

# **Termination rates at European level**

**July 2016**

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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 July 2016, referring – if not differently indicated – to data as of 1st July 2016. It includes rates from the thirty seven (37) NRAs<sup>1</sup> that provided responses to our request.

As of July 2016, this is the situation regarding TRs in Europe:

- The lowest regulated FTR simple average of incumbents at the European level (all 37 countries) stands at 0.3828 eurocents per minute.
- The lowest FTR simple average of European Union incumbents stands at 0.2355 eurocents per minute.

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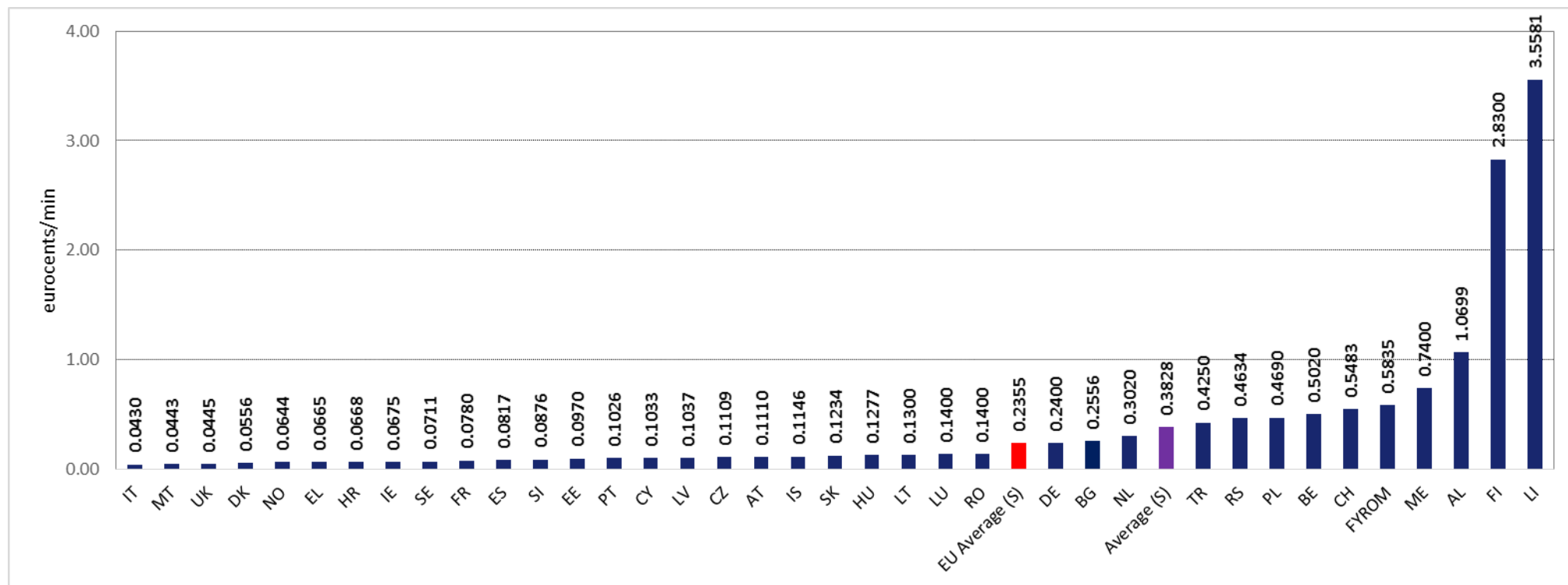
<sup>1</sup> 28 EU member states plus 4 EFTA states (Switzerland, Iceland, Norway and Liechtenstein) and 5 candidate states Albania, Montenegro, FYROM, Serbia and Turkey.

- The MTR simple average (A(s)) at the European level (all 37 countries) stands at 1.27 eurocents per minute, whereas the weighted average (A(w)) at European level is estimated at 1.14 eurocents per minute.
- The MTR A(s) at the EU level (only EU member states) stands at 1.04 eurocents per minute, whereas A(w) at EU level is estimated at 1.08 eurocents per minute.
- The SMS TR A(s) at the European level is 2.49 eurocents per SMS, whereas A(w) is reported to be 2.20 eurocents per SMS.
- Since not all EU member states report their SMS TR, no averages at the EU level could be calculated.

For non-euro countries, the average exchange rate for the second quarter of the year (Q2 2016) was used for the calculation of MTRs and SMS TRs. The exchange rates used are reported in [Annex 10](#) .

## Overview of incumbents' lowest<sup>23</sup> regulated fixed termination rates per country – July 2016 (Euro cents per minute of service)

Figure 1 FTRs

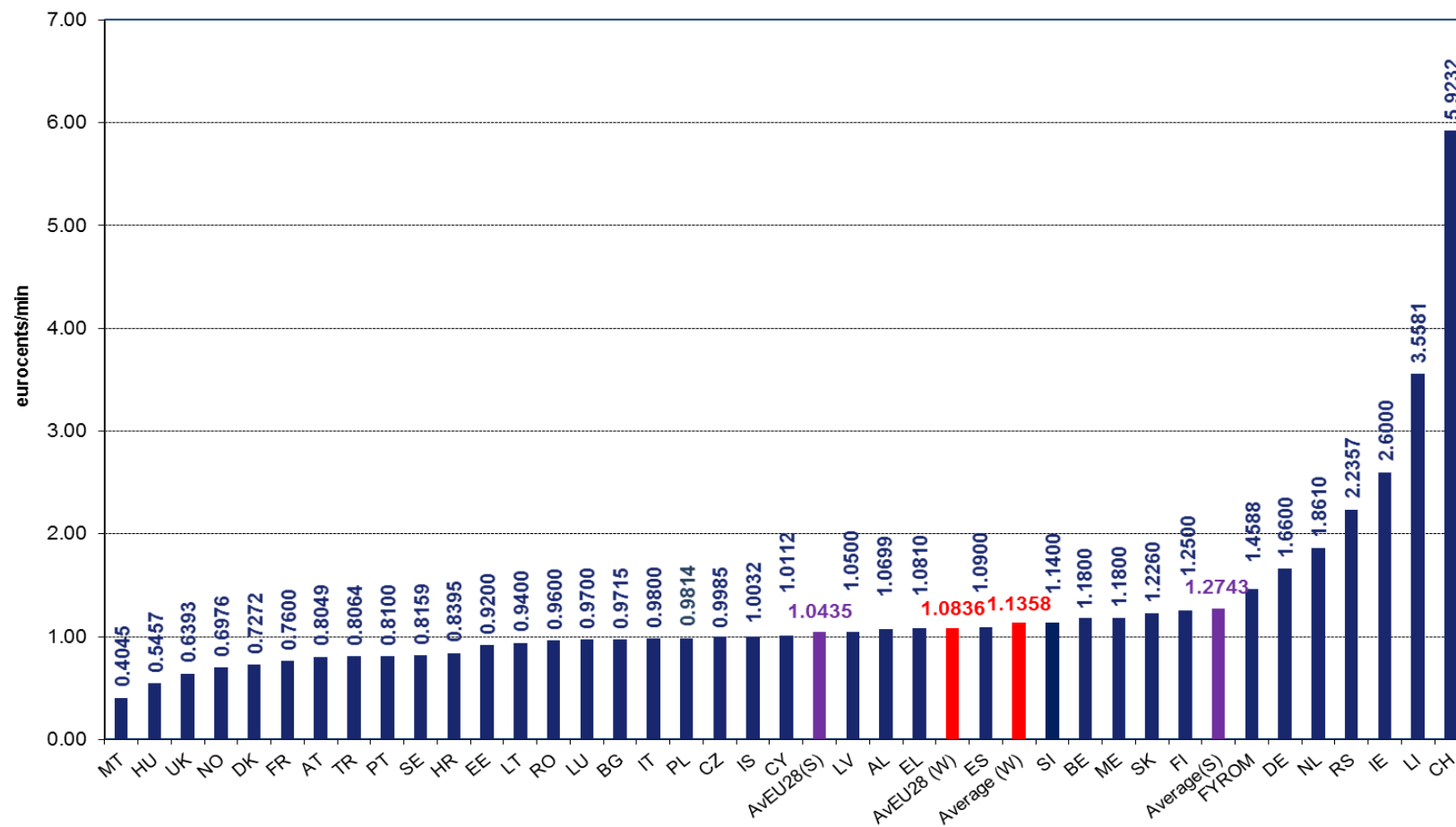


<sup>2</sup> The lowest regulated rate of the incumbent. In case the operator uses only one rate, it is considered as a single rate.

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

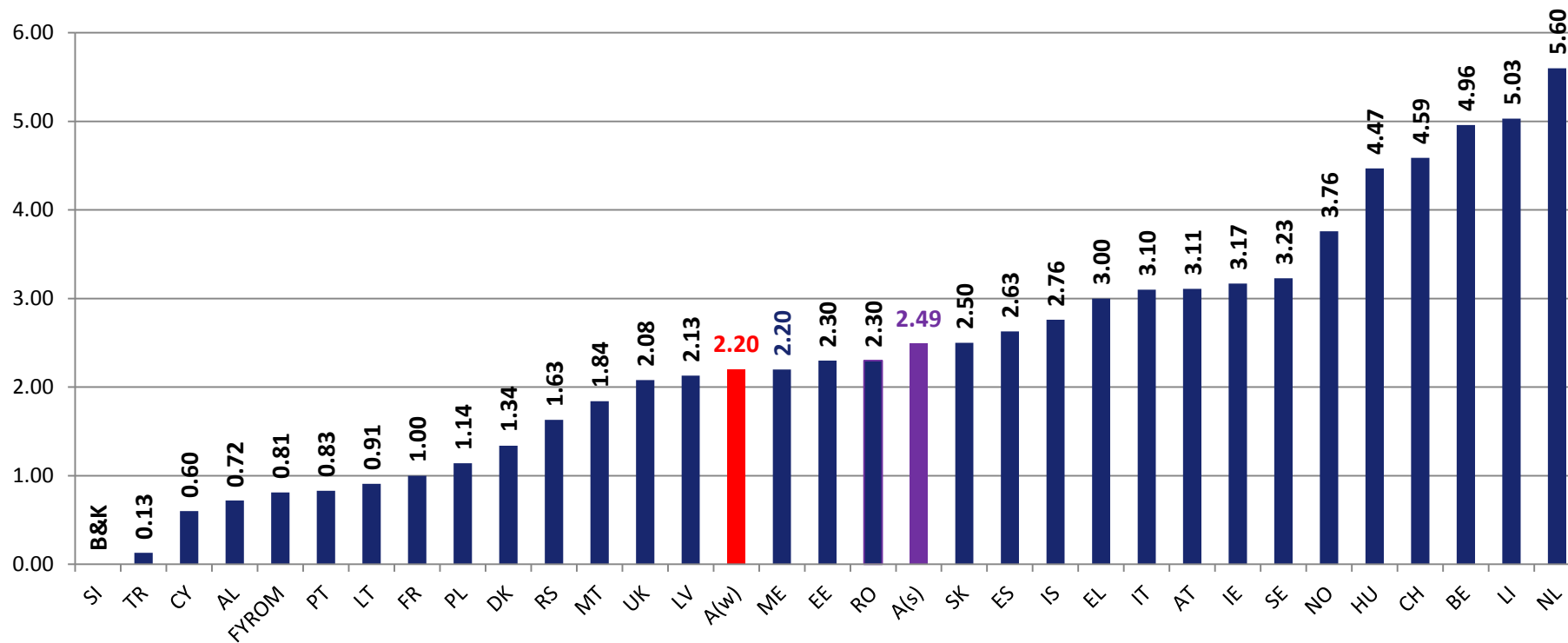
## MTR per country – July 2016 (Euro cents per minute of service)

Figure 2 MTR



## SMS TR per country – July 2016 (Euro cent per message)

Figure 3 SMS TR



## 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>4</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.

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<sup>4</sup> Layer 1 is defined as the closest possible interconnection level to the network termination point.



- 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

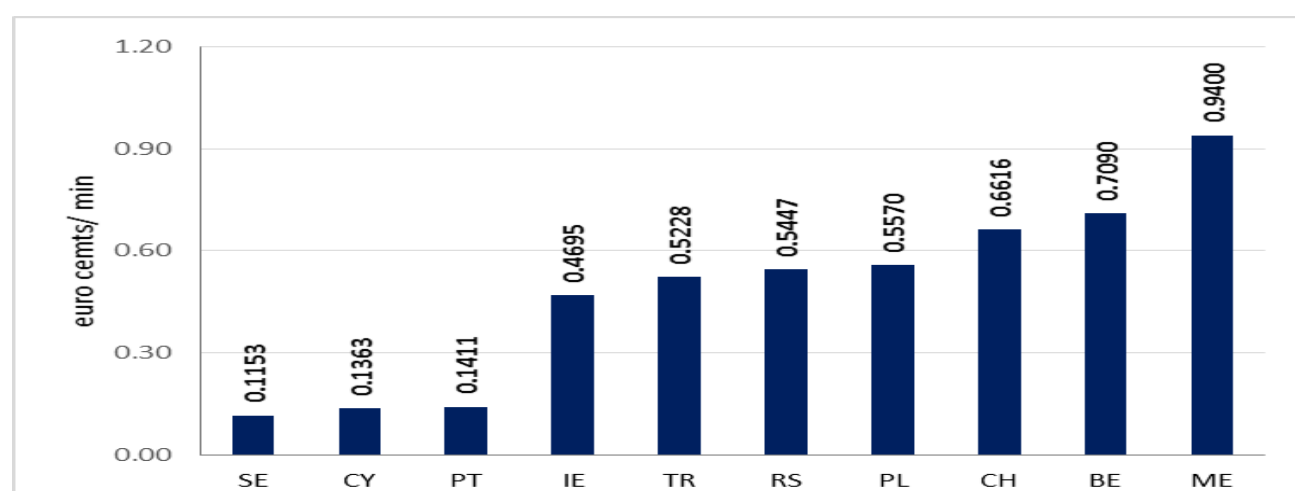
In Annex 1 the interconnection prices of operators listed by countries are presented. For each country, the NRA has provided information on the incumbent and some alternative or cable operators offering interconnection services. In the last column a weighted average of peak/off-peak prices is provided.

