

# **Termination rates at European level**

## **January 2018**

14 June 2018

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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 Benchmarking Expert Working Group in cooperation with the BEREC Remedies Expert Working Group and 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 2014 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 an 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 2018, referring – if not differently indicated – to data as of 1st January 2018. It includes rates from the thirty seven (37) NRAs<sup>1</sup> that provided responses to our request.

As of January 2018, the situation regarding TRs in Europe can briefly be described as follows (see also Figures 1-2):

- The lowest regulated FTR simple average of incumbents at the European level (all 37 countries) stands at 0.33 cents per minute.
- The lowest FTR simple average of European Union incumbents (only EU member states) stands at 0.22 cents per minute.
- The MTR simple average (Avg (S)) at the European level (all 37 countries) stands at 0.97 cents per minute, whereas the weighted average<sup>2</sup> (Avg (W)) at European level is estimated at 0.89 cents per minute.
- The MTR simple average at the EU level (only EU member states) stands at 0.86 cents per minute, whereas the weighted average at EU level is estimated at 0.89 cents per minute.

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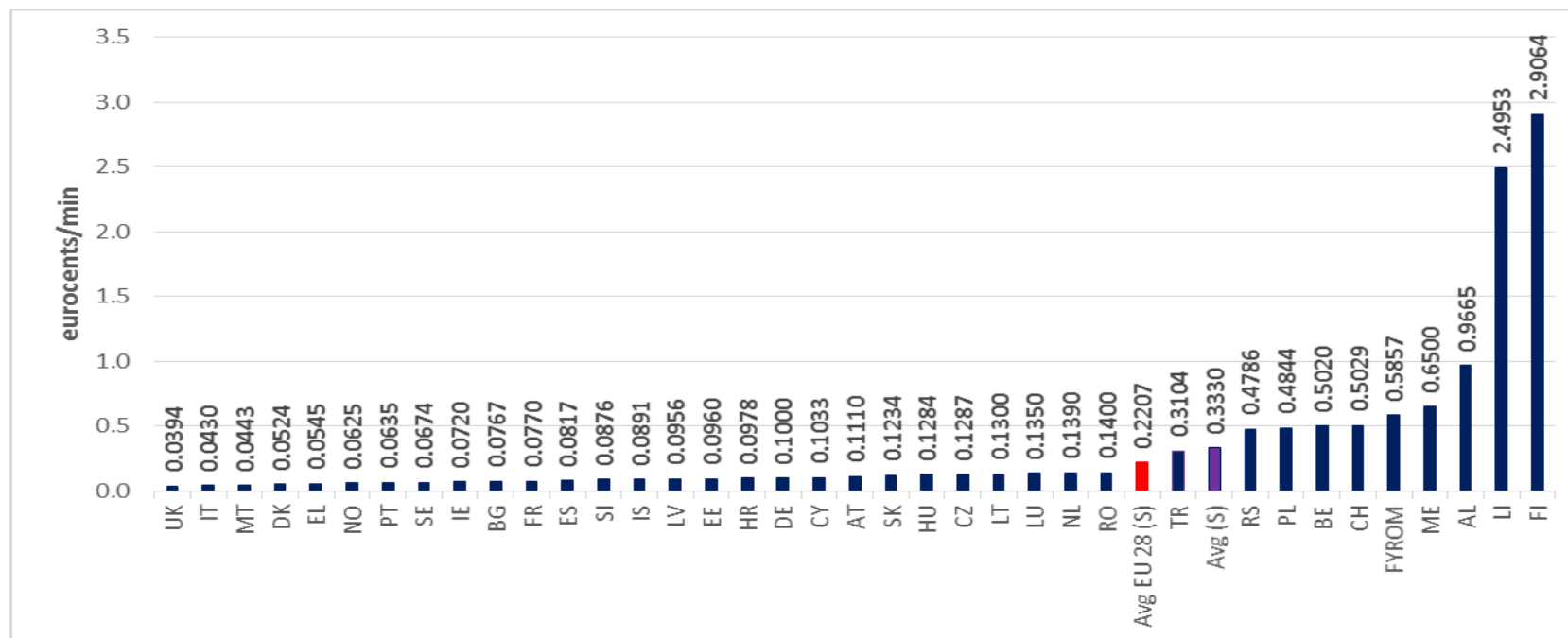
<sup>1</sup> 28 EU member states plus 4 EFTA states (Switzerland, Iceland, Norway and Liechtenstein) and 5 candidate states Albania, Montenegro, FYROM, Serbia and Turkey.

<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).

For non-euro countries, the average exchange rate for the fourth quarter of the year (Q4 2017) was used for the calculation of FTRs and MTRs. The exchange rates used are reported in [Annex 7](#).

## Overview of incumbents' lowest<sup>3,4</sup> regulated fixed termination rates per country – January 2018 (eurocents per minute of service)

Figure 1 FTRs



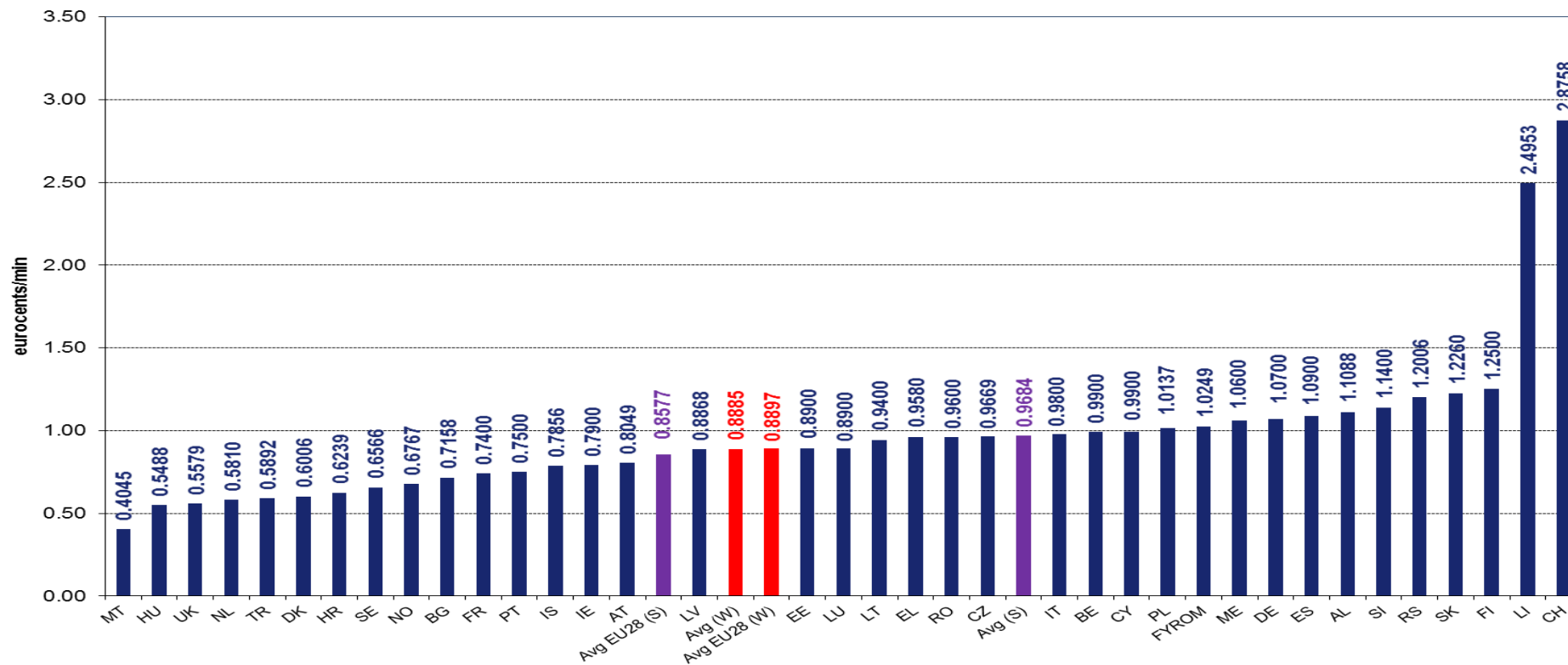
Source: NRAs, BEREC

<sup>3</sup> The lowest regulated rate of the incumbent. In case the operator uses only one rate, it is considered as a single rate.

<sup>4</sup> Due to the large number of incumbents present in Finland a weighted average is included for comparison.

### MTR per country – January 2018 (eurocents per minute of service)

Figure 2 MTRs



Source: NRAs, BEREC

## 2. Fixed networks – voice interconnection

The regulation of FTRs has been harmonized by the Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (C (2009) 3359 final). However, some differences can be found across the national regulatory regimes:

- 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 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 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, 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 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, an average price has been calculated taking into account the traffic distribution between peak and off-peak time. 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 are presented. For each country, the NRA has provided information on the incumbent and some alternative or cable

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

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

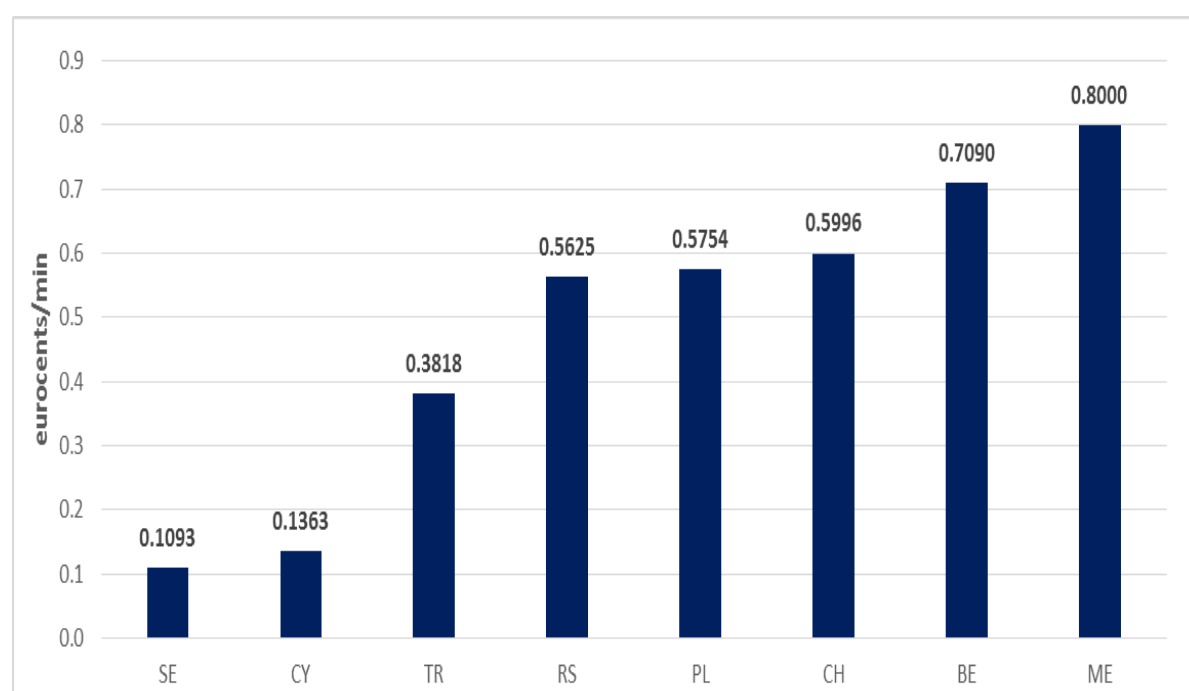
The lowest regulated rate is the rate applied by the operator at the level of interconnection that is closest to the network termination point. The second and third lowest regulated rates apply only to operators that have more than one regulated rate/interconnection layer.

Only five countries out of 37 maintain interconnection services in fixed networks at three different levels in the hierarchy of the incumbents' networks and 3 countries have 2 layers of interconnection.

