

# **Termination rates at the European level**

## **January 2020**

11 June 2020

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# 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 Statistics and Indicators Working Group in cooperation with the BEREC Office, and aims to offer a picture of the regulated rates for fixed and mobile interconnection services in Europe. Fixed and mobile termination services in Europe are subject to price regulation.

The European Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC identifies:

- wholesale call termination on individual public telephone networks provided at a fixed location as a relevant market susceptible of ex-ante regulation (market 1).
- wholesale voice call termination on individual mobile networks as a relevant market susceptible of ex-ante regulation (market 2).

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

The present overview of TRs is based upon the results of a request for information sent to all NRAs in January 2020, referring – if not differently indicated – to data as of 1st January 2020. It includes rates from the thirty eight (38) NRAs<sup>1</sup> that provided responses to our request.

Comparing with the previous Termination Report, Kosovo\* has joined this TR report as a participant through the Regulatory Authority for Electronic and Postal Communications.

As of January 2020, the situation regarding TRs in Europe can briefly be described as follows (see also Figures 1-2):

- The simple average of the lowest regulated FTR of incumbents at the European level (all 38 countries/participants, Avg (S)) stands at 0.3118 cent per minute.
- The simple average of the lowest regulated FTR of European Union incumbents (only EU member states, Avg EU27(S)) stands at 0.2002 cent per minute.
- The simple average of MTR at the European level (all 38 countries/participants, Avg (S)) stands at 0.8442 cent per minute, whereas the weighted average<sup>2</sup> (Avg (W)) at European level is estimated at 0.7400 cent per minute.

<sup>1</sup> 27 EU member states plus 4 EFTA states (Switzerland, Iceland, Norway and Liechtenstein), 5 economies of the Western Balkans (Albania, Montenegro, North Macedonia, Serbia and Kosovo\*), Turkey and the UK. The United Kingdom withdrew from the European Union on 31 January 2020.

\* *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.*

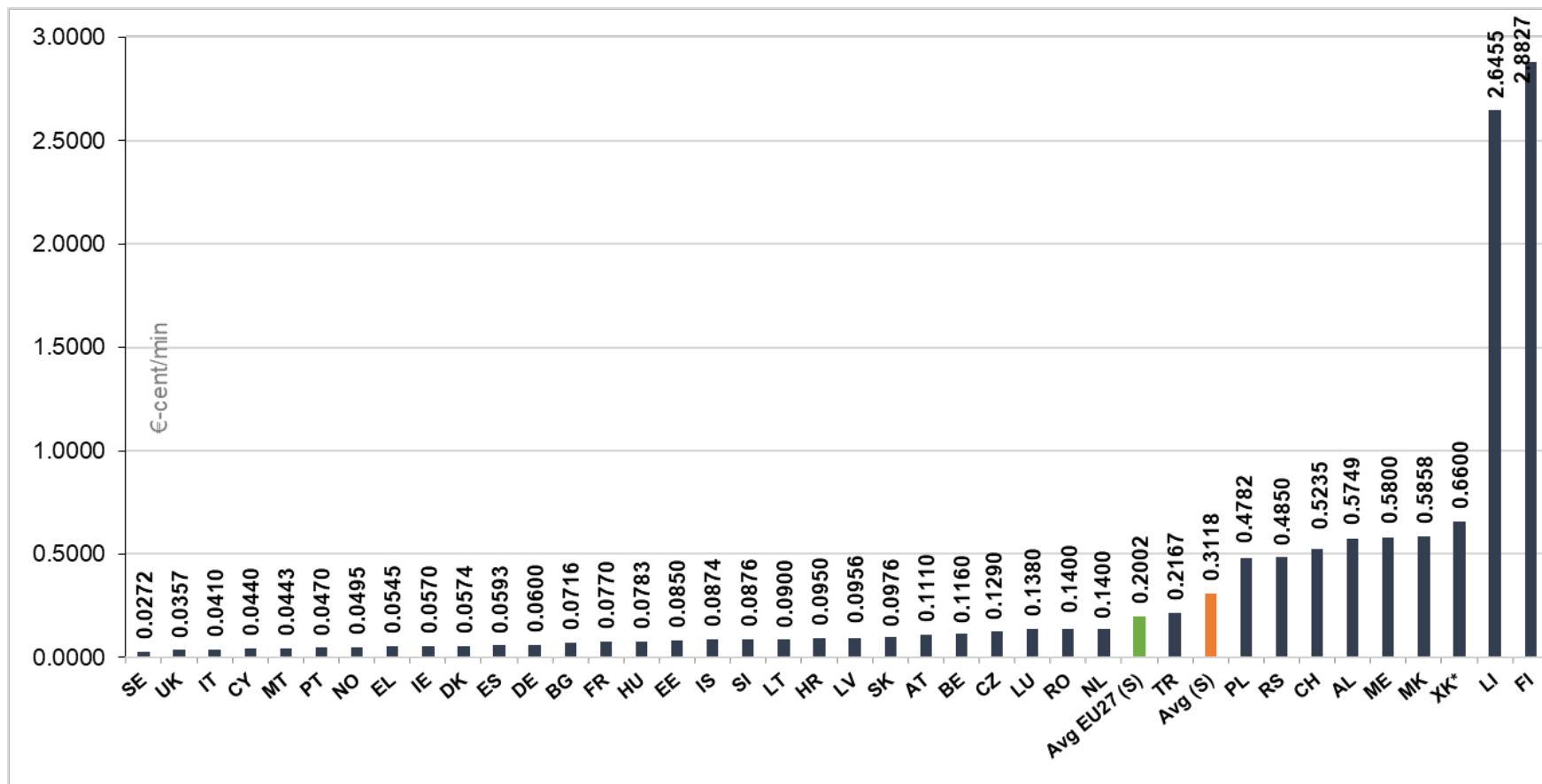
<sup>2</sup> The weighted averages weight each country's average rate with the share of the country's subscribers (total subscribers per country / total subscribers in all countries).

- The simple average of MTR at the EU level (only EU member states, (EU Avg (S)) stands at 0.7251 cent per minute, whereas the weighted average at EU level (EU Avg (W)) is estimated at 0.7725 cent per minute.

For non-Euro countries/participants, the average exchange rate in the last quarter of 2019 was used to calculate the FTRs and MTRs. The exchange rates used are reported in [Annex 7](#).

### Overview of incumbents<sup>3</sup> lowest regulated fixed termination rates<sup>4</sup> per country/participant – January 2020 (eurocent per minute of service)

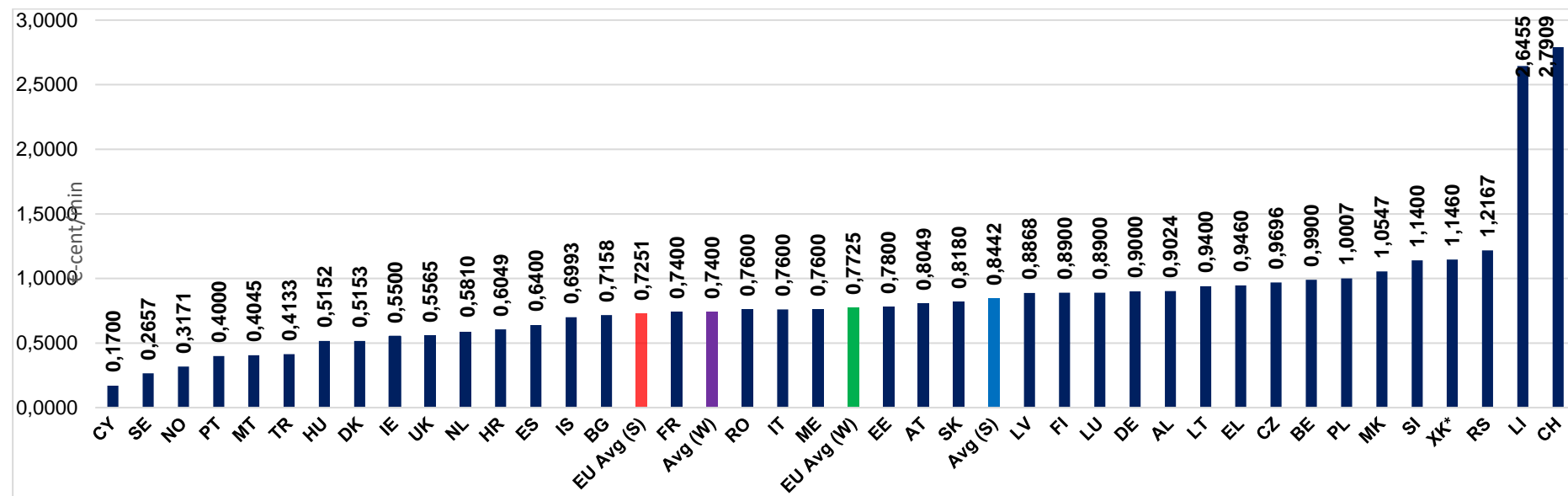
Figure 1 FTRs



Source: NRAs, BEREC

## MTR per country/participant – January 2020 (eurocent per minute of service)

Figure 2 MTRs



Source: NRAs, BEREC

<sup>3</sup> Due to the large number of incumbents present in Finland a weighted average is included for comparison.

<sup>4</sup> The lowest regulated rate of the incumbent. In case the operator uses only one rate, it is considered as a single rate.

## 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:

- 1) In some cases (CH), 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, the termination rate 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 1<sup>5</sup>, 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 presents a ranking of the lowest regulated rates together with the 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, 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:

- A 3-minute average call duration has been assumed, using the standard formula: (fixed set-up charge + price per minute\*3)/3.
- Nominal tariffs are reported only when the NRA has set the maximum price per minute that operators may charge each other.
- For those countries/participants 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. Where this distribution has not been made available, a 50/50 distribution has been assumed.

### 2.2. FTR benchmark

[Annex 1](#) presents the FTRs of operators listed by country/participant. For each country/participant, the respective NRA provided information on the incumbent and some

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

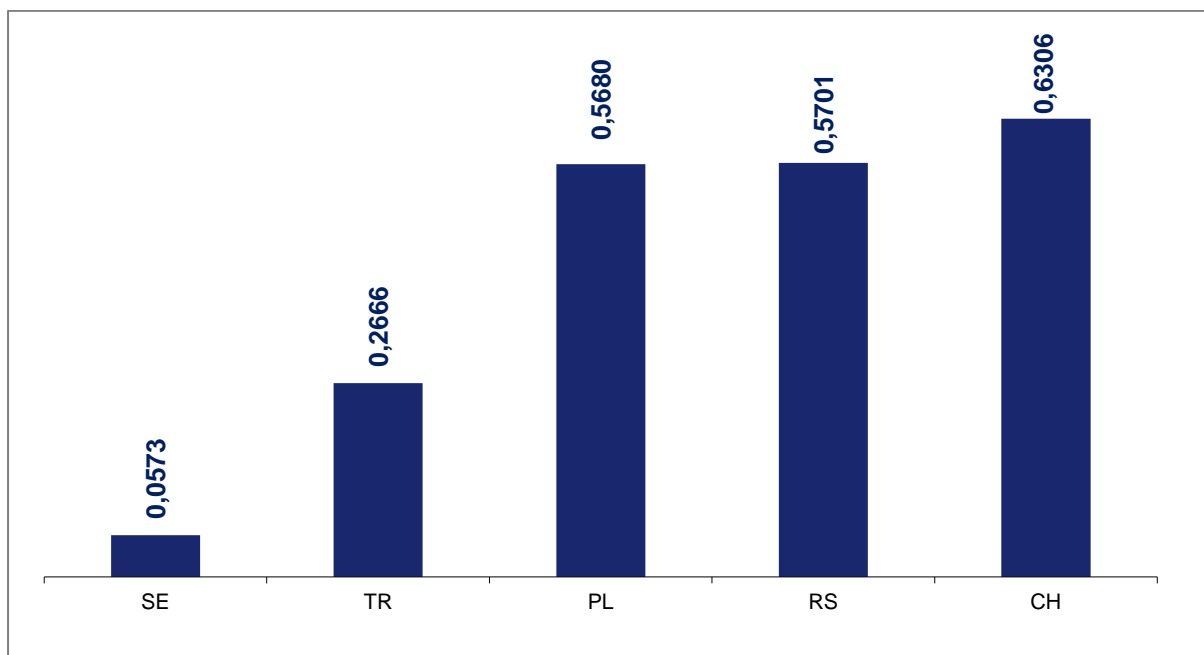
alternative or cable operators offering interconnection services. In the last column, the weighted average of peak/off-peak prices is provided.

The lowest regulated rate (LRR) 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.

