRs in non-euro countries/participants:

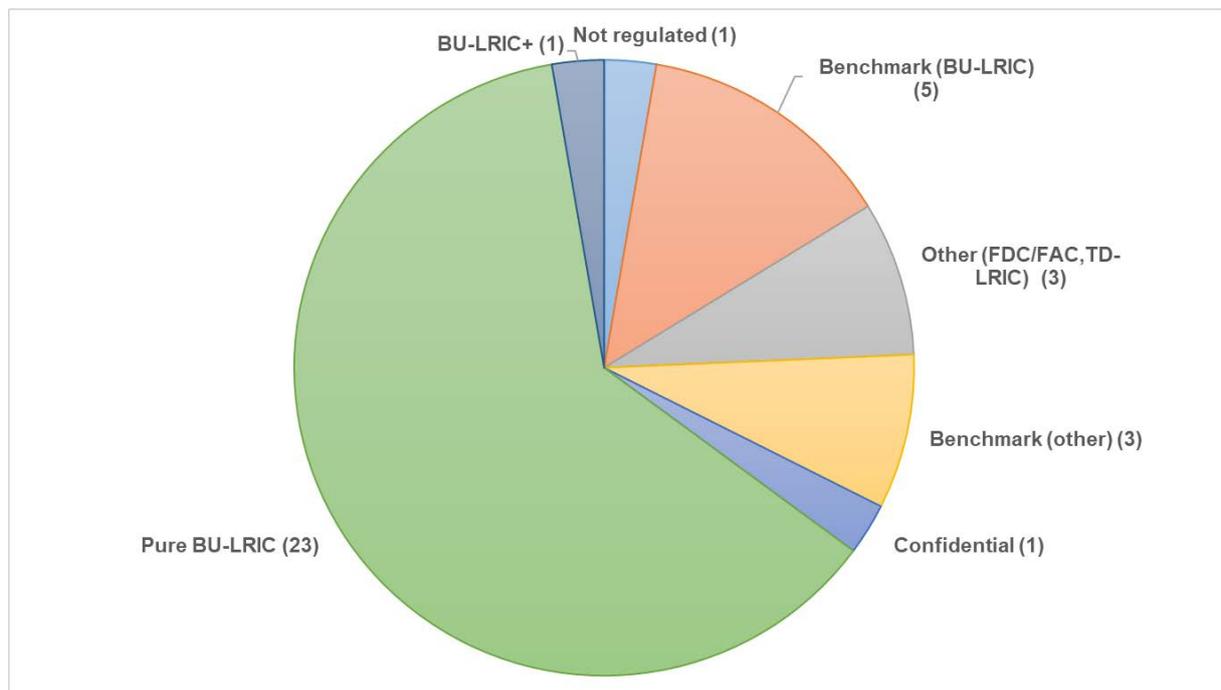
There have been no changes in the 3rd LRR of the FTRs reported by those countries where the national currency is not euro. With regards to the impact of currency exchange rate on the value provided in national currency, the 3rd LRR decreased by 19.50% in Turkey and by 0.05% in Poland between period of July 2020 and January 2021 solely because of the depreciation of the respective national currencies.

2.4. FTR regulatory model implemented and symmetry overview

Most NRAs (23) use Pure BU LRIC models to set FTRs, while 5 NRAs use Benchmarking (BU-LRIC) approaches and Benchmark (other) is used by 3 NRAs. Further, 1 NRA uses a BU LRAIC+ model and 1 NRA reported its cost model as confidential (Figure 8).

For more information, consult [Annex 2](#).

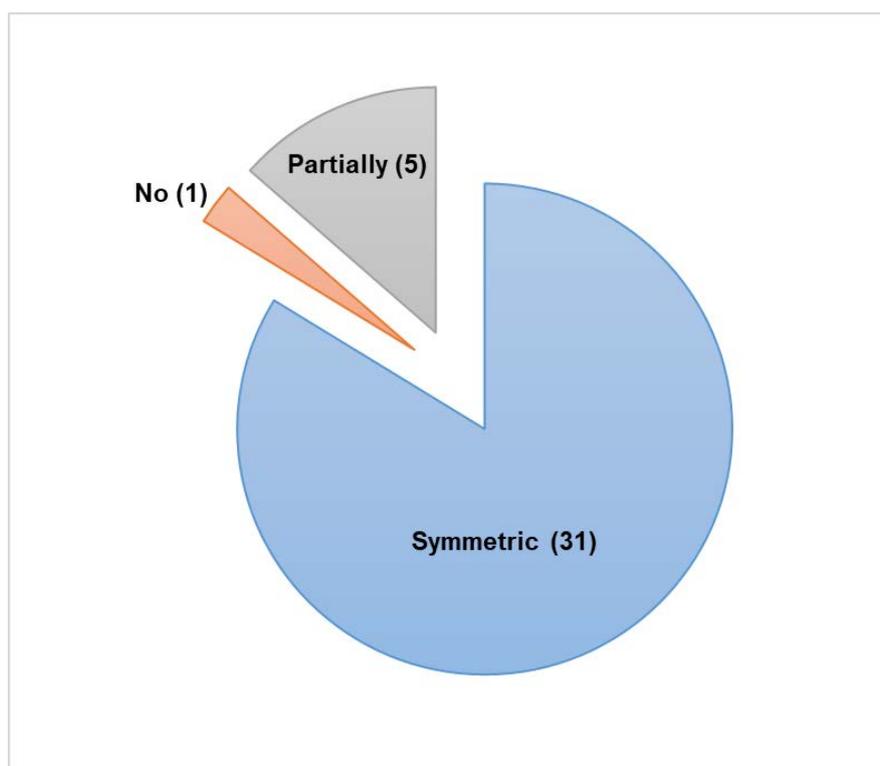
Figure 8 Cost accounting models for FTRs used by NRAs



Source: NRAs, BEREC

According to the Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC), NRAs should set termination rates based on the costs incurred by an efficient operator. This implies that they would also be symmetric. The above figure shows compliance with the Recommendation in the case of 23 NRAs using Pure BU LRIC models. At the same time, 8 NRAs are using Benchmarking, while 5 of these NRAs are using Benchmarking based on Pure BU LRIC.

Furthermore, in most of the respondent countries/participants (31), FTRs are symmetric across all operators. 5 NRAs reported partial symmetry, while the rates are not symmetric in only 1 of the reporting countries.

Figure 9 FTRs Symmetry

Source: NRAs, BEREC

For more information, consult [Annex 3](#).

2.5. Number of lines and market shares

In [Annex 4](#) the number of active fixed telephony lines in the retail market is provided for each operator included in the report. For a number of countries, this information is confidential.

3. Mobile networks – voice interconnection

This section presents the benchmark of mobile termination rates (MTRs) with reference data as of 1 January 2021 and their recent evolution. The purpose of this comparison is to provide an indication of the level of MTRs across the countries/participants, their variations and the cost models adopted by NRAs for setting MTRs.

The present overview of MTRs is based upon the results of a request for information sent to all NRAs in January 2021. It includes data from thirty-seven (37) countries/participants⁷.

3.1. Assumptions made for the benchmarking

For the present benchmarking exercise, the following assumptions have been made in order to make tariffs comparable⁸:

- Operators with a market share below 1.5% have been excluded from the national MTR average calculation.
- Only nominal tariffs are represented in the report, defining them as “the price (in eurocent/minute) set out by the regulator that represents the maximum price per minute which operators may charge each other (without any adjustment for purchasing power parity or real effects – inflation).”
- Average MTRs per country have been obtained by weighing the MTR of each operator by its market share, measured in terms of subscribers. Four general averages have been calculated: a simple average and a weighted average, each at the European level (including all 37 countries/participants reporting data) and at EU level (including only the 27 EU member states). The weighted averages weigh each country’s average rate with the share of the country’s subscribers (total subscribers per country / total subscribers in all countries).
- Regarding the number of subscribers, the different estimation methods used among European countries (especially in the case of pre-paid consumers) need to be taken into account. Mobile subscribers (active SIM cards) mean 2G, 3G, 4G and 5G subscribers of a Mobile Network Operator or Mobile Virtual Network Operators. An active subscriber of mobile telephony means a subscriber of post-paid mobile telephony who has a valid contract, or a pre-paid subscriber who has made or received a call, sent an SMS or MMS or used data services at least once in the last 3 months. M2M, M2P and data-only SIMs cards should be excluded.

Regarding the short-term MTRs evolution (from July 2020 to January 2021), some variation may be a consequence of any of the following reasons:

- i. Modifications in the tariff structure (for instance, disappearance of the set-up charge or initial period);

⁷ The United Kingdom withdrew from the European Union on 31 January 2020. Since the January 2021 UK data are not available to BEREC, those are not reported in this TR Report.

⁸ Generally speaking, these assumptions may create margins of error in the present comparison, making it difficult to draw valid conclusions for policy purposes.

- ii. Currency exchange rate variations in non-EUR countries/participants⁹;
- iii. Changes in operators' market shares (e.g. due to a change in methodology in the calculation of subscriber rates) may have an effect on the average MTR for an individual country;
- iv. Inclusion of new operators that were not present in the previous benchmarks.