### Incumbents' fixed termination rates per lowest regulated rate and country

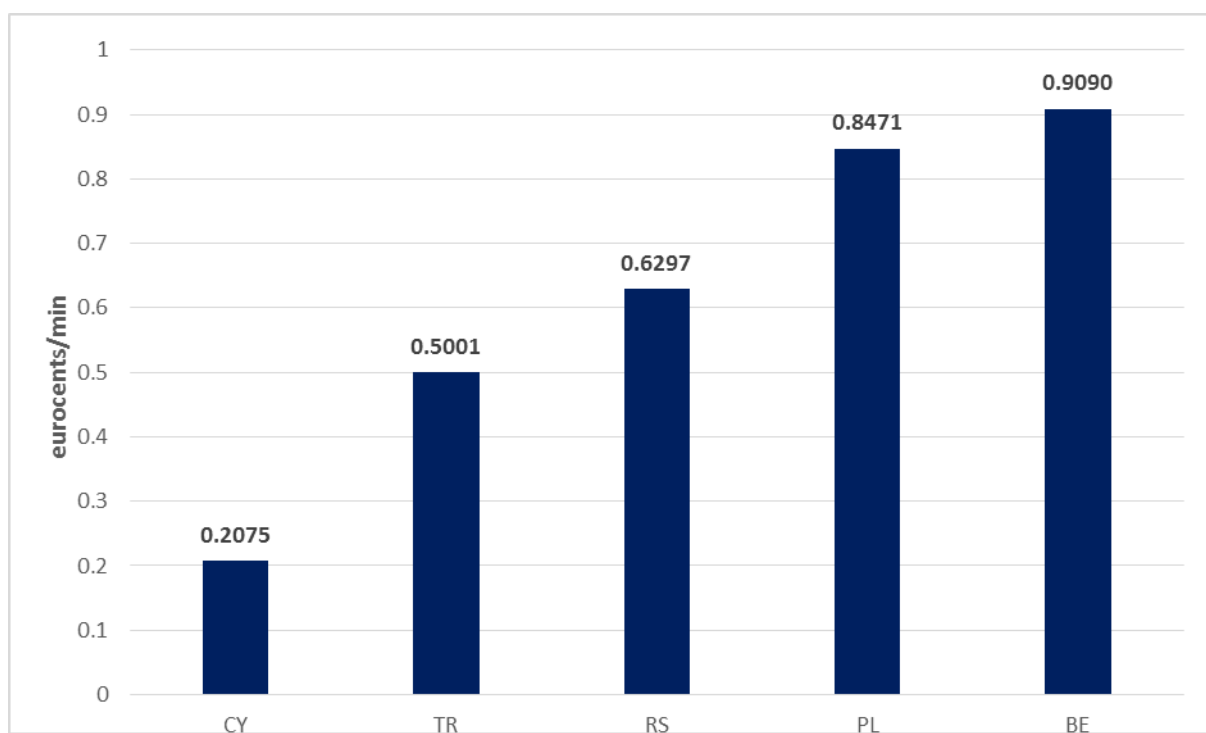
For more information on the individual lowest rates of respective incumbents, please refer to Figure 1 and respectively [Annex 1](#).

**Figure 3 Incumbents' second lowest regulated fixed termination rate per country**



Source: NRAs, BEREC

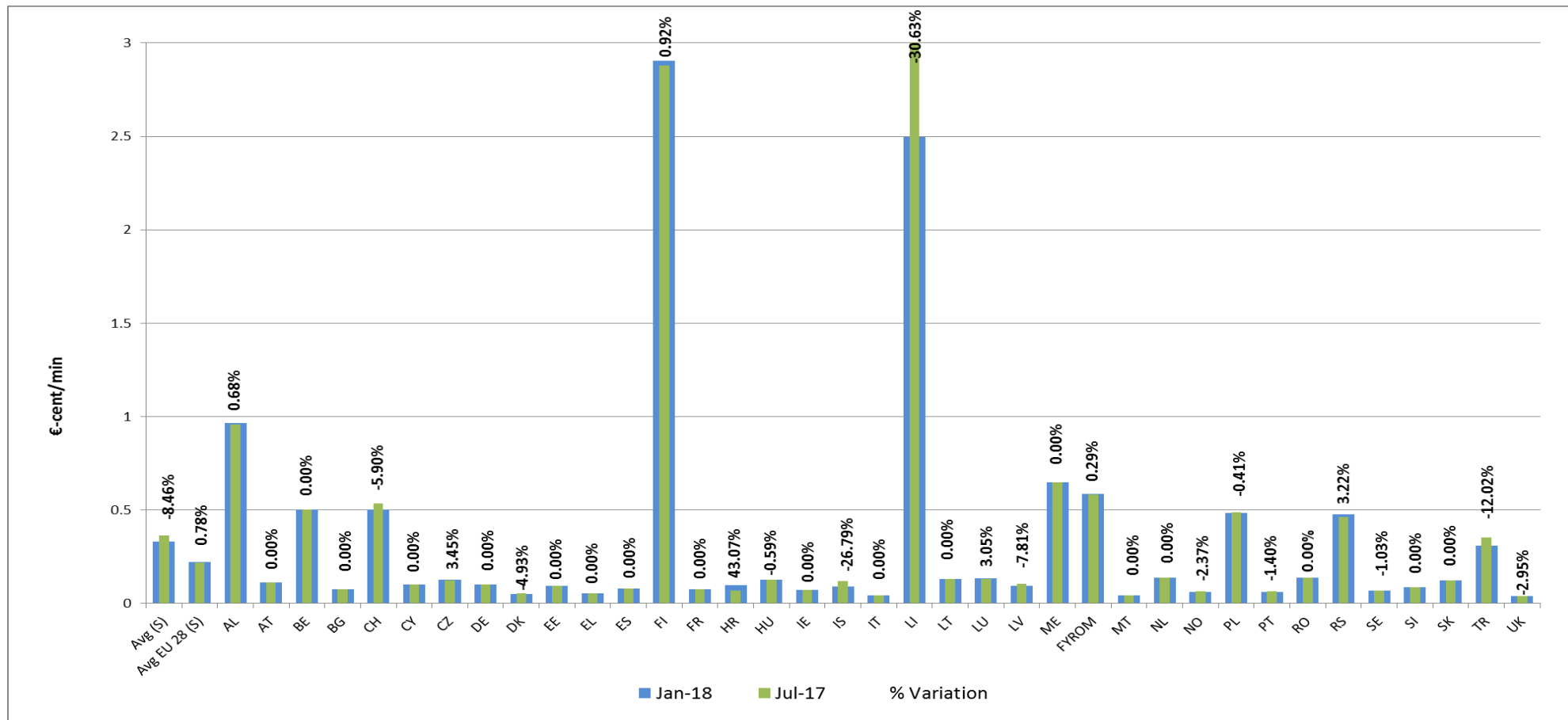


**Figure 4 Incumbents' third lowest regulated fixed termination rate per country**

Source: NRAs, BEREC

### 2.3. Short term evolution of fixed incumbents' FTRs (from July 2017 to January 2018)

Figure 5 Incumbents' lowest regulated rate per country (eurocents/min)



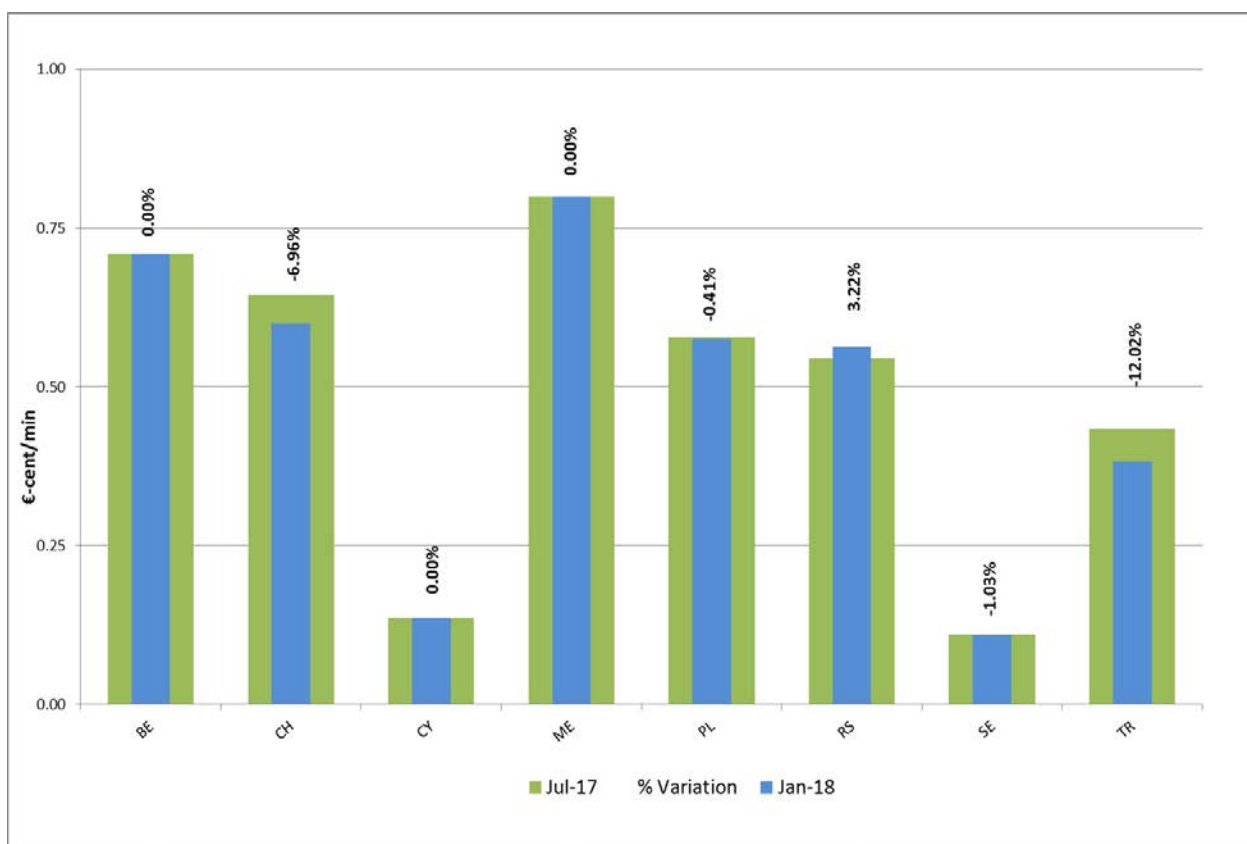
Source: NRAs, BEREC

The above chart shows the variation in percentage of the lowest regulated fixed termination rate of incumbents between July 2017 and January 2018. For easier comparison, rates are stated in cents.

Short-term evolution in national currency:

In addition to the comparison in eurocents shown in Figure 5, BEREC also collects data in other national currencies. Five countries reported changes in their FTRs in their national currencies. The lowest regulated rate decreased in Denmark (-4.88%), Iceland (-21.43%) and Liechtenstein (-25.64%), as opposed to Croatia and Switzerland, where the lowest regulated rate increased by 45.05%, respectively 0.87%. There were no other changes reported in national currency in the rest of the non-euro countries also shown in Figure 5.

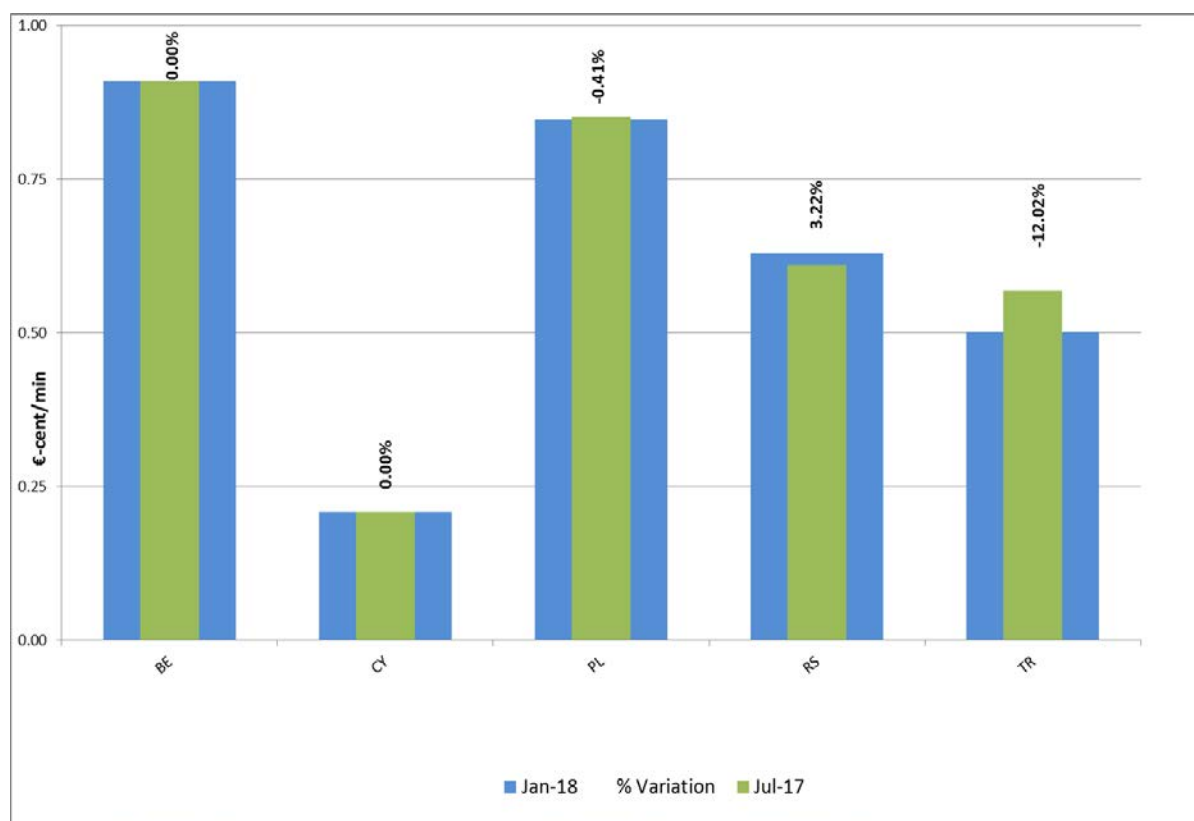
**Figure 6 Incumbents' second lowest regulated rate per country (eurocents/min)**



Source: NRAs, BEREC

Short-term evolution in national currency:

In addition to the comparison in eurocents shown in Figure 6, BEREC also collects data in other national currencies. Switzerland reported a decrease of 0.26% in its second lowest regulated FTR in the national currency.