In five countries (out of 38 countries/participants) operators maintain interconnection services in fixed networks at only two different levels in the hierarchy of the incumbents' networks. In three countries operators have three layers of interconnection.

For more information on the lowest rates of incumbents, please refer to Figure 1 and [Annex 1](#).

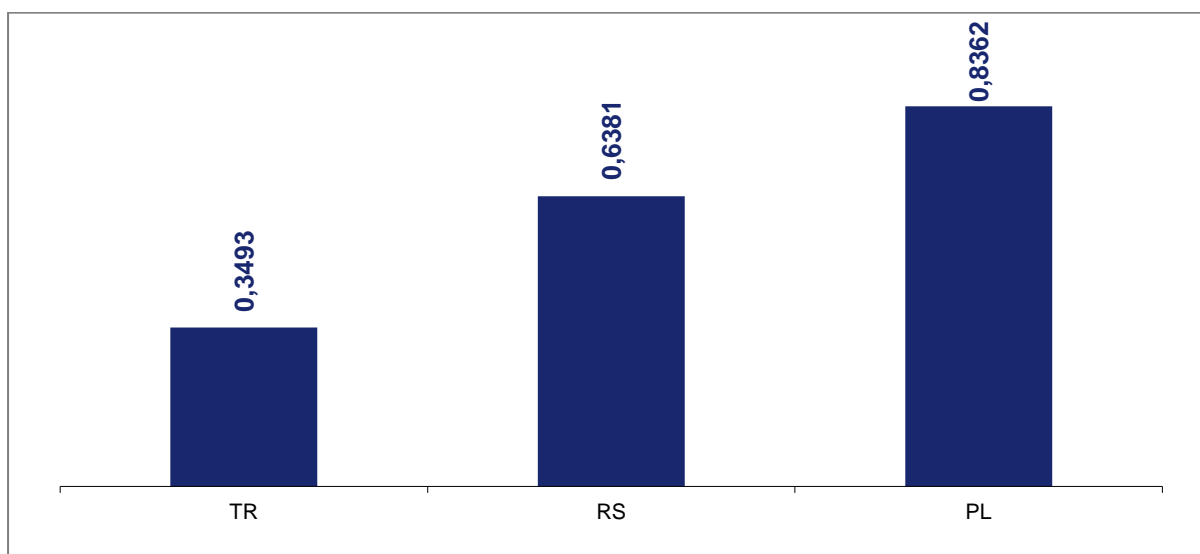
**Figure 3 Incumbents' second lowest regulated fixed termination rate per country (eurocent per minute)**



Source: NRAs, BEREC



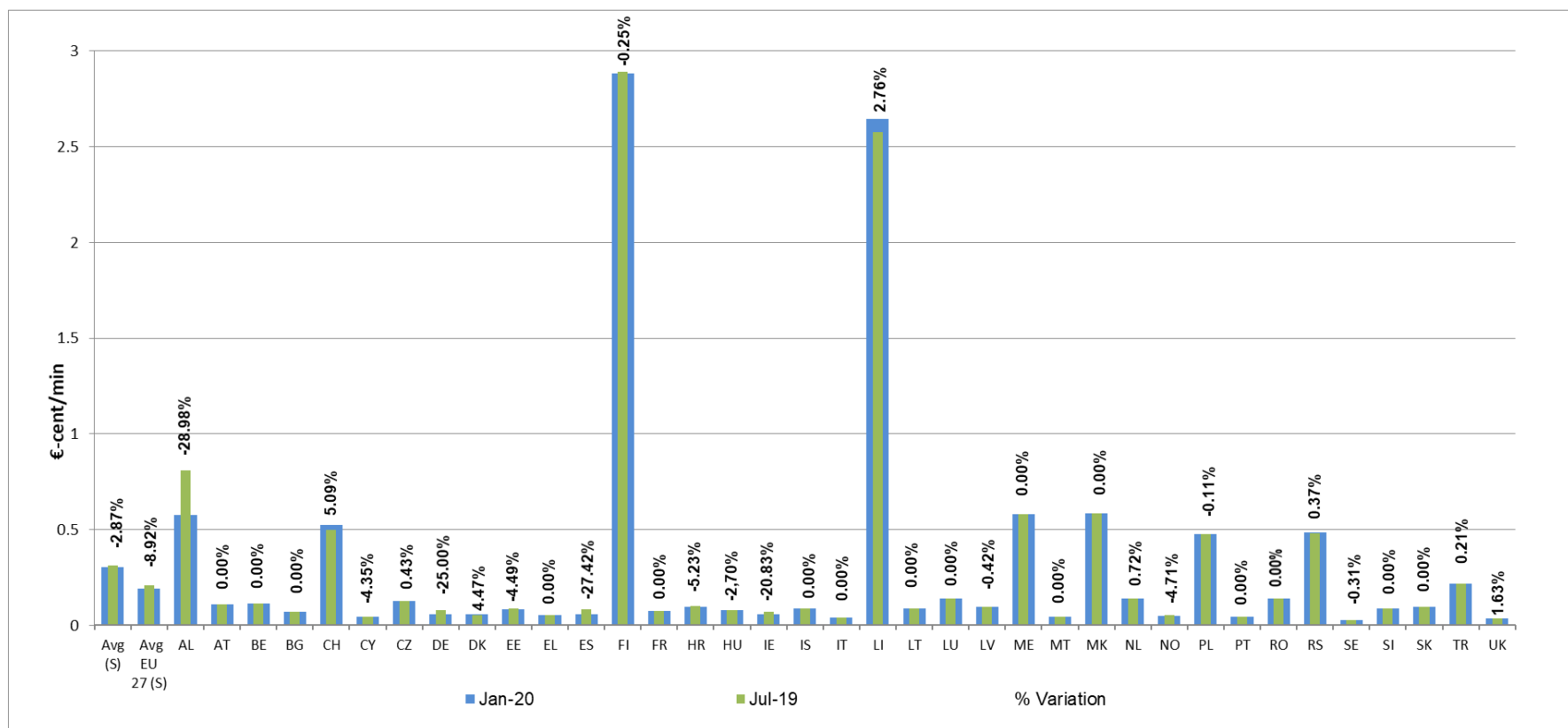
**Figure 4 Incumbents' third lowest regulated fixed termination rate per country (eurocent per minute)**



Source: NRAs, BEREC

### 2.3. Short term evolution of fixed incumbents' FTRs (from July 2019 to January 2020)

Figure 5 Incumbents' lowest regulated rate per country<sup>6,7</sup> (eurocent per minute)



Source: NRAs, BEREC

<sup>6</sup> Due to the large number of incumbents present in Finland a weighted average of all operators have been used for both periods. The variation shown in the graph is due to the change in numbers of lines, since the actual rates have remained unchanged.

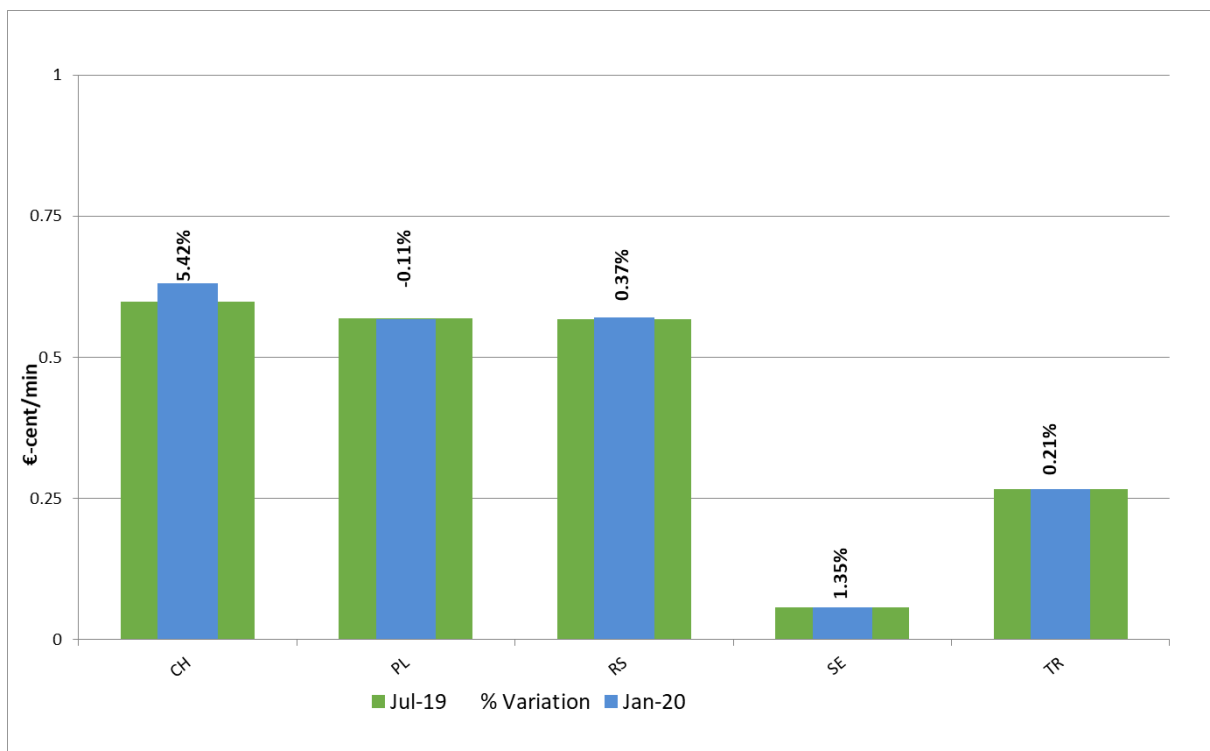
<sup>7</sup> Calculation for Iceland is based on data from 1 January 2019 and 2020.

The above chart shows the percentage change in the lowest regulated fixed termination rate of incumbents between July 2019 and January 2020. For easier comparison, rates are presented in eurocent. The reported changes in FTRs in non-Euro countries (Figures 5, 6 and 7) is partially due to currency exchange rate variations. In cases where there is no variation in termination rates in national currencies, the percentage change is only due to the variation in the exchange rate. The exchange rates used are reported in Annex 7.

#### LRR Changes in FTRs in non-euro countries:

Albania, Croatia, Denmark, Iceland, Sweden, Switzerland and the UK reported changes in their FTRs in their national currencies. The rates (in eurocents) decreased in Albania (by 28.89%), Sweden (by 0.31%) and Croatia (by 5.23%). Denmark reported an increase of 4.47% in January 2020 compared to July 2019 and Switzerland notified a rise of 5,09% (Figure 5).

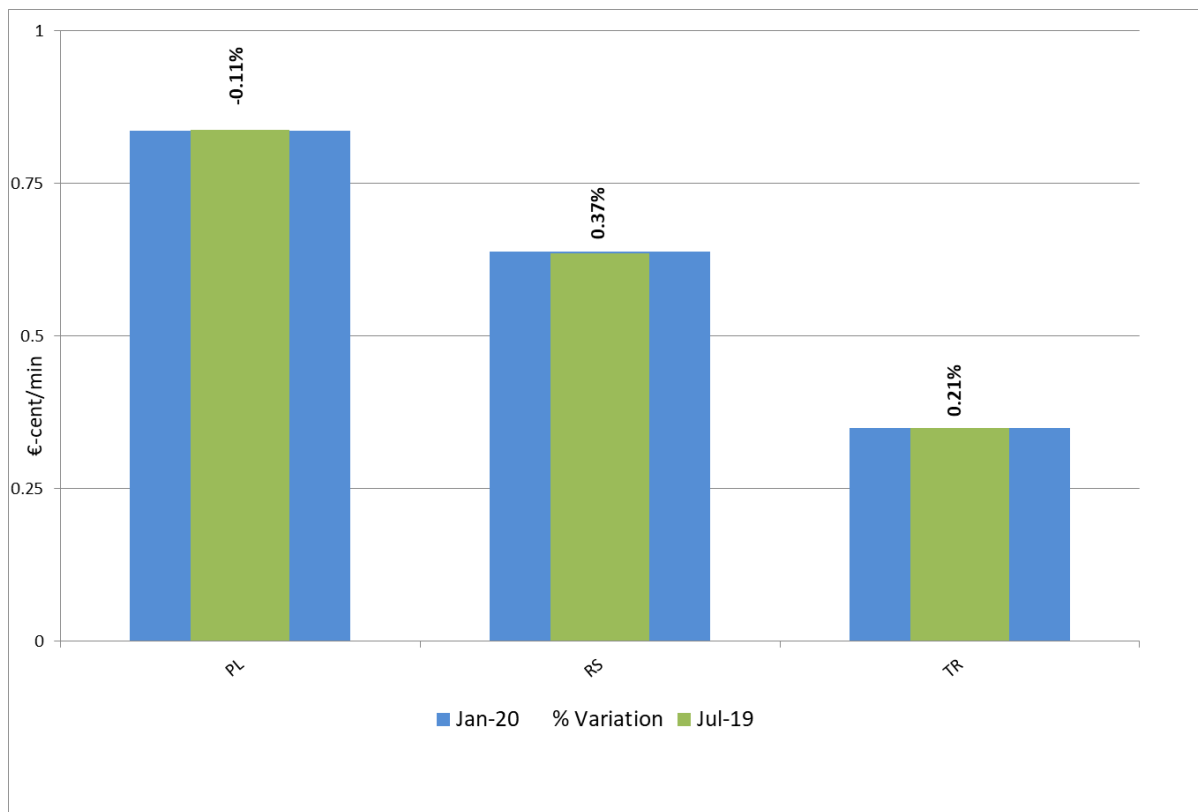
**Figure 6 Incumbents' second lowest regulated rate per country (eurocent per minute)**



Source: NRAs, BEREC

#### 2<sup>nd</sup> LRR Changes in FTRs in non-euro countries:

There have been substantial changes in the 2<sup>nd</sup> LRR of the FTRs reported by those countries where the national currency is not euro, except for Switzerland and Sweden. The Swedish 2<sup>nd</sup> LRR of the FTR has a modest increase of 1.35%.