3.2. Average MTR per country: rates per voice minute (as of January 2021)

Table 1- Average MTR per country

Country/Participant	Average MTR per country/participant (eurocents/min)
AL	0.8968
AT	0.8049
BE	0.9900
BG	0.7158
CH	2.8051
CY	0.1700
CZ	0.9300
DE	0.7800
DK	0.5173
EE	0.7000
EL	0.6220
ES	0.6400
FI	0.8200
FR	0.7400
HR	0.5953
HU	0.4744
IE	0.4300
IS	0.6367
IT	0.6700
LI	0.7144
LT	0.7600
LU	0.8900
LV	0.8868
ME	0.6700
MK	1.0362
MT	0.4045
NL	0.5810
NO	0.2975
PL	0.9523
PT	0.3600

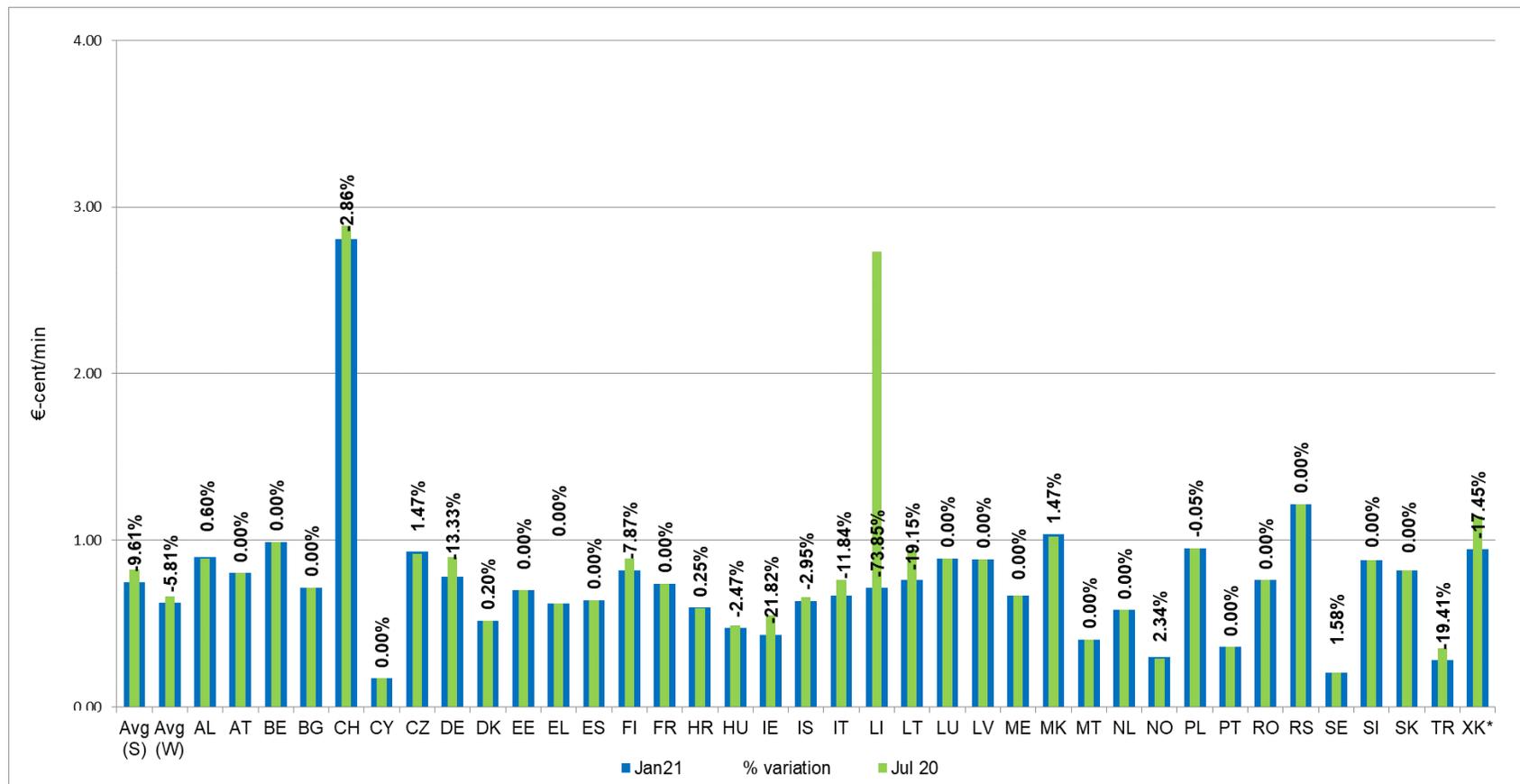
⁹ This only affects the six month MTRs evolution presented in figure 10, since the percentage of tariff variation in each country (figure 11) has been calculated by comparing rates expressed in terms of the national currency.

Country/Participant	Average MTR per country/participant (eurocents/min)
RO	0.7600
RS	1.2162
SE	0.2060
SI	0.8820
SK	0.8180
TR	0.2826
XK*	0.9460
Avg (S)	0.7460
Avg (W)	0.6234
EU Avg (S)	0.6704
EU Avg (W)	0.7179

Figure 10 shows the short term variations of MTRs in eurocent. This figure illustrates the effect of the exchange rate on the six month period considered.

Variation of MTRs per country (from July 2020 to January 2021)

Figure 10 Variation in eurocent and percentage¹⁰

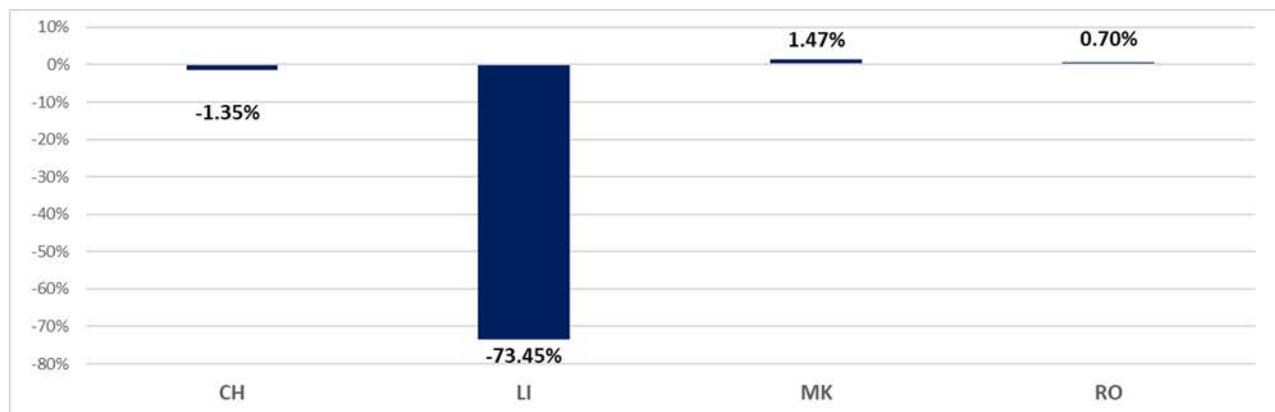


Source: NRAs, BEREC

¹⁰ The UK data are not included into calculation of MTRs' variation in the period from July 2020 to January 2021; UK is also excluded both from the 2020 July Avg (S)&Avg(W) and 2021 January Avg (S)&Avg(W).

Variation of average MTRs in national currency other than euro per country (from July 2020 to January 2021)

Figure 11 Variation in national currency (%)



Source: NRAs, BEREC

Most countries/participants did not experience a real short-term variation of MTRs and, therefore, are not shown in figure 11.

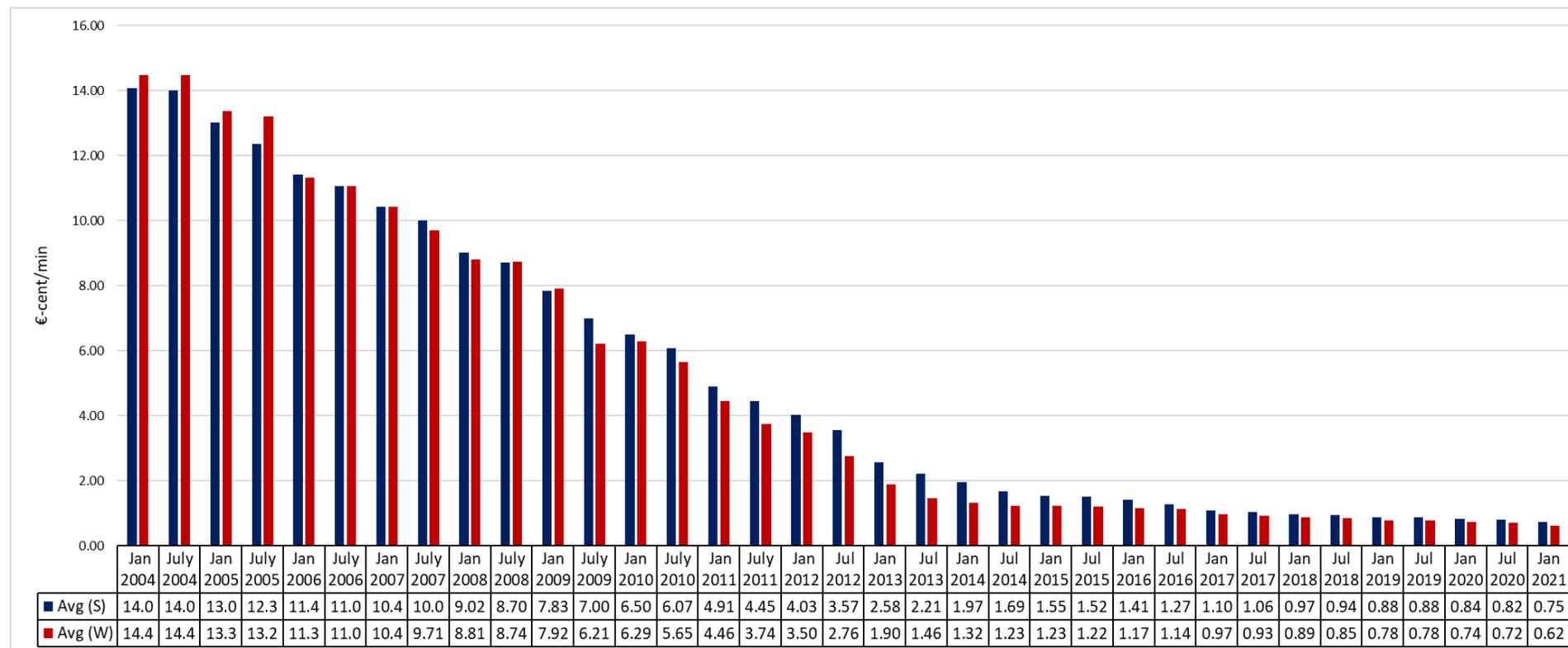
3.3. Average MTR per operator

There are a number of countries where the data regarding the number of subscribers and/or market share have been declared as confidential and, for this reason, the report does not publish this information. Nevertheless, market shares have been taken into account for the average MTR calculations.

For further details see [Annex 5](#).