**Figure 7 Incumbents' third lowest regulated rate per country (eurocents/min)**

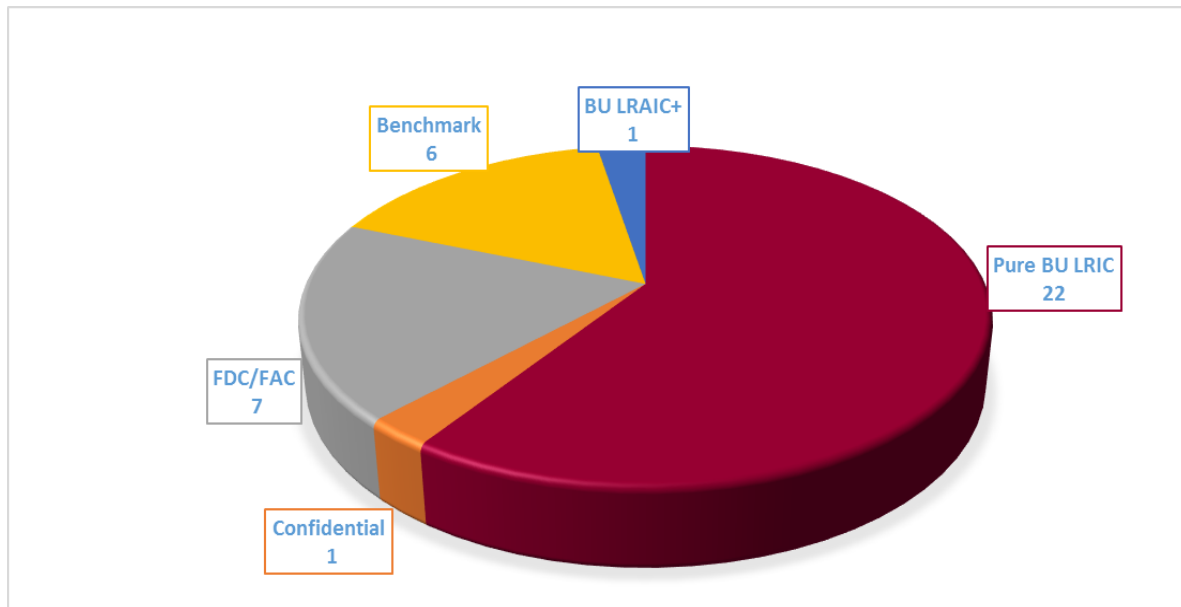
Source: NRAs, BEREC

#### Short-term evolution in national currency:

In addition to the comparison in eurocents shown in Figure 7, BEREC also collects data in other national currencies. There were no changes reported by any of the countries in the FTRs in national currency.

## **2.4. FTR regulatory model implemented and symmetry overview**

22 NRAs use Pure BULRIC models to set FTRs. The second most common model is FDC/FAC, used by 7 NRAs. 6 NRAs use Benchmarking approaches and BU LRAIC+ is used by 1 NRA. In one NRA the model is considered confidential.

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

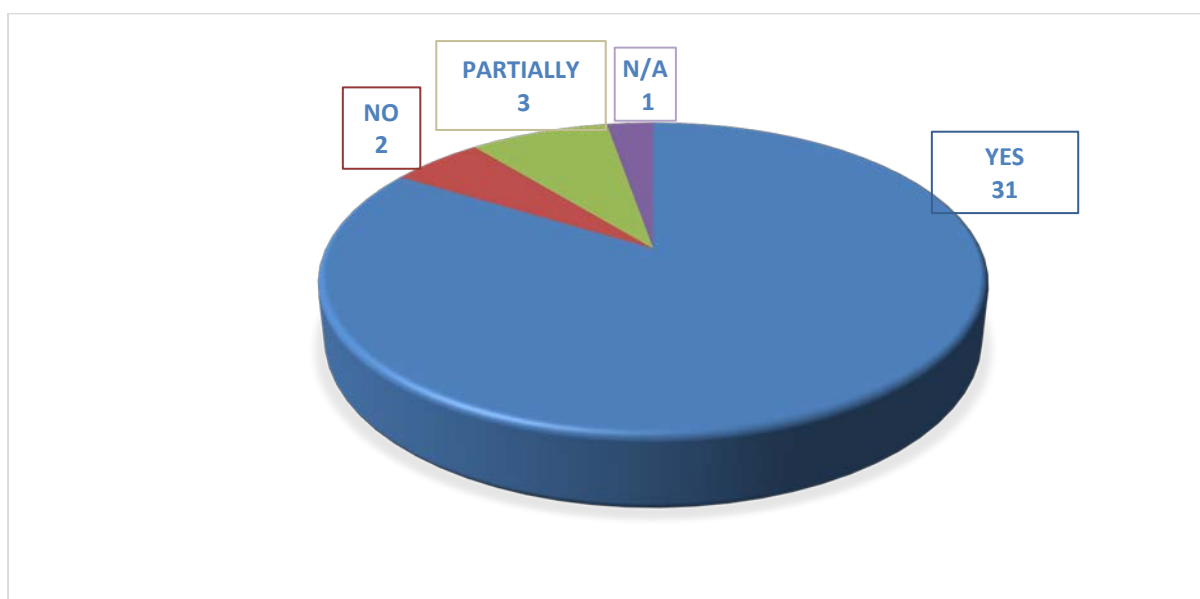
Source: NRAs, BEREC

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

According to the European Commission Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Rates in the EU Member States, 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 22 NRAs using Pure BU LRIC models. 6 NRAs are using Benchmarking while 5 of these NRAs are using Benchmarking based on Pure BU LRIC.

Furthermore, in most of the respondent countries (31), FTRs are symmetric across all operators. 3 NRAs reported partial symmetry while rates are not symmetric in only 2 of the reporting countries. In one of the cases, there is only one operator in the country, therefore, symmetry is not applicable.

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 (MTR) with data as of 1<sup>st</sup> January 2018 and its recent evolution. The purpose of this comparison is to provide an indication of the level of MTRs across the NRAs, 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>6</sup>.

The present overview of MTRs is based upon the results of a request for information sent to all NRAs in January 2018. It includes data from thirty-seven (37) 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>7</sup>:

- 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 cents/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 weighting 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 reporting data) and at EU level (including only the 28 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 must be considered that different estimation methods are used among European countries (especially in the case of pre-paid consumers. 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.<sup>8</sup>

Regarding the short-term MTR evolution (from July 2017 to January 2018), 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);

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<sup>6</sup> See [Annex 6 – Table 7](#)

<sup>7</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>8</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.

- ii. Currency exchange rate variations in non-Euro countries<sup>9</sup>;
- 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 2018)

Table 1 - Average MTR per country

Country	Average MT per country
AL	1.1088
AT	0.8049
BE	0.9900
BG	0.7158
CH	2.8758
CY	0.9900
CZ	0.9669
DE	1.0700
DK	0.6006
EE	0.8900
EL	0.9580
ES	1.0900
FI	1.2500
FR	0.7400
HR	0.6239
HU	0.5488
IE	0.7900
IS	0.7856
IT	0.9800
LI	2.4953
LT	0.9400
LU	0.8900
LV	0.8868
ME	1.0600
FYROM	1.0249
MT	0.4045
NL	0.5810
NO	0.6767
PL	1.0137
PT	0.7500
RO	0.9600
RS	1.2006
SE	0.6566
SI	1.1400
SK	1.226
TR	0.5892
UK	0.5579
<b>Avg (S)</b>	<b>0.9684</b>

<sup>9</sup> This only affects short-term MTR evolution (figure 10) because the percentage of tariff variation in each country (figure 11) has been calculated by comparing rates expressed in terms of the national currency.

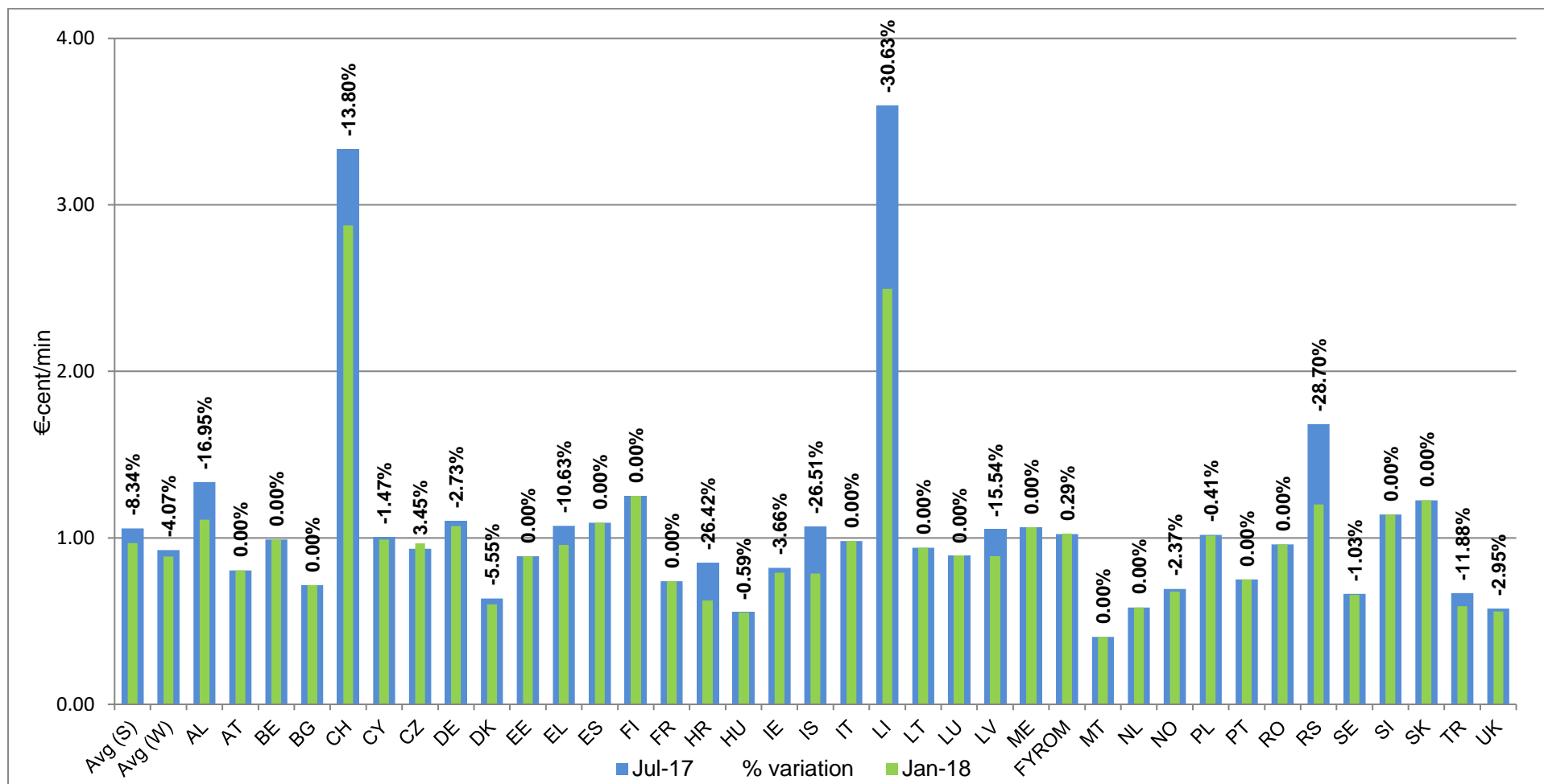


<b>Avg (W)</b>	<b>0.8885</b>
<b>Avg EU28 (S)</b>	<b>0.8577</b>
<b>Avg EU28 (W)</b>	<b>0.8897</b>

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 2017 to January 2018)

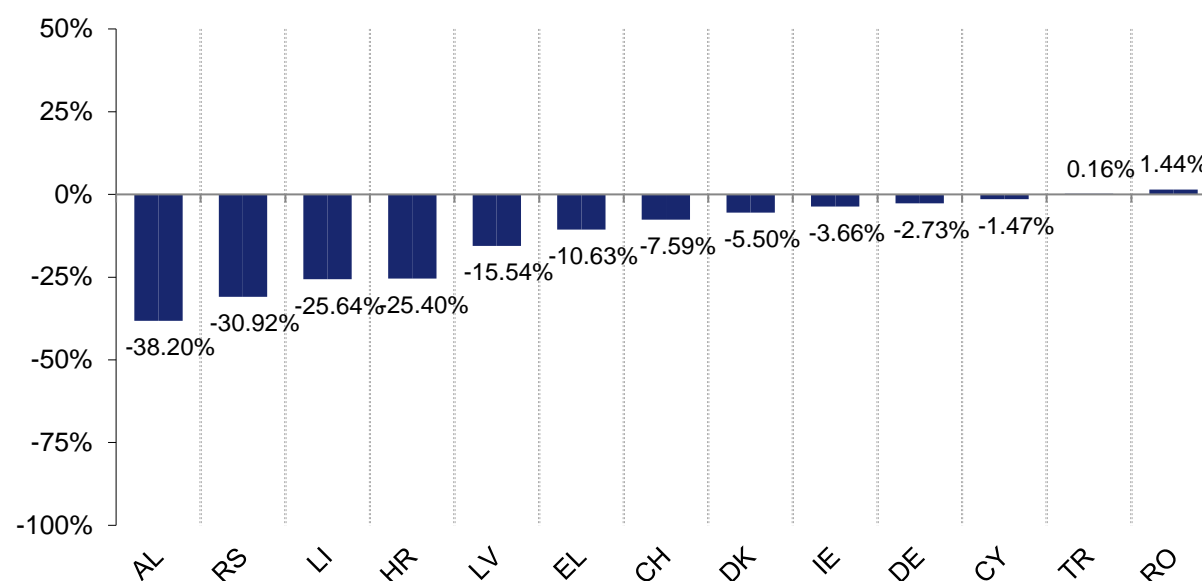
Figure 10 Variation in eurocents and %



Source: NRAs, BEREC

## Variation of average MTRs in national currency per country (from July 2017 to January 2018)

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. Albania experienced a significant decrease, while Serbia, Liechtenstein, and Croatia all showed decreases of more than 25%, followed by Latvia and Greece, still above 10 percentage points of reduction. The slight increases in Turkey are a result of changes of the markets shares of the different operators. In Romania, the regulated tariff is expressed in eurocents and had no variation during the period. Therefore, the increase is a result of changes in the exchange rate.