**Figure 7 Incumbents' third lowest regulated rate per country (eurocent per minute)**

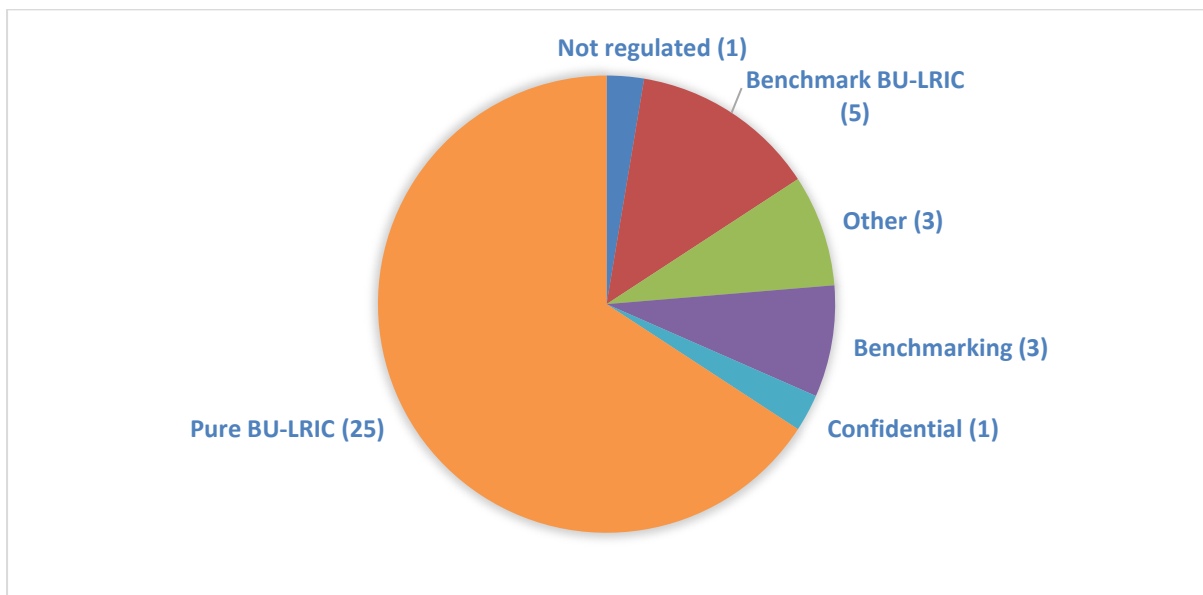
Source: NRAs, BEREC

### 3<sup>rd</sup> LRR Changes in FTRs in non-euro countries/participants:

There have been no changes in the 3<sup>rd</sup> LRR of the FTRs reported by those countries/participants where the national currency is not euro.

## **2.5. FTR regulatory models and symmetry overview**

25 NRAs use Pure BU LRIC models to set FTRs, 8 NRAs use Benchmarking approaches and FDC/FAC is used by 3 NRAs. Further, 1 NRA uses a BU LRAIC+ model and 1 NRA reported its cost model as confidential (Figure 8).

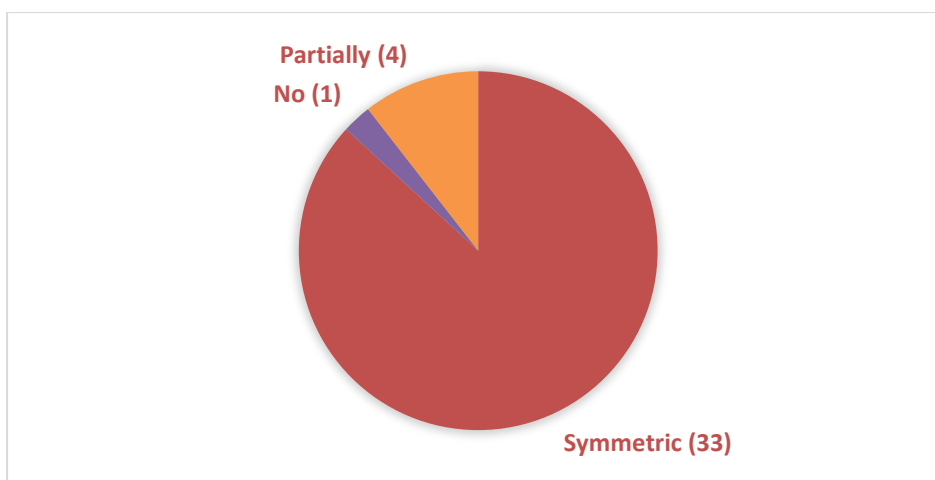
**Figure 8 Cost accounting models for FTR used by NRAs**

Source: NRAs, BEREC

For more information see [Annex 2](#).

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 should be symmetric. According to BEREC's information, 25 NRAs use Pure BU-LRIC models and 5 NRAs use benchmarking based on Pure BU LRIC.

Furthermore, in most of the respondent countries/participants (33), FTRs are symmetric across all operators. 4 NRAs reported partial symmetry in only 1 NRA reported non-symmetric rates. In one case, there is only one operator in the country, therefore, symmetry is not applicable.

**Figure 9 FTRs symmetry**

Source: NRAs, BEREC

For more information see [Annex 3](#).

## **2.6. 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 benchmarks the mobile termination rates (MTR) as of 1 January 2020 and its 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 for setting MTRs. Moreover, this benchmarking exercise includes a section devoted to the future evolution of MTRs<sup>8</sup>.

The overview of MTRs is based on the replies of a request for information sent to all NRAs in January 2020. It includes data from thirty-eight (38) NRAs that provided responses.

#### 3.1. Assumptions made for the benchmarking

For the present benchmarking exercise, the following assumptions have been made in order to make tariffs comparable<sup>9</sup>:

- Operators with a market share below 1.5% have been excluded from the calculation of the national MTR average.
- Only nominal tariffs are represented in the report, defining them as “the price (in cent per minute) set 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).”
- Four averages have been calculated: a simple average and a weighted average, each at the European level (including all 38 countries/participants reporting data) and at EU level (including only the 27 EU member states). The weighted averages weight 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, it should be noted that different estimation methods are used among European countries (especially in the case of pre-paid consumers). Mobile subscribers (active SIM cards) mean 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, and/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.<sup>10</sup>

Regarding the short-term MTR evolution (from July 2019 to January 2020), 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);
- ii. Currency exchange rate variations in non-Euro countries<sup>11</sup>;

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<sup>8</sup> See [Annex 6](#)

<sup>9</sup> Generally speaking, these assumptions may create margins of error in the present comparison, making it difficult to draw valid conclusions for policy purposes.

<sup>10</sup> Please note that due to a specification of the definition of mobile subscribers the number of total subscribers in some countries changed significantly compared to the previous reports.

<sup>11</sup> This only affects short-term MTR evolution (figure 12) because the percentage of tariff variation in each country (figure 13) has been calculated by comparing rates expressed in terms of the national currency.

- 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/participant: rates per voice minute (as of January 2020)

Table 1

Country/Participant	Average MTR per country/Participant (eurocents/min)
AL	0.9024
AT	0.8049
BE	0.9900
BG	0.7158
CH	2.7909
CY	0.1700
CZ	0.9696
DE	0.9000
DK	0.5153
EE	0.7800
EL	0.9460
ES	0.6400
FI	0.8900
FR	0.7400
HR	0.6049
HU	0.5152
IE	0.5500
IS	0.6993
IT	0.7600
LI	2.6455
LT	0.9400
LU	0.8900
LV	0.8868
ME	0.7600
MK	1.0547
MT	0.4045
NL	0.5810
NO	0.3171
PL	1.0007
PT	0.4000
RO	0.7600

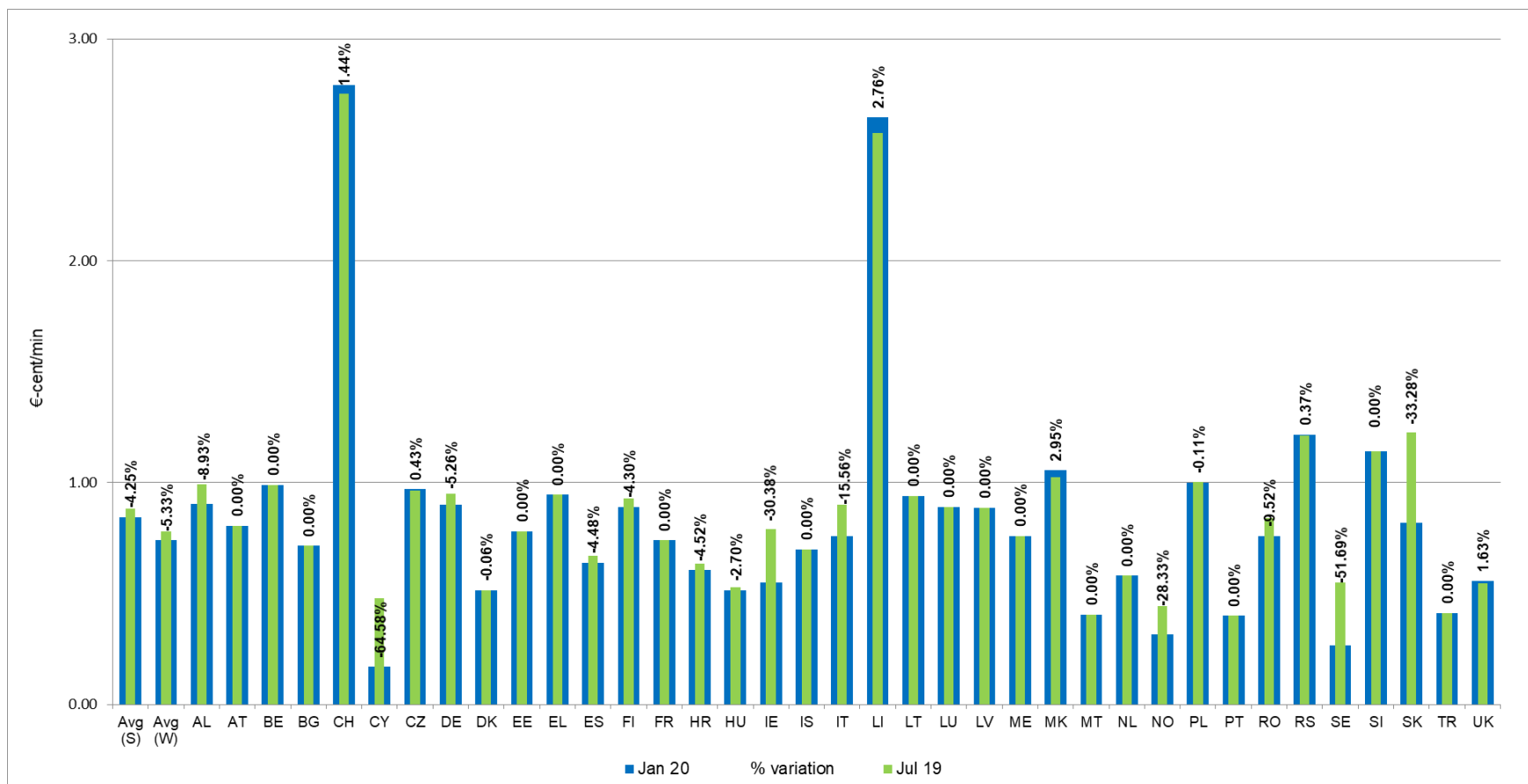


<b>Country/Participant</b>	<b>Average MTR per country/Participant (eurocents/min)</b>
RS	1.2167
SE	0.2657
SI	1.1400
SK	0.8180
XK*	1.1460
TR	0.4133
UK	0.5565
<b>Avg (S)</b>	<b>0.8442</b>
<b>Avg (W)</b>	<b>0.7400</b>
<b>EU Avg (S)</b>	<b>0.7251</b>
<b>EU Avg (W)</b>	<b>0.7725</b>

Figures 10 and 11 show the short-term variations of MTRs in Euro and in national currency. These two figures illustrate the effect of the exchange rate on the short-term evolution.