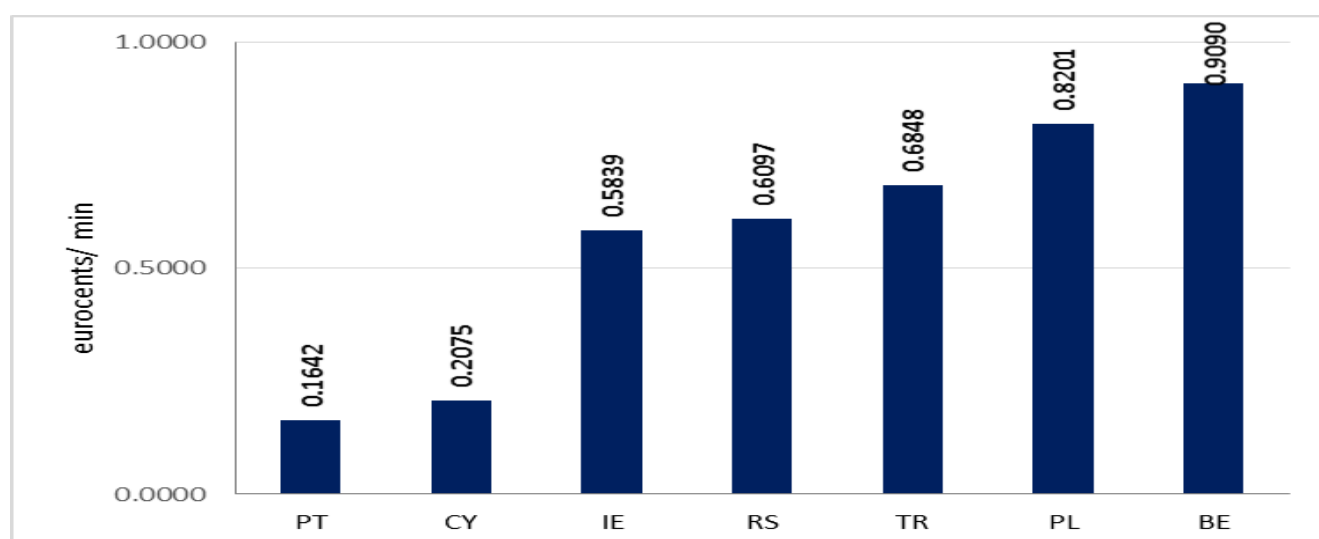
The lowest regulated rate is the rate applied by the operator at the level of interconnection that is closest to the network termination point. The second and third lowest regulated rates apply only to operators that have more than one regulated rate/interconnection layer.

### 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 4 Incumbents' second lowest regulated fixed termination rate per country**



**Figure 5 Incumbents' third lowest regulated fixed termination rate per country**

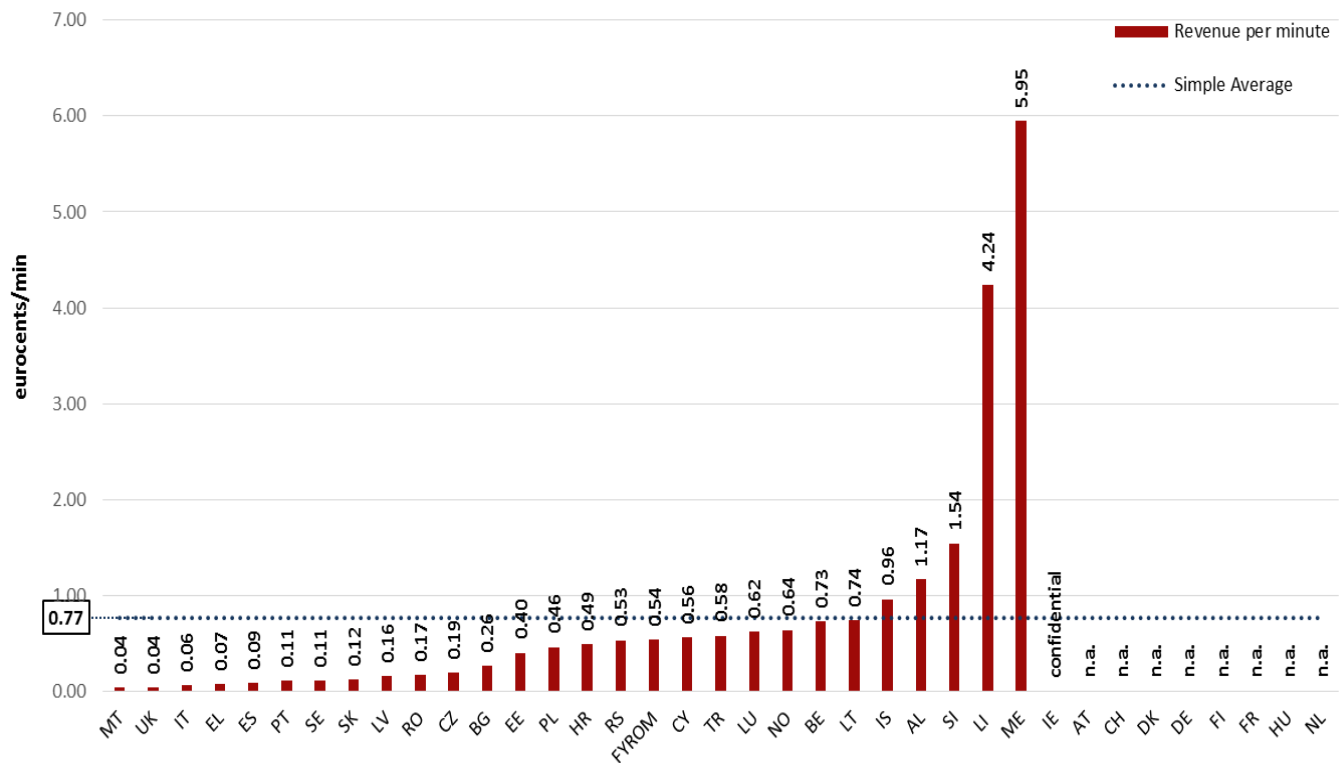
### 2.3. Average fixed termination revenue per minute per country

In the next graph (Figure 6) the average revenue per minute from interconnection services across all Layers and for all operators is reported, together with the simple average (horizontal line). The data refer to the entire year of 2015, unless otherwise stated in the notes. Note that the average revenues per minute provided are aggregated for each country to: 1) the different existing layers of interconnection, 2) the different operators (i.e., incumbents and the rest), and 3) the different prices deriving from the peak /off-peak differentiation in a number of countries.

The comparison across countries of this average revenue per minute has limitations, since each country may have a different distribution in usage across the different layers of interconnection and in the distribution between peak and off-peak traffic.

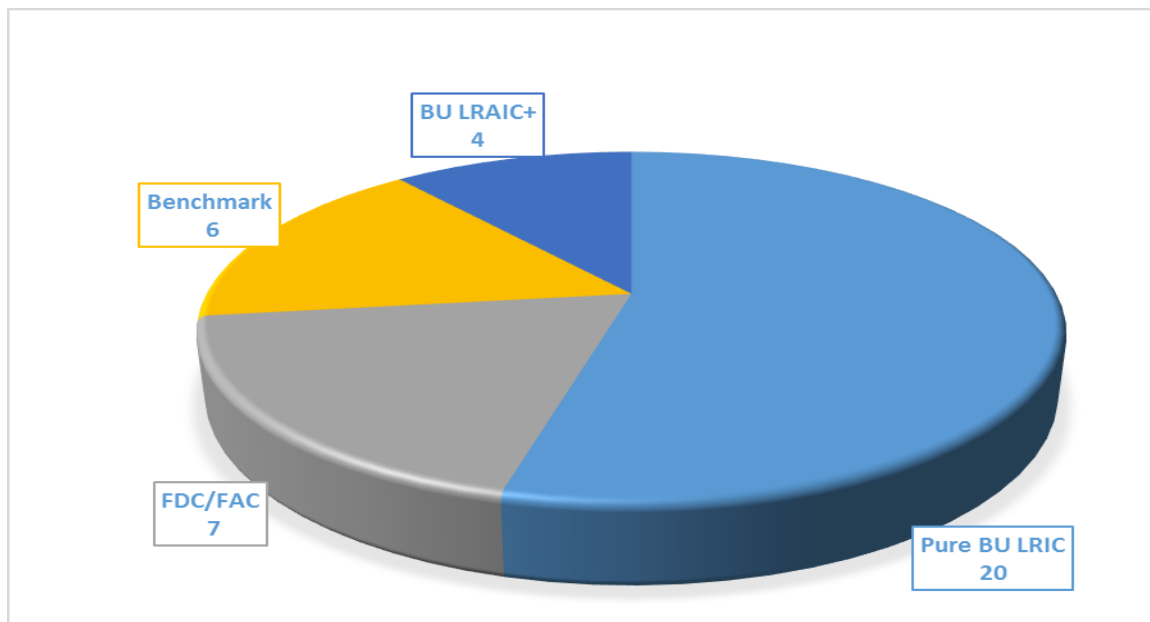
For more details please consult [Annex 2](#).

Figure 6 Average wholesale termination revenues per country (eurocent/min)



## 2.4. FTR regulatory model implemented and symmetry overview

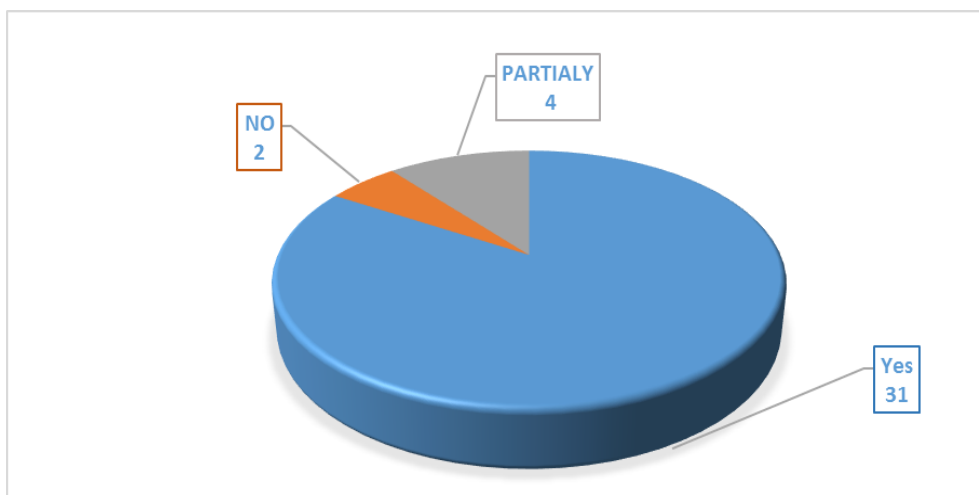
20 of the NRAs use Pure BULRIC models to set FTRs. The second most common model is FDC/FAC, used by 7 NRAs. 4 NRAs reported using LRAIC+ models and 6 NRAs use Benchmarking approaches consistent with the EC's TRs Recommendation.

**Figure 7 Cost accounting models used by NRAs**

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

The European Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Rates in the EU 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 case of 20 NRAs using Pure BU LRIC models and another 6 NRAs using benchmarking as an alternative methodology not exceeding the average of the termination rates set by NRAs implementing the recommended cost methodology (Benchmarking based on PURE BU-LRIC).

Furthermore, in most of the respondent countries (31), FTRs are symmetric across all operators. 4 of the NRAs reported partial symmetry while prices are not symmetric only in 2 of the reporting countries.

**Figure 8 FTRs Symmetry**

For more information consult [Annex 4](#).

## 2.5. Number of lines and market shares

In [Annex 5](#) 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 July 2016 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>5</sup>

The present overview of MTRs is based upon the results of a request for information sent to all NRAs in July 2016. 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>6</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 Euro cent/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).

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<sup>5</sup> See Annex 8 – Table 8

<sup>6</sup> Generally speaking, these assumptions may create margins of error in the present comparison, making it difficult to draw valid conclusions for policy purposes.

- 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).
- VAT is not included in the revenues.
- For non-Euro countries, the average exchange rate for the fourth quarter of the year (Q2 2016) was used to convert the currencies. The exchange rates used are reported in Annex 10.

Regarding the short-term MTR evolution (from January 2016 to July 2016), some variation may be a consequence of any of the following reasons:

- Modifications in the tariff structure (for instance, disappearance of the set-up charge or initial period);
- Currency exchange rate variations in non-Euro countries<sup>7</sup>;
- 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;
- Inclusion of new operators that were not present in the previous benchmarks;

### 3.2. Average MTR per country: rates per voice minute (as of July 2016)

**Table 1 - Average MTR per country<sup>8</sup>**

	Average MTR per country (€cent)
AL	1.0699
AT	0.8049
BE	1.1800
BG	0.9715
CH	5.9232
CY	1.0112
CZ	0.9985
DE	1.6600
DK	0.7272
EE	0.9200

<sup>7</sup> This only affects short-term MTR evolution (figure 13) because the percentage of tariff variation in each country (figure 14) has been calculated by comparing rates expressed in terms of the national currency.