3.4. Average MTR: Time series of simple average and weighted average at European level¹¹

Figure 12 Evolution of simple and weighted averages



Source: NRAs, BEREC

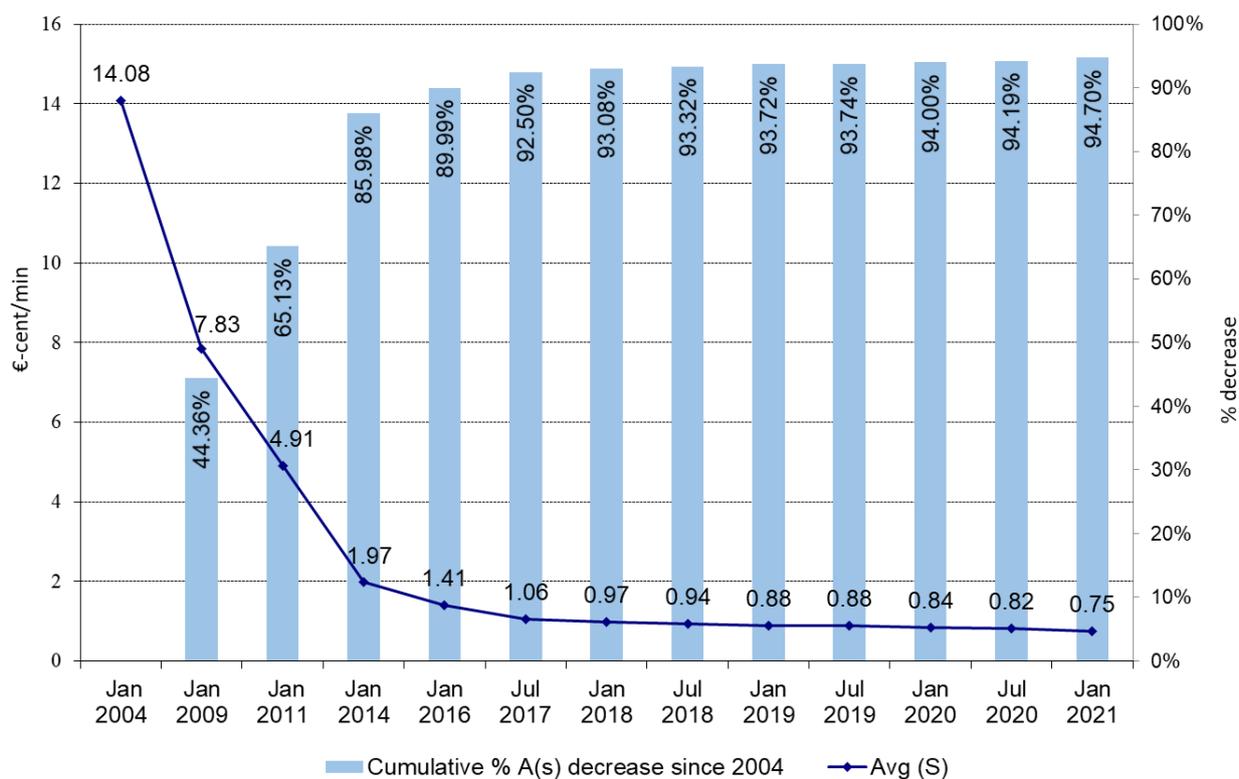
Note to Figure 12: Averages are based on nominal rates per minute of service. The number of countries/participants and operators considered has increased over the years, thus affecting slightly the average. The weighted average does not take into account countries not providing the total number of subscribers, therefore the graph shows the general trend.

¹¹ UK data are excluded from the calculations as from January 2021.

Figure 13 and Figure 14 show the cumulative declines of the simple and the weighted average of European MTRs since 2004. Considering the number of countries/participants and operators included over the years, the simple average MTRs dropped by almost 95% since January 2004, from 14.08 eurocent to 0.75 eurocent in January 2021.

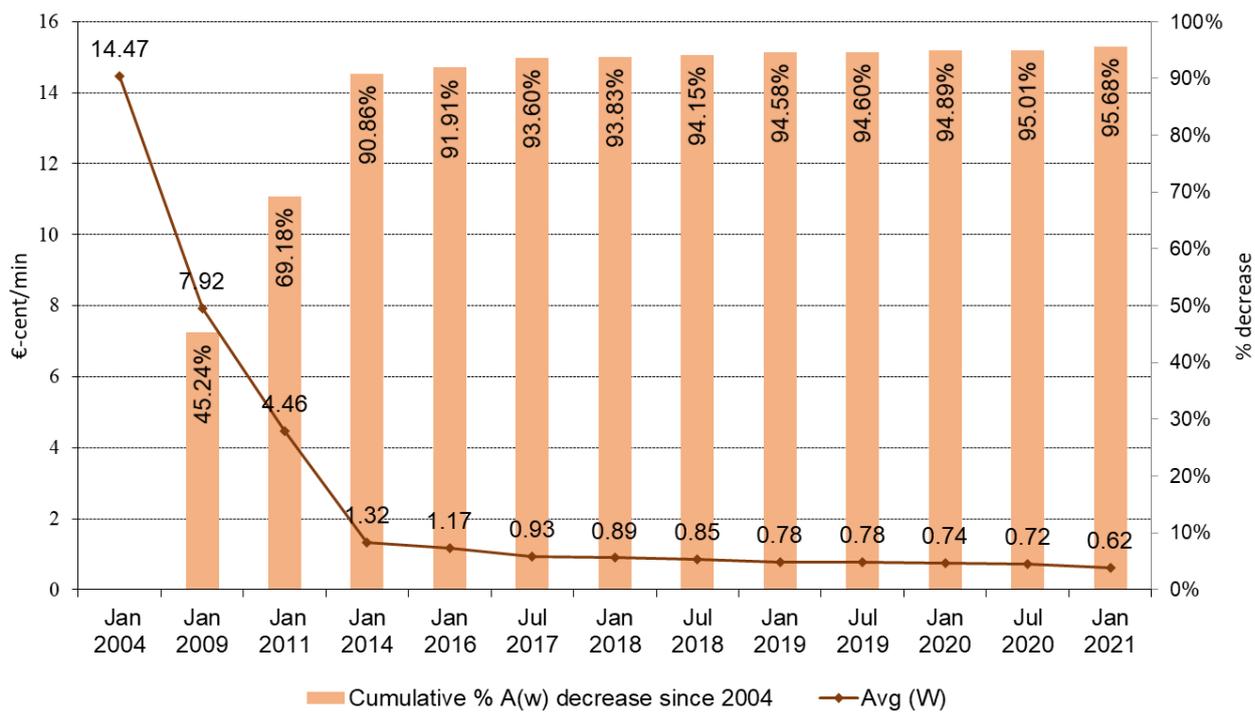
The weighted average of European MTRs has declined even more, from 14.47 eurocent to 0.62 eurocent in the same period.

Figure 13 European MTRs simple average and cumulative decline



Source: NRAs, BEREC

Figure 14 European MTRs weighted average and cumulative decline

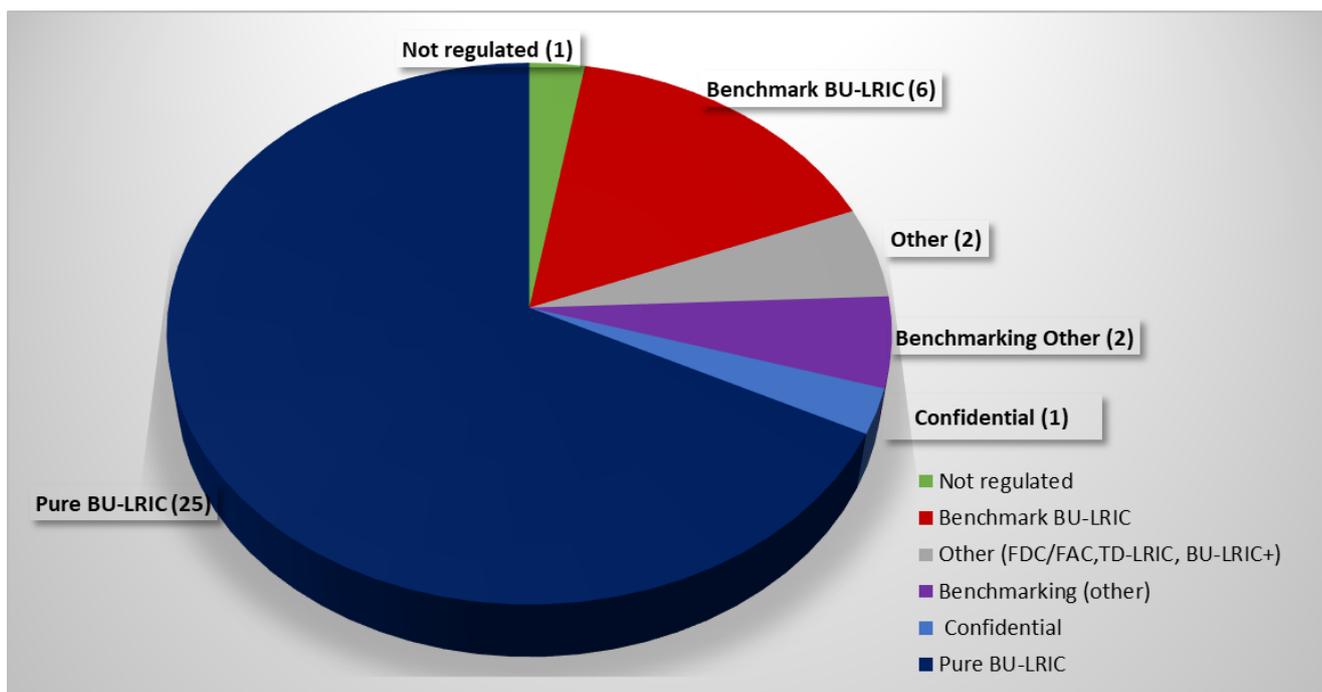


Source: NRAs, BEREC

3.5. Regulatory model implemented and glide paths for MTRs

In the majority of countries/participants, BU LRIC models are used to calculate the MTRs. However, a significant number of NRAs base their price decision on benchmarking. In one country (Switzerland), MTRs are not regulated and one NRA reported its model to be confidential.

Figure 15 Cost accounting models used by NRAs



Source: NRAs, BEREC

For further details, see [Annex 6](#).