### Variation of MTRs per country (from July 2019 to January 2020)

Figure 10 Variation in eurocent and percentage<sup>12</sup>

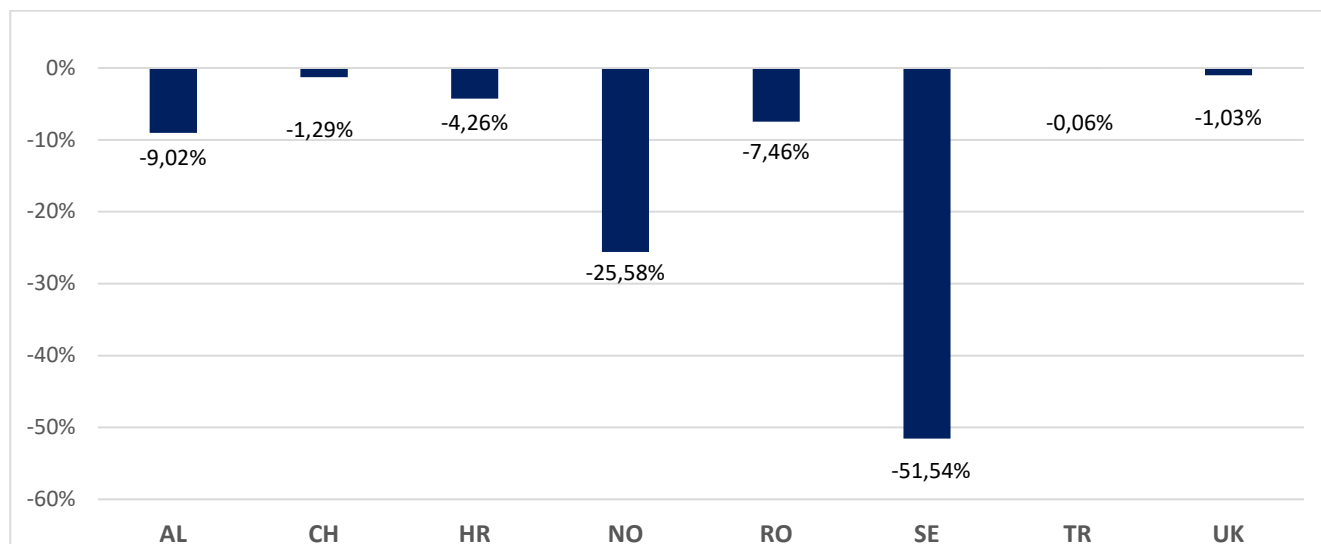


Source: NRAs, BEREC

<sup>12</sup> Calculation for Iceland is based on data from 1 January 2019 and 2020.

## Variation of average MTRs in national currency other than euro per country (from July 2019 to January 2020)

Figure 11 Variation in national currency (%)



Source: NRAs, BEREC

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

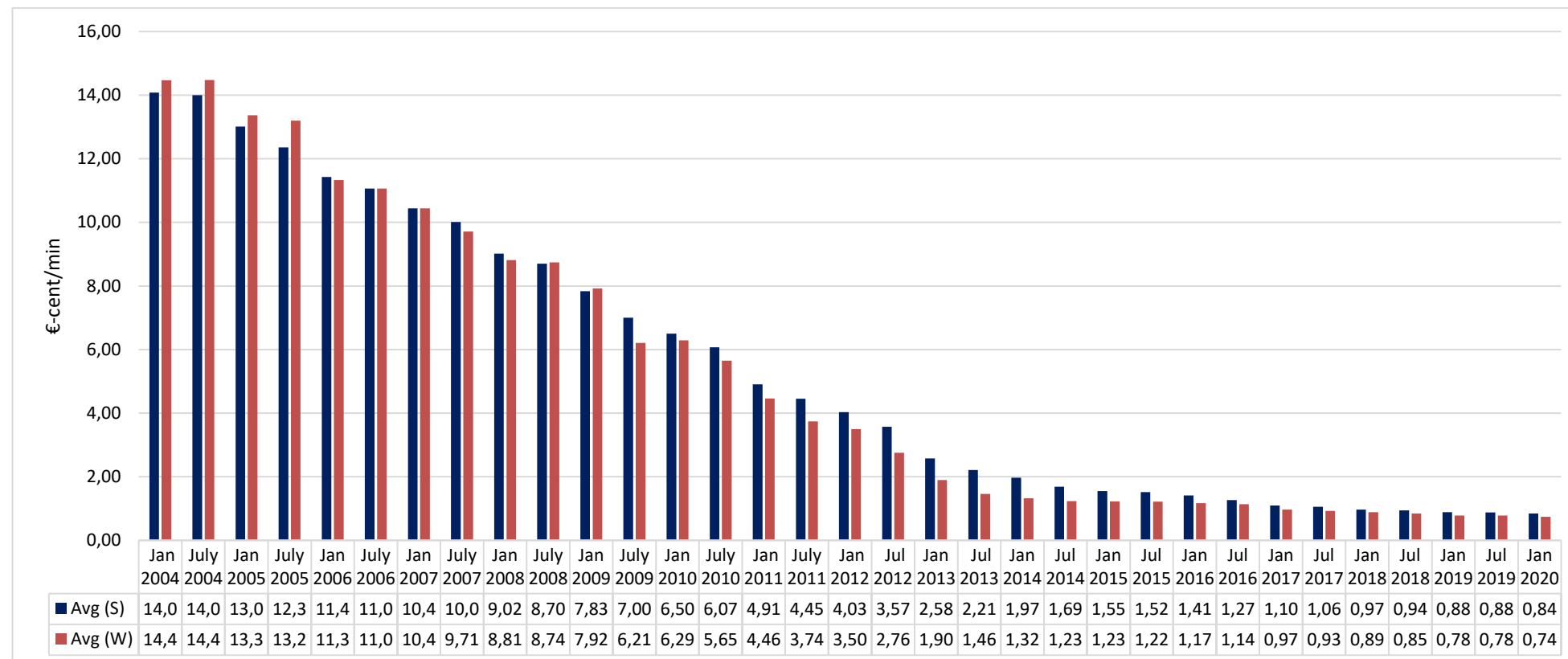
### 3.3. Average MTR per operator

There are several countries where the number of subscribers and/or market shares have been declared as confidential data and thus they are not published in this report. 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 level

Figure 12 Evolution of simple and weighted averages



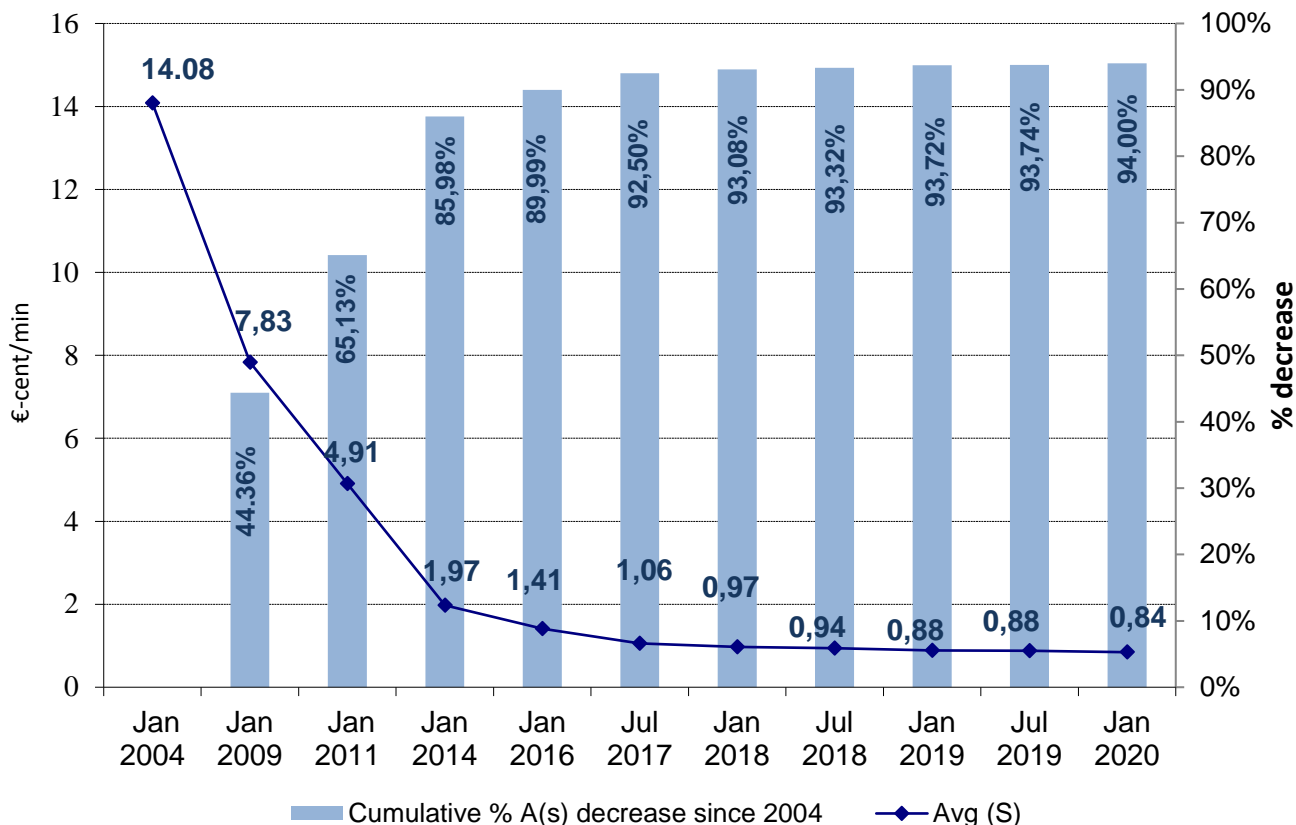
Source: NRAs, BEREC

**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 the average slightly. Moreover, the weighted average does not take into account countries/participants not providing the total number of subscribers and those that could have changed over the years. Considering these caveats, the graph shows the general trend.

Figures 13 and 14 show the cumulative decline 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 94% since January 2004, from 14.08 eurocent to 0.84 eurocents in January 2020.

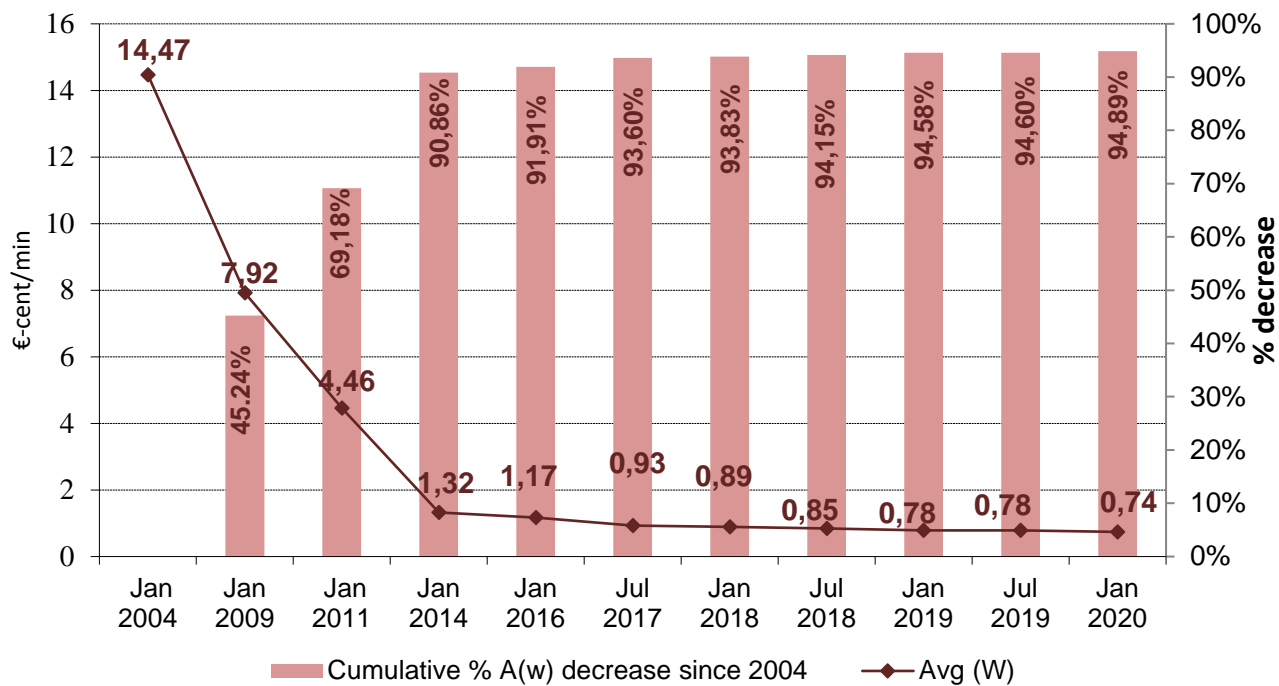
**Figure 13 European MTRs simple average and cumulative decline**



Source: NRAs, BEREC

**Figure 14 European MTRs weighted average and cumulative decline**

The weighted average of European MTRs has declined even more, from 14.47 eurocent to 0.74 eurocent in the same period from January 2004.