<sup>8</sup> For comparison: the averages excluding Albania would be: Average(W) 1.1313, average(S) 1.2800

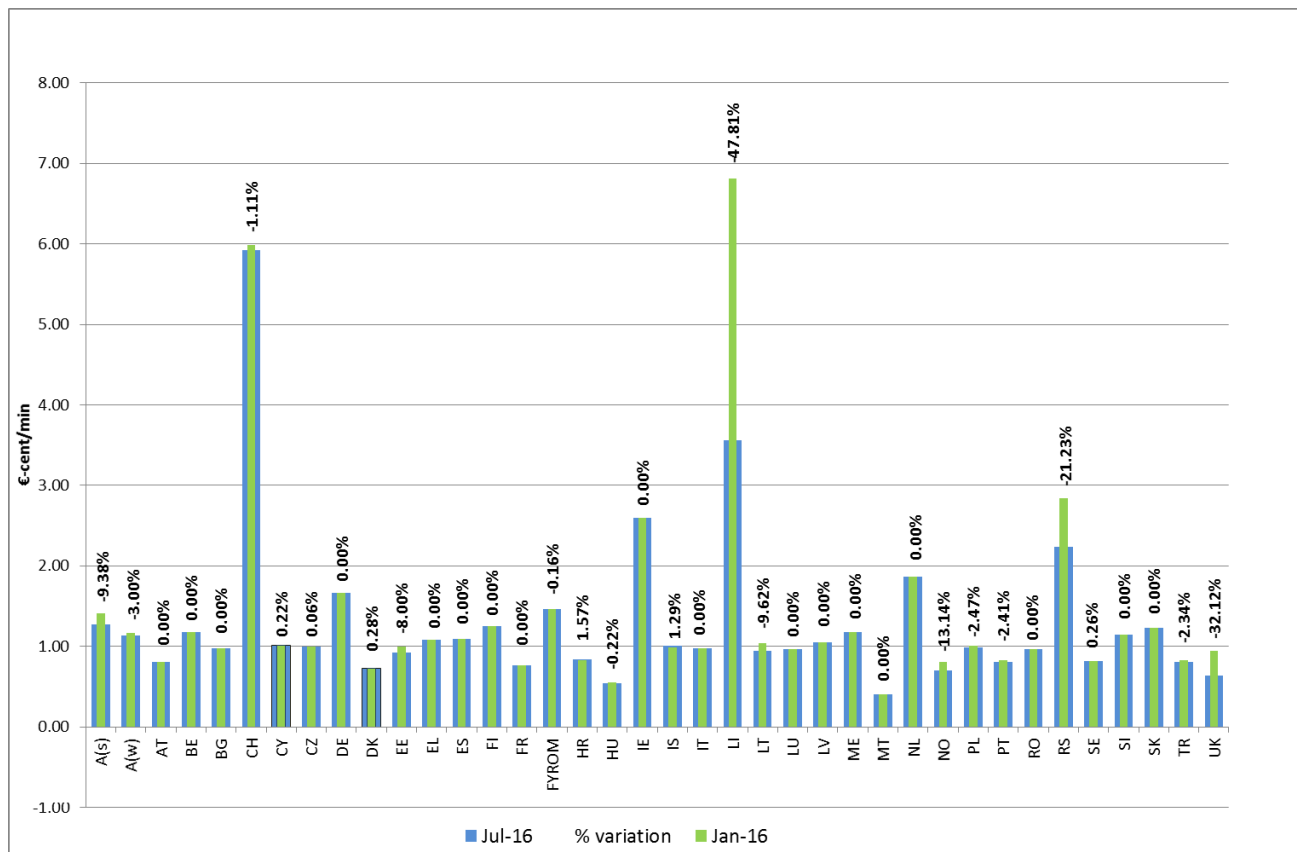
EL	1.0810
ES	1.0900
FI	1.2500
FR	0.7600
HR	0.8395
HU	0.5457
IE	2.6000
IS	1.0032
IT	0.9800
LI	3.5581
LT	0.9400
LU	0.9700
LV	1.0500
ME	1.1800
FYROM	1.4588
MT	0.4045
NL	1.8610
NO	0.6976
PL	0.9814
PT	0.8100
RO	0.9600
RS	2.2357
SE	0.8159
SI	1.1400
SK	1.2260
TR	0.8064
UK	0.6393
<b>Average(S)</b>	<b>1.2743</b>
<b>Average (W)</b>	<b>1.1358</b>
<b>AverageEU28(S)</b>	<b>1.0435</b>
<b>AverageEU28 (W)</b>	<b>1.0836</b>

Figures 9 and 10 show the short term variations of MTRs in Euro cent and in national currency. These two figures illustrate the effect of the exchange rate on the short term evolution.



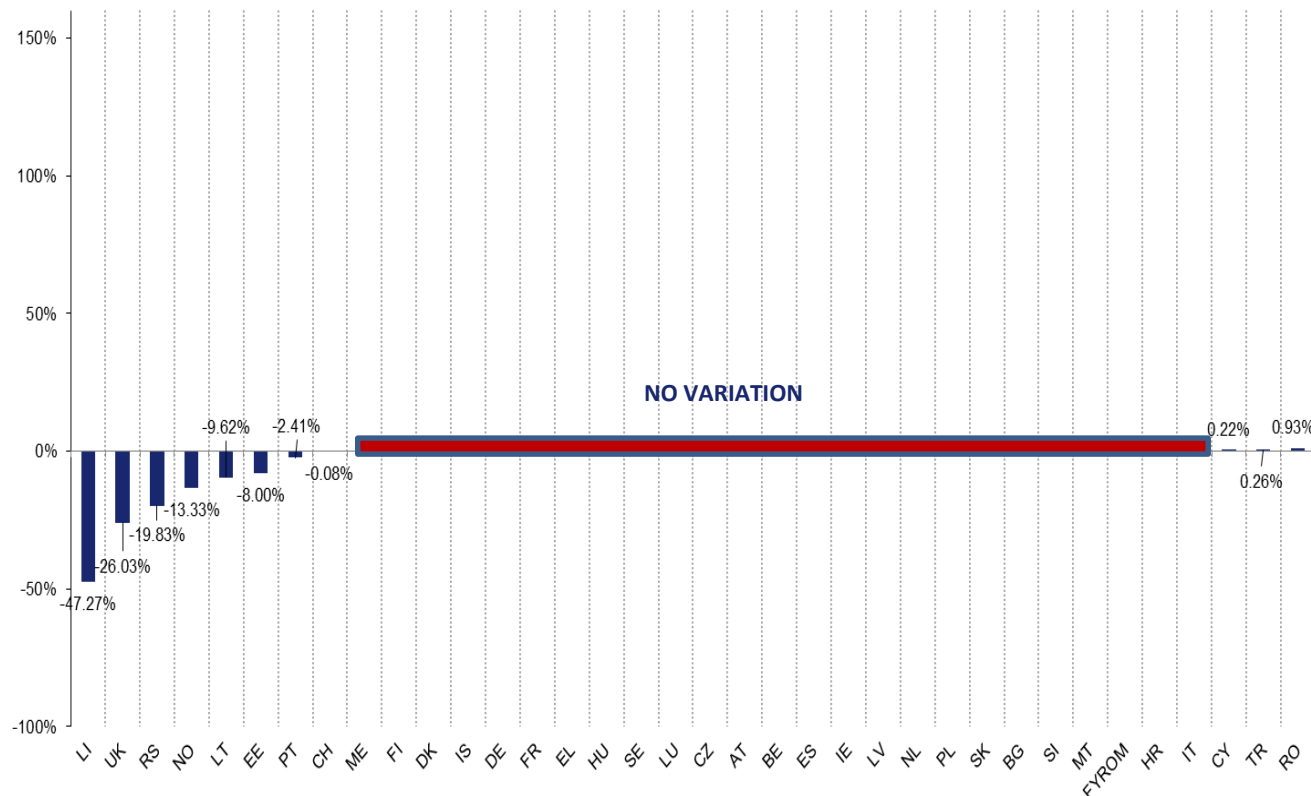
## Variation of MTRs per country (from January 2016 to July 2016)

Figure 9 Variation in Euro cent and %



## Percentage variation of average MTRs in national currency per country (from January 2016 to July 2016)

Figure 10 Variation in national currency (%)



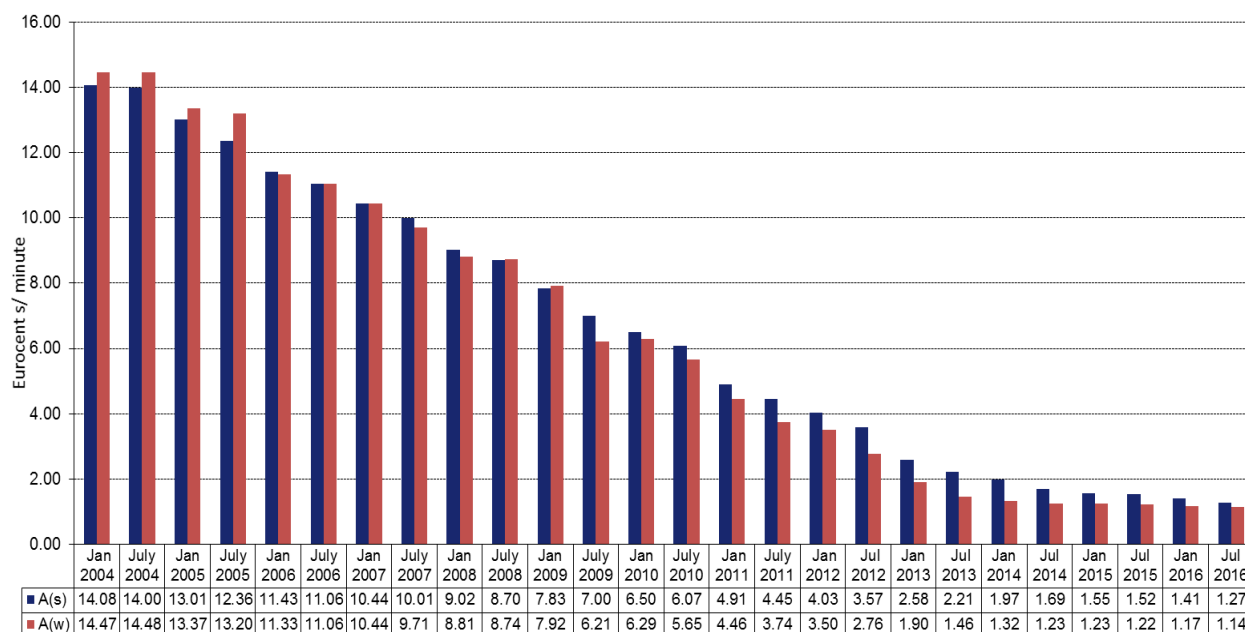
### 3.3. Average MTR per operator

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 6](#) .

### 3.4. Average MTR: Times series of simple average and weighted average at European level

Figure 11 Evolution of simple A(s) and weighted A(w) averages



**Note to figure 11:** 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 12 and 13 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 90% since January 2004, from 14.08 euro cents to 1.27 euro cents in July 2016. When weighted, European MTRs average have declined even more, by around 92 % since 2004.

Figure 12 European MTRs simple average cumulative decline

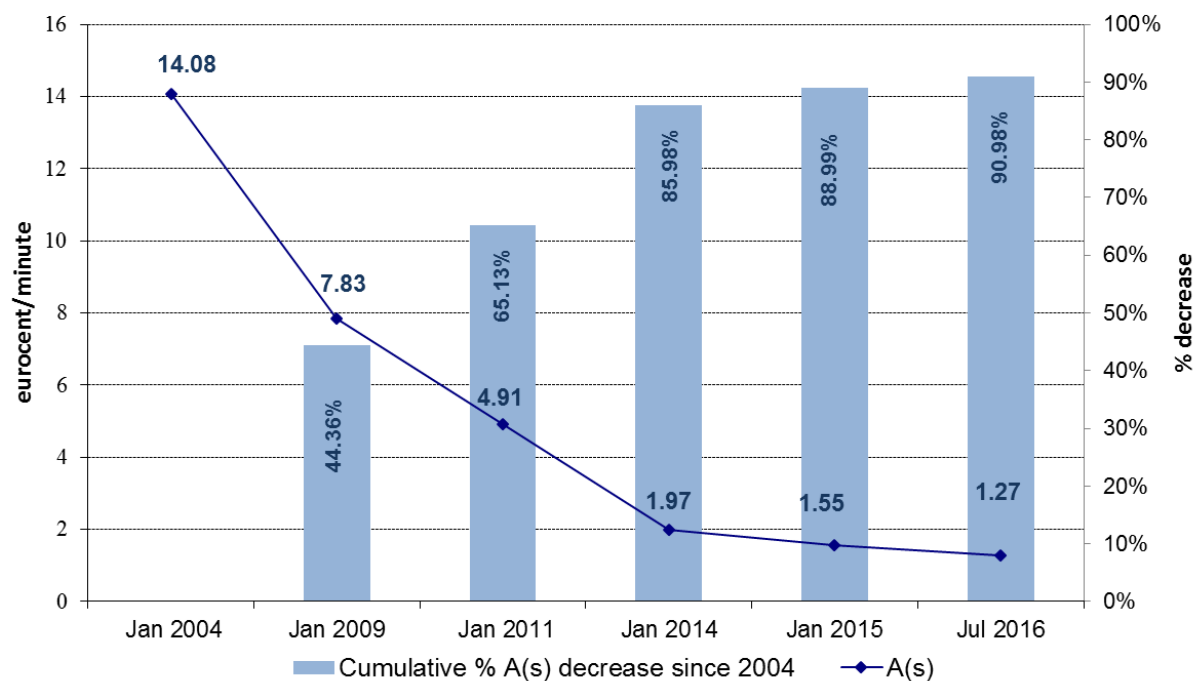
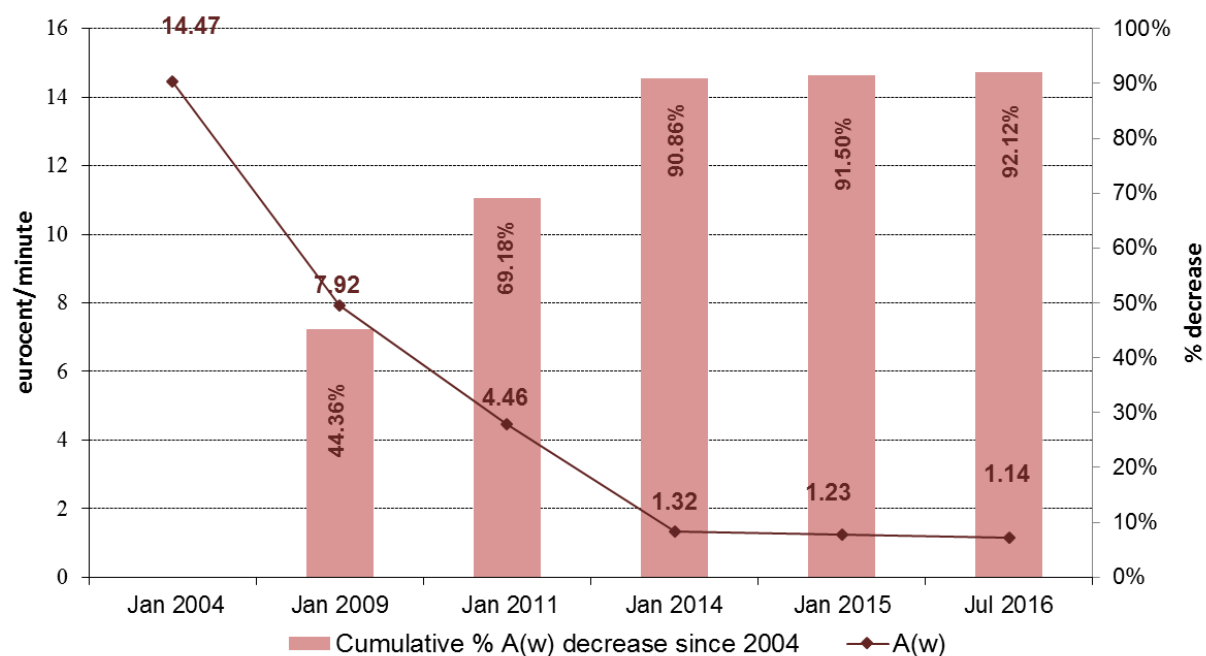