Annex

Annex 1 Fixed termination rates as of 1 January 2021

Table 2

Country	Operator	Lowest Regulated Rate	WA in cents
AL	Albtelecom	Single-rate	0.5656
	Vodafone – Abcom	Single-rate	0.5656
	Albanian Satellite Communications	Single-rate	0.5656
	Rest of operators	Single-rate	0.5656
AT	Operator 1	Single-rate	0.1110
	Operator 2	Single-rate	0.1110
	Operator 3	Single-rate	0.1110
	Operator 4	Single-rate	0.1110
	Operator 5	Single-rate	0.1110
	Operator 6	Single-rate	0.1110
	Rest of operators	Single-rate	0.1110
BE	Proximus	LRR	0.1160
	Proximus	2nd LRR	0.1160
	Rest of operators	Single-rate	0.1160
BG	Bulgarian Telecommunication Company (BTC)	Single-rate	0.0716
	A1 Bulgaria	Single-rate	0.0716
	Telenor Bulgaria	Single-rate	0.0716
	Rest of operators	Single-rate	0.0716
CH	Swisscom	Single-rate	0.5511
CY	Cyta	Single-rate	0.0440
	Primetel PLC	Single-rate	0.0440
	Epic	Single-rate	0.0440
	Cablenet Communication Systems Plc	Single-rate	0.0440
CZ	Česká telekomunikační infrastruktura a.s.	Single-rate	0.1237
	Nej.cz s.r.o.	Single-rate	0.1237
	T-Mobile Czech Republic a.s.	Single-rate	0.1237
	Vodafone Czech Republic a.s.	Single-rate	0.1237
	IPEX a.s.	Single-rate	0.1237
	miniTEL s.r.o.	Single-rate	0.1237
DE	Telekom Deutschland GmbH	LRR	0.0500
DK	TDC	Single-rate	0.0577
	Telia	Single-rate	0.0577
	Telenor	Single-rate	0.0577
EE	Telia	Single-rate	0.0840
	Elisa	Single-rate	0.0850
	Elisa Teleteenused	Single-rate	0.0850

Country	Operator	Lowest Regulated Rate	WA in cents
	STV	Single-rate	0.0850
EL	OTE	Single-rate	0.0545
	Forthnet	Single-rate	0.0545
	Vodafone	Single-rate	0.0545
	Wind	Single-rate	0.0545
ES	Telefónica de España	Single-rate	0.0545
	Vodafone - Ono	Single-rate	0.0545
	Orange	Single-rate	0.0545
	Grupo MASMOVIL	Single-rate	0.0545
	Euskaltel	Single-rate	0.0545
	Rest of operators	Single-rate	0.0545
FI	DNA Oyj	Single-rate	2.8000
	Elisa Oyj	Single-rate	2.8000
	Telia Finland Oyj	Single-rate	2.8000
	Rest of operators (weighted average)	Single-rate	3.2000
	Weighted average of all operators	Average	2.9221
FR	All operators	Single-rate	0.0770
HR	HT	Single-rate	0.0939
	OPTIMA	Single-rate	0.0939
	A1	Single-rate	0.0939
HU	Magyar Telekom	Single-rate	0.0721
	Digi	Single-rate	0.0721
	Vodafone	Single-rate	0.0721
	Rest of operators	Single-rate	0.0721
IE	Eircom	LRR	0.0510
	Virgin Media	LRR	0.0510
	Vodafone	LRR	0.0510
	Sky	Not regulated	
IS*	Siminn	Single-rate	0.0749
	Vodafone	Single-rate	0.0749
IT	TIM	Single-rate	0.0410
	Vodafone Italia	Single-rate	0.0410
	Fastweb	Single-rate	0.0410
	Wind Tre	Single-rate	0.0410
	Linkem	Single-rate	0.0410
	Eolo	Single-rate	0.0410
	Rest of operators	Single-rate	0.0410
LT	Telia Lietuva, AB	Single-rate	0.0900
	CSC Telecom	Single-rate	0.0900

Country	Operator	Lowest Regulated Rate	WA in cents
	Rest of operators	Single-rate	0.0900
LI	Telecom Liechtenstein AG	Single-rate	0.0835
	Backbone Solutions AG	Single-rate	0.0835
	Nexphone AG	Single-rate	0.0835
LU	Post Luxembourg	Single-rate	0.1380
	Proximus Luxembourg S.A.	Single-rate	0.1380
	Luxembourg Online S.A.	Single-rate	0.1380
	Rest of operators	Single-rate	0.1380
LV	SIA "Tet"	Single-rate	0.0956
	"Latvijas Mobilais Telefons" SIA	Single-rate	0.0956
	SIA "CSC Telecom"	Single-rate	0.0956
	SIA "Baltcom"	Single-rate	0.0956
	Rest of operators	Single-rate	0.0956
ME	Crnogorski Telekom	Single-rate	0.4900
	Mtel	Single-rate	0.4900
	Telenor	Single-rate	0.4900
	Telemach	Single-rate	0.4900
MT	Go plc	Single-rate	0.0443
	Melita plc	Single-rate	0.0443
	Vodafone Malta Ltd	Single-rate	0.0443
	Vanilla Telecoms Ltd	Single-rate	0.0443
MK*	Makedonski Telekom	Single-rate	0.5835
	A1	Single-rate	0.5835
	Telekabel Robi	Single-rate	0.5835
	Rest of operators	Single-rate	0.5835
NL	KPN	Single-rate	0.1400
	Ziggo	Single-rate	0.1400
	Rest of operators	Single-rate	0.1400
NO	Telenor	Single-rate	0.0372
	Telia	Single-rate	0.0372
	Next Gentel	Single-rate	0.0372
	Rest of operators	Single-rate	0.0372
PL	Orange Polska S.A.	LRR	0.4550
	Orange Polska S.A.	2nd LRR	0.5405
	Orange Polska S.A.	3rd LRR	0.7958
	UPC Polska Sp. z o.o.	2nd LRR	0.4550
	Netia S.A.	Single-rate	0.4550
	Multimedia Polska S.A.	2nd LRR	0.4828
PT	MEO	Single-rate	0.0460
	NOS Group	Single-rate	0.0460

Country	Operator	Lowest Regulated Rate	WA in cents
	Vodafone	Single-rate	0.0460
	NOWO/ONI	Single-rate	0.0460
	Rest of operators	Single-rate	0.0460
RO	Telekom RC S.A.	Single-rate	0.0980
	S.C. RCS&RDS S.A.	Single-rate	0.0980
	S.C. Vodafone Romania S.A	Single-rate	0.0980
	Orange Romania S.A.	Single-rate	0.0980
RS	Telekom Srbija	LRR	0.5273
	Telekom Srbija	2nd LRR	0.5273
	Telekom Srbija	3rd LRR	0.5273
	Orion	Single-rate	0.5273
	Telenor	Single-rate	0.5273
	Serbia Broadband	Single-rate	0.5273
SE	Telia Company AB	LRR	0.0277
	Telia Company AB	2 nd LRR	0.0582
	Tele2	LRR	0.0277
	Telavox	LRR	0.0277
	Telenor	LRR	0.0277
	Rest of operators	LRR	0.0277
SI	Telekom Slovenije	Single-rate	0.0717
	Telemach	Single-rate	0.0717
	T-2	Single-rate	0.0717
	A1 Slovenija	Single-rate	0.0717
	Rest of operators	Single-rate	0.0717
SK	Slovak Telekom a.s.	Single-rate	0.0976
	Orange Slovensko a.s.	Single-rate	0.0976
	UPC Broadband Slovakia s.r.o.	Single-rate	0.0976
	SWAN, a.s.	Single-rate	0.0976
TR	Türk Telekom	LRR	0.1479
	Türk Telekom	2nd LRR	0.1819
	Türk Telekom	3rd LRR	0.2383
	TTNet	Single-rate	0.3404
	Türksat	Single-rate	0.3404
	Superonline	Single-rate	0.3404
	Rest of operators	Single-rate	0.3404
XK	Telekom of Kosovo SH.A.	Single-rate	0.6600
	IPKO Telecommunications L.L.C.	Single-rate	0.6600
	Kujtesa.Net SH.P.K.	Single-rate	0.6600
	mts d.o.o.	Single-rate	0.6600

Notes to table 2:

Incumbents are indicated first in the table

IE: Sky is a resale based FSP (purchased from BT) but is not required to comply with the maximum termination rates as set out in ComReg Decision D11/19.

Annex 2 FTR regulatory cost accounting models implemented

Table 3

COST ACCOUNTING MODEL								
	Model	Rate status	When a tariff adopted by a final decision and meeting the standards of the TR Recommendation has been or will be firstly applied?	Period 1 - From 01/01/2021 until entry into force DA of Eurorates (unknown date) or 30/06/2021, depending on the case	Period 2 - From 01/07/2021 until 31/12/2021	Period 3 - From 01/01/2022 until 30/06/2022	Period 4 - From 01/07/2022 until 31/12/2022	Period 5 - From 01/01/2023 until 30/06/2023
AL	Benchmark (Other)	adopted	01.10.2018	0.5656	0.5656	0.5656	0.5656	0.5656
AT	Pure BU-LRIC	adopted		0.137/0.085				
BE	Pure BU-LRIC	adopted		0.116/0.116	0.093/0.093	0.07/0.07		
BG	Pure BU-LRIC	adopted	20.10.2016.	0.0716				
CH	BU-LRIC+	not regulated						
CY	Pure BU-LRIC	adopted	01.01.2020	0.0440				
CZ	Pure BU-LRIC	adopted	01.08.2014	0.1237				
DE	Pure BU-LRIC	adopted	01.01.2021	0.0500				
DK	Pure BU-LRIC	adopted	01.01.2013	0.0578				
EE	Benchmark (BU-LRIC)	adopted	29.11.2019	0.0850				
EL	Pure BU-LRIC	adopted	28.05.2014	0.0545				
ES	Pure BU-LRIC	adopted		0.0545	0.0545	0.0545	0.0545	0.0545
FI	Other (FDC/FAC)	adopted						
FR	Pure BU-LRIC	adopted	01.01.2013	0.0770				
HR	Pure BU-LRIC	adopted	01.01.2015	0.0939				
HU	Pure BU-LRIC	adopted	01.07.2018	0.0721	not decided	not decided	not decided	not decided
IE	Pure BU-LRIC	adopted	1 July 2013 / ComReg Decision D12/12)	0.0510	0.051 (eurorate 0.07)	0.045 (eurorate 0.07)	0.045 (euro rate 0.07)	0.045 (euro rate 0.07)

COST ACCOUNTING MODEL								
	Model	Rate status	When a tariff adopted by a final decision and meeting the standards of the TR Recommendation has been or will be firstly applied?	Period 1 - From 01/01/2021 until entry into force DA of Eurorates (unknown date) or 30/06/2021, depending on the case	Period 2 - From 01/07/2021 until 31/12/2021	Period 3 - From 01/01/2022 until 30/06/2022	Period 4 - From 01/07/2022 until 31/12/2022	Period 5 - From 01/01/2023 until 30/06/2023
IS	Benchmark (BU-LRIC)	notified						
IT	Pure BU-LRIC	adopted	01.07.2013	0.0410				
LI	Benchmark (BU-LRIC)	adopted	01.01.2021	0.0835				
LT	Benchmark (BU-LRIC)	adopted	01.07.2019	0.0900				
LU	Pure BU-LRIC	adopted	18.01.2021	0.1380				
LV	Benchmark (BU-LRIC)	adopted	26.04.2017	0.0956				
ME	Other (TD-LRIC)	adopted		0.4900				
MK	BU-LRIC+	adopted	Glide path not planned.	0.5854	0.5854			
MT	Pure BU-LRIC	adopted	01.07.2013	0.4045	0.4045			
NL	Pure BU-LRIC	adopted	01.07.2017	0.1390	0.1390	0.1390	0.1390	0.1390
NO	Pure BU-LRIC	adopted	04.01.2016	0.0372	0.0372			
PL	Other (TD-FDC/FAC)							
PT	Pure BU-LRIC	adopted	01.01.2013	0.0460				
RO	Pure BU-LRIC	adopted	01.04.2014	0.0980				
RS	Benchmark (Other)			0.5273				
SE	Pure BU-LRIC	adopted	01.01.2014	0.0277				
SI	Pure BU-LRIC	adopted	from 01.02.2020 for 0.0717 eurocent	0.0717				
SK	Pure BU-LRIC	adopted	01.09.2018	0.0976				
TR	Confidential							