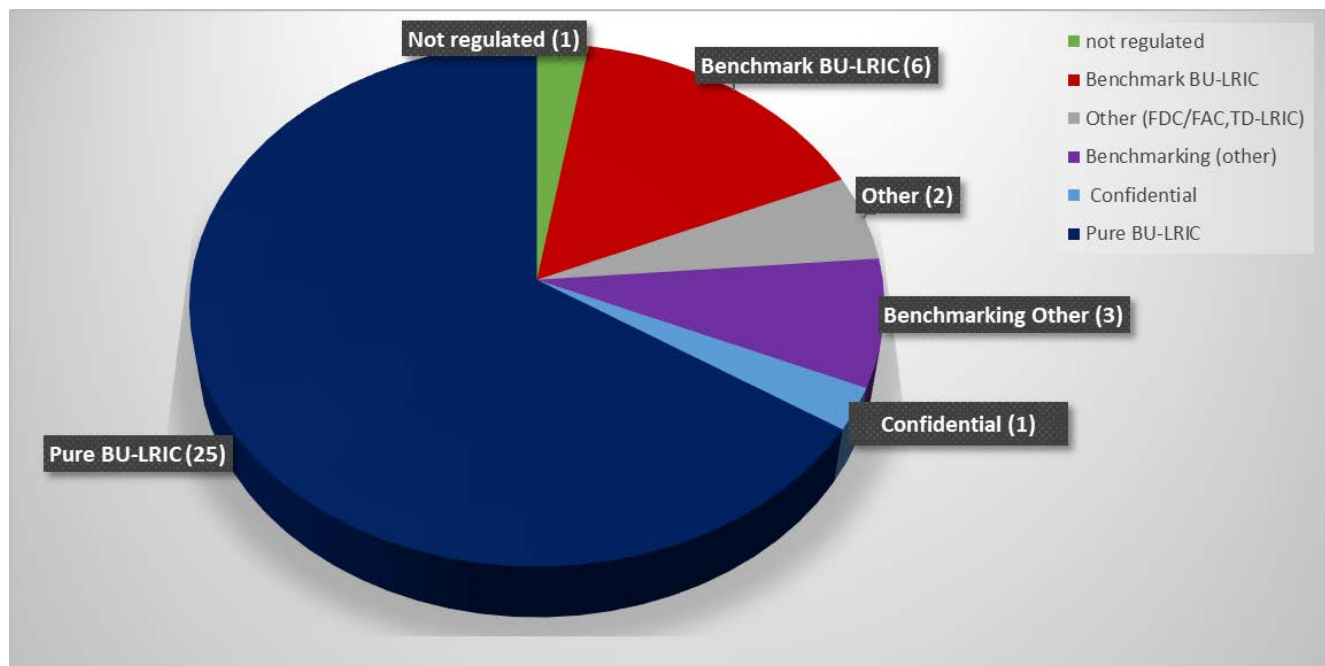


Source: NRAs, BEREC

### 3.6. Regulatory model implemented and glide paths for MTRs

In the majority of countries 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 2020

Table 2 <sup>13</sup>

Country /Participant	Operator	Lowest Regulated Rate	WA in cents
AL	Albtelecom	Single-rate	0.5749
	Abcom	Single-rate	0.5749
	Albanian Satellite Communications	Single-rate	0.5749
	Rest of operators	Single-rate	0.5749
AT	A1 Telekom Austria	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	Single-rate	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
CH	Swisscom	LRR	0.5235
	Swisscom	2nd LRR	0.6307
CY	Cyta	Single-rate	0.0440
	Primetel	Single-rate	0.0440
	Cablenet	Single-rate	0.0440
	EPIC	Single-rate	0.0440
CZ	CETIN a.s.	Single-rate	0.1290
	UPC Česká republika, s.r.o.	Single-rate	0.1290
	Vodafone Czech Republic a.s.	Single-rate	0.1290
	T-Mobile Czech Republic a.s.	Single-rate	0.1290
	IPEX a.s.	Single-rate	0.1290
	Nej.cz.s.r.o.	Single-rate	0.1290
DE	Telekom Deutschland GmbH	Single-rate	0.0600
DK	TDC	Single-rate	0.0574
	Telia	Single-rate	0.0574
	Telenor	Single-rate	0.0574
EE	Telia Eesti AS	Single-rate	0.0850
	STV	Single-rate	0.0850
	Elisa	Single-rate	0.0850

<sup>13</sup> For a Decimal separator in the tables is used **comma** to separate whole numbers from decimals and a **point** is used to indicate thousands in whole numbers. More information: <http://publications.europa.eu/code/en/en-360500.htm>



Country /Participant	Operator	Lowest Regulated Rate	WA in cents
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	0.0593
	Vodafone - Ono	Single-rate	0.0593
	Orange	Single-rate	0.0593
	Grupo MASMOVIL	Single-rate	0.0593
	Euskaltel	Single-rate	0.0593
	Rest of operators	Single-rate	0.0593
FI	DNA Oyj	Single-rate	2.8000
	Elisa Oyj	Single-rate	2.8000
	Telia Finland Oyj	Single-rate	2.8000
	Rest of operators	Single-rate	3.2000
	Weighted average of all operators	Average	2.8827
FR	All operators	Single-rate	0.0770
HR	HT	Single-rate	0.0950
	OPTIMA	Single-rate	0.1001
	A1	Single-rate	0.0983
HU	Magyar Telekom	Single-rate	0.0783
	Digi	Single-rate	0.0783
	Vodafone	Single-rate	0.0783
	Rest of operators	Single-rate	0.0783
IE	Eir	Single-rate	0.0570
	Virgin Media	Single-rate	0.0570
	Vodafone	Single-rate	0.0570
	Rest of operators	Single-rate	0.0570
IS*	Siminn	Single-rate	0.0874
	Vodafone	Single-rate	0.0874
IT	Telecom Italia	Single-rate	0.0410
	Vodafone	Single-rate	0.0410
	Wind Tre	Single-rate	0.0410
	Fastweb	Single-rate	0.0410
	Linkem	Single-rate	0.0410
	Tiscali	Single-rate	0.0410
	Rest of operators	Single-rate	0.0410
LT	Telia Lietuva, AB	Single-rate	0.0900
	UAB „CSC Telecom“	Single-rate	0.0900
	AB Lietuvos geležinkeliai	Single-rate	0.0900
	Rest of operators	Single-rate	0.0900
LI	Telecom Liechtenstein AG	Single-rate	2.6455

Country /Participant	Operator	Lowest Regulated Rate	WA in cents
	Backbone Solutions AG	Single-rate	2.6455
LU	POST Telecom	Single-rate	0.1380
	Proximus S.A.	Single-rate	0.1380
	Luxembourg Online S.A.	Single-rate	0.1380
	Rest of operators	Single-rate	0.1380
LV	Tet (ex. Lattelecom)	Single-rate	0.0956
	Latvijas Mobilais Telefons	Single-rate	0.0956
	CSC Telecom	Single-rate	0.0956
	D-COM	Single-rate	0.0956
	Rest of operators	Single-rate	0.0956
ME	Crnogorski Telekom	Single-rate	0.5800
	Mtel	Single-rate	0.5800
	Telenor	Single-rate	0.5800
	Telemach	Single-rate	0.5800
MT	Go plc	Single-rate	0.0443
	Melita Ltd	Single-rate	0.0443
	Vodafone Malta Ltd	Single-rate	0.0443
	Ozone	Single-rate	0.0443
	Vanilla Telecoms Ltd	Single-rate	0.0443
MK*	Makedonski Telekom	Single-rate	0.5858
	One.VIP	Single-rate	0.5858
	Robi	Single-rate	0.5858
	Neotel	Single-rate	0.5858
NL	KPN	Single-rate	0.1400
	Ziggo	Single-rate	0.1400
	T-Mobile/Tele2	Single-rate	0.1400
NO	Telenor	Single-rate	0.0495
	Telia	Single-rate	0.0495
	Altibox	Single-rate	0.0495
	Nextgentel	Single-rate	0.0495
	Rest of operators	Single-rate	0.0495
PL	Orange Polska S.A.	Single-rate	0.4782
	Orange Polska S.A.	2nd LRR	0.5680
	Orange Polska S.A.	3rd LRR	0.8362
	UPC Polska Sp. z o.o.	2nd LRR	0.4782
	Netia S.A.	Single-rate	0.4782
	Multimedia Polska S.A.	2nd LRR	0.5073
PT	MEO	Single-rate	0.0470
	NOS Group	Single-rate	0.0470
	Vodafone	Single-rate	0.0470
	ONI/NOWO	Single-rate	0.0470
	Rest of operators	Single-rate	0.0470
RO	Telekom RC S.A.	Single-rate	0.1400

Country /Participant	Operator	Lowest Regulated Rate	WA in cents
	S.C. RCS&RDS S.A.	Single-rate	0.1400
	S.C. UPC Romania S.R.L.	Single-rate	0.1400
	S.C. VODAFONE ROMANIA S.A.	Single-rate	0.1400
RS	Telekom Srbija	LRR	0.4850
	Telekom Srbija	2nd LRR	0.5701
	Telekom Srbija	3rd LRR	0.6381
	Orion	Single-rate	0.5275
	Telenor	Single-rate	0.5275
	SBB	Single-rate	0.5275
	Rest of operators	Single-rate	0.5275
SE	Telia Company AB	LRR	0.0272
	Telia Company AB	2nd LRR	0.0573
	Com Hem AB	LRR	0.0272
	Tele2 Sverige AB	LRR	0.0272
	Telenor Sverige AB	LRR	0.0272
	Telavox AB	LRR	0.0272
	Rest of operators	LRR	0.0272
SI	Telekom Slovenije	Single-rate	0.0876
	Telemach	Single-rate	0.0876
	T-2	Single-rate	0.0876
	A1 Slovenija	Single-rate	0.0876
	Rest of operators	Single-rate	0.0876
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	0.2167
	Türk Telekom	2nd LRR	0.2666
	Türk Telekom	3rd LRR	0.3493
	TTNet	Single-rate	0.4989
	Türksat	Single-rate	0.4989
	Superonline	Single-rate	0.4989
	Rest of operators	Single-rate	0.4989
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
UK	BT	Single-rate	0.0357
	TalkTalk	Single-rate	0.0357
	Sky	Single-rate	0.0357
	Virgin Media	Single-rate	0.0357
	Vodafone	Single-rate	0.0357

**Notes to table 2:****Incumbents are indicated first in the table.**

**AL:** Market analysis and SMP decisions for fixed call termination for the incumbent and 67 other fixed network operators on 1.10.2018 imposed the regulation of FTRs through benchmarking methodology and a glide path (1.12.2018 AKEP's decision): symmetrical FTRs starting from 1.01.2016 and only one single layer FTR to be applied from the incumbent and the other FNOs; the FTR (one single rate) to be applied from 01/01/2018 was calculated by AKEP as the simple average of FTRs in BEREC countries with one layer interconnection as of 01/07/2017.