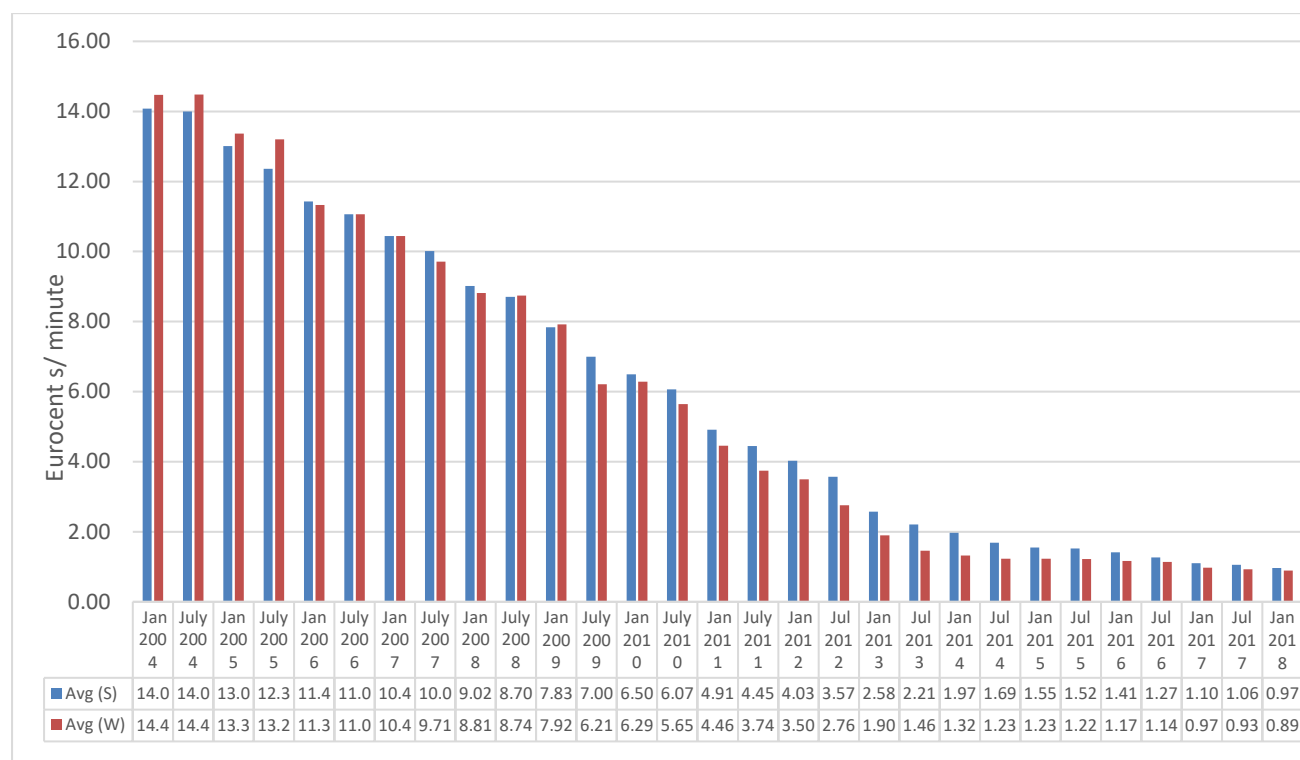
### 3.3. Average MTR per operator

There are a number of countries where information regarding number of subscribers and/or market share has been declared as confidential data and for this reason this report does not publish this data. 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



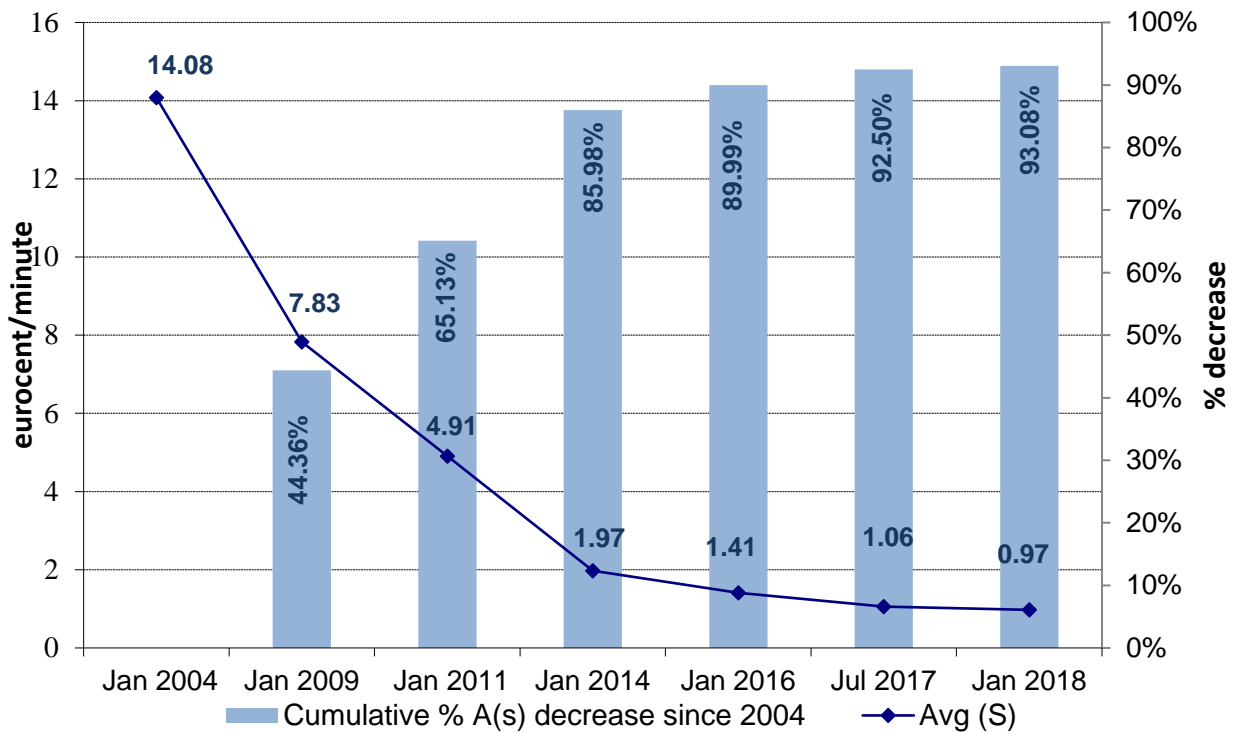
Source: NRAs, BEREC

**Note to figure 12:** Averages are based on nominal rates per minute of service. The number of countries and operators considered has increased over the years, thus affecting the average slightly. Moreover, the Weighted Average does not take into account countries 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 declines of the simple and the weighted average of European MTRs since 2004.

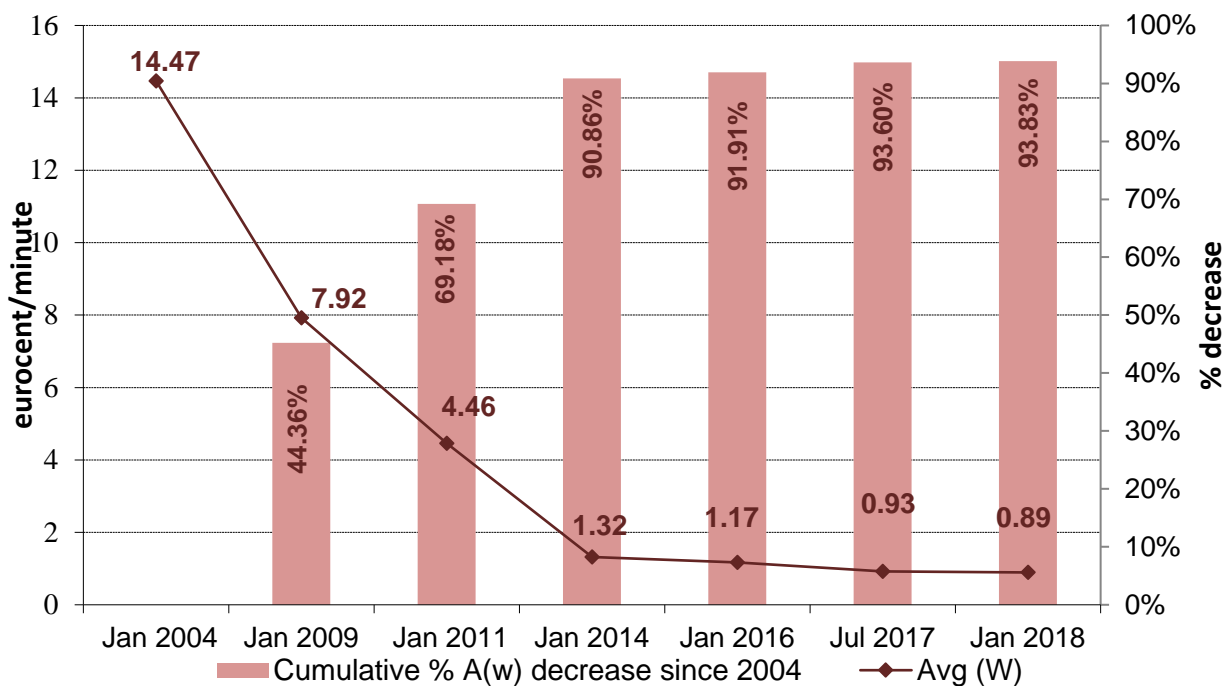
Considering the number of countries and operators included over the years, the simple average MTRs dropped by more than 93% since January 2004, from 14.08 cents to 0.97 cents in January 2018. When weighted, the average of European MTRs has declined even more, from 14.47 cents to 0.89 in the same period.

Figure 13 European MTRs simple average cumulative decline



Source: NRAs, BEREC

Figure 14 European MTRs weighted average cumulative decline

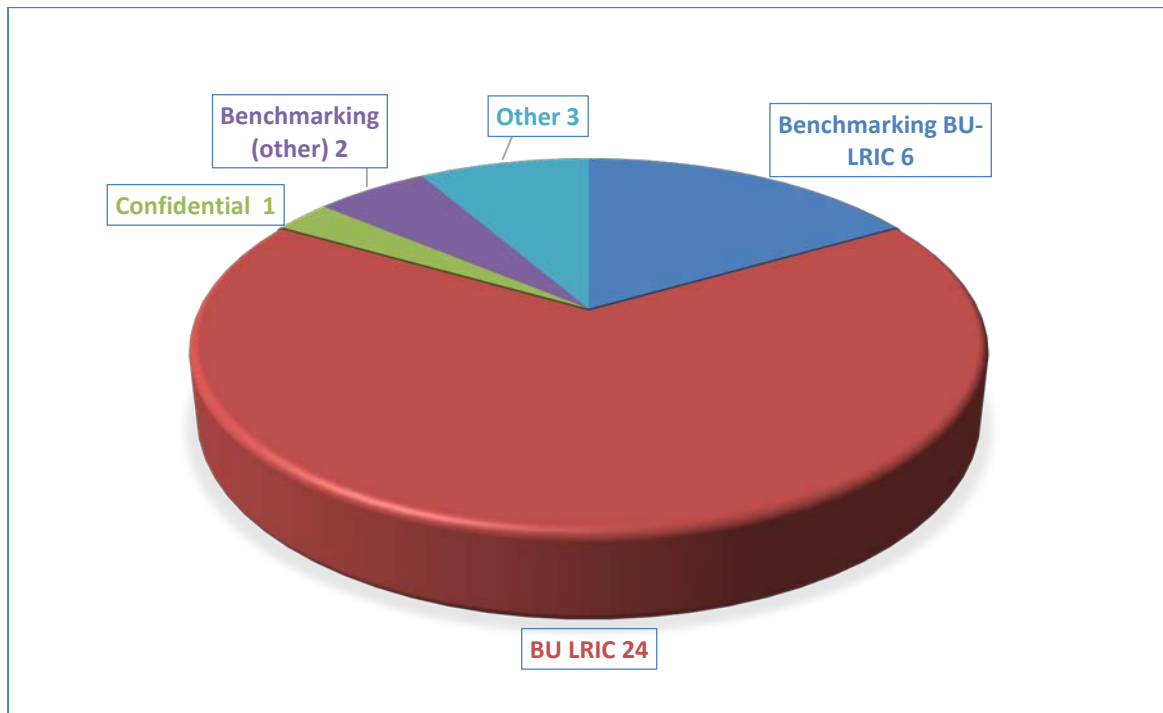


Source: NRAs, BEREC

### 3.5. 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. One NRA (Turkey) considers the model confidential. In one country (Switzerland) MTRs are not regulated.