COST ACCOUNTING MODEL								
	Model	Rate status	When a tariff adopted by a final decision and meeting the standards of the TR Recommendation has been or will be firstly applied?	Period 1 - From 01/01/2021 until entry into force DA of Eurorates (unknown date) or 30/06/2021, depending on the case	Period 2 - From 01/07/2021 until 31/12/2021	Period 3 - From 01/01/2022 until 30/06/2022	Period 4 - From 01/07/2022 until 31/12/2022	Period 5 - From 01/01/2023 until 30/06/2023
XK	Benchmark (Other)			0.6600				

Notes to table 3:

AL: The reported FTRs are valid until next decision will be made.

BE: Precise timing will depend on the adoption of the Delegated Act, when the new tariffs will enter in force the currently imposed tariffs (i.e. 0.99 eurocent for MTR and 0.116 eurocent for FTR) will be replaced by those set out in the DA.

BG: The applied fixed termination rate is cost-oriented based on Pure Bu-LRIC model: 0,0014 BGN/minute and there is no differentiation between peak/off-peak or hierarchy levels.

With Decision 550 from 20 October 2016 CRC approved cost-oriented fixed termination rates based on Pure Bu-LRIC model as follows:

from 01.11.2016 - to 31.12.2018 - 0,0015 BGN/minute;

from 01.01.2019 - 0,0014 BGN/minute.

CH: No glide path is applied. There exists a "clause of reciprocity", meaning that the tariffs of other operators have to be same as the ones of Swisscom. Source of the Swisscom-Tariffs: https://www.swisscom.ch/content/dam/swisscom/de/ws/documents/D_IC-Dokumente/voip-ic/de_voip_ic_handbuch-preise2-7.pdf.dl.res/de_voip_ic_handbuch-preise2-7.pdf, p.7.

EL: IP interconnection. A Pure BU LRIC model applies since 28/5/2014 as a result of EETT's decision 714/09/10-4-2014 (Official Gazette 1049/28-04-2014). According to the 4th round of market analysis (EETT's decision 968 /01 /16.11.2020 / Official Gazette 5380 / B / 07.12.2020), current termination rate of 0.0545 eurocents/minute will be maintained until the issuance of European Commission's Delegated Act and the implementation of the maximum fixed Euro rate.

FI: In Finland, there are no (ex ante) price caps on FTRs. FNOs have cost-oriented pricing obligations. The obligation is monitored ex post.

HR: Please note that FTRs are regulated only for the calls originated on A numbers belonging to the EU/EEA operators and terminated into the individual fixed networks in Croatia.

IE: Eircom uses a two-part charging mechanism for fixed termination rates. This consists of a charge per call and a charge per minute. The rate above is the one-part charging equivalent of the two-part charging mechanism. FNOs in Ireland are free to use either mechanism until the euro rate becomes effective (as only one part charging will be available then). Precise timing will depend on the adoption of the Delegated Act, when the new tariffs will enter in force the currently imposed tariffs (i.e. 0.43 eurocent for MTR and 0.051 eurocent for FTR) will be replaced by those set out in the Delegated Act.

IT: A tariff adopted by final decision and meeting the standard of the TR Recommendation has been firstly applied in 1st July 2013. Rates for each of the years following 2013 have been calculated updating the model's inputs.

LV: Rates of termination on alternative fixed networks should not be higher than rates applied by Telia Lietuva, AB at particular network level. No differentiation Peak/Off-peak. There is a national point of interconnection only.

LU: Regulation ILR/T21/1 of 18 January, 2021 related to the definition of the relevant market for the wholesale supply of call termination on individual public telephone networks in a determined position (market 1/2014).

Since 01.02.2021: ILR/T21/2 Regulation of 18 January, 2021 related to the definition of the relevant market for the wholesale supply of voice call termination on individual mobile networks (market 2/2014).

ME: NRA in Montenegro does not apply any glide path for FTR. From the end of 2015 NRA applied FTR based on TD LRIC methodology and cost model for incumbent operator - Crnogorski Telekom. Other SMP operators apply symmetrical FTR. There is only one interconnection level for all fixed operators in Montenegro. Current FTR are regulated according to the TD LRIC costing methodology. Incumbent operator Crnogorski Telekom had developed TD LRIC cost model, and NRA approved results every year. Other SMP operators apply symmetrical FTR.

PT: In September 2018, ANACOM approved the latest fixed termination market analysis, that has set a new FTR and scheduled updates to the FTR for October 1st 2019 and October 1st 2020 based on existing and foreseen inflation data. On October 1st 2020 the FTR changed to 0.046 eurocent.

SK: RU does not apply any glide path.

TR: ICTA does not regulate FTRs via glidepath, in general, FTRs are revised when it is needed. The cost accounting model used in FTR regulation is confidential and can only be used for internal reporting purposes in BEREC.

Annex 3 FTR symmetry

The following table emphasises the level of **symmetry** among the operators when interconnection in fixed networks is offered. The information below is directly reported by each NRA explaining its particular situation.

Table 4

Country	Symmetry	Comments
AL	Yes	Starting from January 2016, AKEP has decided to apply symmetric tariffs for all operators, in line with EC Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU.
AT	Yes	Full symmetry.
BE	Yes	
BG	Yes	
CH	Yes	Symmetry is ensured on the basis of geographical coverage from a certain point of interconnection (e.g. regional termination is priced the same both ways regardless of actual network hierarchy). Symmetry is evaluated on the basis of the average FTR (i.e. pricing flexibility is left for operators).
CY	Yes	
CZ	Yes	
DE	Yes	Tariffs are symmetrical because of contractual agreements between incumbent Telekom Deutschland and alternative fixed network operators to charge reciprocal tariffs.
DK	Yes	Same FTR apply to all price regulated operators, cf. market decisions as of 02.06.2017.
EE	Partially	Same FTR applies for 13 operators with SMP
EL	Yes	
ES	Yes	
FI	Partially	The biggest operators (DNA, Elisa and Telia) have the same FTRs (2,8), smaller operators have a little bit higher FTRs (3,2).
FR	Yes	
HR	Yes	Symmetry in fixed network is prescribed for all operators as of the 1st January 2013.
HU	Yes	
IE	Yes	FTRs are symmetrical based on interconnection at primary exchange level for all those operators found by market review to have SMP in fixed voice call termination. Interconnection at higher levels in the network could result in transit fees. Transit fees are not regulated. There were some very small operators who have not been found previously with SMP and who charge above the regulated rate. Following a consultation process a Decision was made in 2020 to designate a further three operators with SMP (see ComReg Decision D09/20).
IS	Yes	
IT	Yes	
LI	Yes	Rates between FIXnet-Operators are symmetrical.
LT	Yes	FTRs of all fixed operators having SMP are symmetrical, i .e. FTRs are the same despite number of subscribers, difference in network topologies, level of interconnection and so on.
LU	Partially	
LV	Yes	
ME	Yes	

Country	Symmetry	Comments
MK	Yes	
MT	Yes	Due to national characteristics interconnection is at layer 1. The FTR charge applicable to all those operators having an SMP in the wholesale fixed termination market is on a symmetrical basis.
NL	Yes	
NO	Yes	
PL	Partially	
PT	Yes	Prices applied by operators with SMP in the wholesale markets for call termination on the public telephone network at a fixed location must be symmetrical.
RO	Yes	Symmetric FTR irrespective of interconnection level.
RS	Partially	Operators have different topology and different number of the levels of interconnection. Telekom Srbija has 3 levels of interconnection but from 01.02.2020. prices are equal for all levels of interconnection.
SE	Yes	The price regulation is symmetric in all senses, i.e. both in terms of level and layers. The same concept/regulation is applied to all operators, both in terms level and topology (if applicable, i.e. not all operators have the same coverage).
SI	Yes	It's based on national coverage of layer.
SK	Yes	The FTR is non-discriminatory for all operators without any exception.
TR	No	
XK	Yes	

Annex 4 Number of active fixed telephony lines and market shares

Table 5

Country	Operator	Number of lines	Total number of lines	Market share
AL	Albtelecom	168,142	223,459	75.25%
	Vodafone - Abcom	8,524		3.81%
	Albanian Satellite Communications	30,399		13.60%
	Rest of operators	16,394		7.34%
AT	Operator 1	1,726,939	3,065,588	56.33%
	Operator 2	571,719		18.65%
	Operator 3	409,237		13.35%
	Operator 4	71,281		2.33%
	Operator 5	64,226		2.10%
	Operator 6	32,738		1.07%
	Rest of operators	189,448		6.18%
BE	Proximus	2,297,141	3,930,410	58.45%
	Rest of operators	1,633,269		41.55%
BG	Bulgarian Telecommunication Company	Confidential	986,565	Confidential
	A1 Bulgaria	Confidential		Confidential
	Telenor Bulgaria	Confidential		Confidential
	Rest of operators	51,953		5.27%
CH	Swisscom	N/A		N/A
CY	Cyta	Confidential	324,135	Confidential
	Primetel PLC	Confidential		Confidential
	Epic	Confidential		Confidential
	Cablenet Communication Systems Plc	Confidential		Confidential
CZ	Česká telekomunikační infrastruktura a.s.	Confidential	Confidential	35.28%
	Nej.cz s.r.o.	Confidential		2.51%
	T-Mobile Czech Republic a.s.	Confidential		7.49%
	Vodafone Czech Republic a.s.	Confidential		18.86%
	IPEX a.s.	Confidential		3.56%
	miniTEL s.r.o.	Confidential		3.22%
	Rest of operators	Confidential		29.08%
DE	Telekom Deutschland GmbH	17,760,000	38,220,000	46.47%
	Rest of operators	20,460,000		53.53%
DK	TDC	318,009	406,123	78.30%
	Telia	44,603		10.98%
	Telenor	25,146		6.19%
	Rest of operators	18,365		4.52%
EE	Telia	258,232	298,054	86.64%
	Elisa	8,547		2.87%