**BE:** The second lowest regulated rate is identical to the 1st LRR in Belgium.

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

from 01.11.2016 - 0,0015 BGN/minute

from 01.01.2017 - 0,0015 BGN/minute

from 01.01.2018 - 0,0015 BGN/minute

from 01.01.2019 - 0,0014 BGN/minute

from 01.01.2020 - 0,0014 BGN/minute.

**CH:** The prices indicated are taken from the Swisscom price manual for TDM-Interconnection. For IP-Interconnection the same prices as the ones for regional TDM-interconnection (LRR) apply. Furthermore, there exists a "clause of reciprocity", meaning that the tariffs of other operators have to be same as the ones of Swisscom.

**CY:** OCECPR has revised the FTR in May 2020. The new FTR rate based on the BU-LRIC Model latest results was applied retroactively from 01.01.2020. No peak and off-peak separation of rates.

**DE:** BNetzA notified in May 2019 the following glide path for fixed termination rates of incumbent Telekom Deutschland and 67 alternative network operators: 0.08 €cents/min in 2019; 0.06 €cents/min in 2020; 0.05 €cents/min in 2021; 0.03 €cents/min in 2022. The tariffs for 2021 and 2022 only apply as long as the tariffs are not yet in force according to the European Electronic Communications Code (EECC) Article 75.

**IE:** ComReg Decision D11/19 (document 19/48) set fixed terminations rates for all SMP FSP with effect from August 2019. Prior to this Decision, the maximum regulated FTR was 0.072 euro cent per minute. In order to reduce the possibility of FTRs being lowered pursuant to ComReg's Decision and then raised by operators when the Eurorate FTRs come into effect, and also in order to set maximum FTRs in a manner consistent with the approach to setting maximum MTRs, ComReg decided to implement FTRs using a glide path. Based on the glide path, the FTR rate fell to 0.063 euro cent per minute in August 2019 and then to 0.057 euro cent per minute in January 2020 and is expected to fall to 0.051 euro cent per minute in January 2021. These rates are expected to remain in place until replaced by the Euro Rates.

**IT:** Last market analysis review was concluded in 2016 and defined termination rates until 2019. The new market analysis review is ongoing and in the meantime operators are still applying termination rates of 2019. Therefore, AGCOM has not yet calculated rates for 2020.

**LI:** The operator Backbone Solutions AG has just entered the market in 2019.

**TR:** In Turkey, there is no differentiation in fixed termination rates such as peak and off-peak.

## Annex 2 FTR regulatory cost accounting model implemented

Table 3

Country /Participant	Cost Accounting Model
AL	Benchmark (Other)
AT	Pure BU LRIC
BE	Pure BU LRIC
BG	Pure BU LRIC
CH	BU LRAIC +
CY	Pure BU LRIC
CZ	Pure BU LRIC
DE	Pure BU LRIC
DK	Pure BU LRIC
EE	Benchmark (Pure BU LRIC)
EL	Pure BU LRIC
ES	Pure BU LRIC
FI	FDC/FAC
FR	Pure BU LRIC
HR	Pure BU LRIC
HU	Pure BU LRIC
IE	Pure BU LRIC
IS	Benchmark (Pure BU LRIC)
IT	Pure BU LRIC
LI	FDC/FAC
LT	Benchmarking (Pure BU LRIC)
LU	Pure BU LRIC
LV	Benchmark (Pure BU LRIC)
ME	Other (TD LRIC)
MT	Pure BU LRIC
NMK	Pure BU LRIC
NL	Pure BU LRIC
NO	Pure BU LRIC
PL	TD-FDC/FAC
PT	Pure BU LRIC
RO	Pure BU LRIC
RS	Other (TDC-FAC/FDC-CCA)
SE	Pure BU LRIC
SI	Pure BU LRIC
SK	Pure BU LRIC
TR	Confidential
XK*	Benchmarking (Other)

Country /Participant	Cost Accounting Model
UK	Pure BU LRIC

### Notes to table 3:

**CH:** Source of the Swisscom-Tariffs:

[https://www.swisscom.ch/dam/swisscom/de/ws/documents/D\\_IC-Dokumente/de\\_handbuch-preiseicv1-21.pdf](https://www.swisscom.ch/dam/swisscom/de/ws/documents/D_IC-Dokumente/de_handbuch-preiseicv1-21.pdf), p.11.

**DE:** The calculation of rates is based on a pure LRIC cost model. The tariffs for 2021 and 2022 only apply as long as the tariffs are not yet in force according to the European Electronic Communications Code (EECC) Artikel 75.

**EL:** 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). During Q4 2019 EETT launched a national consultation regarding a new market analysis for fixed termination services.

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

**IE:** The termination rates are based on a Pure BU-LRIC model however a glide path was chosen to implement them to minimise the possibility of the termination rates being lower than the Eurorates when they come into force.

**LI:** FTR regulation is not finalized Current FTR cap was decided in 2007. Market analysis and remedies M3 decided in 2010. New FTR decision expected in 2020/2021, based on benchmarking. (EFTA Surveillance Authority Recommendation of 13<sup>th</sup> April 2011 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EFTA States).

**LT:** 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".

**LU:** Règlement 16/209/ILR du 28 novembre 2016 portant sur la fixation des plafonds tarifaires pour les prestations de la terminaison d'appel sur divers réseaux téléphoniques publics individuels en position déterminée (Marché 1/2014)

**ME:** 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.

**SE:** A new Pure BU LRIC model was adopted by PTS in September 2018; prices applicable from 01.10.2018.

**SI:** On 20.12.2019 new decision was issued for market 1 with new value of FTR which will be in use from 1.2.2020 on and its value is 0,000717 EUR/min.

**SK:** Ru has not used any glide path.

**UK:** Rates have been set on a BU LRIC basis since 01.01.2014.

### 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 /Participant	Symmetry	Comments
AL	Yes	
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	Yes, the same regulated terminations rates apply for all providers.
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 18.12.2013.
EE	Yes	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 cents), smaller operators have a little bit higher FTRs (3,2 cents).
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. Following a consultation process, ComReg identified 22 Fixed Service Providers as having SMP (see ComReg Decision document 19/47 D10/19, Section 6.2.15). A price control obligation of cost orientation was imposed on such. Some operators have not, up to now been designated with SMP and so their FTR rate has not been regulated. ComReg has recently issued a consultation (i.e. ComReg document 20/19) regarding this issue (amongst others).
IS	Yes	
IT	Yes	
LI	Yes	Rates between fixed net operators are symmetrical.
LT	Yes	FTRs of all fixed operators having SMP, are symmetrical, i.e. FTRs are the same despite number of customers, difference in network topologies, level of interconnection, etc.

Country /Participant	Symmetry	Comments
LU	Partially	A maximal price cap is defined by the regulation, but operators may implement the solution in their own way.
LV	Yes	
ME	Yes	
NMK	Yes	Based on incumbent operators' rates.
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 FTRs irrespective of interconnection level.
RS	Partially	Operators have different topology and different number of the levels of interconnection. Telekom Srbija have 3 levels of interconnection. Other operators have 1 level of interconnection. As of 1st February 2020 the FTRs for all 3 levels are equal to single rate of other operators.
SE	Yes	
SI	Yes	Based on national coverage of layer.
SK	Yes	The FTR is non-discriminatory for all operators without any exception.
XK*	Yes	All operators have flat hierarchy of the network and all of them are interconnected at central level.
TR	No	
UK	Yes	



## Annex 4 Number of active fixed telephony lines and Market shares

Table 5

Country /Participant	Operator	Number of lines	Total number of lines	Market share
AL	Albtelecom	176,653	242,791	72.76%
	Abcom	11,409		4.70%
	Albanian Satellite Communications	35,558		14.65%
	Rest of operators	19,171		7.90%
AT	A1 Telekom Austria	1,826,807	3,111,530	58.71%
	Operator 2	561,631		18.05%
	Operator 3	406,296		13.06%
	Operator 4	67,133		2.16%
	Operator 5	61,027		1.96%
	Operator 6	32,310		1.04%
	Rest of operators	156,326		5.02%
BE	Proximus	2,297,141	3,930,410	58.45%
	Rest of operators	1,633,269		41.55%
BG	Bulgarian Telecommunication Company	Confidential	1,054,894	Confidential
	A1 Bulgaria	Confidential		Confidential
	Telenor Bulgaria	Confidential		Confidential
	Rest of operators	65.825		6.24%
CH	Swisscom	N/A		N/A
CY	Cyta	203,319	320,756	63.39%
	Primetel	46,545		14.51%
	Cablenet	46,225		14.41%
	EPIC	24,667		7.69%
CZ	CETIN a.s.	Confidential	Confidential	37.03%
	UPC Česká republika, s.r.o.	Confidential		13.58%
	Vodafone Czech Republic a.s.	Confidential		5.08%
	T-Mobile Czech Republic a.s.	Confidential		6.99%
	IPEX a.s.	Confidential		3.91%
	Nej.cz s.r.o.	Confidential		2.74%
	Rest of operators	Confidential		30.66%
DE	Telekom Deutschland GmbH	17,760,000	38,220,000	46.47%
	Rest of operators	20,460,000		53.53%
DK	TDC	363,578	472,463	77.0%
	Telia	58,463		12.4%
	Telenor	31,217		6.6%
	Rest of operators	19,205		4.1%

Country /Participant	Operator	Number of lines	Total number of lines	Market share
EE	Telia	273,207	317,975	85.9%
	Elisa	10,566		3.3%
	Elisa Teleteenused	23,220		7.3%
	STV	10,982		3.5%
EL	OTE	2,658,870	4,706,366	56.5%
	FORTHNET	Confidential		Confidential
	VODAFONE	Confidential		Confidential
	WIND	Confidential		Confidential
ES	Telefónica de España	8,787,959	19,511,193	45.04%
	Vodafone - ONO	4,383,606		22.47%
	Orange	3,985,854		20.43%
	Grupo MASMOVIL	1289333		6.61%
	Euskaltel	773,628		3.97%
	Rest of operators	290,813		1.49%
FI	DNA Oyj	Confidential	266,000	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	1,335,562	Confidential
	OPTIMA	Confidential		Confidential
	A1	Confidential		Confidential
	Rest of operators	Confidential		Confidential
HU	Magyar Telekom	1,470,149	3,049,000	48.22%
	DIGI	677,942		22.23%
	Vodafone	650,658		21.34%
	Rest of operators	250,251		8.21%
IE	Eir	543,406	1,401,321	43.55%
	Virgin Media	335,459		26.66%
	Vodafone	194,291		14.98%
	Sky	195,316		14.80%
	Rest of operators	132,849		9.48%
IS	Siminn	80,073	128,056	62.53%
	Vodafone	47,983		37.47%
IT	Telecom Italia	9,305,681	19,621,082	47.43%
	Vodafone	2,678,750		13.65%
	Wind Tre	2,721,569		13.87%
	Fastweb	2,950,395		15.04%
	Linkem	626,562		3.19%
	Tiscali Italia	354,541		1.81%

Country /Participant	Operator	Number of lines	Total number of lines	Market share
	Rest of operators	983,584		5.01%
LI	Telecom Liechtenstein AG	Confidential	20,700	Confidential
	Backbone Solutions AG	Confidential		Confidential
LT	Telia Lietuva, AB	295,494	367,375	80.43%
	UAB „CSC Telecom“	20,470		5.57%
	AB Lietuvos gelezinkeliai	3,482		0.95%
	Other	47,929		13.05%
LU	POST Telecom	178,600	270,800	65.95%
	Proximus S.A.	40,800		15.07%
	Luxembourg Online S.A.	17,300		6.39%
	Rest of operators	34,100		12.59%
LV	Tet (ex. Lattelecom)	112,128	233,062	48.11%
	Latvijas Mobilais Telefons	41,171		17.67%
	CSC TELECOM	20,771		8.91%
	D-COM	12,482		5.36%
	Rest of operators	46,510		19.96%
ME	Crnogorski Telekom	108,636	188,175	56.02%
	Mtel	61,983		33.66%
	Telenor	1,830		6.34%
	Telemach	15,726		3.97%
MK	Makedonski Telekom	210,333	375,441	56.02%
	One.VIP	126,387		33.66%
	Robi	23,805		6.34%
	Rest of operators	14,916		3.97%
MT	Go plc	153,168	287,164	53.34%
	Melita Ltd	107,024		37.27%
	Vodafone Malta Ltd	21,514		7.49%
	Ozone	538		0.19%
	Vanilla Telecoms Ltd	4,920		1.71%
NL	KPN	2,862,140	5,982,500	47.84%
	Vodafone/Ziggo	2,490,240		41.63%
	T-Mobile/Tele2	630,120		10.53%
NO	Telenor	315,426	502,706	62.75%
	NextGenTel	71,293		14.18%
	Get	32,385		6.44%
	Telia	17,826		3.55%
	Rest of operators	65,776		13.08%
PL	Orange Polska S.A	Confidential	4,098,701	Confidential
	Netia S.A.	Confidential		Confidential