Figure 13 European MTRs weighted average cumulative decline

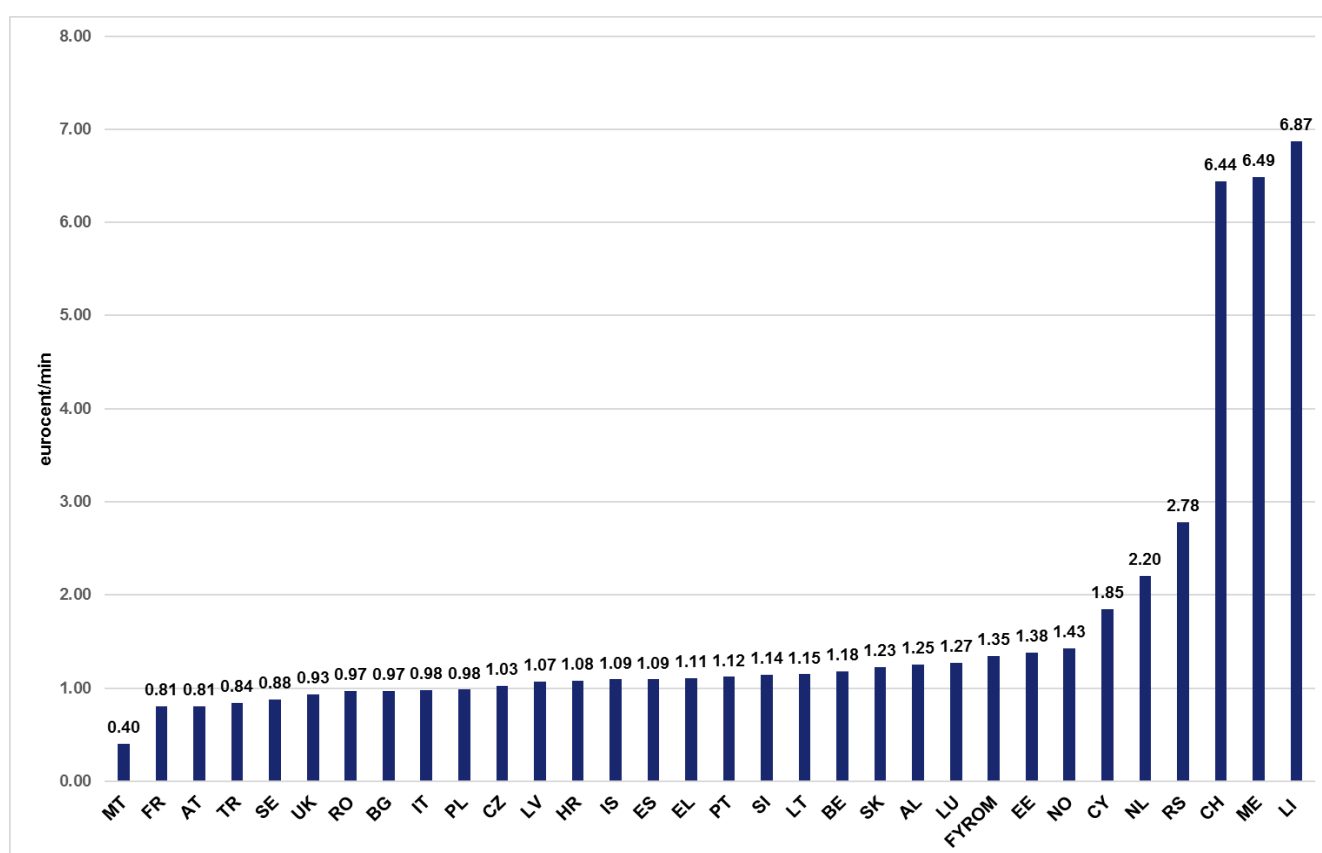


### 3.5. Average mobile termination revenue per minute per country

The average wholesale termination revenue per minute is obtained as a ratio of total revenues from termination of voice services divided by the total number of minutes of termination provided by the operators. The data refer to the entire year of 2015, unless otherwise stated in the notes.

Some countries do not collect information about termination revenues or treat this data as confidential. Those countries are not included in the figure.

**Figure 14 Average wholesale termination revenues per country (euro cent/min)**

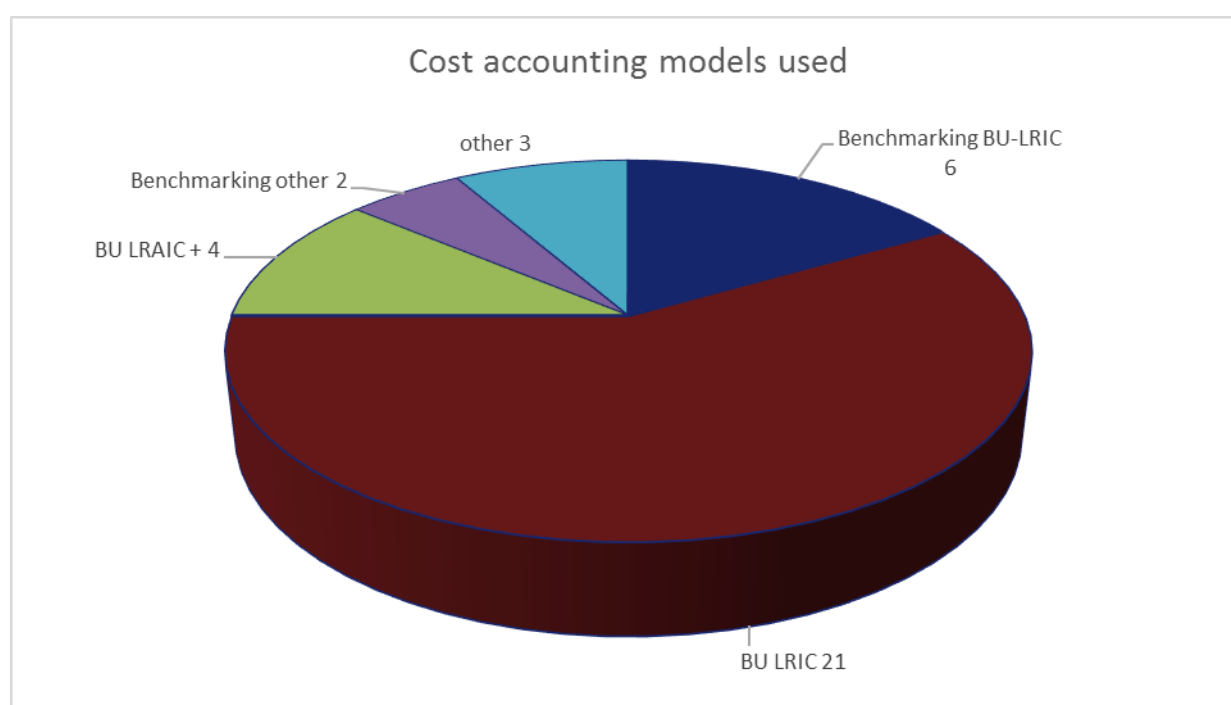


Notes to figure 14 see [Annex 7](#).

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

In the majority of countries BU LRIC models are used to calculate the MTRs. But still a significant number of NRAs base their price decision on a BU LRAIC+ model or benchmarking.

**Figure 15 Cost accounting models used by NRAs**



For further details see [Annex 8](#).

## 4. Mobile networks - SMS interconnection

The short message service (SMS) offered by operators is used every day by millions of people all over the world. This service is not regulated in most EU countries, but the evolution of wholesale SMS termination rates is monitored in most cases by NRAs.

The present SMS benchmark report bases its results on the data provided by NRAs as of July 2016. Thirty-seven (37) countries provided data, but some NRAs – following national law provisions – asked to treat the SMS Termination Rates as confidential information.

The benchmark aims at keeping track of the main trends in wholesale SMS TRs in Europe. The scope of the report is limited to describe termination prices at national level (no international SMS TR are therefore considered<sup>9</sup>).

#### 4.1. Assumptions made for benchmarking

The SMS TRs collected in this report reflect wholesale rates applied among domestic operators for an off-net SMS exchange, excluding VAT. They may diverge from the “average revenue from an SMS at wholesale level”.

In this report individual, i.e. operator specific, SMS TRs are presented, as well as averages calculated for each country as a whole. 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). In some countries, SMS wholesale rates are considered to be confidential information.

The following characteristics of SMS TRs make the collection and comparison of data more straightforward (as compared to the exercise of benchmarking the FTRs and the MTRs):

- No countries differentiate between peak time, off-peak time and weekend hours.
- The price for SMS termination is related to each delivered domestic off-net SMS; therefore, no assumption is necessary about set-up charges or average call durations. Slovenia is the only country where “Bill & Keep” agreements are in place for traffic between all domestic operators.
- Average SMS TRs per country have been obtained by weighting the average TR of each operator by its market share, measured in terms of subscribers. Two general averages at the European level have been calculated: a simple average and a weighted average. The latter weights each country’s average with the share of the country’s subscribers (total subscribers per country / total European subscribers). In the case of the European weighted average, only the countries that reported TRs and the number of subscribers are taken into account. Since not all countries report complete sets of data, the calculated averages might vary slightly.

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<sup>9</sup> International SMS TRs in most European countries are also based on bilateral negotiations among operators, which generally result in higher levels than the domestic rates that are reflected in this report.

On the other hand and due to the generally unregulated environment existing for SMS TRs in most European countries, there is a high degree of bilateral negotiation among operators. Therefore, some peculiarities in setting SMS TRs could emerge and require additional assumptions (as compared to the exercise of benchmarking the FTRs and the MTR):

- In some countries, operators have bilateral contract agreements implying different rates depending on the volume of SMS sent across the two networks. These non-linear relationships imply different average rates depending on the volume of SMS exchanged. In this case, the lowest average rate expected (corresponding to the highest volume of SMS) has been considered.
- Additionally, in some countries, operators will negotiate different SMS TRs vis-à-vis each one of the other operators. In this case, if not differently indicated, a TR simple average is considered.

Due to these considerations, for some countries the benchmarking proposed in this exercise may represent – with different levels of accuracy – the average SMS TR effectively charged for an off-net SMS.

For non-Euro countries, the exchange rates reported in the [Annex 10](#) are used.

For more information consult [Annex 9](#): SMS TR per operator.

## 4.2. Average SMS TR per country and per message (as of July 2016)

Table 2 - Average SMS TR per country<sup>10</sup>

Country	Average SMS TR per country (€cent)
AL	0.73
AT	3.11
BE	4.96
BG	confidential
CH	4.59
CY	0.60
CZ	Confidential
DE	n.a.
DK	1.34
EE	2.30

<sup>10</sup> For comparison: the averages excluding Albania would be: Average(W) 2.22, average(S) 2,55



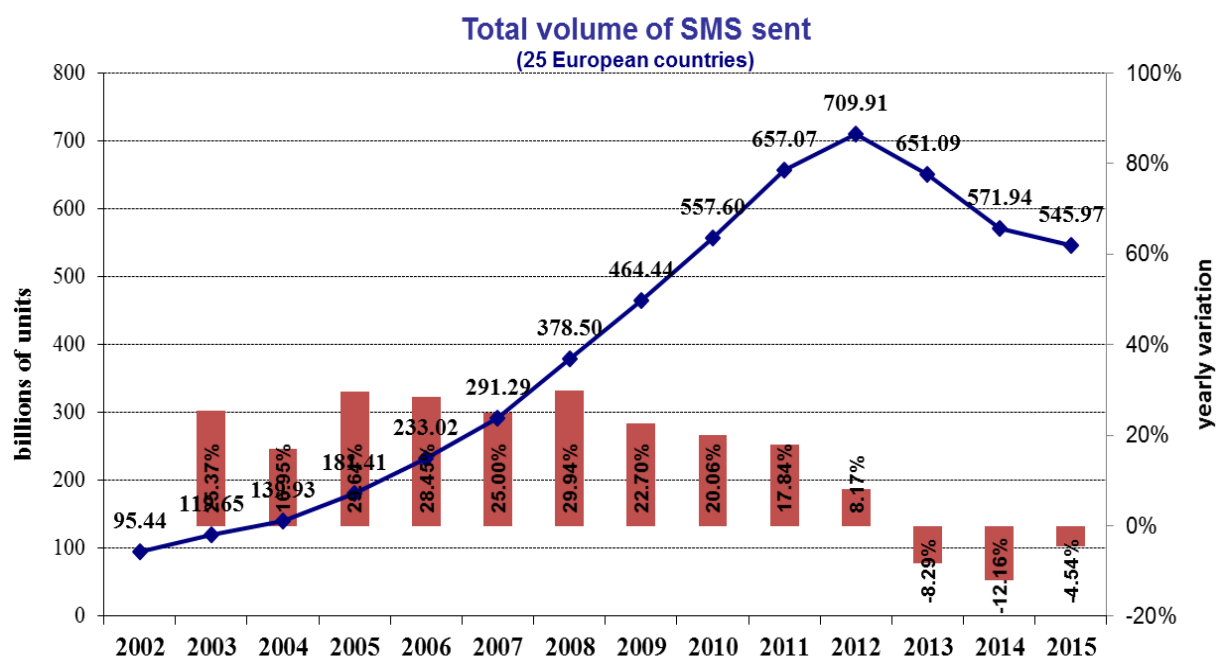
EL	3.00
ES	2.63
FI	confidential
FR	1.00
HR	n.a.
HU	4.47
IE	3.17
IS	2.76
IT	3.10
LI	5.03
LT	0.91
LU	n/a
LV	2.13
ME	2.20
FYROM	0.81
MT	1.84
NL	5.60
NO	3.76
PL	1.14
PT	0.83
RO	2.30
RS	1.63
SE	3.23
SI	Bill & keep
SK	2.50
TR	0.13
UK	2.08
<b>Average(W)</b>	<b>2.20</b>
<b>Average(S)</b>	<b>2.49</b>

### 4.3. Volumes of SMS sent (2015)

Figure 16 is based on the time series of the countries from which information was available from 2002 to 2015. These countries are: Austria, Belgium, Croatia, Cyprus, Czech Republic,

Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Lithuania, Malta, Norway, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden, Switzerland and UK.