Country	Operator	Number of lines	Total number of lines	Market share
	Elisa Teleteenused	21,307		7.15%
	STV	9,968		3.34%
EL	OTE	2,670,242	4,569,008	58.44%
	Forthnet	Confidential		Confidential
	Vodafone	Confidential		Confidential
	Wind	Confidential		Confidential
ES	Telefónica de España	8,486,351	19,310,761	43.94%
	Vodafone - ONO	4,247,091		21.99%
	Orange	3,866,635		20.02%
	Grupo Masmovil	1,633,999		8.46%
	Euskaltel	724,646		3.75%
	Rest of operators	352,039		1.82%
FI	DNA Oyj	Confidential	249,000	Confidential
	Elisa Oyj	Confidential		Confidential
	Telia Finland Oyj	Confidential		Confidential
	Rest of operators	Confidential		Confidential
FR		N/A	N/A	N/A
HR	HT	Confidential	1,298,768	Confidential
	Optima	Confidential		Confidential
	A1	Confidential		Confidential
	Rest of operators	Confidential		Confidential
HU	Magyar Telekom	1,434,510	2,970,000	48.30%
	DIGI	653,400		22.00%
	Vodafone	623,700		21.00%
	Rest of operators	258,390		8.70%
IE	Eircom	534,446	1,327,000	40.27%
	Virgin Media	299,982		22.61%
	Vodafone	179,995		13.56%
	Sky	181,091		13.65%
	Rest of operators	131,486		9.91%
IS	Siminn	78,087	102,271	76.35%
	Vodafone	24,184		23.65%
IT	TIM	7,518,670	17,855,620	42.11%
	Vodafone Italia	2,984,031		16.71%
	Fastweb	2,704,412		15.15%
	Wind Tre	2,497,000		13.98%
	Linkem	665,862		3.73%
	Eolo	514,384		2.88%
	Rest of operators	971,261		5.44%
LI	Telecom Liechtenstein AG	Confidential	12,957	Confidential
	Backbone Solutions AG	Confidential		Confidential

Country	Operator	Number of lines	Total number of lines	Market share
	Nexphone AG	Confidential		Confidential
LT	Telia Lietuva, AB	200,516	214,946	93.29%
	CSC Telecom	12,797		5.95%
	Rest of operators	1,633		0.76%
LU	Post Luxembourg	169,300	263,400	64.27%
	Proximus Luxembourg S.A.	42,500		16.14%
	Luxembourg Online S.A.	18,500		7.02%
	Rest of operators	33,100		12.57%
LV	SIA "Tet"	Confidential	189,999	Confidential
	"Latvijas Mobilais Telefons" SIA	Confidential		Confidential
	SIA "CSC Telecom"	Confidential		Confidential
	SIA "Baltcom"	Confidential		Confidential
	Rest of operators	Confidential		Confidential
ME	Crnogorski Telekom	103,304	191,768	53.87%
	Mtel	70,165		36.59%
	Telenor	2,159		1.13%
	Telemach	16,140		8.42%
MK	Makedonski Telekom	218,248	408,618	53.41%
	A1	156,467		38.29%
	Telekabel Robi	20,367		4.98%
	Rest of operators	13,536		3.31%
MT	Go plc	148,016	294,085	50.33%
	Melita plc	112,828		38.37%
	Vodafone Malta Ltd	28,231		9.60%
	Vanilla Telecoms Ltd	5,010		1.70%
NL	KPN	2,534,000	5,491,000	46.15%
	Vodafone/Ziggo	2,341,000		42.63%
	Rest of operators	616,000		11.22%
NO	Telenor	221,746	385,333	57.55%
	Telia	61,709		16.01%
	Next Gentel	20,459		5.31%
	Rest of operators	81,419		21.13%
PL	Orange Polska S.A	Confidential	3,583,494	Confidential
	UPC Polska Sp. z o.o.	Confidential		Confidential
	Netia S.A.	Confidential		Confidential
	Multimedia Polska S.A.	Confidential		Confidential
PT	MEO	Confidential	5,212,507	45.02%
	NOS Group	Confidential		33.19%
	Vodafone	Confidential		18.30%
	NOWO / ONI	Confidential		2.92%

Country	Operator	Number of lines	Total number of lines	Market share
	Rest of operators	Confidential		0.57%
RO	Telekom RC S.A.	1,048,828	3,050,473	34.38%
	S.C. RCS&RDS S.A.	1,065,197		34.92%
	S.C. Vodafone Romania S.A.	728,374		23.88%
	Orange România S.A.	117,292		3.85%
	Rest of operators	90,782		2.98%
RS	Telekom Srbija	Confidential	2,565,392	Confidential
	Orion telekom	Confidential		Confidential
	Telenor	Confidential		Confidential
	Serbia Broadband	Confidential		Confidential
	Rest of operators	Confidential		Confidential
SE	Telia Company AB	795,320	1,624,000	48.97%
	Tele2	268,592		16.54%
	Telavox	112,890		6.95%
	Telenor	111,492		6.87%
	Rest of the operators	335,706		20.67%
SI	Telekom Slovenije	Confidential	Confidential	50.19%
	Telemach	Confidential		21.50%
	T-2	Confidential		14.83%
	A1 Slovenija	Confidential		9.29%
	Rest of operators	Confidential		4.18%
SK	Slovak Telekom, a. s.	Confidential	728,219	Confidential
	Orange Slovensko, a. s.	Confidential		Confidential
	UPC Broadband Slovakia, s.r.o.	Confidential		Confidential
	SWAN, a. s.	Confidential		Confidential
	Rest of operators	Confidential		Confidential
TR	Türk Telekom	4,967,232	12,448,604	39.90%
	TTNet	5,583,957		44.86%
	Superonline	207,073		1.66%
	Türksat	483,717		3.89%
	Rest of operators	1,206,625		9.69%
XK	Telekom of Kosovo SH.A.	25,431	76,055	33.44%
	Ipko Telecommunications LLC	35,027		46.05%
	KUJTESA.NET SH.P.K.	123		0.16%
	mts d.o.o.	15,474		20.35%

Notes to table 5

AT: Numer of lines as of end Q3/2020.

BE: Number of lines: data as of the 1st of January 2020. The volume represents the number of channels and not the number of lines.

BG: Data on number of lines (network termination points) per operators as of 1.7.2020 should be treated as confidential.

CZ: The total number of lines as of 30th June 2020 is available as the latest information. Data regarding number of lines are as of 30th June 2020; data for the whole year 2020 are not yet available.

DE: Number of lines are for end of year 2019.

DK: Number of lines is of ultimo H1 2020.

FI: Market shares as of 01.07.2020. Volumes are confidential.

HR: Total number of lines: Data refer to Q3 2020.

IE: ComReg collects information on numbers of lines held by various operators as part of its quarterly key data gathering exercise.

IT: Number of lines are as of September 2020 (last available data).

LU: Data as of 30.06.2020.

MT: Data reflect the position as at Q3 2020.

NO: Number of subscribers are provided as of 30 June 2020, instead of number of lines per 1 January 2021. The number of subscribers per 1 January 2021 will not be available before Q2 2021.

RS: Number of lines are as of 31/12/2019. Number of lines are collected by using ITU indicator i112 Fixed-telephone subscriptions which refers to the sum of of active number of analogue fixed-telephone line, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivavelnts and fixed public payphones. Number of fixed telephone subscriptions over FWA networks and number of fixed subscriptions over mobile networks (CLL technology) are also included. Information on individual's number of lines by operator is confidential.

SE: Latest data for subscribers used, i.e. 1 Jul, 2020.

SI: Absolute number of lines per operator is confidential. Absolute number of all lines is confidential if this number is published with market shares of operators together.

SK: The number of lines per operator have to be treated as confidential information.

TR: The number of lines specified above table for alternative network operators includes the number of wholesale line rental and VoIP subscribers .Number of Lines can be given as total number of lines including layer 1, layer 2 and layer 3 termination points.

Annex 5 Average MTR per operator as of 1 January 2021

Table 6

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers ¹²	Market Shares
AL	One Telecommunications	0.8968	876,535	2,471,199	35.47%
	Vodafone Albania	0.8968	1,200,614		48.58%
	Albtelecom	0.8968	394,050		15.95%
AT	A1Telekom Austria	0.8049	Confidential	10,634,476	Confidential
	T-Mobile Austria	0.8049	Confidential		Confidential
	Hutchison Drei Austria	0.8049	Confidential		Confidential
	Rest of the operators	0.8049	Confidential		Confidential
BE	Proximus	0.9900	Confidential	11,529,728	Confidential
	Orange	0.9900	Confidential		Confidential
	Telenet	0.9900	Confidential		Confidential
	Full MVNO	0.9900	Confidential		Confidential
BG	A1 Bulgaria	0.7158	Confidential	7,937,828	Confidential
	Telenor Bulgaria	0.7158	Confidential		Confidential
	BTC	0.7158	Confidential		Confidential
	Rest of the operators	0.7158	Confidential		Confidential
CH	Swisscom	2.5976	4,740,000	8,574,590	55.28%
	Sunrise	3.0615	2,123,600		24.77%
	Salt	3.0615	1,710,990		19.95%
CY	Cyta	0.1700	Confidential	1,239,960	Confidential
	Epic Ltd	0.1700	Confidential		Confidential
	Primetel PLC	0.1700	Confidential		Confidential
	Cablenet Communication Systems Plc	0.1700	Confidential		Confidential
CZ	T-Mobile Czech Republic a.s.	0.9300	Confidential	Confidential	38.02%
	O2 Czech Republic a.s.	0.9300	Confidential		27.33%

¹² Mobile subscribers (active SIM cards) means both 2G, 3G and 4G subscribers of a Mobile Network Operator or Mobile Virtual Network Operators. An active subscriber of mobile telephony' means a subscriber of post-paid mobile telephony who has a valid contract, or a pre-paid subscriber who has made or received a call, sent an SMS or MMS or used data services at least once in the last 3 months. M2M, M2P and data-only SIMs cards should be excluded."