Country /Participant	Operator	Number of lines	Total number of lines	Market share
	Multimedia Polska S.A.	Confidential		Confidential
	Multimedia Polska Poludnie S.A.	Confidential		Confidential
	Rest of operators	Confidential		Confidential
PT	MEO	Confidential	5,128,698	44.66%
	NOS Group	Confidential		33.81%
	Vodafone	Confidential		17.47%
	ONI/NOWO	Confidential		3.48%
	Rest of operators	Confidential		0.58%
RO	Telekom RC S.A.	1,238,707	3,375,644	36.70%
	S.C. RCS&RDS S.A.	1,116,987		33.09%
	S.C. UPC Romania S.R.L.	632,563		18.74%
	S.C. VODAFONE ROMANIA S.A.	173,492		5.14%
	Rest of operators	213,895		6.34%
RS	Telekom Srbija	Confidential	2,565,091	Confidential
	Serbia Broadband	Confidential		Confidential
	Rest of operators	Confidential		Confidential
SE	Telia Company AB	1,146,579	1,924,972	59.56%
	Tele2 Sverige AB	242,821		12.61%
	Telenor Sverige AB	124,690		6.48%
	Telavox AB	96,442		5.01%
	Rest of operators	314,440		16.33%
SI	Telekom Slovenije	Confidential	Confidential	51.31%
	Telemach	Confidential		19.64%
	T-2	Confidential		14.97%
	A1 Slovenija	Confidential		9.39%
	Rest of operators	Confidential		4.69%
SK	Slovak Telekom, a. s.	Confidential	764,446	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	5,539,241	11,532,903	48.03%
	TTNet	4,354,498		37.76%
	Türksat	277,866		2.41%
	Superonline	237,386		2.06%
	Rest of operators	1,123,912		9.75%
XK*	Telekom of Kosovo* SH.A.	28,050	55,825	59.08%
	IPKO TELECOMMUNICATIONS L.L.C.	10,912		39.39%
	KUJTESA.NET SH.P.K.	1,349		0.00%

Country /Participant	Operator	Number of lines	Total number of lines	Market share
	mts d.o.o.	15,514		1.53%
UK	BT	Confidential	26,515,976	Confidential
	TalkTalk	Confidential		Confidential
	Sky	Confidential		Confidential
	Virgin Media	Confidential		Confidential
	Vodafone	Confidential		Confidential

#### Notes to table 5:

**AT:** Number of lines as of end Q3/19..

**BE:** Number of access channels to the fixed telephone network at the 1st of January 2020.

**BG:** Data on number of lines (network termination points) per operators as of 31.12.2019 should be treated as confidential.

**CY:** Number of lines as of 01.01.2020.

**DE:** Number of lines as of the end of 2019.

**FI:** Market shares as of 1.7.2019. Volumes are confidential. NRA has not set price caps for FTRs.

**HR:** Data refers to Q3 2019.

**IE:** Data refers to Q4, 2019. The market shares refer to market shares at a retail level.

**IT:** note that the number of lines refer to September 2019.

**LT:** Data about number of lines as of 2019 Q4.

**LI:** The operator Backbone Solutions AG just entered the market in 2019.

**MT:** Data reflects the position as at Q4 2019. Data includes the number of channels.

**NO:** Number of subscribers are provided as of 30.06.2019., instead of number of lines per 1.1.2020. The number of subscribers per 1.1.2020 will not be available before Q2 2020.

**RS:** Number of lines as of 31.12.2019. Number of lines are collected by using ITU indicator i112 Fixed-telephone subscriptions which refers to the sum of active number of analogue fixed-telephone line, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents 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 number of lines per operator is confidential.

**SE:** PTS has no information of the number of lines. Instead the number of subscriptions has been used. The market shares represent the wholesale level, i.e. including WLR (WLR is considered as belonging to the incumbent).

**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.

**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 2020

Table 6

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers[1]	Real Mkt Shares
AL	Telekom Albania	0.9024	853,339	2,476,814	34.45%
	Vodafone Albania	0.9024	1,229,177		49.63%
	Albtelecom	0.9024	394,298		15.92%
AT	A1Telekom Austria	0.8049	Confidential	10,804,165	Confidential
	T-Mobile Austria	0.8049	Confidential		Confidential
	Hutchison Drei Austria	0.8049	Confidential		Confidential
BE	Proximus	0.9900	Confidential	11,509,573	Confidential
	Orange	0.9900	Confidential		Confidential
	Telenet	0.9900	Confidential		Confidential
	Vectone	0.9900	Confidential		Confidential
	DPG Media	0.9900	Confidential		Confidential
	Lycamobile	0.9900	Confidential		Confidential
BG	A1 Bulgaria	0.7158	Confidential	Confidential	38.48%
	Telenor Bulgaria	0.7158	Confidential		33.41%
	BTC	0.7158	Confidential		28.11%
CH	Swisscom	2.5543	4,960,000	8,738,303	56.76%
	Sunrise	3.1016	2,085,000		23.86%
	Salt	3.1016	1,693,303		19.38%
CY	CYTA	0.1700	663,376	1,243,151	53.36%
	EPIC	0.1700	438,024		35.23%
	PRIMETEL	0.1700	126,374		10.17%
	CABLENET	0.1700	15,377		1.24%
CZ	T-Mobile Czech Republic a.s.	0.9696	Confidential	Confidential	36.85%
	O2 Czech Republic a.s.	0.9696	Confidential		28.46%
	Vodafone Czech Republic a.s.	0.9696	Confidential		26.56%
	Nordic Telecom s.r.o.	0.9696	Confidential		0.11%
DE	Telekom Deutschland GmbH	0.9000	N/A	107,200,000	N/A
	Vodafone GmbH	0.9000			

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers[1]	Real Mkt Shares
	Telefónica Germany GmbH & Co. OHG	0.9000			
DK	TDC	0.5153	2,873,544	7,241,638	39.65%
	Telenor	0.5153	1,433,365		19.78%
	Telia	0.5153	1,089,692		15.04%
	3 (Hi3G)	0.5153	1,091,458		15.06%
	Rest of the operators	0.5153	759,579		10.48%
EE	Telia Eesti AS	0.7800	832,423	1,945,690	42.78%
	Tele2 Eesti AS	0.7800	472,716		24.30%
	Elisa Eesti AS	0.7800	640,551		32.92%
EL	Cosmote	0.9460	Confidential	11,168,585	Confidential
	Vodafone	0.9460	Confidential		Confidential
	WIND	0.9460	Confidential		Confidential
	CYTA Hellas	0.9460	Confidential		Confidential
ES	TME	0.6400	16,261,859	54,961,112	29.59%
	Orange	0.6400	13,855,699		25.21%
	Vodafone	0.6400	12,433,716		22.62%
	Masmovil	0.6400	7,154,067		13.02%
FI	DNA Oyj	0.8900	Confidential	7,140,000	Confidential
	Elisa Oyj	0.8900	Confidential		Confidential
	Telia Finland Oyj	0.8900	Confidential		Confidential
	Ålcom	0.8900	Confidential		Confidential
FR	Orange	0.7400	Confidential	76,800,000	Confidential
	SFR	0.7400			Confidential
	Bouygues Telecom	0.7400			Confidential
	Free Mobile	0.7400			Confidential
	MVNOs	0.7400			Confidential
HR	HT	0.6049	2,104,093	4,604,635	45.70%
	A1	0.6049	1,584,709		34.42%
	Tele2	0.6049	915,833		19.89%
HU	Magyar Telekom	0.5152	Confidential	10,247,842	Confidential
	Telenor	0.5152	Confidential		Confidential
	Vodafone	0.5152	Confidential		Confidential
	UPC	0.5152	Confidential		Confidential
	Netfone	0.5152	Confidential		Confidential
	Tarr	0.5152	Confidential		Confidential

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers[1]	Real Mkt Shares
IE	Vodafone	0.5500	1,797,311	5,145,256	34.93%
	Three Ireland Group	0.5500	1,640,174		31.88%
	Eircom Group Mobile	0.5500	1,087,874		21.14%
	Tesco Mobile	0.5500	415,842		8.08%
IS	Siminn	0.6993	138,241	422,992	32.68%
	Vodafone	0.6993	128,011		30.26%
	Nova	0.6993	147,248		34.81%
	Hringdu	0.6993	9,492		2.24%
IT	Telecom Italia	0.7600	22,092,151	80,580,548	27.42%
	Vodafone	0.7600	20,191,922		25.06%
	WindTre	0.7600	24,738,495		30.70%
	Iliad Italia S.p.A.	0.7600	4,541,000		5.64%
	PosteMobile	0.7600	4,737,096		5.88%
LI	Telecom Liechtenstein AG	2.6455	Confidential	16,266	Confidential
	Swisscom (Schweiz) AG	2.6455	Confidential		Confidential
	Salt (Liechtenstein) AG	2.6455	Confidential		Confidential
LT	Tele2	0.9400	1,957,750	4,658,823	42.02%
	Telia Lietuva, AB	0.9400	1,346,645		28.91%
	Bite Lietuva	0.9400	1,191,203		25.57%
	Rest of the operators	0.9400	163,225		3.50%
LU	POST Telecom	0.8900	371,700	814,100	42.02%
	Proximus Luxembourg	0.8900	275,500		28.91%
	Orange	0.8900	121,100		25.57%
LV	Bite Latvija	0.8868	473,397	2,070,424	22.86%
	Latvijas Mobilais Telefons	0.8868	721,034		34.83%
	Tele2	0.8868	875,993		42.31%
ME	Telenor	0.7600	378,023	1,150,998	32.84%
	Crnogorski Telekom	0.7600	374,918		32.57%
	Mtel	0.7600	398,057		34.58%
MK	Luca Mobile	2.4392	43,984	2,055,339	2.14%
	A1	1.0244	996,428		48.48%
	Makedonski Telekom	1.0244	1,003,211		48.81%



Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers[1]	Real Mkt Shares
	Telekabel/Robi	1.0244	11,715		0.57%
MT	Go plc	0.4045	234,909	634,386	37.03%
	Melita Ltd	0.4045	150,208		23.68%
	Vodafone	0.4045	249,240		39.29%
	Yom	0.4045	29		0.00%
NL	KPN	0.5810	6,600,716	21,841,364	30.22%
	Vodafone Ziggo	0.5810	4,966,792		22.74%
	T-Mobile	0.5810	4,012,729		18.37%
	Tele2	0.5810	1,379,000		6.31%
NO	Telenor	0.3171	2,755,449	5,737,455	48.03%
	Telia	0.3171	2,125,178		37.04%
	ICE	0.3171	536,061		9.34%
PL	Orange Polska S.A.	1.0007	Confidential	46,853,711	Confidential
	Polkomtel sp. z o.o.	1.0007	Confidential		Confidential
	P4 sp. z o.o.	1.0007	Confidential		Confidential
	T-Mobile Polska S.A.	1.0007	Confidential		Confidential
PT	MEO	0.4000	Confidential	11,909,751	Confidential
	NOS	0.4000	Confidential		Confidential
	Vodafone	0.4000	Confidential		Confidential
RO	Vodafone Romania S.A.	0.7600	6,901,462	22,673,892	30.44%
	Orange Romania S.A.	0.7600	8,801,928		38.82%
	Telekom RMC S.A.	0.7600	2,938,278		12.96%
	RCS & RDS S.A.	0.7600	3,184,686		14.05%
	LycaMobile	0.7600	17,225		0.08%
	Rest of the operators	0.7600	830,313		3.66%
RS	Telekom Srbija - MTS	1.2167	Confidential	8,453,887	44.3%
	Telenor	1.2167	Confidential		31.4%
	Vip mobile	1.2167	Confidential		24%
SE	Telia Company	0.2657	4,993,394	14,302,677	34.91%
	Tele2	0.2657	4,036,741		28.22%
	Telenor	0.2657	2,741,270		19.17%
	Hi3G	0.2657	1,975,716		13.81%
	Lycamobile	0.2657	182,637		1.28%
	Telavox AB	0.2657	77,507		0.54%

Country /Participant	Operator (B)	Average effective prices (eurocents)	Mobile Subscribers	Total mobile subscribers[1]	Real Mkt Shares
	Rest of the operators	0.2657	295,412		2.07%
SI	Telekom Slovenije	1.1400	Confidential	Confidential	40.52%
	A1 Slovenija	1.1400	Confidential		30.94%
	Telemach	1.1400	Confidential		22.49%
	T-2	1.1400	Confidential		6.05%
SK	Orange Slovensko, a s.	0.8180	Confidential	6,163,433	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	0.3898	30,510,768	75,479,251	40.42%
	Vodafone	0.4023	23,422,645		31.03%
	Avea	0.4615	21,545,838		28.55%
XK*	Telecom of Kosovo*	1.1460	1,225,697	2,074,556	59.08%
	Ipko Telecommunications	1.1460	817,145		39.39%
	Dukagjini telecommunications	1.1460	77		0.00%
	mts d.o.o.	1.1460	31,637		1.53%
UK	EE	0.5565	Confidential	79,148,841	Confidential
	Telefonica	0.5565	Confidential		Confidential
	Vodafone	0.5565	Confidential		Confidential
	H3G	0.5565	Confidential		Confidential

**Notes to table 6:**

**AL:** The subscribers data refers to yearly reported for 2019, M2M SIM cards are excluded from 'Subscribers'

**AT:** Individual operator subscriber data strictly confidential, not to be published in the report.

**BE:** Subscriber data as of the 1st of January 2020.

**BG:** Data as of 31.12.2019. Individual data on number of subscribers/M2M SIM Cards by operators is confidential. M2M, M2P and data-only SIMs cards are not included in the figure of total mobile subscribers.