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 2018

Table 2

Country	Operator	Lowest Regulated Rate	WA in eurocents
AL	Albtelecom	Single-rate	<b>0.9665</b>
	Abcom	Single-rate	<b>0.9665</b>
	Albanian Satellite Communications	Single-rate	<b>0.9665</b>
	Rest of operators	Single-rate	<b>0.9665</b>
AT	A1 Telekom Austria	Single-rate	<b>0.1110</b>
	Operator 2	Single-rate	<b>0.1110</b>
	Operator 3	Single-rate	<b>0.1110</b>
	Operator 4	Single-rate	<b>0.1110</b>
	Operator 5	Single-rate	<b>0.1110</b>
	Operator 6	Single-rate	<b>0.1110</b>
	Rest of operators	Single-rate	<b>0.1110</b>
BE	Proximus	LRR	<b>0.5020</b>
	Proximus	2 <sup>nd</sup> LRR	<b>0.7090</b>
	Proximus	3 <sup>rd</sup> LRR	<b>0.9090</b>
	Rest of operators	LRR	<b>0.7090</b>
	Rest of operators	2 <sup>nd</sup> LRR	<b>0.9090</b>
BG	Bulgarian Telecommunication Company	Single-rate	<b>0.0767</b>
	Telenor Bulgaria	Single-rate	<b>0.0767</b>
	Mobilitel	Single-rate	<b>0.0767</b>
	Rest of operators	Single-rate	<b>0.0767</b>
CH	Swisscom	LRR	<b>0.5029</b>
	Swisscom	2 <sup>nd</sup> LRR	<b>0.5996</b>
CY	Cyta	LRR	<b>0.1033</b>
	Cyta	2 <sup>nd</sup> LRR	<b>0.1363</b>
	Cyta	3 <sup>rd</sup> LRR	<b>0.2075</b>
	Primetel	LRR	<b>0.1033</b>
	Primetel	2 <sup>nd</sup> LRR	<b>0.1363</b>
	Primetel	3 <sup>rd</sup> LRR	<b>0.2075</b>
	Cablenet	LRR	<b>0.1363</b>
	Cablenet	2 <sup>nd</sup> LRR	<b>0.2075</b>
	MTN	LRR	<b>0.1363</b>
CZ	Česká telekomunikační infrastruktura a.s.	Single-rate	<b>0.1287</b>
	UPC Česká republika, s.r.o.	Single-rate	<b>0.1287</b>
	Vodafone Czech Republic a.s.	Single-rate	<b>0.1287</b>
	T-Mobile Czech Republic a.s.	Single-rate	<b>0.1287</b>

	IPEX a.s.	Single-rate	<b>0.1287</b>
	České Radiokomunikace a.s.	Single-rate	<b>0.1287</b>
	Rest of operators	Single-rate	<b>0.1287</b>
<b>DE</b>	Telekom Deutschland GmbH	Single-rate	<b>0.1000</b>
<b>DK</b>	TDC	Single-rate	<b>0.0524</b>
	Telia	Single-rate	<b>0.0524</b>
	Telenor	Single-rate	<b>0.0524</b>
	DLG Tele	Single-rate	<b>0.0524</b>
<b>EE</b>	Telia Eesti AS	Single-rate	<b>0.0960</b>
	STV	Single-rate	<b>0.0960</b>
	Starman	Single-rate	<b>0.0960</b>
	Elisa	Single-rate	<b>0.0960</b>
<b>EL</b>	OTE	Single-rate	<b>0.0545</b>
	FORTHNET	Single-rate	<b>0.0545</b>
	VODAFONE	Single-rate	<b>0.0545</b>
	WIND	Single-rate	<b>0.0545</b>
	Rest of operators	Single-rate	<b>0.0545</b>
<b>ES</b>	Telefónica de España	Single-rate	<b>0.0817</b>
	Vodafone - Ono	Single-rate	<b>0.0817</b>
	Orange	Single-rate	<b>0.0817</b>
	Euskaltel	Single-rate	<b>0.0817</b>
	Rest of operators	Single-rate	<b>0.0817</b>
<b>FI</b>	DNA Oyj	Single-rate	<b>2.8000</b>
	Elisa Oyj	Single-rate	<b>2.8000</b>
	TeliaSonera Finland Oyj	Single-rate	<b>2.8000</b>
	Rest of operators (weighted average)	Average	<b>3.2000</b>
	Weighted average of all operators (weighted average)	Average	<b>2.9064</b>
<b>FR</b>	All operators	Single-rate	<b>0.0770</b>
<b>HR</b>	HT	Single-rate	<b>0.0978</b>
	OPTIMA	Single-rate	<b>0.1015</b>
	VIPnet	Single-rate	<b>0.0988</b>
<b>HU</b>	Magyar Telekom	Single-rate	<b>0.1284</b>
	Invitel	Single-rate	<b>0.1284</b>
	UPC	Single-rate	<b>0.1284</b>
	Rest of operators	Single-rate	<b>0.1284</b>
<b>IE</b>	Eir	Single-rate	<b>0.0720</b>
	Virgin Media	Single-rate	<b>0.0720</b>
	Vodafone	Single-rate	<b>0.0720</b>
	Sky	Single-rate	<b>0.0720</b>
	Rest of operators	Single-rate	<b>0.0720</b>
<b>IS</b>	Siminn	Single-rate	<b>0.0891</b>
	Vodafone	Single-rate	<b>0.0891</b>
<b>IT</b>	Telecom Italia S.p.A.	Single-rate	<b>0.0430</b>
	Wind Telecomunicazioni S.p.A.	Single-rate	<b>0.0430</b>



	Fastweb S.p.A.	Single-rate	<b>0.0430</b>
	Vodafone Italia S.p.A.	Single-rate	<b>0.0430</b>
	Tiscali	Single-rate	<b>0.0430</b>
	Rest of operators	Single-rate	<b>0.0430</b>
LT	Telia Lietuva, AB	Single-rate	<b>0.1300</b>
	CSC Telecom	Single-rate	<b>0.1300</b>
	AB Lietuvos gelezinkeliai	Single-rate	<b>0.1300</b>
LI	Telecom Liechtenstein AG	Single-rate	<b>2.4953</b>
LU	POST	Single-rate	<b>0.1350</b>
LV	Lattelecom	Single-rate	<b>0.0956</b>
	Latvijas Mobilais Telefons	Single-rate	<b>0.0956</b>
	Baltcom	Single-rate	<b>0.0956</b>
	Telecom Baltija	Single-rate	<b>0.0956</b>
ME	Crnogorski Telekom	LRR	<b>0.6500</b>
	Crnogorski Telekom	2nd LRR	<b>0.8000</b>
	Mtel	Single-rate	<b>0.9400</b>
	Telenor	Single-rate	<b>0.9400</b>
	Telemach	Single-rate	<b>0.9400</b>
FYROM	Makedonski Telekom	Single-rate	<b>0.5857</b>
	One VIP	Single-rate	<b>0.5857</b>
	Robi	Single-rate	<b>0.5857</b>
MT	Go plc	Single-rate	<b>0.0443</b>
	Melita plc	Single-rate	<b>0.0443</b>
	Vodafone Malta Ltd	Single-rate	<b>0.0443</b>
	Ozone	Single-rate	<b>0.0443</b>
	Vanilla Telecoms Ltd	Single-rate	<b>0.0443</b>
NL	KPN	Single-rate	<b>0.1390</b>
	Vodafone Ziggo	Single-rate	<b>0.1390</b>
	Rest of operators	Single-rate	<b>0.1390</b>
NO	Telenor	Single-rate	<b>0.0625</b>
	NexGenTel	Single-rate	<b>0.0625</b>
	Get	Single-rate	<b>0.0625</b>
	Phonero	Single-rate	<b>0.0625</b>
	Phonect	Single-rate	<b>0.0625</b>
PL	Orange Polska S.A.	LRR	<b>0.4844</b>
	Orange Polska S.A.	2nd LRR	<b>0.5754</b>
	Orange Polska S.A.	3rd LRR	<b>0.8471</b>
	Netia	Single-rate	<b>0.4844</b>
	Multimedia Polska S.A.	Single-rate	<b>0.4844</b>
	Multimedia Polska Poludnie S.A.	Single-rate	<b>0.5139</b>
PT	MEO	Single-rate	<b>0.0635</b>
	NOS Group	Single-rate	<b>0.0635</b>
	Vodafone	Single-rate	<b>0.0635</b>
	Apax Group	Single-rate	<b>0.0635</b>

	Rest of operators	Single-rate	<b>0.0635</b>
<b>RO</b>	Telekom RC S.A.	Single-rate	<b>0.1400</b>
	S.C. RCS&RDS S.A.	Single-rate	<b>0.1400</b>
	S.C. UPC Romania S.R.L.	Single-rate	<b>0.1400</b>
	S.C. VODAFONE ROMANIA S.A.	Single-rate	<b>0.1400</b>
<b>RS</b>	Telekom Srbija	LRR	<b>0.4786</b>
	Telekom Srbija	2nd LRR	<b>0.5625</b>
	Telekom Srbija	3rd LRR	<b>0.6297</b>
	Orion telekom	Single-rate	<b>0.5205</b>
	Telenor	Single-rate	<b>0.5205</b>
	Serbia Broadband	Single-rate	<b>0.5205</b>
<b>SE</b>	TeliaSonera AB	LRR	<b>0.0674</b>
	TeliaSonera AB	2 <sup>nd</sup> LRR	<b>0.1093</b>
<b>SI</b>	Telekom Slovenije	Single-rate	<b>0.0876</b>
	Telemach	Single-rate	<b>0.0876</b>
	T-2	Single-rate	<b>0.0876</b>
	A1 Slovenija	Single-rate	<b>0.0876</b>
	Rest of operators	Single-rate	<b>0.0876</b>
<b>SK</b>	Slovak Telekom a.s.	Single-rate	<b>0.1234</b>
	Orange Slovensko a.s.	Single-rate	<b>0.1234</b>
	UPC BROADBAND SLOVAKIA s.r.o.	Single-rate	<b>0.1234</b>
	SWAN, a.s.	Single-rate	<b>0.1234</b>
<b>TR</b>	Türk Telekom	LRR	<b>0.3104</b>
	Türk Telekom	2 <sup>nd</sup> LRR	<b>0.3818</b>
	Türk Telekom	3 <sup>rd</sup> LRR	<b>0.5001</b>
	TTNet	Single-rate	<b>0.7145</b>
	Superonline	Single-rate	<b>0.7145</b>
	Turknet	Single-rate	<b>0.7145</b>
	Rest of operators	Single-rate	<b>0.7145</b>
<b>UK</b>	BT	Single-rate	<b>0.0394</b>
	TalkTalk	Single-rate	<b>0.0394</b>
	Sky	Single-rate	<b>0.0394</b>
	Virgin Media	Single-rate	<b>0.0394</b>
	Others	Single-rate	<b>0.0394</b>

**Notes to table 2:**

**Incumbents are indicated first in the table.**

**AL:** Starting from 01.01.2016 only one interconnection level is applied for termination of calls on all fixed network operators.

**BG:** The applied fixed terminating rate is 0,0015 BGN/minute and there is no differentiation between peak/off-peak or hierarchy levels.

**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:** No peak and off-peak differentiation applies.

**IE:** Operators can choose between a set per call and charge per minute rate or a charge per minute rate.

**MT:** Data as of Q3 2017.

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

**UK:** Between 01.12.2017 and 31.01.2018 BT was subject to a transitional charge control. This was an average price cap for the period that had to be no more than 0.035ppm. BT was free to set prices within this cap. BT has set different rates for day, evening and weekend traffic. The off-peak rate shown above corresponds to the evening rate. Its weekend rate was 0.016ppm. All other CPs were required to set rates that are fair and reasonable rates, which are presumed to be symmetric to BT, during this period.