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers ¹²	Market Shares
	Vodafone Czech Republic a.s.	0.9300	Confidential		26.26%
	Nordic Telecom s.r.o.	0.9300	Confidential		0.09%
	Rest of the operators	0.9300	Confidential		8.30%
DE	Telekom Deutschland GmbH	0.7800	N/A	107,200,000	N/A
	Vodafone GmbH	0.7800			
	Telefónica Germany GmbH & Co. OHG	0.7800			
DK	TDC	0.5173	2,758,699	7,144,123	38.61%
	Telenor	0.5173	1,434,287		20.08%
	Telia	0.5173	1,114,373		15.60%
	3 (Hi3G)	0.5173	1,151,729		16.12%
	Rest of the operators	0.5173	685,035		9.59%
EE	Telia Eesti AS	0.7000	828,146	1,922,639	43.07%
	Tele2 Eesti AS	0.7000	462,199		24.04%
	Elisa Eesti AS	0.7000	632,294		32.89%
EL	Cosmote	0.6220	Confidential	11,412,995	Confidential
	Vodafone	0.6220	Confidential		Confidential
	WIND	0.6220	Confidential		Confidential
ES	Movistar	0.6400	16,397,412	55,642,473	29.47%
	Orange	0.6400	13,195,443		23.71%
	Vodafone	0.6400	12,269,232		22.05%
	Masmovil	0.6400	9,466,945		17.01%
	Rest of the operators	0.6400	4,313,441		7.75%
FI	DNA Oyj	0.8200	Confidential	7,115,000	Confidential
	Elisa Oyj	0.8200	Confidential		Confidential
	Telia Finland Oyj	0.8200	Confidential		Confidential
	Ålcom	0.8200	Confidential		Confidential
	Rest of the operators	0.8200	Confidential		Confidential
FR	Orange	0.7400	Confidential	78,100,000	Confidential
	SFR	0.7400			Confidential
	Bouygues Telecom	0.7400			Confidential
	Free Mobile	0.7400			Confidential
	MVNOs	0.7400			Confidential
HR	HT	0.5953	Confidential	4,471,710	Confidential

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers ¹²	Market Shares
	A1	0.5953	Confidential		Confidential
	Telemach	0.5953	Confidential		Confidential
HU	Magyar Telekom	0.4744	Confidential	10,332,660	Confidential
	Telenor	0.4744	Confidential		Confidential
	Vodafone	0.4744	Confidential		Confidential
	DIGI	0.4744	Confidential		Confidential
	Netfone	0.4744	Confidential		Confidential
	Tarr	0.4744	Confidential		Confidential
IE	Vodafone	0.4300	1,848,350	5,234,027	35.31%
	Three	0.4300	1,597,507		30.52%
	Eircom	0.4300	1,137,172		21.73%
	Tesco	0.4300	433,218		8.28%
	Others (MVNOs)	0.4300	217,780		4.16%
IS	Siminn	0.6367	173,599	472,694	36.73%
	Vodafone	0.6367	126,982		26.86%
	Nova	0.6367	155,871		32.98%
	Hringdu	0.6367	16,242		3.44%
IT	Wind Tre	0.6700	21,956,300	77,796,840	28.22%
	TIM	0.6700	20,633,469		26.52%
	Vodafone	0.6700	18,742,609		24.09%
	Iliad	0.6700	6,840,000		8.79%
	PostePay	0.6700	4,317,436		5.55%
	Rest of the operators	0.6700	5,307,026		6.82%
LI	Swisscom (Schweiz) AG	0.7144	Confidential	17,041	Confidential
	Telecom Liechtenstein AG	0.7144	Confidential		Confidential
	Salt (Liechtenstein) AG	0.7144	Confidential		Confidential
LT	Tele2	0.7600	1,956,766	4,742,427	41.26%
	Telia Lietuva, AB	0.7600	1,397,545		29.47%
	Bite Lietuva	0.7600	1,225,103		25.83%
	Rest of the operators	0.7600	163,013		3.44%
LU	Post Telecom S.A.	0.8900	391,400	853,000	45.89%
	Proximus Luxembourg S.A.	0.8900	286,800		33.62%
	Orange S.A.	0.8900	129,200		15.15%
	Rest of the operators	0.8900	45,600		5.35%

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers ¹²	Market Shares
LV	Bite Latvija, SIA	0.8868	Confidential	2,051,359	Confidential
	Latvijas Mobilais Telefons	0.8868	Confidential		Confidential
	Tele2, SIA	0.8868	Confidential		Confidential
ME	Telenor	0.6700	340,734	1,080,089	31.55%
	Crnogorski Telekom	0.6700	362,489		33.56%
	Mtel	0.6700	376,866		34.89%
MK	Makedonski Telekom	1.0211	847,906	1,833,689	46.24%
	A1 Macedonia	1.0211	930,304		50.73%
	Lajkamobajl	1.0211	35,942		1.96%
	Telelabel TRD ROBI	2.4313	19,537		1.07%
MT	Go plc	0.4045	242,978	635,040	38.26%
	Melita plc	0.4045	154,701		24.36%
	Vodafone Malta Ltd	0.4045	237,332		37.37%
	Yom Ltd	0.4045	29		0.00%
NL	KPN	0.5810	6,366,000	22,060,000	28.86%
	Vodafone Ziggo	0.5810	5,155,000		23.37%
	T-Mobile/Tele2	0.5810	5,577,000		25.28%
	Rest of the operators	0.5810	4,962,000		22.49%
NO	Telenor	0.2975	2,694,064	5,747,195	46.98%
	Telia	0.2975	2,069,428		36.08%
	ICE	0.2975	598,485		10.44%
	Com4	0.2975	0		0.00%
	Rest of the operators	0.2975	385,218		6.72%
PL	Orange Polska S.A.	0.9523	Confidential	46,712,938	Confidential
	Polkomtel sp. z o.o.	0.9523	Confidential		Confidential
	P4 sp. z o.o.	0.9523	Confidential		Confidential
	T-Mobile Polska S.A.	0.9523	Confidential		Confidential
PT	MEO	0.3600	Confidential	11,854,999	Confidential
	NOS	0.3600	Confidential		Confidential
	Vodafone	0.3600	Confidential		Confidential
	Rest of the operators	0.3600	Confidential		Confidential
RO	Vodafone Romania s.a.	0.7600	6,679,013	22,594,215	29.56%

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers ¹²	Market Shares
	Orange Romania S.A.	0.7600	8,625,880		38.18%
	Telekom RMC S.A.	0.7600	2,844,129		12.59%
	RCS & RDS S.A.	0.7600	3,504,153		15.51%
	Telekom RC S.A.	0.7600	921,010		4.08%
	Rest of the operators	0.7600	20,030		0.09%
RS	Telekom Srbija (MTS)	1.2162	Confidential	8,260,758	Confidential
	Telenor	1.2162	Confidential		Confidential
	Vip mobile	1.2162	Confidential		Confidential
SE	Telia Company	0.2060	4,470,130	12,960,000	34.49%
	Tele2	0.2060	3,980,465		30.71%
	Telenor	0.2060	2,274,747		17.55%
	Hi3G	0.2060	1,759,030		13.57%
	Rest of the operators	0.2060	475,628		3.67%
SI	Telekom Slovenije	0.8820	Confidential	Confidential	38.59%
	A1 Slovenija	0.8820	Confidential		31.23%
	Telemach	0.8820	Confidential		23.63%
	T-2	0.8820	Confidential		6.55%
SK	Orange Slovensko, a.s.	0.8180	Confidential	6,227,320	Confidential
	Slovak Telekom, a.s.	0.8180	Confidential		Confidential
	O2 Slovakia, s.r.o.	0.8180	Confidential		Confidential
	SWAN Mobile, a.s.	0.8180	Confidential		Confidential
TR	Turkcell	0.2659	30,790,414	75,747,650	40.65%
	Vodafone	0.2745	23,256,167		30.70%
	TT Mobil (Avea)	0.3149	21,701,069		28.65%
XK*	Kosovo Telecom	0.9460	1,182,878	1,988,774	59.48%
	Ipko Telecommunications LLC	0.9460	775,148		38.98%
	Dukagjini telecommunications	0.9460	53		0.00%
	mts d.o.o.	0.9460	30,695		1.54%

Notes to Table 6

AL: M2M SIM cards are excluded from 'Subscribers'.

AT: Individual operator subscriber data are strictly confidential.

BE: Mobile subscribers : data as of the 1st of October 2020 (confidential).

BG: Data as of 01.07.2020. Individual data on number of subscribers/M2M SIM Cards by operators are confidential. M2M, M2P and data-only SIMs cards are not included in the figure of total mobile subscribers.

CH: Subscriber base as of 31.12.2020.

CZ: Regulated MTR is defined as a single price per minute. SIM cards filled in column "rest of operators" are MVNOs (Service Providers) with no MTR regulation - however, termination is carried out by their MNOs for regulated rates. The total number of SIM cards as of 30th June 2020 is available as the latest information. Individual data on number of subscribers/M2M SIM Cards by operators are confidential.

DE: The number of subscribers (not including M2M and IoT) and M2M SIM cards is for end of year 2019 and is not available by individual operator.

DK: Total Subscribers is derived as of ultimo H1 2020.

EL: Data of Active Subscribers are confidential.

FI: Subscriber and M2M figures per operator are confidential. Subscriber figures per 01.07.2020. Subscriber figures depict the number of subscriptions not SIM cards. Subscription figures include all subscriptions other than data-only and M2M. SIM card volumes are very close to the subscription number in Finland. Traficom does not collect detailed information on SIM cards (e.g. data-only SIM cards) and therefore the figure would not have reflected the asked figures. Number of M2M cards is collected and is reported in the figures.

FR: Subscribers' base and M2M SIM Cards Volume per operator are confidential data. Only aggregated market data are provided.

HR: Total mobile subscribers: Data refer to Q3 2020.

HU: Subscribers and M2M data are confidential.

IS: Subscriber data from middle of 2020, most recent data available.

LI: Subscribers and M2M data are confidential.

LT: Data as of 2020 IVQ. These M2M SIM cards are used for M2M services only..

LU: Regulation ILR / T17 / 4 of 9 June, 2017 fixing the tariff ceiling for voice call termination services on individual mobile networks (Market 7/2007). Price cap based on Pure-LRIC.

Since 01.02.2021: ILR /T21/2 Regulation of 18 January, 2021 related to the definition of the relevant market for the wholesale supply of voice call termination on individual mobile networks (market 2/2014).

Data as of 30.06.2020.

MT: Data reflect as at Q3 2020.

NO: Number of subscribers and market share are provided as of 30 June 2020. The total number of subscribers per 01 January 2021 will be available in Q2 2021.

PT: The individual number of subscribers is confidential.