**Figure 16 Volumes of SMS sent<sup>11</sup>**



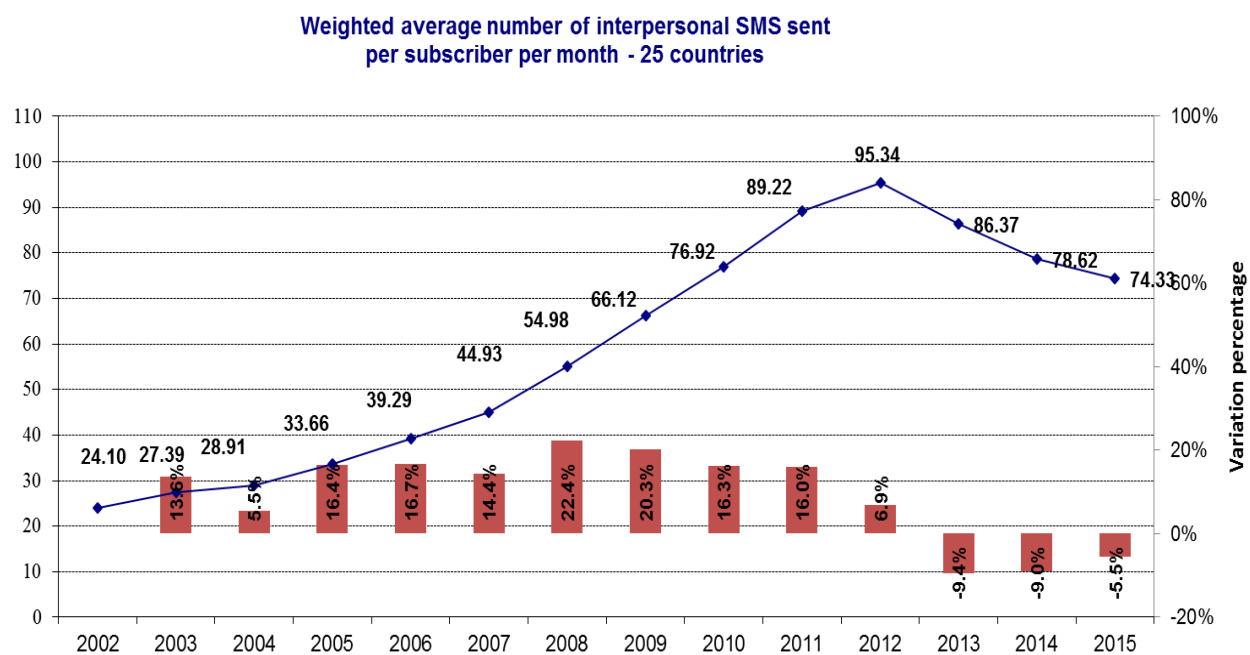
#### 4.4. Interpersonal SMS per subscriber

Since SMS volume growth has two components (the development of usage, i.e. the change in consumer consumption and a variation in the number of subscribers), it is worth describing the SMS usage through the average number of SMS per subscriber per month for each country (and its variation in time).

Figure 17 describes the trend from 2002 on for the same 25 countries as in figure 16. For a given year, the weighted average is obtained through pondering the average number of interpersonal SMS per subscriber per month of each country by its relative part of total subscribers (used in the panel of countries).

<sup>11</sup> Differences compared to the figures in previous reports are due to the change in the methodology concerning the calculation of subscriber numbers in various countries.

Figure 17 SMS per subscriber per month



## Annex

## Annex 1 Fixed termination rates as of 1 July 2016

Table 3

Country	Operator	Lowest Regulated Rate	WA in Cents
AL	Albtelecom	Single rate	1.0699
	Abcom	Single rate	1.0699
	Nisatel	Single rate	1.0699
	Albanian Satellite Communications	Single rate	1.0699
	Other operators	Single rate	1.0699
AT	Telekom Austria	Single rate	0.1110
	Other operators	Single rate	0.1110
BE	Proximus	1 <sup>st</sup> lowest	0.5020
		2 <sup>nd</sup> lowest	0.7090
		3 <sup>rd</sup> lowest	0.9090
	Other operators	1 <sup>st</sup> lowest	0.7090
		2 <sup>nd</sup> lowest	0.9090
BG	Bulgarian Telecommunication Company	Single rate	0.2556
		Single rate	0.2556
	Telenor Bulgaria	Single rate	0.2556
	Mobitel	Single rate	0.2556
	Blizoo Media and Broadband	Single rate	0.2556
CH	Swisscom	1 <sup>st</sup> lowest	0.5483
		2 <sup>nd</sup> lowest	0.6616
CY	CYTA	1 <sup>st</sup> lowest	0.1033
		2 <sup>nd</sup> lowest	0.1363
		3 <sup>rd</sup> lowest	0.2075
	PRIMETEL	Single rate	0.1363
	CABLENET	Single rate	0.1363
	MTN FIXED	Single rate	0.1363
CZ	Česká telekomunikační infrastruktura a.s.	Single rate	0.1109
	UPC Česká republika, s.r.o.	Single rate	0.1109
	T-Mobile Czech Republic a.s.	Single rate	0.1109
	Vodafone Czech Republic a.s.	Single rate	0.1109
	České Radiokomunikace a.s.	Single rate	0.1109
	IPEX a.s.	Single rate	0.1109
DE	Telekom Deutschland GmbH	Single rate	0.2400
DK	TDC	Single rate	0.0556
EE	Eesti Telekom	Single rate	0.0970
		Single rate	0.0970

	Starman	Single rate	<b>0.0970</b>
	Elisa	Single rate	<b>0.0970</b>
	STV	Single rate	<b>0.0970</b>
EL	OTE	Single rate	<b>0.0665</b>
	Forthnet	Single rate	<b>0.0665</b>
	HOL/VODAFONE	Single rate	<b>0.0665</b>
	WIND	Single rate	<b>0.0665</b>
	Other operators	Single rate	<b>0.0665</b>
ES	Telefónica de España	Single rate	<b>0.0817</b>
	Orange - Jazztel	Single rate	<b>0.0817</b>
	Vodafone - Ono	Single rate	<b>0.0817</b>
	Other operators	Single rate	<b>0.0817</b>
FI	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>
	Other operators (weighted average)	average	<b>2.9860</b>
	Weighted average of all operators	average	<b>2.8300</b>
FR	Orange	Single rate	<b>0.0780</b>
	Other operators	Single rate	<b>0.0780</b>
HR	HT	Single rate	<b>0.0668</b>
	Optima Telekom	Single rate	<b>0.0691</b>
	VIPnet	Single rate	<b>0.0676</b>
	H1 Telekom	Single rate	<b>0.0731</b>
HU	Magyar Telekom	Single rate	<b>0.1277</b>
	Invitel	Single rate	<b>0.1277</b>
	UPC	Single rate	<b>0.1277</b>
	Other operators	Single rate	<b>0.1277</b>
IE	Eircom	1 <sup>st</sup> lowest	<b>0.0675</b>
		2 <sup>nd</sup> lowest	<b>0.4695</b>
		3 <sup>rd</sup> lowest	<b>0.5839</b>
IS	Siminn	Single rate	<b>0.1146</b>
	Vodafone	Single rate	<b>0.1146</b>
IT	TIM	Single rate	<b>0.0430</b>
	Wind	Single rate	<b>0.0430</b>
	Fastweb	Single rate	<b>0.0430</b>
	Vodafone	Single rate	<b>0.0430</b>
LI	Telecom Liechtenstein AG	Single rate	<b>3.5581</b>
LT	TEO LT AB	Single rate	<b>0.1300</b>
	UAB CSC Telecom	Single rate	<b>0.1300</b>
	AB Lietuvos gelezinkeliai	Single rate	<b>0.1300</b>
LU	EPT	Single rate	<b>0.1400</b>
	Other operators	Single rate	<b>0.1400</b>
LV	Lattelecom	Single rate	<b>0.1037</b>
	Latvijas Mobilais Telefons	Single rate	<b>0.1037</b>
	Baltcom	Single rate	<b>0.1037</b>
	Telekom Baltija	Single rate	<b>0.1037</b>
	Other operators	Single rate	<b>0.1037</b>
ME	Crnogorski Telekom	1 <sup>st</sup> lowest	<b>0.7400</b>

		2 <sup>nd</sup> lowest	<b>0.9400</b>
	Mtel	Single rate	<b>0.9400</b>
<b>FYROM</b>	Makedonski Telekom AD	Single rate	<b>0.5835</b>
	ONE Telecom services	Single rate	<b>0.5835</b>
	Robi	Single rate	<b>0.5835</b>
	Blizoo	Single rate	<b>0.5835</b>
	Other operators	Single rate	<b>0.5835</b>
<b>MT</b>	GO plc	Single rate	<b>0.0443</b>
	Melita plc	Single rate	<b>0.0443</b>
	Vodafone	Single rate	<b>0.0443</b>
	Ozone	Single rate	<b>0.0443</b>
	SIS	Single rate	<b>0.0443</b>
	Vanilla	Single rate	<b>0.0443</b>
<b>NL</b>	KPN	Single rate	<b>0.3020</b>
	Ziggo	Single rate	<b>0.3020</b>
	Tele2	Single rate	<b>0.3020</b>
<b>NO</b>	Telenor	Single rate	<b>0.0644</b>
	NextGen Tel	Single rate	<b>0.0644</b>
	Get	Single rate	<b>0.0644</b>
	Phonect	Single rate	<b>0.0644</b>
	Phonero	Single rate	<b>0.0644</b>
<b>PL</b>	Orange Polska S.A.	1 <sup>st</sup> lowest	<b>0.4690</b>
		2 <sup>nd</sup> lowest	<b>0.5570</b>
		3 <sup>rd</sup> lowest	<b>0.8201</b>
	Netia	Single rate	<b>0.6245</b>
	Multimedia Polska S.A.	Single rate	<b>0.6245</b>
	Multimedia Polska Poludnie S.A.	Single rate	<b>0.6245</b>
<b>PT</b>	MEO	1 <sup>st</sup> lowest	<b>0.1026</b>
		2 <sup>nd</sup> lowest	<b>0.1411</b>
		3 <sup>rd</sup> lowest	<b>0.1642</b>
	NOS Group	Single rate	<b>0.1114</b>
	Vodafone	Single rate	<b>0.1114</b>
	ONI/Cabovisão	Single rate	<b>0.1114</b>
<b>RO</b>	Telekom RC S.A. (former Romtelecom)	Single rate	<b>0.1400</b>
	Other operators	Single rate	<b>0.1400</b>
<b>RS</b>	Telekom Srbija	1 <sup>st</sup> lowest	<b>0.4634</b>
		2 <sup>rd</sup> lowest	<b>0.5447</b>
		3 <sup>th</sup> lowest	<b>0.6097</b>
	Orion telekom	Single rate	<b>0.5040</b>
	Telenor	Single rate	<b>0.5040</b>
	SBB	Single rate	<b>0.5040</b>
<b>SE</b>	TeliaSonera	1 <sup>st</sup> lowest	<b>0.0711</b>
		2 <sup>nd</sup> lowest	<b>0.1153</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>
	Si.mobil	Single rate	<b>0.0876</b>
	Other operators	Single rate	<b>0.0876</b>

SK	Slovak Telekom a.s.	Single rate	0.1234
	Orange Slovensko a.s.	Single rate	0.1234
	UPC BROADBAND SLOVAKIA s.r.o.	Single rate	0.1234
	Swan a.s.	Single rate	0.1234
TR	Türk Telekom	1 <sup>st</sup> lowest	0.4250
		2 <sup>nd</sup> lowest	0.5228
		3 <sup>rd</sup> lowest	0.6848
	Other operators	Single rate	0.9783
UK	BT	Single rate	0.0445
	TalkTalk	Single rate	0.0445
	Sky	Single rate	0.0445
	Virgin Media	Single rate	0.0445
	Vodafone	Single rate	0.0445
	Other operators	Single rate	0.0445

### Notes to Table 3

#### Incumbents per country are indicated first.

**AL:** The termination tariff on 01/01/2018 is the average (benchmark) of BEREC country that apply in one Layer and the average of three Layers in EU country, based on 01.01.2014.

**BE:** The same levels are applicable to other operators. However they usually provide L2 IC (except a cable incumbent that also provides L3).