## Annex 2 FTR regulatory model implemented

Table 3

Country	COST MODEL	ACCOUNTING
AL	Benchmark (Other)	
AT	Pure BU LRIC	
BE	FDC/FAC	
BG	Pure BU LRIC	
CH	BU LRAIC+	
CY	Benchmark (Pure BU LRIC)	
CZ	Pure BU LRIC	
DE	Benchmark (Pure BU LRIC)	
DK	Pure BU LRIC	
EE	Benchmark (Pure BU LRIC)	
EL	Pure BU LRIC	
ES	Pure BU LRIC	
FI	FDC	
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	Pure BU LRIC	
LU	Pure BU LRIC	
LV	Benchmark (Pure BU LRIC)	
ME	TD LRIC	
FYROM	TD LRIC	
MT	Pure BU LRIC	
NL	Pure BU LRIC	
NO	Pure BU LRIC	
PL	TD-FDC /FAC	
PT	Pure BU LRIC	
RO	Pure BU LRIC	
RS	TD-FAC-CCA	
SE	Pure BU LRIC	
SI	Pure BU LRIC	
SK	Pure BU LRIC	
TR	Confidential	
UK	Pure BU LRIC	

**Notes to table 3:**

**BG:** With Decision 550 from 20.10.2016 CRC approved cost-oriented fixed terminating rates based on Pure Bu-LRIC model as follows:

from 01.11.2016 - BGN/min 0.0015

from 01.01.2017 - BGN/min 0.0015

from 01.01.2018 - BGN/min 0.0015

from 01.01.2019 - BGN/min 0.0014

from 01.01.2020 - BGN/min 0.0014

**CY:** OCECPR is in the process of issuing the relevant final decisions where FTRs will be based on Pure BU LRIC model.

**DE:** The calculation of rates is based on a pure LRIC cost model, adjusted by benchmarking with other European countries that use pure LRIC.

**ES:** From 01.11.2015 onwards, new regulation for FTR is applied. There is no differentiation between peak- off peak, there is symmetry in tariffs and only local level is regulated.

**LI:** Current FTR cap was decided in 2007. Market analysis and remedies M3 decided in 2010.

**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 between Peak/Off-peak.

**LU:** Règlement16/209/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.

**PT:** The latest fixed termination market analysis was approved in December 2016 together with a pure BU LRIC costing model developed for ANACOM in accordance with the Commission Recommendation on Termination rates. This rate applies to the local and single transit interconnection levels, the price for double transit interconnection is subject to negotiation between operators.

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

**UK:** Between 01.12.2017 and 31.01.2018 BT was subject to a transitional charge control. This was an average price cap for the period that had to be no more than 0.035ppm, in line with the previous charge control. BT was free to set prices within this cap. The new charge control has taken force from 01.02.2018 and will continue until 31.03.2021. This new charge control is a single maximum cap on all calls to all CPs, removing the flexibility for time of day pricing. 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	Symmetry	Comments
AL	Yes	FTRs are symmetrical for all FNOs since 01.01.2016 as decided in market analysis and SMP decisions on October 2015. The same FTR applies to all FNOs regardless of network topology and levels of interconnection.
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, from 01.01.2016 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 02.06.2017.
EE	Yes	Same FTR applies for ten operators with SMP.
EL	Yes	
ES	Yes	The FTR is symmetrical for all the operators and established in market analysis. As the FTR is based on an efficient NGN-based operator, there is not anymore the concept of level of interconnection, as there was in the past, because the architecture of NGN operators is not hierarchical. However, it was decided in the market analysis that, just for the case of termination in incumbent network, the interconnected operator should be connected at 21 Points of Interconnection, if TDM based interconnection is used. If the operator connects to less than these 21 Pol, then a transit for terminating at the other Pol should be paid. For IP interconnection the number of Pol for termination in incumbent operator is still pending of decision. For the termination in alternative operators, there is no remedy concerning the minimum number of Pol for FTR. It is subject to commercial negotiation, as it was in the past.
FI	Partially	The three biggest operators have symmetric termination rates. Rest of the operators have different rates.
FR	Yes	
HR	Yes	Symmetry in fixed network is prescribed for all operators as of the 01.01. 2013.
HU	Yes	

IE	Yes	Please note that ComReg Decision D12/12 set fixed termination rates at layer one (i.e. eircom's primary). ComReg Decision D12/12 imposed symmetrical blended rate of 0.085 cent per minute for all SMP fixed operators from 1 July 2014. This blended FTR was reduced to 0.072 cent per minute from 1 July 2015. Please refer to Annex1 in ComReg Decision D12/12 at <a href="http://www.comreg.ie/fileupload/publications/ComReg12125.pdf">http://www.comreg.ie/fileupload/publications/ComReg12125.pdf</a>
IS	Yes	
IT	Yes	
LI	N/A	There is only one FNO in Liechtenstein: Telecom Liechtenstein AG. Fixed net interconnection partners of Telecom Liechtenstein are regulated by other NRAs and are not obliged to apply Liechtenstein's FTR regulation.
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, and so on.
LU	Partially	A maximal price cap is defined by the regulation, but operators may implement the solution in their own way.
LV	Yes	
ME	No	
FYROM	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	Same FTR rate for all operators.
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, and following ANACOM's Decision on 21.12. 2016, they were set at the level of 0.0644 cents per minute starting on 04.01.2017 and updated to 0,0635 eurocents per minute on 1.10.2017.
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.
SE	Yes	
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	
UK	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	171,516	243,944	70.3%
	Abcom	15,282		6.3%
	Albanian Satellite Communications	42,829		17.6%
	Rest of operators	14,317		5.9%
AT	A1 Telekom Austria	2,239,654	3,567,153	62.79%
	Operator 2	550,531		15.43%
	Operator 3	215,962		6.05%
	Operator 4	191,247		5.36%
	Operator 5	59,264		1.66%
	Operator 6	55,472		1.56%
	Rest of operators	255,023		7.15%
BE	Proximus	2,352,987	4,251,564	55.34%
	Rest of operators	1,898,577		44.66%
BG	Bulgarian Telecommunication Company (incumbent)	Confidential	1,374,064	Confidential
	Mobiltel	Confidential		Confidential
	Telenor Bulgaria	Confidential		Confidential
	Rest of operators	64,032		4.66%
CH	Swisscom	N/A	N/A	N/A
CY	Cyta	225,795	318,131	71%
	Primetel	44,474		14%
	Cablenet	27,495		8.60%
	MTN	20,367		6.40%
CZ	Česká telekomunikační infrastruktura a.s.	Confidential	Confidential	41.84%
	UPC Česká republika, s.r.o.	Confidential		9.18%
	Vodafone Czech Republic a.s.	Confidential		8.22%
	T-Mobile Czech Republic a.s.	Confidential		7.33%
	IPEX a.s.	Confidential		3.68%
	České Radiokomunikace a.s.	Confidential		2.53%
	Rest of operators	Confidential		27.22%



DE	Telekom Deutschland GmbH	19,340,000	38,520,000	50.21%
	Rest of operators	19,180,000		49.79%
DK	TDC	471,335	634,824	74.25%
	Telia	50,625		7.97%
	Telenor	50,784		8%
	DLG Tele	40,023		6.30%
	Rest of operators	22,057		3.48%
EE	Telia Eesti AS	294,767	348,715	84.53%
	STV	12,426		3.56%
	Starman	28,682		8.23%
	Elisa	12,840		3.68%
EL	OTE	2,639,966	4,744,419	55.64%
	FORTHNET	Confidential		Confidential
	VODAFONE	Confidential		Confidential
	WIND	Confidential		Confidential
	Rest of operators	Confidential		Confidential
ES	Telefónica de España	9,176,977	19,494,073	47.08%
	Vodafone - ONO	4,739,768		24.31%
	Orange	4,048,329		20.77%
	Euskaltel	804,373		4.13%
	Rest of operators	724,626		3.72%
FI	Elisa Oyj	Confidential	Confidential	36.58%
	DNA Oyj	Confidential		14.25%
	Telia Finland Oyj	Confidential		22.57%
	Rest of operators	Confidential		26.60%
FR		N/A	N/A	N/A
HR	HT	Confidential	1,377,720	Confidential
	OPTIMA	Confidential		Confidential
	VIPnet	Confidential		Confidential
	Rest of operators	Confidential		Confidential
HU	Magyar Telekom	1,586,271	3,132,000	50.65%
	Invitel	379,461		12.12%
	UPC	590,359		18.85%
	Rest of operators	575,909		18.39%
IE	Eir	562,947	1,468,548	38.33%
	Virgin Media	356,311		24.26%
	Vodafone	211,538		14.40%
	Sky	187,392		12.76%

	Rest of operators	150,360		10.24%
IS	Siminn	81,389	121,961	66.73%
	Vodafone	40,572		33.23%
IT	Telecom Italia	11,139,053	20,577,224	54.13%
	WindTre	2,677,762		13.01%
	Fastweb	2,525,185		12.27%
	Vodafone	2,484,356		12.07%
	Tiscali	485,038		2.36%
	Rest of operators	1,265,830		6.15%
LI	Telecom Liechtenstein AG	15,352	15,352	100.00%
LT	Telia Lietuva, AB	Confidential	Confidential	88.84%
	UAB „CSC Telecom“	Confidential		1.12%
	AB Lietuvos gelezinkeliai	Confidential		2.11%
	Rest of operators	Confidential		7.93%
LU	POST	202,000	280,400	72.04%
	Rest of operators	78,400		27.96%
LV	Lattelecom	Confidential	268,597	Confidential
	Latvijais Mobilais Telefons	Confidential		Confidential
	CSC Telecom	11,740		4.37%
	Baltcom	10,029		3.73%
	Rest of operators	32,288		12.02%
ME	Crnogorski Telekom	122,636	152,155	80.60%
	Mtel	20,584		13.53%
	Telenor	7,521		4.94%
	Telemach	1,414		0.93%
FYROM	Makedonski Telekom	212,522	360,804	58.90%
	One VIP	106,413		29.49%
	Robi	25,457		7.06%
	Rest of operators	16,412		4.55%
MT	Go plc	160,783	269,058	59.76%
	Melita plc	85,519		31.78%
	Vodafone Malta Ltd	18,809		6.99%
	Ozone	857		0.32%
	Vanilla Telecoms Ltd	3,090		1.15%
NL	KPN	3,401,000	6,685,000	50.88%
	VODAFONEZIGGO	2,570,000		38.44%
	Rest of operators	714,000		10.68%
NO	Telenor	567,508	845,519	67.12%

	NextGenTel	53,760		6.36%
	Get	48,335		5.72%
	Phonero	37,186		4.40%
	Phonect	30,442		3.60%
	Rest of operators	108,288		12.81%
PL	Orange Polska S.A	Confidential	5,246,720	Confidential
	Netia S.A.	Confidential		Confidential
	Multimedia Polska S.A.	Confidential		Confidential
	Rest of operators	Confidential		Confidential
PT	MEO (incumbent)	Confidential	4,831,022	44.77%
	NOS Group	Confidential		35.24%
	Vodafone	Confidential		15.86%
	Apax Group	Confidential		3.82%
	Rest of operators	Confidential		0.31%
RO	Telekom RC S.A.	Confidential	3,889,933	Confidential
	S.C. RCS&RDS S.A.	Confidential		Confidential
	S.C. UPC Romania S.R.L.	Confidential		Confidential
	S.C. VODAFONE ROMANIA S.A.	Confidential		Confidential
	Rest of operators	Confidential		Confidential
RS	Telekom Srbija	Confidential	2,609,578	86%
	Serbia Broadband	Confidential		11.8%
	Rest of operators	Confidential		2.2%
SE	TeliaSonera AB	1,912,085	2,794,418	68.43%
	Com Hem AB	272,021		9.73%
	Tele2 Sverige AB	15,056		0.54%
	Telenor Sverige AB	164,559		2.80%
	Telavox AB	352,560		12.62%
SI	Telekom Slovenije	Confidential	Confidential	54.28%
	Telemach	Confidential		17.29%
	T-2	Confidential		14.03%
	A1 Slovenija	Confidential		8.43%
	Rest of operators	Confidential		5.97%
SK	Slovak Telekom, a. s.	Confidential	840,350	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	7,095,065	11,308,444	62.74%

	TTNet	2,453,298		21.69%
	Superonline	339,425		3%
	Turknet	207,773		1.84%
	Rest of operators	1,212,883		10.73%
UK	BT	Confidential	32,808,114	Confidential
	TalkTalk	Confidential		Confidential
	Sky	Confidential		Confidential
	Virgin Media	Confidential		Confidential
	Rest of operators	Confidential		Confidential

### Notes to table 5

**AL:** Number of fixed lines as of 31.12.2017.

**AT:** Number of lines as of end Q3 2017.

**BE:** Number of fixed telephone lines as of 1.1.2018.

**BG:** Number of lines (network termination points) as of 31.12.2017.

**CY:** Number of lines as of 31.12.2017.

**CZ:** Data regarding number of lines are as of 30.06.2017, data for the whole year 2017 are not yet available.

**DE:** Number of lines is at end of year 2017 (estimate).

**DK:** Number of lines as of July 2017.

**EL:** The 'Number of Lines' data refer to the number of active telephone access lines as of 30.06.2017. The wholesale line rental lines are included in the incumbent's (OTE) lines.