**CH:** Subscriber base as of 31.12.2019.

**CY:** OCECPR has revised the MTR in May 2020. The new MTR rate based on the BU-LRIC Model latest results was applied retroactively from 01.01.2020.

**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 2019 is available as the latest information.

**DE:** Current MTR is valid until 30.11.2019. The total number of active subscribers is not available by individual operator. The data are as of the end of 2019.

**DK:** Total subscribers is derived as of ultimo H1 2019. 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 1/1/2021, DBA has decided to reuse the 2019 rate for 2020.

**EL:** As far as the subscriptions are concerned, please note that: a) data refers to 31/12/2019, and b) data per operator is considered confidential. The price on 1/1/2020 was 0.946 eurocents/min for all operators. However, EETT very recently issued a new decision that sets the MTR at 0.622 eurocents per minute. Operators are obliged to apply this price from February 2020. Please note that in the table of Annex 6 the next sheet the new value is inserted and not the one of 1/1/2020 because the new rate will be applied for a longer period within the first semester of 2020.

**FI:** Subscriber and M2M figures per operator are confidential. Subscriber figures per 1.7.2019.

Subscriber figures depict the number of subscriptions not SIM cards. Subscription figures include all subscriptions other than data-only subscriptions and M2M. SIM card volumes are very close to the subscription number in Finland. Traficom does not collect detailed information of 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:** Data refers to Q3 2019. Please note that MRs 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.

**LT:** Data as of 2019 Q4.

**LU:** Règlement ILR/T17/4 du 9 juin 2017 portant fixation du plafond tarifaire pour les prestations de la terminaison d'appel vocal sur les réseaux mobiles individuels (Marché 7/2007) , Price cap based on Pure-LRIC. Individual data of operators is confidential.

**MT:** Data reflects as at Q4 2019.

**NO:** Number of subscribers are provided as of 30 June 2019. The total number of subscribers per 1. January 2020 will be available in Q2 2020.

**PT:** Information on the number of subscribers of each operator is confidential. 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 will be further updated on the basis of existing and foreseen inflation data.

**RS:** Information on individual's number of subscribers by operator is confidential. Number of subscribers are as of 31/12/2019 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.)

**SI:** Information on the 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:** Information on the number of subscribers per operator is confidential.

## Annex 6 Regulatory model implemented to calculate MTRs

Table 7

Jan-20	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 01/01/2020 until 30/06/2020	Period 2 - From 01/07/2020 until 31/12/2020	Period 3 - From 01/01/2021 until 30/06/2021	Period 4 - From 01/07/2021 until 31/12/2021	Period 5 - From 01/01/2022 until 30/06/2022
AL	Benchmark BU-LRIC	adopted	1.1.2020	0.9024	0.9024	0.9024	0.9024	0.9024
AT	Pure BU-LRIC	adopted		0.8049	0.8049			
BE	Pure BU-LRIC	adopted	1.1.2013	0.9900	0.9900			
BG	Pure BU-LRIC	adopted	1.12.2016	0.7158				
CH		not regulated	Not applicable					
CY	Pure BU-LRIC	adopted		0.1700				
CZ	Pure BU-LRIC	adopted	1.7.2013	0.9696				
DE	Pure BU-LRIC	adopted	1.12.2017	0.9000	until 30.11.2020 0.90 €cent until 31.12.2020 0.78 €cent	0.7800	until 30.11.2021 0.78 €cent until 31.12.2021 0.70 €cent	0.7000
DK	Pure BU-LRIC	adopted		0.5153	0.5153	Unknown	Unknown	Unknown
EE	Benchmark BU-LRIC	adopted	25.5.2019	0.7800				
EL	Pure BU-LRIC	adopted	1.1.2013	0.6220	0.6220	0.6220	0.6220	0.6220
ES	Pure BU-LRIC	adopted	5.10.2012	0.6400	0.6400	0.6400	0.6400	0.6400
FI	other (FDC/FAC)	adopted		0.8900	0.8900	0.8200		
FR	Pure BU-LRIC	adopted	1.1.2013	0.7400				
HR	Pure BU-LRIC	adopted		0.6049	0.6049			
HU	Pure BU-LRIC	adopted	1.4.2015	0.5152				

Jan-20	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 01/01/2020 until 30/06/2020	Period 2 - From 01/07/2020 until 31/12/2020	Period 3 - From 01/01/2021 until 30/06/2021	Period 4 - From 01/07/2021 until 31/12/2021	Period 5 - From 01/01/2022 until 30/06/2022
IE	Pure BU-LRIC	adopted	1.8.2019	0.5500	0.5500	0.4300	0.4300	0.3100
IS	Benchmark BU-LRIC	notified						
IT	Pure BU-LRIC	adopted	1.7.2013	0.7600	0.7600	0.6700	0.6700	
LI	Benchmarking (other)	adopted		2.6455				
LT	Benchmark (BU-LRIC)	adopted	1.4.2016	0.9400				
LU	Pure BU-LRIC	adopted	9.6.2017					
LV	Benchmark BU-LRIC	adopted	26.4.2017	0.8868	0.8868	0.8868		
ME	Other (TD - LRIC)	adopted		0.7600				
MK	Pure BU LRIC	adopted						
MT	Pure BU-LRIC	adopted		0.4045	0.4045			
NL	Pure BU-LRIC	adopted	1.7.2017	0.5810	0.5810	0.5810	0.5810	0.5810
NO	Pure BU-LRIC	adopted	1.7.2015	0.3171	0.3171			
PL	Pure BU-LRIC	adopted	1.7.2013	1.0007	1.0007	1.0007	1.0007	1.0007
PT	Pure BU-LRIC	adopted	31.12.2012	0.4000	0.3600	0.3600		
RO	Benchmark BU-LRIC	adopted	1.4.2014	0.7600				
RS	Benchmarking (other)	adopted		1.2167				
SE	Pure BU-LRIC	adopted	1.7.2013	0.2657	0.2028			
SI	Pure BU-LRIC	adopted	1.9.2014 for 1.14 / predictably 1st quarter of the year 2020 for 0.8820	1.1400	0.8820			
SK	Pure BU-LRIC	adopted	1.8.2019	0.8180				
TR	Confidential							

Jan-20	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 01/01/2020 until 30/06/2020	Period 2 - From 01/07/2020 until 31/12/2020	Period 3 - From 01/01/2021 until 30/06/2021	Period 4 - From 01/07/2021 until 31/12/2021	Period 5 - From 01/01/2022 until 30/06/2022
XK*	Benchmarking (other)	adopted		1.1460				
UK	Pure BU-LRIC	adopted		0.5430	0.5384			

**Notes to Table 7:**

**BE:** The market analysis and rates remain applicable until entry in force a new BIPT decision.

**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 - 0.014 BGN/minute

from 01/01/2017 - 0.014 BGN/minute

from 01/01/2018 - 0.014 BGN/minute

from 01/01/2019 - 0.014 BGN/minute

from 01/01/2020 - 0.014 BGN/minute

No MTRs peak/off-peak differentiation.

**CH:** MTRs are not regulated in 2020.

**DE:** Deviating from the specified regulation periods, adopted MTR are valid until 30.11.2019 (0,95 Eurocent/Minute). The BNetzA sets glide path tariffs for the following periods:

01.12.2019 until 30.11.2020: 0.90 €cent/Min

01.12.2020 until 30.11.2021: 0.78 €cent/Min

01.12.2021 until 01.12.2022 0.70 €cent/Min

The tariffs for 2021 and 2022 only apply as long as the tariffs are not yet in force according to the European Electronic Communications Code (EECC) Artikel 75.

**DK:** The DBA issues MTR ultimo any year for the entire following year. However, due to the EU MTR will be applicable for use from 1/1/2021, DBA has decided to reuse the 2019 rate for 2020.

**HR:** Period 3 - From 01/01/2021 until 30/06/2021 Existing cost oriented prices will be in force until the Commission adopts delegated act in which single maximum Union-wide EU MTR/FTR will be set.

**IE:** The termination rates are based on a Pure BU-LRIC model however a glide path was chosen to implement them to minimise the possibility of the termination rates being lower than the Eurorates when they come into force.

**FI:** DNA, Elisa and Telia have commercially agreed on new terminations rates. New termination rates will be as follows: 1.12.2019 MTRs will be 0,89€cent/min. 1.12.2020 MTRs will be 0,82€cent/min. Ålcom will follow the same glide path.

**LI:** Operator specific information on MTR and Market Share is confidential. Last step of glide path, effective since 1/1/2013: 0.0765 CHF/min (cap). Benchmarking method: The weighted average of the termination rates in Switzerland, 0.0765 CHF per minute as of 1 January 2011, served as a reference value for setting the termination rates of the Liechtenstein mobile operators in the context of the M7 market analysis. Effective MTR as of June 1, 2017 is 2.9 CHF-cents per minute.

**LT:** Setting MTR (0,94 EUR cents) based on average of pure BU-LRIC by other countries. Now there is a public consultation where it is planning to set MTR (0,76 Eur ct) based on average of pure BU-LRIC by other countries since 01/01/2021.

**LV:** SPRK doesn't use any glide path.

**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.



**MT:** Data reflects Q4 2019.

**NO:** Number of subscribers and market share are provided as of 30 June 2019.

**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 will be further updated on the basis of existing and foreseen inflation data. Information on the number of subscribers of each operator is confidential.

**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. MTR is based on the termination rates applied in countries in our region and represent national MTR which is subject of regulation.

**SK:** RU does not apply any glide path.

## Annex 7 Abbreviations and Exchange rates

Table 8 – Abbreviations

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

Table 9 – Exchange Rates<sup>14</sup>

<b>COUNTRY</b>	<b>1 EURO</b>
<b>AL</b>	<b>121.7700</b>
<b>BG</b>	<b>1.9558</b>
<b>CH</b>	<b>1.0962</b>
<b>CZ</b>	<b>25.5770</b>
<b>DK</b>	<b>7.4710</b>
<b>HR</b>	<b>7.4392</b>
<b>HU</b>	<b>331.9300</b>
<b>IS</b>	<b>136.6800</b>
<b>LI</b>	<b>1.0962</b>
<b>MK</b>	<b>61.4500</b>
<b>NO</b>	<b>10.0910</b>
<b>PL</b>	<b>4.2871</b>
<b>RO</b>	<b>4.7666</b>
<b>RS</b>	<b>117.5330</b>
<b>SE</b>	<b>10.6524</b>
<b>TR</b>	<b>6.4137</b>
<b>UK</b>	<b>0.86078</b>

<sup>14</sup> ECB website, <https://sdw.ecb.europa.eu/browse.do?node=9691296>

Bank of Albania website [https://www.bankofalbania.org/Tregjet/Kursi\\_zyrtar\\_i\\_kembimit](https://www.bankofalbania.org/Tregjet/Kursi_zyrtar_i_kembimit)

National Bank of the Republic of North Macedonia website [http://www.nbrm.mk/kursna\\_lista-en.nspj](http://www.nbrm.mk/kursna_lista-en.nspj)

National Bank of Serbia website [https://www.nbs.rs/export/sites/default/internet/english/scripts/kl\\_srednji.html](https://www.nbs.rs/export/sites/default/internet/english/scripts/kl_srednji.html)

## Annex 8 Glossary

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