Average FTRs are not based on actual data (i.e. revenues/volumes) as no data is available for each layer. Rather, the 'average FTR' per minute per Layer is calculated by de-averaging the setup/conveyance and peak/off-peak tariffs (peak/off-peak gradient is 1.22/0.64 and the setup amounts to 16% of the total cost of a 3.2 minute call). Current (2016) rates are based on de-averaging setup/conveyance and peak/off-peak (see remark in previous spreadsheets) - therefore these are not actual FTRs. Meanwhile, a new decision has been taken based on BULRIC rates, with no setup component nor peak/off peak differentiation. The Pure BULRIC tariffs of the new decision will enter in force on 01/11/2016.

**BG:** The incumbent's core network is conditionally divided into two logical hierarchy levels: referring to regional and national coverage. The segmentation of the network is based on geographical codes served by the media gateways in the network and is used only for routing and traffic management purposes although the incumbent's core network is also all-IP flat-hierarchy network. For interconnection with other nation-wide networks there's a requirement for setting a minimum of 3 Pols (at layer 2 according to your definition). Local and regional networks can be interconnected to the incumbent's network by one Pol (at Layer 1 according to your definition). Due to this we cannot define the reference interconnection levels in Table 1.2 above according to your requirements and definitions. The applied fixed termination rate is cost-oriented based on Pure Bu-LRIC model: 0,005 BGN/minute and there is no differentiation between peak/off-peak or hierarchy levels. There are no hierarchical levels defined by all other alternative operators.

**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 (layer 2) 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:** Only one rate applies. There is no separation of rates to peak and off-peak. CYTA uses layer 1 interconnection for local and regional coverage and layer 2 for national coverage. Alternative operators use layer 2 interconnection.

**EL:** Note that: (a) Layer 1 (i.e., the closest possible interconnection level to the network termination point) is from subscriber to tandem. (b) Since 1/1/2014 there is no distinction between peak and off peak FTRs.

**FI:** The FTR average for the Other operators (combined market share 23 %) is a weighted average as of 1.1.2016.

**IE:** Please note that ComReg Decision D12/12 set fixed termination rates at layer one (ie ericom'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 will reduce to 0.072 cent per minute from 1 July 2015. Please refer to Annex1 in ComReg Decision D12/12 at [http://www.comreg.ie/\\_fileupload/publications/ComReg12125.pdf](http://www.comreg.ie/_fileupload/publications/ComReg12125.pdf)

**IS:** Single Transit - FTR average calculated for a 3 minute call

**IT:** AGCOM does not distinguish between national and local FTR.

**LI:** Telecom Liechtenstein AG does not use differentiated Peak/Off-peak FTRs.

**LT:** Data as of Q1 2016.

**LU:** Data are valid as of 31/12/ 2015. Règlement 15/186/ILR du 3 février 2015 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 3/2007).

**MT:** Data reflect the position as at Q1 2016.

**NL:** The rate imposed is based on court decision. For more information see note to Table 4.

**PT:** Termination price is charged on a per second basis from the first second. There is no differentiation on prices concerning peak and off peak hours. Current prices are in place as from 1 October 2013, and they will be replaced by new prices based on the results of the pure LRIC model developed for that purpose. In this context a draft decision was approved which foresees the application of a maximum termination price based on the results of the pure LRIC cost model. As such the maximum price will decrease from 0,1114 to 0,0644 euro cents per minute.

**SK:** Operators do not differentiate between peak and off-peak traffic.

**TK:** no peak off-peak differentiation in place.

**UK:** BT is subject to a charge control where the average price cap for the year must equal 0.035ppm.

BT is 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 is 0.016ppm. All other CPs must set rates that are fair and reasonable rates, which are presumed to be symmetric to BT.



## Annex 2 Average fixed termination revenue per minute per country

### Notes

**AT:** No differentiation in national/regional/local. Billed minutes are not available (only total minutes including internal sales).

**BE:** termination to geo numbers.

**BG:** Data filled in the table refers to year 2015. The traffic that is outside of the regulation is not included in the questionnaire.

In 2015 the cost-oriented fixed terminating rates based on Pure Bu-LRIC model are into force – 0,005 BGN/minute. No FTRs differentiation between peak/off-peak or interconnection levels.

**CZ:** Provided data include only national traffic.

**EL:** Data are for the first half of 2015.

**HR:** In Croatia, HT has only one interconnection level (regional), however, this doesn't mean that some operators can't be interconnected on national level but this will be subject to commercial agreements between operators.

**IT:** Estimated data. Since FTR are symmetric (with respect to the level of termination), AGCOM does not distinguish between national and local FTR.

**LU:** National and international (EU and non-EU) termination traffic on fixed networks in Luxembourg.

**ME:** Data for National FTR are for calls originated from national (fixed and mobile) operators and from abroad. FTR for calls that are originated from abroad are not regulated, and different from FTR for calls that originated from national operators.

**PT:** Estimated values.

**RS:** Data provided are for 2015 and includes only national fixed-to-fixed and mobile-to-fixed calls. Revenue and traffic do not include self-supply and do not include calls when both the the fixed and the mobile network are owned and run by the same operator. Local FTR include minutes and revenue for layer 1 Local and layer 1 National.

**SI:** National FTR revenues and minutes also include traffic terminated in fixed network on premium numbers, numbers for televoting, mass calling, short dialling numbers.

**TR:** This table is filled according to the data of fixed incumbent operator (Türk Telekom). Total FTR minutes includes only calls that originates and terminates within Turkey regardless of the origin of call. In the table above total FTR revenues and total FTR minutes include data of the year 2015. FTRs for different level of layers have been same since 01.04.2010. Please note that Total FTR revenue and Total FTR minutes are confidential and they should not be published.

## Annex 3 FTR regulatory model implemented

Table 4

Country	COST ACCOUNTING MODEL
AL	Benchmark
AT	Pure BU LRIC
BE	TD FDC
BG	Pure BU LRIC
CH	BU LRAIC+
CY	Benchmark
CZ	Pure BU LRIC
DE	BU LRAIC+
DK	Pure BU LRIC
EE	Benchmark
EL	Pure BU LRIC
ES	Pure BU LRIC
FI	TD FDC
FR	Pure BU LRIC
HR	Pure BU LRIC
HU	Pure BU LRIC
IE	Pure BU LRIC
IS	Benchmark
IT	Pure BU LRIC
LI	TD FDC
LT	Pure BU LRIC
LU	Pure BU LRIC
LV	Benchmark
FYROM	TD LRIC
ME	TD LRIC
MT	Pure BU LRIC
NL	BU LRAIC +
NO	PURE BU LRIC
PL	TD FDC
PT	Benchmark PURE BU LRIC
RO	Pure BU LRIC
RS	TD-FAC-CCA
SE	Pure BU LRIC
SI	Pure BU LRIC
SK	Pure BU LRIC
TR	BU LRAIC+
UK	Pure BU LRIC

**Notes to Table 4**

**AL:** According the market analysis of fixed telephony on October 2015, AKEP have approved the following Glide Path:

01.01.2016 1.08 Eurocent

01.01.2017 0.79 EuroCent

01.01.2018 0.51 EuroCent.

**BE:** The principle of setting Pure BULRIC FTRs dates back from our last FTR market analysis (March, 2nd, 2012), however the cost model was not readily available so BIPT engaged to set Pure BULRIC FTRs in a separate decision. This draft decisions has been notified to the EC on June ,18th 2016. A final decision has been taken on August, 25<sup>th</sup> 2016, Pure BULRIC FTR rates will apply as of 01/11/2016.

**BG:** With Decision 134 from 14 February 2013 CRC approved cost-oriented fixed terminating rates based on Pure Bu-LRIC model as follows:

from 01.07.2013 - 0,005 BGN/minute

from 01.01.2014 - 0,005 BGN/minute

from 01.01.2015 - 0,005 BGN/minute.

**CH:** Source of the Swisscom-Tariffs: [https://www.swisscom.ch/dam/swisscom/de/ws/documents/D\\_IC-Dokumente/Handbuch%20Preise\\_IC\\_V1-15.pdf](https://www.swisscom.ch/dam/swisscom/de/ws/documents/D_IC-Dokumente/Handbuch%20Preise_IC_V1-15.pdf), p.11 and [https://www.swisscom.ch/dam/swisscom/de/ws/documents/D\\_IC-Dokumente/voip-ic/DE\\_Handbuch%20Preise\\_VoIP-IC\\_V1-1.pdf](https://www.swisscom.ch/dam/swisscom/de/ws/documents/D_IC-Dokumente/voip-ic/DE_Handbuch%20Preise_VoIP-IC_V1-1.pdf), p. 5.

**CY:** Until 31/12/2015 termination rates were calculated on TD-LRAIC basis. The rates for all the operators that were found to have significant market power are based on CYTA's rates (incumbent). This year OCECPR is in the process to develop a BULRIC model. With the last market analysis which was concluded in July 2015 benchmarking has been set for the calculation of the new termination rates starting 1/1/2016. Only one rate applies. No separation of rates to peak and off-peak. No data exist per layer. CYTA uses layer 1 interconnection for local and regional coverage and layer 2 for national coverage. Alternative operators use layer 2 interconnection.

**CZ:** Calculation of FTR is based on pure BU-LRIC model. For purposes of FTR regulation CTU has determined one level of FTR without differentiation between peak and off-peak time or POI.

**DE:** No glide path regulation. FTR are valid from 01.12.2014 until 31.12.2016. The decision is preliminary and still subject to Phase II investigation.

**EE:** PURE BU LRIC based on EEA rates.

**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).

**ES:** From November 1st 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.

**HR:** HAKOM is currently in the process of updating FTR cost model. Please note that FTRs are regulated only for the calls originated on A numbers belonging to the EU/EEA operators and terminated into the individual fixed networks in Croatia.

**IE:** In relation to fixed termination for layer 1 (ie 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 will reduce to 0.072 cent per minute from 1 July 2015. Please refer to Annex 1 in ComReg Decision D12/12 at <http://www.comreg.ie/fileupload/publications/ComReg12125.pdf>.

**IT:** AGCOM has developed a BU-LRIC model for determining IP termination rates, which has been applied from 1st July 2015.

**IS:** The country is a single interconnection area with one pricing structure and SINGLE TRANSIT. Cost model is Benchmark - Target rate in glide path based on historical cost reached 4.dec 2012. Benchmarked tariff for 2017 Notified to ESA - tariff for 2018 to be benchmarked in autumn 2017, decision 1.oct and ratified by ESA 1. nov

**LI:** FTR regulation is not finalized.

Current FTR was decided in 2007. Market analysis and remedies M3 decided in 2010. New FTR decision expected in 2016, based on TD-FDC and Benchmarking. (EFTA Surveillance Authority Recommendation of 13 April 2011 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EFTA States).

**LT:** Prices of termination on alternative fixed networks should not be higher than prices applied by TEO LT, AB at particular network level. No differentiation Peak/Off-peak FTR.

**LU:** Règlement 15/186/ILR du 3 février 2015 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 3/2007).

**LV:** PURE BU LRIC countries.

**ME:** NRA in Montenegro does not apply any glide path for FTR. From the end of 2015 we applied new FTR based on TD LRIC methodology for incumbent operator.

**NL:** ACM imposed maximum rates calculated on the basis of Pure BU - LRIC model, however, the court imposed maximum rates calculated on the basis of a BU LRAIC + model. The case is still pending.

**PT:** ANACOM has set the fixed termination rates by benchmarking against the BU pure LRIC prices in countries that had already applied those prices. The benchmark has therefore taken into account the prices established by the following countries: Denmark; France; Ireland; Malta; Bulgaria; Austria and Slovakia.

These prices are in place as from 1 October 2013, and they will be replaced by new prices based on the results of the pure LRIC model developed for that purpose.

Based on the referred benchmark, ANACOM set a pure LRIC price per minute of 0.1114 EUR cents. In light of MEO's interconnection structure, which is comprised of three different interconnection levels (local, single transit and double transit), there are different prices for each level but on average the price applied is 0.1114 eurocents.

**RO:** For Telekom RC S.A. (former Romtelecom S.A.) the 0.14eurocents/min FTR apply irrespective of the interconnection level. No glide path applied.

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

**TR:** The FTR values of incumbent fixed operator is set according to BU LRIC+ cost model. In addition, these values are close to the costs which are calculated in the model.

## Annex 4 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 5**

Country	Symmetry	Comments
AL	YES	For all fixed operators on 1 January 2016 fixed terminate rates are symmetric.
AT	YES	
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 average FTRs (i.e. pricing flexibility is left for operators).
CY	YES	Yes, from 1.1.2016 the same regulated terminations rates apply for all providers.
CZ	YES	There is only one FTR valid irrespective of time and place of interconnection.
DK	YES	Same FTR apply to all 35 price regulated operators, cf. market decisions as of December 18, 2013.
DE	YES	Tariffs are symmetrical because of an agreement between incumbent Telekom Deutschland and alternative fixed network operators to charge reciprocal tariffs.
EE	YES	Same FTR applies for ten operators with SMP.
EL	YES	Symmetry applies since 28 May 2014.
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 no longer 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 the 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 Pols should be paid. For IP interconnection the number of Pols 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 Pols for FTR. It is subject to commercial negotiation, as it was in the past.
FI	PARTIALLY	In Finland there are no price caps on FTRs. FTRs are symmetrical among most fixed operators.
FR	YES	

HR	YES	Symmetry in fixed network is prescribed for all operators as of the 1 January 2013.
HU	YES	
IE	PARTIALLY	Please note that ComReg Decision D12/12 set fixed termination rates at layer one (ie ericom'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 will reduce 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	NO	There is only one fixed network operator in Liechtenstein: Telecom Liechtenstein AG. National interconnecting partners are MNOs. 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 symmetric, i.e. the FTRs are the same, irrespective of the number of customers, the difference in network topologies, level of interconnection and so on.
LU	PARTIALLY	A maximum price cap is defined by the regulation, but operators may implement the solution in their own way.
LV	YES	
ME	YES	Only incumbent operator have 2 layers of Interconnection. Concept of Symmetry is applied on National coverage of POI.
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	
NO	YES	
PL	YES	

PT	YES	<p>Prices applied by operators with SMP in the wholesale markets for call termination on the public telephone network at a fixed location must be symmetric and they were set at the level of 0.1114 euro cents per minute.</p> <p>With regard to MEO:</p> <p>Local, single and double transit prices were set at a level that, weighted with the traffic, the average price is 0,1114 eurocents.</p> <p>For the other SMP operators:</p> <p>Whenever the operator decides to offer a pricing structure with several levels of interconnection prices:</p> <p>The applicable termination prices may not exceed the maximum prices established for the local, single and double transit charged by MEO.</p> <p>Whenever the operator decides to offer a simplified pricing structure with only one level of prices, the termination price may not exceed 0.1114 EUR cents per minute.</p>
RO	YES	
RS	PARTIALLY	Operators have different network topologies and different number of levels of interconnection. Telekom Srbija (incumbent) have 3 levels of interconnection. Other operators have 1 level of interconnection.
SE	YES	The incumbent is regulated with a cost orientation obligation, whilst all other operators have an obligation to set fair and reasonable prices. The definition of fair and reasonable is in line (symmetry) with the cost oriented price of the incumbent.
SI	YES	It is based on national coverage of layer.
SK	YES	The operators offer non-discriminatory FTRs to all their interconnect partners without any exception.
TR	NO	
UK	YES	Termination is regulated only at the point of interconnection closest to the called customer. At this point, BT has rates set via a charge control. All other CPs' rates are required to be set on fair and reasonable terms, and it is presumed that this means rates should be symmetric with the charge controlled rates unless the CP can demonstrate why a higher rate is necessary and in the interests of consumers. Rates for regional and national level interconnection are not regulated.