**FI:** Market shares as of 30.06.2017.

**FYROM:** Number of lines as of Q3 2017.

**HR:** Number of lines as of Q3 2017.

**IE:** Number of lines and market share data is as of 31.12.2017.

**IS:** Number of lines refer to mid-2017.

**IT:** Number of lines as of September 2017.

**LT:** Data as of Q4 2017.

**ME:** Data for number of lines are from 31.12.2017.

**MT:** Data reflects the position as at Q3 2017. Data includes the number of channels.

**NO:** Number of lines are provided as of 30.06.2017.

**RS:** Number of lines are as of 31.12.2017. 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.

**RO:** data as of 01.01.2018 is provisional.

**SI:** As all operator's systems are not adopted to reporting the data at such detailed level, all lines in case of VoIP are not taken into account.

**TR:** Number of lines 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 2018

Table 6

Country	Operator	Average effective prices (eurocents)	Subscribers	Country total (real) subscribers	Real Market Share %
AL	Telekom Albania	1.1088	1,131,714	2,987,614	37.88%
	Vodafone Albania	1.1088	1,406,147		47.07%
	Albtelecom	1.1088	449,753		15.05%
AT	A1Telekom Austria	0.8049	Confidential	11,933,508	Confidential
	T-Mobile Austria	0.8049	Confidential		Confidential
	Hutchison Drei Austria	0.8049	Confidential		Confidential
BE	Proximus	0.99	Confidential	11,357,286	Confidential
	Orange	0.99	Confidential		Confidential
	Telenet Group (ex-Base)	0.99	Confidential		Confidential
BG	Mobiltel	0.7158	Confidential	8,532,908	Confidential
	Telenor Bulgaria	0.7158	Confidential		Confidential
	BTC	0.7158	Confidential		Confidential
CH	Swisscom	2.5383	5,480,000	9,334,747	58.71%
	Sunrise	3.3557	2,070,000		22.18%
	Salt	3.3557	1,784,747		19.12%
CY	MTN	0.99	408,168	1,166,882	34.98%
	Primetel	0.99	104,939		8.99%
	Cyta	0.99	639,375		54.79%
CZ	T-Mobile Czech Republic a.s.	0.9669	Confidential	Confidential	38.20 %
	O2 Czech Republic a.s.	0.9669	Confidential		28.84 %
	Vodafone Czech Republic a.s.	0.9669	Confidential		25.26 %
DE	Telekom Deutschland	1.07	43,152,000	109,400,000 <sup>10</sup>	NA
	Vodafone	1.07	46,000,000		NA
	Telefónica Germany GmbH & Co. OHG	1.07	45,918,000		NA
DK	TDC	0.6006	2,719,553	6,974,961	38.99%
	Telenor	0.6006	1,590,353		22.80%
	Telia	0.6006	1,074,683		15.41%
	3 (Hi3G)	0.6006	956,000		13.71%
EE	Telia Eesti AS	0.89	778,083	1,904,425	40.86%
	Elisa Eesti AS	0.89	493,244		25.90%
	Tele2 Eesti AS	0.89	633,098		33.24%

<sup>10</sup> The total number of subscribers correspond with the definition in this report (M2M, M2P and data-only SIMs cards are excluded), but those data are not available by individual operator.

EL	Cosmote	<b>0.958</b>	Confidential	12,851,921	<b>Confidential</b>
	Vodafone	<b>0.958</b>	Confidential		<b>Confidential</b>
	Wind	<b>0.958</b>	Confidential		<b>Confidential</b>
ES	TME	<b>1.09</b>	15,411,440	51,811,831	<b>29.75%</b>
	Orange	<b>1.09</b>	14,067,926		<b>27.15%</b>
	Vodafone	<b>1.09</b>	13,090,345		<b>25.27%</b>
	Masmovil	<b>1.09</b>	4,531,676		<b>8.75%</b>
FI	Elisa Oyj	<b>1.25</b>	Confidential	7,411,000	<b>Confidential</b>
	TeliaSonera Finland Oyj	<b>1.25</b>	Confidential		<b>Confidential</b>
	DNA Oy	<b>1.25</b>	Confidential		<b>Confidential</b>
FR	Orange	<b>0.74</b>	N/A	72,008,000	<b>N/A</b>
	SFR	<b>0.74</b>	N/A		<b>N/A</b>
	Bouygues Telecom	<b>0.74</b>	N/A		<b>N/A</b>
	Free Mobile	<b>0.74</b>	N/A		<b>N/A</b>
HR	HT	<b>0.6239</b>	Confidential	4,501,677	<b>Confidential</b>
	VIPnet	<b>0.6239</b>	Confidential		<b>Confidential</b>
	Tele2	<b>0.6239</b>	Confidential		<b>Confidential</b>
HU	T-Mobile	<b>0.5488</b>	Confidential	11,783,806	<b>Confidential</b>
	Telenor	<b>0.5488</b>	Confidential		<b>Confidential</b>
	Vodafone	<b>0.5488</b>	Confidential		<b>Confidential</b>
IE	Vodafone	<b>0.7900</b>	1,780,684	4,898,872	<b>36.35%</b>
	Three Ireland Group	<b>0.7900</b>	1,557,373		<b>31.79%</b>
	Eircom Group Mobile	<b>0.7900</b>	985,742		<b>20.12%</b>
	Tesco Mobile	<b>0.7900</b>	389,283		<b>7.95%</b>
IS	Siminn	<b>0.7856</b>	131,117	404,207	<b>32.44%</b>
	Vodafone	<b>0.7856</b>	108,550		<b>26.86%</b>
	Nova	<b>0.7856</b>	141,471		<b>35.00%</b>
	365/Tal	<b>0.7856</b>	16,752		<b>4.14%</b>
IT	WindTre	<b>0.98</b>	29,774,288	83,877,669	<b>35.50%</b>
	Telecom Italia	<b>0.98</b>	24,049,655		<b>28.67%</b>
	Vodafone	<b>0.98</b>	22,571,694		<b>26.91%</b>
	PosteMobile	<b>0.98</b>	3,668,919		<b>4.37%</b>
LI	Salt (Liechtenstein) AG	<b>2.4953</b>	Confidential	12,536	<b>Confidential</b>
	Swisscom (Schweiz) AG	<b>2.4953</b>	Confidential		<b>Confidential</b>
	Telecom Liechtenstein AG	<b>2.4953</b>	Confidential		<b>Confidential</b>
LT	Tele2	<b>0.94</b>	1,830,072	4,295,222	<b>42.61%</b>
	Bite Lietuva	<b>0.94</b>	1,087,395		<b>25.32%</b>
	Telia Lietuva, AB	<b>0.94</b>	1,292,598		<b>30.10%</b>
LU	POST	<b>0.89</b>	Confidential	782,000	<b>Confidential</b>
	Tango	<b>0.89</b>	Confidential		<b>Confidential</b>
	Orange	<b>0.89</b>	Confidential		<b>Confidential</b>
LV	Bite Latvija	<b>0.8868</b>	540,754	2,469,266	<b>21.90%</b>
	Latvijas Mobilais Telefons	<b>0.8868</b>	Confidential		<b>Confidential</b>
	Tele2	<b>0.8868</b>	951,797		<b>38.55%</b>

	Zetcom	<b>0.8868</b>	Confidential		<b>Confidential</b>
ME	Telenor	<b>1.06</b>	374,959	1,044,674	<b>35.89%</b>
	Crnogorski Telekom	<b>1.06</b>	352,137		<b>33.71%</b>
	Mtel	<b>1.06</b>	317,578		<b>30.40%</b>
FYROM	Makedonski Telekom	<b>1.0249</b>	1,028,166	2,121,805	<b>48.46%</b>
	one.VIP	<b>1.0249</b>	1,027,033		<b>48.40%</b>
	Lycamobile	<b>1.0249</b>	66,606		<b>3.14%</b>
MT	Go plc	<b>0.4045</b>	222,988	609,809	<b>36.57%</b>
	Melita plc	<b>0.4045</b>	110,158		<b>18.06%</b>
	Vodafone	<b>0.4045</b>	267,591		<b>43.88%</b>
NL	KPN	<b>0.581</b>	6,674,000	20,518,000	<b>32.53%</b>
	VodafoneZiggo	<b>0.581</b>	4,977,000		<b>24.26%</b>
	T-Mobile	<b>0.581</b>	3,704,000		<b>18.05%</b>
NO	Telenor	<b>0.6767</b>	2,837,842	5,721,255	<b>49.60%</b>
	Telia	<b>0.6767</b>	2,002,778		<b>35.01%</b>
	ICE	<b>0.6767</b>	293,095		<b>5.12%</b>
	Phonero	<b>0.6767</b>	217,925		<b>3.81%</b>
PL	Orange Polska S.A.	<b>1.0137</b>	Confidential	53,001,776	<b>Confidential</b>
	Polkomtel sp. z o.o.	<b>1.0137</b>	Confidential		<b>Confidential</b>
	P4 sp. z o.o.	<b>1.0137</b>	Confidential		<b>Confidential</b>
	T-Mobile Polska S.A.	<b>1.0137</b>	Confidential		<b>Confidential</b>
PT	MEO	<b>0.75</b>	Confidential	11,764,106	<b>Confidential</b>
	VODAFONE	<b>0.75</b>	Confidential		<b>Confidential</b>
	NOS	<b>0.75</b>	Confidential		<b>Confidential</b>
RO	Vodafone Romania S.A.	<b>0.96</b>	Confidential	22,552, 896	<b>Confidential</b>
	Orange Romania S.A.	<b>0.96</b>	Confidential		<b>Confidential</b>
	TELEKOM RMC S.A.	<b>0.96</b>	Confidential		<b>Confidential</b>
	RCS & RDS S.A.	<b>0.96</b>	Confidential		<b>Confidential</b>
RS	Telekom Srbija - MTS	<b>1.2006</b>	Confidential	8,626,903	<b>45.6%</b>
	Telenor	<b>1.2006</b>	Confidential		<b>31%</b>
	Vip mobile	<b>1.2006</b>	Confidential		<b>23.2%</b>
SE	Telia Company	<b>0.6566</b>	5,237,111	14,456,486	<b>36.23%</b>
	Tele2	<b>0.6566</b>	4,027,608		<b>27.86%</b>
	Telenor	<b>0.6566</b>	2,661,659		<b>18.41%</b>
	Hi3G	<b>0.6566</b>	1,954,723		<b>13.52%</b>
SI	Telekom Slovenije	<b>1.14</b>	Confidential	Confidential	<b>46.76%</b>
	A1 Slovenija	<b>1.14</b>	Confidential		<b>29.25%</b>
	Telemach	<b>1.14</b>	Confidential		<b>19.30%</b>
	T-2	<b>1.14</b>	Confidential		<b>4.69%</b>
SK	Orange Slovensko, a.s.	<b>1.226</b>	Confidential	6,137,760	<b>Confidential</b>
	Slovak Telekom, a.s.	<b>1.226</b>	Confidential		<b>Confidential</b>
	O2 Slovakia, s.r.o.	<b>1.226</b>	Confidential		<b>Confidential</b>
	Swan Mobile a.s.	<b>1.226</b>	Confidential		<b>Confidential</b>
TR	Turkcell	<b>0.5582</b>	32,004,180	73,049,541	<b>43.81%</b>

	Vodafone	0.5761	22,972,222		31.45%
	Avea	0.6609	18,073,139		24.74%
UK	EE	0.5579	Confidential	65,754,792	Confidential
	Telefonica	0.5579	Confidential		Confidential
	Vodafone	0.5579	Confidential		Confidential
	H3G	0.5579	Confidential		Confidential

### Notes to Table 6

**AL:** The reported data for subscribers are as of 01.01.2018.

**AT:** Latest data available for number of subscribers: end of September 2017.

**BE:** Country total subscribers as of 1/1/2018 ( m2m and data-only simcards excluded )  
. MVNO includes light and full MVNO

**BG, CH, :** Number of subscribers as of 31.12.2017.

**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 30.6.2017 is available as the latest information.

**DE:** Current MTR are valid from 01.12.2016 until 30.11.2019.

The number of subscribers by operator are data published by operators and are not subject to the definition specified in this report. Data are as of Q4 2017.

The total number of subscribers and the total number of M2M SIM Cards correspond with the definition in this report but are not available by individual operator.

**DK:** Total Subscribers is derived as of ultimo H12017. We also regulate MVNO Mundio Mobile but do not have information regarding number of subscribers. Mundio Mobile faces the same MTR as all the other operators.

**EL:** The rates are derived from the model that EETT has developed during 2012. Following EC's comment on the 2017 EETT's notification of Market 2, EETT will update as soon as possible the 2012 pure LRIC bottom-up model and will adapt the MTRs accordingly. As far as the subscriptions are concerned, please note that data refer to 30.09.2017.