RS: Information on individual's number of subscribers by operator is confidential. Number of subscribers are as of Q4 2020 and include both MNO and MVNO operators' subscribers. Numbers of subscribers are collected by using ITU indicator i271 which excludes data cards and USB modems. M2M are collected by using ITU indicator i271m2m with the following definition – M2M mobile-network subscriptions refers to the number of mobile-cellular machine-to-machine subscriptions that are assigned for use in machines and devices (cars, smart meters, consumer electronics) for the exchange of data between networked devices, and are not part of a consumer subscription. For instance, SIM-cards in personal navigation devices, smart meters, trains and automobiles should be included. Mobile dongles and tablet subscriptions should be excluded.)

SE: Latest data available for subscribers used, i.e. July 1, 2020

SI: Absolute number of subscribers per operator is confidential. Absolute number of all subscribers is confidential if this number is published with market shares of operators together.

SK: The number of subscribers per operator has to be treated as confidential. RU does not apply any glide path.

Annex 6 Regulatory models implemented to calculate MTRs

Table 7

Jan-21	COST ACCOUNTING MODEL			Period 1 - From 01/01/2021 until entry into force of Eurorates (unknown dates) or 30/06/2021, depending on the case	Period 2 - From 01/07/2021 until 31/12/2021	Period 3 - From 01/01/2022 until 30/06/2022	Period 4 - From 01/07/2022 until 31/12/2022	Period 5 - From 01/01/2023 until 30/06/2023
	Model	Rate status	When a tariff adopted by a final decision and meeting the standards of the TR Recommendation has been or will be firstly applied?					
AL	Benchmark (BU-LRIC)	adopted	16.06.2020	0.8968	0.8968	0.8968	0.8968	0.8968
AT	Pure BU-LRIC	adopted		0.8049				
BE	Pure BU-LRIC	adopted	01.01.2013	0.9900	0.7000	0.5500	0.4000	0.2000
BG	Pure BU-LRIC	adopted	01.12.2016	0.7158				
CH		not regulated	not applicable					
CY	Pure BU-LRIC	adopted	01.01.2018	0.1700	0.2000	0.2000	0.2000	0.2000
CZ	Pure BU-LRIC	adopted	01.07.2013	0.9300				
DE	Pure BU-LRIC	adopted	01.12.2020	0.7800				
DK	Pure BU-LRIC	adopted		0.5173				
EE	Benchmark (BU-LRIC)	adopted	07.05.2020	0.7000				
EL	Pure BU-LRIC	adopted	01.01.2013	0.6220				
ES	Pure BU-LRIC	adopted	10.05.2012	0.6400	0.6400	0.5500	0.5500	0.4000
FI	Other (FDC/FAC)	adopted		0.8200				
FR	Pure BU-LRIC	adopted	01.01.2013	0.7400				
HR	Pure BU-LRIC	adopted	01.01.2015	0.5953	0.5953	0.5500	0.5500	0.4000
HU	Pure BU-LRIC	adopted	01.04.2015	0.4744	0.4744			
IE	Pure BU-LRIC	adopted	01.09.2016 (see ComReg Decision D02/16)	0.4300	0.4300 (eurorate also 0.4300)	0.3100 (eurorate 0.4300)	0.3100 (eurorate 0.4300)	0.3100 (eurorate 0.4000)

Jan-21	COST ACCOUNTING MODEL			Period 1 - From 01/01/2021 until entry into force of Eurorates (unknown dates) or 30/06/2021, depending on the case	Period 2 - From 01/07/2021 until 31/12/2021	Period 3 - From 01/01/2022 until 30/06/2022	Period 4 - From 01/07/2022 until 31/12/2022	Period 5 - From 01/01/2023 until 30/06/2023
	Model	Rate status	When a tariff adopted by a final decision and meeting the standards of the TR Recommendation has been or will be firstly applied?					
IS	Benchmark (BU-LRIC)	adopted		0.6367	0.6367			
IT	Pure BU-LRIC	adopted	01.07.2013	0.6700	0.6700		-	
LI	Benchmark (BU-LRIC)	adopted	01.01.2021	0.7144				
LT	Benchmark (BU-LRIC)	adopted	01.04.2016	0.7600				
LU	Pure BU-LRIC	adopted	18.01.2021	0.8900				
LV	Pure BU-LRIC	adopted	26.04.2017	0.8868				
ME	Other (TD LRIC)	adopted		0.6700				
MK	Pure BU LRIC	adopted	2010	1.0211				
MT	Pure BU-LRIC	adopted		0.4045				
NL	Pure BU-LRIC	adopted	01.07.2017	0.5810	0.5810	0.5810	0.5810	0.5810
NO	Pure BU-LRIC	adopted	01.07.2015	0.2975	0.2975			
PL	Pure BU-LRIC	adopted	01.07.2013	0.9528	0.9528	0.9528	0.9528	0.9528
PT	Pure BU-LRIC	adopted	31.12.2012	0.3600				
RO	Benchmark (BU-LRIC)	adopted	01.04.2014	0.7600				
RS	Benchmarking (other)			1.2162				
SE	Pure BU-LRIC	adopted	01.07.2013	0.2060	0.1631			
SI	Pure BU-LRIC	adopted	from 01.08.2020 for 0.882 eurocent	0.8820				
SK	Pure BU-LRIC	adopted	01.08.2019	0.8180				
TR	Confidential							
XK*	Benchmarking (other)	adopted		0.9460	0.9460	0.8460		

Notes to Table 7:

AL: The reported MTR are valid until next decision will be made.

BE: Precise timing will depend on the adoption of the Delegated Act, when the new tariffs will enter in force the currently imposed tariffs (i.e. 0.99 eurocent for MTR and 0.116 eurocent for FTR) will be replaced by those set out in the DA.

BG: With Decision 585 from 24 November 2016 CRC approved cost-oriented mobile termination rates based on Pure Bu-LRIC model as follows:

from 01.12.2016 to 01.01.2019 – 0.014 BGN/minute

from 01.01.2020 – 0.014 BGN/minute

According CRC`s Decision 266/23.07.2020, until the adoption of the Delegated Act setting a single maximum Union-wide mobile voice termination rate, all undertakings designated as having SMP on mobile call termination market are obliged to apply cost-oriented call termination rates (equal to BGN 0.014), determined by BU-LRIC model adopted with CRC's Decision 585/24.11.2016. No MTRs peak/off-peak differentiation. Data as of 01.07.2020. M2M, M2P and data-only SIMs cards are excluded. Individual data on number of subscribers by operators are confidential.

CH: MTRs are not regulated in 2021.

CZ: Individual data on number of subscribers/M2M SIM Cards by operators are confidential.

DK: Usually the DBA issues MTR ultimo any year for the entire following year. However, due to the EU MTR will be applicable for use from 1/7/2021, DBA has decided to reuse the 2019 rate for 2020 and 2021 (until EU MTR are in force).

FI: DNA, Elisa and Telia have commercially agreed on new termination rates. New termination rates will be as follows:

01.12.2018 MTRs will be 0.93 eurocent /minute

01.12.2019 MTRs will be 0.89 eurocent /minute

01.12.2020 MTRs will be 0.82 eurocent /minute

Ålcom will follow the same glide path.

IE: Precise timing will depend on the adoption of the Delegated Act, when the new tariffs will enter in force the currently imposed tariffs (i.e. 0.43 eurocent for MTR and 0.051 eurocent for FTR) will be replaced by those set out in the Delegated Act.

IS: MTR is benchmarked against BU-LRIC rates in the EEA, decision is made in october 2020 and valid for the following year, 2021. Rates for 2022 will be benchmarked late 2021, unless Eurorate becomes valid by law or regulation.

LT: Right now MTR is 0.76 eurocent based on average of pure BU-LRIC by other countries on 01/01/2021. Data about subscribers as of 2020 IVQ.

LU: Regulation ILR/T21/2 18 of January, 2021 on the definition of the relevant market for the wholesale supply of voice call termination on individual mobile networks (market 2/2014). Number of subscribers as of 30.06.2020.

ME: NRA in Montenegro does not apply any glide path for MTR. Currently SMP operators have applied MTR based on TD LRIC methodology and cost model.

PT: In June 21, 2018, ANACOM approved a new decision establishing the new MTR also in accordance with the EC Recommendation on Termination rates - BU-LRIC. According to this decision, in 01.07.2020 the MTRs was updated on the basis of existing and foreseen inflation data.

RO: MTR 0.76 eurocents/min, based on benchmark of MTRs applied by member states that developed pure LRIC models.

RS: Price of 1,43 RSD is effective from 01.01.2018, until new RATEL`s definition. Presented price is national MTR which is subject of regulation.

SE: Regulated MTRs: MTR for period 2 will not enter into force since it's below the stipulated eurorate for MTR, hence current level will be valid even after the DA-level is applied. Taking into account the exchange rates to be applied according to the DA.

SK: RU does not apply any glide path.

TR: ICTA does not regulate MTRs via glidepath.

XK: The benchmarking methodology used to set the MTR is not fully in line with the Recommendation. The glide path for MTR was made by using average MTR of EU member states and MTR from Western Balkans Countries.

Annex 7 Abbreviations and Exchange rates**Table 8 – Abbreviations**

AL	Albania
AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LI	Liechtenstein
LT	Lithuania
LV	Latvia
LU	Luxembourg
ME	Montenegro
MK	The Republic of North Macedonia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Serbia
SE	Sweden
SI	Slovenia
SK	Slovakia
TR	Turkey
XK*	Kosovo*
UK	United Kingdom

Table 9 – Exchange Rates¹³

COUNTRY	1 EURO
AL	123.7698
BG	1.9558
CH	1.0779
CZ	26.6670
DK	7.4431
HR	7.5595
HU	360.4700
IS	160.2000
LI	1.0779
MK	61.6954
NO	10.7562
PL	4.5051
RO	4.8718
RS	117.5771
SE	10.4848
TR	9.4005

¹³ ECB website, <https://sdw.ecb.europa.eu/browse.do?node=9691296>

Annex 8 Glossary

Avg(S)	Simple average
Avg(W)	Weighted average
FTR	Fixed Termination Rate
MTR	Mobile Termination Rate
NRA	National Regulatory Authority
SMS	Short Message Service
TR	Termination Rate
TD	Top Down
BU	Bottom Up
LRIC	Long Run Incremental Cost
LRAIC	Long Run Average Incremental Cost
FAC	Fully Allocated Cost
CCA	Current Cost Accounting
FDC	Fully Distributed Cost
LRR	Lowest Regulated Rate