## Annex 5 Market shares

Table 6

	Operator	Number of lines	Total number of lines	Market shares
AL	Albtelecom	177,774	225,189	78.90%
	Abcom	14,290		6.30%
	Nisatel	5,389		2.40%
	Albanian Satellite Communications	5,230		2.30%
	Other operators	22,506		10.00%
AT	A1 Telekom Austria	2,259,617	3,603,061	62.71%
	Operator 2	505,571		14.03%
	Operator 3	208,504		5.79%
	Operator 4	190,353		5.28%
	Operator 5	90,068		2.50%
	Operator 6	53,204		1.48%
	Other operators	295,744		8.21%
BE	Proximus	N/A	N/A	N/A
	Other operators	N/A		N/A
BG	Bulgarian Telecommunication Company	Confidential	Confidential	62.80%
	Telenor Bulgaria	Confidential		14.40%
	Mobiltel	Confidential		12.70%
	Blizoo Media and Broadband	Confidential		8.70%
	Other operators	Confidential		1.40%
CH	Swisscom	N/A	N/A	N/A
	Other operators	N/A	N/A	N/A
CY	CYTA	251,565	324,771	77.46%
	PRIMETEL	37,065		11.41%
	CABLENET	25,805		7.95%
	MTN FIXED	9,348		2.88%
	Other operators	988.00		0.30%
CZ	Česká telekomunikační infrastruktura a.s.	Confidential	Confidential	46.50%
	UPC Česká republika s.r.o.	Confidential		8.50%
	T-Mobile Czech Republic a.s.	Confidential		7.40%
	Vodafone Czech Republic a.s.	Confidential		6.60%
	České radiokomunikace a.s.	Confidential		4.10%
	IPEX a.s.	Confidential		3.30%
	Other operators	Confidential		23.50%



DE	Telekom Deutschland GmbH	20,170,000	36,940,000	54.60%
	Other operators	16,770,000		45.40%
DK	TDC	613,198	791,150	78.51%
	Other operators	177,952		22.49%
EE	Eesti Telekom	310,980	368,028	84.50%
	Starman	13,159		3.60%
	Elisa Eesti	30,255		8.20%
	STV	13,634		3.70%
EL	OTE	2,698,735	4,743,358	56.90%
	FORTHNET	Confidential		Confidential
	HOL/ VODAFONE	Confidential		Confidential
	WIND	Confidential		Confidential
	Other operators	Confidential		Confidential
ES	Telefónica de España	9,864,489	18,852,781	52.32%
	Vodafone - Ono	3,908,003		20.73%
	Orange - Jazztel	4,246,059		22.52%
	Other operators	834,230		4.40%
FI	DNA Oyj	N/A	N/A	13.50%
	Elisa Oyj			39.00%
	TeliaSonera Finland Oyj			23.50%
	Other operators			24.00%
FR	Orange	Confidential	36,674,098	Confidential
	Other operators			
HR	HT	Confidential	1,413,947	Confidential
	OPTIMA	Confidential		Confidential
	VIPnet	Confidential		Confidential
	H1	Confidential		Confidential
HU	Magyar Telekom	1,654,632	3,123,000	53.00%
	Invitel	404,321		12.90%
	UPC	533,409		17.10%
	Other operators	530,638		17.00%
IE	Eircom	867450	867450	100.00%

IS	Siminn	86,639	124,284	69.70%
	Vodafone	37,645		30.30%
IT	TIM	11,602,429	20,191,289	57.46%
	Wind	2,736,618		13.55%
	Fastweb	2,280,244		11.29%
	Vodafone	2,195,749		10.87%
	Other operators	1,376,249		6.82%
LI	Telecom Liechtenstein AG	17,098	17,098	100.00%
LT	TEO LT AB	464,122	509,289	91.10%
	UAB CSC Telecom	8,364		1.60%
	AB Lietuvos gelezinkeliai	5,424		1.10%
	Other operators	31,379		6.20%
LV	Lattelecom	255,058	354,905	71.90%
	Telekom Baltija	14,390		4.10%
	Baltcom	12,275		3.50%
	Latvijas Mobilais Telefons	26,750		7.50%
	Other operators	46,432		13.10%
LU	EPT	205,000	273,500	75.00%
	Other operators	68,500		25.00%
ME	Crnogorski Telekom	142,977	151,759	94.20%
	Mtel	7,783		5.10%
	Telenor	719		0.50%
	Telemach	280		0.20%
FYROM	Makedonski Telekom AD	224,802	371,003	60.60%
	ONE Telecom services	54,283		14.60%
	Robi	46,650		12.60%
	Blizoo	25,591		6.90%
	Other operators	19,677		5.30%
MT	Go plc	151,122	229,974	65.71%
	Melita plc	77,602		33.74%
	Vodafone	286		0.12%
	Ozone	737		0.32%
	SIS	168		0.07%
	Vanilla	59		0.03%
NL	KPN	3,531,480	6,889,560	51.26%
	Ziggo	2,599,400		37.73%

	Tele2	291,040		4.22%
	Other operators	467,640		6.80%
NO	Telenor	584,915	944,510	61.93%
	NextGen Tel	82,873		8.77%
	Get	56,396		5.97%
	TeliaSonera	39,023		4.13%
	Phonero	37,640		3.99%
	Other operators	143,663		15.21%
PL	Orange Polska S.A.	Confidential	5,605,442	Confidential
	Netia	Confidential		Confidential
	Multimedia Polska S.A.	Confidential		Confidential
	Multimedia Polska Poludnie S.A.	Confidential		Confidential
	Other operators	Confidential		Confidential
PT	MEO	Confidential	Confidential	48.30%
	NOS Group	Confidential		33.80%
	Vodafone	Confidential		13.50%
	ONI/Cabovisão	Confidential		4.10%
	Other operators	Confidential		0.30%
RO	Telekom RC S.A.	Confidential	4,232,151	Confidential
	RCS&RDS S.A.	Confidential		Confidential
	UPC Romania S.R.L.	Confidential		Confidential
	VODAFONE ROMANIA S.A.	Confidential		Confidential
	Other operators	Confidential		Confidential
RS	Telekom Srbija	Confidential	2,770,462	92.81%
	Other operators	Confidential		7.19%
SE	TeliaSonera	2,708,600	3,554,665	69.10%
	Comhem	2,455,531		9.06%
	Telenor	199,025		5.60%
	TelaVox	121,730		3.42%
	Phonera	83,915		2.36%
	Other operators	372,250		10.47%
SI	Telekom Slovenije	Confidential	Confidential	55.14%
	Telemach	Confidential		21.05%
	T-2	Confidential		11.90%
	Si.mobil	Confidential		6.83%
	Other operators	Confidential		5.08%
SK	Slovak Telekom a.s.	Confidential	Confidential	78.10%
	Orange Slovensko a.s.	Confidential		8.00%
	Swan a.s.	Confidential		1.40%
	UPC BROADBAND SLOVAKIA s.r.o.	Confidential		6.20%

TR	Türk Telekom	8,480,983	11,248,495	75.40%
	TTNET	1,487,124		13.20%
	Superonline	401,890		3.60%
	Turknet	224,571		2.00%
	Other Operators	653,927		5.80%
UK	BT	Confidential	33,559,047	Confidential
	TalkTalk	Confidential		Confidential
	Sky	Confidential		Confidential
	Virgin Media	Confidential		Confidential
	Vodafone	Confidential		Confidential
	Other operators	Confidential		Confidential

#### Notes to Table 6

**AL:** In Albania we collect the number of fixed telephony subscribers that means, subscribers of fixed telephony who have used the service at least once in the last three months. In Albania, several main alternative operators provide prepaid fixed telephony services, and this affects the number of fixed telephony users reported.

**BG:** Data in the field "Number of lines (network termination points)" refers to the number of fixed telephone lines as of 1st of July 2016.

**CY:** Number of lines as at 31/12/2015.

**DE:** The number of lines is based on figures from 2015. Source: BNetzA Annual Report 2015.

**DK:** Number of lines as of 31/12/2015.

**EL:** Figures refer to active telephone access lines as at 31/12/2015. The wholesale line rental lines are included in the incumbent's (OTE) lines.

**FR:** Total number of lines by the end of Q1 2016.

**HR:** Data from Q1 2016.

**IT:** The numbers of lines are estimates.

**LU:** Data as of 01/07/2015.

**MT:** Data reflects position as at Q1 2016.

**NO:** Numbers of subscribers are provided as 01.01.2016. The total number of subscribers according to 1st of July 2016 will not be able before Q3 2016.

**TR:** The number of lines specified above table for alternative network operators includes the number of wholesale line rental and VoIP subscribers.

## Annex 6 Average MTR per operator as of 1 July 2016

Table 7

Country	Operator	Average effective prices (€cent)	Subscribers	Country total subscribers	Market Share %
AL	Telekom Albania	1.0699	1,089,623	3,379,377	32.24%
	Vodafone Albania	1.0699	1,675,744		49.59%
	Albtelecom	1.0699	448,479		13.27%
	Plus Communication	1.0699	165,531		4.90%
AT	A1Telekom Austria	0.8049	5,440,700	13,551,020	40.15%
	T-Mobile Austria	0.8049	3,800,100		28.04%
	Hutchison Drei Austria	0.8049	3,704,900		27.34%
BE	Proximus (incl light MVNO)	1.1800	confidential	12.938.176	confidential
	Orange Belgium (incl light MVNO)	1.1800	confidential		confidential
	Telenet Group (incl light MVNO)	1.1800	confidential		confidential
BG	Mobitel	0.9715	confidential	confidential	39.82%
	Telenor Bulgaria	0.9715	confidential		33.83%
	BTC	0.9715	confidential		26.33%
CH	Swisscom	5.4283	6,561,442	10,711,066	61.26%
	Sunrise	6.7056	2,413,228		22.53%
	Salt	6.7056	1,736,396		16.21%
CY	Cyta	0.9900	689,406	1,135,324	60.72%
	Primetel	1.3900	60,657		5.34%
	MTN	0.9900	376,504		33.16%
CZ	T-Mobile Czech Republic a.s.	0.9985	confidential	confidential	38.99%
	O2 Czech Republic a.s.	0.9985	confidential		30.79%
	Vodafone Czech Republic a.s.	0.9985	confidential		23.40%
DE	T-Mobile	1.6600	41,138,000	126,445,000	32.53%
	Vodafone	1.6600	41,890,000		33.13%
	Telefónica Germany GmbH & Co. OHG	1.6600	43,417,000		34.34%
DK	TDC	0.7272	3,083,416	8,480,723	36.36%
	Telia	0.7272	1,996,684		23.54%
	Telenor	0.7272	1,501,482		17.70%
	Hi3G	0.7272	1,154,432		13.61%
EE	Telia Eesti AS	0.9200	767,559	1,906,369	40.26%
	Elisa Eesti AS	0.9200	628,863		32.99%
	Tele2 Eesti AS	0.9200	509,947		26.75%
EL	Cosmote	1.0810	6,940,537	15,353,553	45.20%
	Vodafone	1.0810	5,388,793		35.10%