**ES:** Volumes as of 30.06.2017.

**FI:** Market shares as of 30.6.2017. FICORA issued new decisions concerning significant market power in the mobile voice call termination markets on 10.08.2015. FICORA has, for the first time, set a cost-oriented maximum price for MTRs. The MTR 1.25 came into effect on 01.12.2015. The cost-oriented maximum price for MTRs has been calculated based on FDC approach. Some of the operators have appealed to Supreme Administrative Court and the process is still going on.

**FR:** see <https://www.arcep.fr/index.php?id=13858>

**HR:** Data for Q3 2017. 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.

**HU:** Subscriber numbers as 01.01.2016

**IE:** market share data for Ireland/ComReg updated as of 31.12.17. Irish MTR as of 01.01.18. Some operators, Virgin Mobile and ID Mobile, are not currently subject to MTR regulation.

**IS:** Subscriber data for end of year not yet available, use 30.06.2017. MTR is set by benchmark against BU-LRIC for one year at a time.



**IT:** Please, note that subscribers and M2M SIM cards refer to September 2017, because more recent data are not available at the moment.

**LT:** Subscriber base as of 31.12.2017, M2M SIM cards included.

**LU:** data as of 31.12.2017. Règlement ILR/T17/4 du 09.06.2017 portant fixation du plafond tarifaire pour les prestations de la terminaison d'appel vocal sur les réseaux mobiles individuels (07.03.2007). Price cap based on Pure-LRIC.

**ME:** Currently SMP operators have applied MTR based on TD LRIC methodology and cost model.

**MT:** Data reflects as at Q3 2017.

**NL:** During the previous period, VodafoneZiggo had 1,290 million M2M SIM Cards. As a result of the joint venture, and therefore the integration of their reporting systems, VodafoneZiggo is not able to report all M2M subscriptions. Therefore, ACM does not yet have any updated figures.

**NO:** Number of subscribers are provided per 30.06.2017. The total number of subscribers per 01.01.2018 will be available in Q2 2018. The latest decision is dated 27.11.2017 with new tariffs applied from 01.03.2018. From 01.01.2018 to 28.02.2018 the tariff was 6.5 Norwegian øre (NOK 0.065).

**PL:** Data as of 31.12.2016

**PT:** The number of subscribers is according to the definition and it only considers users that have effectively used the service in the last 30 days.

**RO:** Data as of 01.01.2018 is provisional.

**RS:** Number of subscribers are as of 31.12.2017 and these numbers are collected by using ITU indicator i271 which excludes data cards, USB modems and M2M. It includes the number of postpaid subscriptions, and the number of active prepaid accounts (i.e. that have been used during the last three months). 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 represents national MTR which is subject of regulation.

**SK:** M2M are excluded from the number of mobile subscribers.

**UK:** Ofcom is planning on publishing a statement setting new MTRs in Q1 2018.

## Annex 6 Regulatory model implemented to calculate MTRs

Table 7

Jan 18	COST ACCOUNTING MODEL	GLIDE PATH in €cent	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 01/01/2018 until 30/06/2018	Period 2 - From 01/07/2018 until 31/12/2018	Period 3 - From 01/01/2019 until 30/06/2019	Period 4 - From 01/07/2019 until 31/12/2019	Period 5 - From 01/02/2020 until 31/06/2020
	Model	Rate status						
AL	Benchmark BU-LRIC	adopted	01.12.2014	1.1088				
AT	Pure BU-LRIC	adopted		0.8049	0.8049	0.8049	0.8049	
BE	Pure BU-LRIC	adopted	01.01.2013	0.9900	0.9900	0.9900	0.9900	0.9900
BG	Pure BU-LRIC	adopted	01.12.2016	0.7158	0.7158	0.7158	0.7158	0.7158
CH		not regulated						
CY	Benchmark BU-LRIC	adopted		0.9900	0.9900	0.9900		
CZ	Pure BU-LRIC	adopted	01.07.2013	0.9669				
DE	Pure BU-LRIC	adopted	01.12.2016	1.0700	1.0700	0.9500	0.9500	
DK	Pure BU-LRIC	adopted	01.01.2013	0.6006	0.6006			
EE	Benchmark BU-LRIC	adopted	26.05.2016	0.8900				
EL	Pure BU-LRIC	adopted	01.01.2013	0.9580	0.9580	0.9460	0.9460	0.9460
ES	Pure BU-LRIC	adopted	05.10.2012	0.7000	0.7000	0.6700	0.6700	0.6400
FI	other (FDC/FAC)	adopted		1.2500	1.2500			
FR	Pure BU-LRIC	adopted	01.01.2013	0.7400				
HR	Pure BU-LRIC	Notified (to Commission)		0.6239				
HU	Pure BU-LRIC	adopted	01.04.2015	0.5488	0.5488	0.5488		
IE	Pure BU-LRIC	adopted	01.09.2016	0.8200	0.7900			
IS	Benchmark BU-LRIC	notified		0.7855	0.7855			

<b>IT</b>	Pure BU-LRIC	national consultation	01.07.2013	0.9800	0.9800	0.9500	0.9500	0.9200
<b>LI</b>	Benchmarking	adopted		2.4953				
<b>LT</b>	Benchmark BU-LRIC	adopted	01.04.2016	0.9400				
<b>LU</b>	Pure BU-LRIC	adopted	09.06.2017	0.8900	0.8900	0.8900	0.8900	
<b>LV</b>	Benchmark BU-LRIC	adopted	26.04.2017	0.8868	0.8868	0.8868	0.8868	0.8868
<b>ME</b>	TD LRIC	adopted		1.0600				
<b>FYROM</b>	TD LRIC	adopted	01.12.2016	1.0249	1.0249	1.0249	1.0249	1.0249
<b>MT</b>	Pure BU-LRIC	adopted	10.04.2014	0.4045	0.4045			
<b>NL</b>	Pure BU-LRIC	adopted	12.07.2017	0.5810	0.5810	0.5810	0.5810	0.5810
<b>NO</b>	Pure BU-LRIC	adopted	01.07.2015	0.562	0.562	0.448	0.448	0.333
<b>PL</b>	Pure BU-LRIC	adopted	01.07.2013	1.0137	1.0137	1.0137	1.0137	1.0137
<b>PT</b>	Pure BU-LRIC	adopted	31.12.2012	0.7500	0.4300			
<b>RO</b>	Pure BU-LRIC	adopted	01.04.2014	0.9600	0.8400			
<b>RS</b>	Benchmarking			1.2006				
<b>SE</b>	Pure BU-LRIC	adopted	01.07.2013	0.6566	0.5963	0.5963		
<b>SI</b>	Pure BU-LRIC	adopted	01.09.2014	1.1400	1.1400	1.1400	1.1400	1.1400
<b>SK</b>	Pure BU-LRIC	adopted	01.08.2013	1.2260				
<b>TR</b>	Confidential							
<b>UK</b>	Pure BU-LRIC	adopted <sup>11</sup>	01.04.2013	0.5579	0.5579	0.5274	0.5274	0.4880

<sup>11</sup> Adoption (until 30.06.2018) / national consultation (from 01.07.2018)

**Notes to Table 7**

**AL:** The reported MTRs for Telekom Albania, Vodafone Albania and Albtelecom have been applied since 01.12.2014. The rate was calculated by AKEP using benchmarking methodology in 2014: the simple average of MTRs in BEREC countries that had applied pure BULRIC cost model until end year 2013. AKEP's decisions regarding the MTR of Plus Communication applicable from 01.04.2015 onward (glide path to reach the MTR of the other 3 MNOs i.e. symmetrical rates, by 01.04.2016) are under several court proceedings and at different stages of court appeals. The reported MTR for Plus Communication applicable from 01.01.2017 is based on the clarification issued by the Administrative Court on 18.01.2017 regarding its decision on 31.10.2016, which revoked AKEP decision to set the MTR of Plus Communication symmetrical to the MTR of the other 3 MNOs starting from 01.04.2016. These decisions of the Administrative Court are currently under appeal to the Administrative Court of Appeal.

A new market analysis for mobile call termination is currently under public consultation. The reported data for subscribers are as of 01.01.2018.

**BG:** With Decision 585 from 24.11.2016 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 2018.

**DE:** Deviating from the specified regulation periods, MTR are valid for the following BNetzA regulation periods:

01.12.2017 until 30.11.2018: 1.07 Eurocent/Minute

01.12.2018 until 30.11.2019: 0.95 Eurocent/Minute

The number of subscribers are as of Q4 2017.

**DK:** The DBA issues MTR ultimo any year for the entire following year. Hence, the MTR after 2018 is undecided.

**EL:** The rates included in the table above are derived from the model that EETT has developed during 2012. Following EC's comment on the 2017 EETT's notification of Market 2, EETT will update as soon as possible the 2012 pure LRIC bottom-up model and will adapt the MTRs accordingly.

**FI:** FICORA issued new decisions concerning significant market power in the mobile voice call termination markets on 10.08.2015. FICORA has, for the first time, set a cost-oriented maximum price for MTRs. The MTR 1.25 came into effect on 01.12.2015. The cost-oriented maximum price for MTRs has been calculated based on FDC approach. Some of the operators have appealed to Supreme Administrative Court and the process is still going on.

**HR:** 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.

**IS:** Benchmark against BU-LRIC made in autumn 2017 for validity in 2018. Notified 01.10.2017 to ESA and ratified 01.11.2017

**LI:** Market analysis M7 and MTR decisions are available on: <https://www.llv.li/#/111026/m>

Last step of glide path, effective since 01.01.2013: 0.0765 CHF/min (cap)

Benchmarking method: The weighted average of the termination rates in Switzerland, 0.0765 CHF per minute as of 01.01.2011, 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 01.06.2017 is 2.9 CHF-cents per minute.

Effective MTR as of 01.05.2016 is 3.9 CHF-cents per minute"

**LV:** SPRK does not apply 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 as at Q3 2017

**NO:** The latest decision is dated 27.11.2017 with new tariffs applied from 01.03.2018. From 01.01.2018 to 28.02.2018 the tariff was 6,5 Norwegian øre (NOK 0,065).

**PT:** A new market analysis is currently under national discussion also involving the update of the pure LRIC cost model. In this regard a new MTR is being considered – 0.43 eurocents/minute.

**RO:** Proposed transitory MTR 0.84eurocents/min, starting 01.05.2018, 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.

**SE:** MTR for period 4 and 5 above will be decided later.

**SK:** MTR price draft decision was withdrawn and RU is preparing new market analysis and SMP decision.

**TR:** The MTR values effective from the date 01.07.2013 are close to the values calculated in cost model for the mobile operator of highest market share. For the other two mobile operators a constant asymmetric regulation ratio is applied with respect to the operator having highest market share. Moreover, ICTA does not regulate MTRs via glidepath, in general MTRs are revised annually when necessary.

**UK:** Future rates are dependent on the level of inflation. For the above we have assumed an inflation rate of 2% per annum from 2012/13 to 2017/18. All prices are nominal.

Ofcom is planning on publishing a statement in Q1 2018 which will set a new charge control for MTRs for the next three years. The above values are from the 2017 consultation (<https://www.ofcom.org.uk/consultations-and-statements/category-1/mobile-call-termination-market-review>). Rates were first set at pure BU LRIC in 01.04.2014 having been set in the March 2011 Statement on a four-year glidepath to LRIC.

## 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>FYROM</b>	the former Yugoslav Republic of 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>UK</b>	United Kingdom

Table 9 – Exchange Rates<sup>12</sup>

<b>COUNTRY</b>	<b>1 EURO</b>
<b>AL</b>	<b>133.4719</b>
<b>BG</b>	<b>1.9558</b>
<b>CH</b>	<b>1.1622</b>
<b>CZ</b>	<b>25.6500</b>
<b>DK</b>	<b>7.4427</b>
<b>HR</b>	<b>7.5327</b>
<b>HU</b>	<b>3.1160</b>
<b>IS</b>	<b>123.4867</b>
<b>LI</b>	<b>1.1622</b>
<b>FYROM</b>	<b>61.468</b>
<b>NO</b>	<b>9.6049</b>
<b>PL</b>	<b>4.2322</b>
<b>RO</b>	<b>4.6189</b>
<b>RS</b>	<b>119.1071</b>
<b>SE</b>	<b>9.7930</b>
<b>TR</b>	<b>4.4787</b>
<b>UK</b>	<b>0.8873</b>

<sup>12</sup> ECB website (<https://sdw.ecb.europa.eu/browse.do?node=9691296>) except for:

- AL at [https://www.bankofalbania.org/Markets/Official\\_exchange\\_rate/](https://www.bankofalbania.org/Markets/Official_exchange_rate/)
- IS at <https://www.cb.is/statistics/official-exchange-rate/>
- FYROM at [http://www.nbrm.mk/kursna\\_lista-en.nsp](http://www.nbrm.mk/kursna_lista-en.nsp)
- RS at [http://nbs.rs/export/sites/default/internet/english/scripts/kl\\_period.html/](http://nbs.rs/export/sites/default/internet/english/scripts/kl_period.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