	Wind	<b>1.0810</b>	2,995,322		<b>19.51%</b>
ES	TME	<b>1.0900</b>	15,433,567	51,067,770	<b>30.22%</b>
	Vodafone	<b>1.0900</b>	12,792,054		<b>25.05%</b>
	Orange	<b>1.0900</b>	10,926,151		<b>21.40%</b>
	Xfera	<b>1.0900</b>	3,313,670		<b>6.49%</b>
FI	DNA	<b>1.2500</b>	2,491,000	9,502,000	<b>26.22%</b>
	Elisa	<b>1.2500</b>	3,686,000		<b>38.79%</b>
	TeliaSonera	<b>1.2500</b>	3,258,000		<b>34.29%</b>
FR	Orange	<b>0.7600</b>	n.a.	69,332,275	<b>n.a.</b>
	SFR	<b>0.7600</b>	n.a.		<b>n.a.</b>
	Bouygues Telecom	<b>0.7600</b>	n.a.		<b>n.a.</b>
	Free Mobile	<b>0.7600</b>	n.a.		<b>n.a.</b>
HR	HT	<b>0.8395</b>	2,060,000	4,376,398	<b>47.07%</b>
	VIPnet	<b>0.8395</b>	1,549,550		<b>35.41%</b>
	Tele2	<b>0.8395</b>	766,848		<b>17.52%</b>
HU	T-Mobile	<b>0.5457</b>	<i>confidential</i>	<i>confidential</i>	<b><i>confidential</i></b>
	Telenor	<b>0.5457</b>	<i>confidential</i>		<b><i>confidential</i></b>
	Vodafone	<b>0.5457</b>	<i>confidential</i>		<b><i>confidential</i></b>
IE	Vodafone Ireland	<b>2.6000</b>	1,840,824	4,867,611	<b>37.82%</b>
	Meteor	<b>2.6000</b>	982,666		<b>20.19%</b>
	Three Ireland	<b>2.6000</b>	1,572,842		<b>32.31%</b>
	Tesco	<b>2.6000</b>	340,750		<b>7.00%</b>
IS	Siminn	<b>1.0032</b>	145,126	425,966	<b>34.07%</b>
	Vodafone	<b>1.0032</b>	120,609		<b>28.31%</b>
	Nova	<b>1.0032</b>	145,734		<b>34.21%</b>
	365/Tal	<b>1.0032</b>	14,497		<b>3.40%</b>
IT	Telecom Italia S.p.A.	<b>0.9800</b>	29,845,763	96,802,548	<b>30.83%</b>
	Vodafone Omnitel N.V.	<b>0.9800</b>	27,990,314		<b>28.91%</b>
	Wind Telecomunicazioni S.p.A.	<b>0.9800</b>	21,922,137		<b>22.65%</b>
	H3G S.p.A.	<b>0.9800</b>	10,082,000		<b>10.42%</b>
	Poste Mobile	<b>0.9800</b>	3,625,741		<b>3.75%</b>
LI	Salt (Liechtenstein) AG	<b>3.5581</b>	<i>confidential</i>	11,738	<b><i>confidential</i></b>
	Swisscom (Schweiz) AG		<i>confidential</i>		<b><i>confidential</i></b>
	Telecom Liechtenstein AG		<i>confidential</i>		<b><i>confidential</i></b>
LT	Tele2	<b>0.9400</b>	1,776,815	4,077,167	<b>43.58%</b>
	Omnitel	<b>0.9400</b>	1,262,237		<b>30.96%</b>
	Bite Lietuva	<b>0.9400</b>	1,038,115		<b>25.46%</b>
LU	Post Télécom	<b>0.9700</b>	438,000	891,700	<b>49.12%</b>
	Tango	<b>0.9700</b>	288,000		<b>32.30%</b>
	Orange	<b>0.9700</b>	138,900		<b>15.06%</b>
	JOIN	<b>0.9700</b>	26,800		<b>3.01%</b>
LV	Latvijas Mobilais Telefons	<b>1.0500</b>	923,206	2,588,057	<b>35.67%</b>

	Tele2	1.0500	905,112		34.97%
	Bite Latvija	1.0500	494,711		19.12%
	Zetcom	1.0500	182,596		7.06%
ME	Telenor	1.1800	381,074	1,011,882	37.66%
	Crnogorski Telekom	1.1800	344,607		34.06%
	Mtel	1.1800	286,201		28.28%
FYROM	T Mobile Macedonia	1.4588	1,001,583	2,083,583	48.07%
	one.VIP	1.4588	1,082,000		51.93%
MT	Go plc	0.4045	216,605	559,830	38.69%
	Melita plc	0.4045	90,289		16.13%
	Vodafone	0.4045	242,696		43.35%
	Redtouch fone	0.4045	10,224		1.83%
NL	KPN	1.8610	6,727,000	20,876,000	32.22%
	Vodafone	1.8610	5,032,000		24.10%
	T-Mobile	1.8610	3,584,000		17.17%
	Tele2	1.8610	927,000		4.44%
NO	Telenor	0.6976	2,942,184	5,714,890	51.48%
	TeliaSonera	0.6976	2,131,539		37.30%
	Phonero	0.6976	204,542		3.58%
	Lyca	0.6976	108,628		1.90%
PL	Orange Polska S.A.	0.9814	confidential	54,537,230	confidential
	Polkomtel sp. z o.o.	0.9814	confidential		confidential
	P4 sp. z o.o.	0.9814	confidential		confidential
	T-Mobile Polska S.A.	0.9814	confidential		confidential
PT	MEO	0.8100	confidential	16,859,476	confidential
	VODAFONE	0.8100	confidential		confidential
	NOS	0.8100	confidential		confidential
RO	Vodafone Romania S.A.	0.9600	confidential	22,579,060	confidential
	Orange Romania S.A.	0.9600	confidential		confidential
	TELEKOM RMC S.A.	0.9600	confidential		confidential
	RCS & RDS S.A.	0.9600	confidential		confidential
RS	MTS (Telekom Srbija)	2.2357	confidential	9,155,664	46.10%
	Telenor	2.2357	confidential		32.30%
	Vip mobile	2.2357	confidential		21.60%
SE	TeliaSonera	0.8159	5,284,601	14,823,000	35.65%
	Tele2	0.8159	4,051,145		27.33%
	Telenor	0.8159	2,548,298		17.19%
	Hi3G	0.8159	1,924,963		12.99%
SI	Telekom Slovenije	1.1400	confidential	confidential	50.32%
	Si.mobil	1.1400	confidential		30.50%
	Telemach	1.1400	confidential		15.41%
	T-2	1.1400	confidential		3.76%
SK	Orange Slovensko, a.s.	1.2260	confidential	6,003,784	confidential
	Slovak Telekom, a.s.	1.2260	confidential		confidential

	O2 Slovakia, s.r.o.	<b>1.2260</b>	<i>confidential</i>		<i>confidential</i>
	Swan Mobile a.s.	<b>1.2260</b>	<i>confidential</i>		<i>confidential</i>
TR	Turkcell	<b>0.7643</b>	32,573,556	73,650,996	<b>44.23%</b>
	Vodafone	<b>0.7888</b>	23,044,383		<b>31.29%</b>
	Avea	<b>0.9049</b>	18,033,057		<b>24.48%</b>
UK	EE	<b>0.6393</b>	<i>confidential</i>	74,768,223	<i>confidential</i>
	Telefonica	<b>0.6393</b>	<i>confidential</i>		<i>confidential</i>
	Vodafone	<b>0.6393</b>	<i>confidential</i>		<i>confidential</i>
	H3G	<b>0.6393</b>	<i>confidential</i>		<i>confidential</i>

## Notes to Table 7

**AL:** MTRs of Plus Communication are subject of court appeal

**BE:** Subscribers = number of active simcards as of the 1st of January 2016, Prices are nominal prices.

**BG:**

Number of mobile voice subscribers (excl. data SIMs and M2M) as of 01.07.2016. Data includes number of post-paid and prepaid active mobile subscribers (number of post-paid active subscribers means number of subscribers with a valid contract; number of prepaid active subscribers means numbers of subscribers that have made or received a call, sent an SMS or MMS at least once in the last three months).

**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. Also we provide the total number of SIM cards as of 31st December 2015 - data for the 1st half of the year 2016 are not yet available.

**DE:** Current MTR are valid from 01.12.2015 until 30.11.2016. They are preliminary and still subject to phase II investigation.

Number of subscribers are as of 2nd quarter 2016 (Vodafone has changed the way of counting subscriber numbers in Q2, 2016).

**DK:** All prices are of 1st January 2016.

Subscribers for the operators Mundio and Lycamobile are not published as the number of subscribers are below the discretion limit of 5 % of the total market share.

The number of subscribers are as of 31.12.2015.

**EL:** Subscribers as of 31.12.2015 (datacards, M2M not included).

**FI, PL, RS:** Number of subscribers as of 31.12.2015.

**IE:** Subscribers based on Q1 2016 data excluding M2M and MBB.

Telefonica Ireland Limited subscriptions data is incorporated with Hutchison 3G Ireland Limited subscriptions data.

Please note that in December 2012 Vodafone issued appeal proceedings with respect to ComReg's MTR decision ([http://www.comreg.ie/\\_fileupload/publications/ComReg12125.pdf](http://www.comreg.ie/_fileupload/publications/ComReg12125.pdf) (ComReg Document 12/125)). On 12 February 2016, ComReg published Decision 02/16 and the purpose being to implement MTRs in the Irish market that have been calculated using a BU pure LRIC methodology.

**IS:** MTR are now 1.4 ISK/min (no setup fee) and are expected to become 1.23 ISK/min on January 1, 2017 - Subscriber numbers for 1.7.2016 not yet available – data as of 31.12.2015

**HR, LT, MT:** Subscribers at Q1 2016.

**LU:** Règlement 15/191/ILR du 20 mars 2015 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.

**FYROM, TR:** Data as of Q3 2015

**NO:** Numbers of subscribers are provided as 01.01.2016. The total number of subscribers according to 1st of January 2016 will not be available before Q3 2016.

**NL:** The rate imposed is based on court decision. For more information see note to Table 8.



## Annex 7 Average mobile termination revenue per minute per country

### Notes to figure 14

**AL:** For the year 2015 the MTRs have been different for the smallest operator (Plus Communication). The three others were in symmetric.

**BE:** Limited to national terminating traffic

**BG:** Revenues from traffic originated from national fixed networks and terminated in mobile networks during 2015. Excluded are fixed-to-mobile calls when both the fixed and the mobile network are owned and run by the same operator.

Traffic originated in national fixed networks and terminated in mobiles networks during 2015. Excluded are fixed-to-mobile calls when both the fixed and the mobile network are owned and run by the same operator.

**CH:** The data refers to the whole year 2015.

**DK:** Price is as of 1st January 2016. There is no setup fee, thereby the average revenue per min is 6.02 (1/100 of national currency). There is no data for the total MTR revenue in Denmark.

**EL:** Data are for the first half of 2015.

**HR:** Data refer to the whole 2014.

This revenue and minutes include only fixed-to-mobile calls, as indicated in the past (i.e. as we have done it in the previous years). Please note that MTRs for the year 2014 were not based on pure BU-LRIC model and therefore were higher than set for the year 2015 (see HAKOM's data submitted in previous reports).

**HU:** Data of 2014 are not yet available.

**IT:** Estimated data

**LU:** National and international (EU and non EU) termination at mobile networks in Luxembourg.

**ME:** Data are for calls originated from national operators (fixed and mobile) and from abroad. MTR for calls that are originated from abroad are not regulated, and different from MTR for call that are originated from national operators.

**FYROM:** Mobile to mobile and fixed to mobile revenue included

**NO:** The MTR was NOK 0.16 until 1, July 2015 and NOK 0,083 the rest of the year.

**RS:** Data provided are for the whole 2015 and includes only national fixed-to-mobile calls. Revenue and traffic do not include fixed-to-mobile calls when both the fixed and the mobile network are owned and run by the same operator.

**SI:** Including international termination. Self-supply is not included! MTR revenues and minutes include also traffic terminated on premium numbers, numbers for tele voting, mass calling, and short dialing numbers.

**TR:** Total MTR minutes includes only calls that originates and terminates within Turkey. In the table above total MTR revenues and total MTR minutes include data of the whole 2015.

## Annex 8 Regulatory model implemented to calculate MTRs

Table 8

Jul-16	COST ACCOUNTING MODEL			GLIDE PATH in €cent				
	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 01/07/2016 until 31/12/2016	Period 2 - From 01/01/2017 until 30/06/2017	Period 3 - From 01/07/2017 until 31/12/2017	Period 4 - From 01/01/2018 until 30/06/2018	Period 5 - From 01/07/2018 until 31/12/2018
AL	Benchmark BU-LRIC	adopted	10/02/2011	1.0699				
AT	Pure BU-LRIC	adopted		0.8049	0.8049			
BE	Pure BU-LRIC	adopted	01/01/2013	1.1800				
BG	Pure BU-LRIC	adopted	01/07/2013					
CH		Not regulated						
CY	Benchmark BU-LRIC	adopted		0.0099				
CZ	Pure BU-LRIC	adopted	01/07/2013					
DE	BU LRAIC+	notified		1.6600				
DK	Pure BU-LRIC	adopted		0.7272	0.7272			
EE	Benchmark BU-LRIC	adopted	01/01/2013	0.9200	0.9200			

<b>EL</b>	Pure BU-LRIC	adopted	01/01/2013	1.0810				
<b>ES</b>	Pure BU-LRIC	adopted	10/05/2012	1.0900	1.0900	1.0900	1.0900	1.0900
<b>FI</b>	other (FDC/FAC)	adopted		1.2500	1.2500	1.2500	1.2500	1.2500
<b>FR</b>	Pure BU-LRIC	adopted	01/01/2013	0.7600	0.7400	0.7400		
<b>HR</b>	Pure BU-LRIC	adopted		0.8395				
<b>HU</b>	Pure BU-LRIC	adopted	01/04/2015	0.5457	0.5457	0.5457	0.5457	not decided
<b>IE</b>	other	adopted	01/09/2016	2.6000	0.8200	0.8200	0.7900	0.7900
<b>IS</b>	Benchmark BU-LRIC	notified		1.0032	0.8813	0.8813		
<b>IT</b>	Pure BU-LRIC	adopted		0.9800	0.9800	0.9800		
<b>LI</b>	Benchmarking	adopted		3.5581	3.5581			
<b>LT</b>	Benchmark BU-LRIC	adopted	01/08/2014	0.9400				
<b>LU</b>	Pure BU-LRIC	adopted	01/04/2015	0.9700	0.9700			
<b>LV</b>	Benchmark BU-LRIC	adopted	01/07/2014	1.0500	1.0500			
<b>ME</b>	TD LRIC	adopted		1.1800				
<b>MK</b>	BU LRAIC+							
<b>MT</b>	Pure BU-LRIC	adopted	01/04/2014	0.4045	0.4045			
<b>NL</b>	BU LRAIC+							

<b>NO</b>	Pure BU-LRIC	adopted	01/07/2015	0.8049	0.6976	0.6976	0.6976	
<b>PL</b>	Pure BU-LRIC	adopted	01/07/2013	0.9814	0.9814	0.9814	0.9814	0.9814
<b>PT</b>	Pure BU-LRIC	adopted	31/12/2012	0.8100	0.8100			
<b>RO</b>	Pure BU-LRIC	adopted	01/04/2014	0.9600				
<b>RS</b>	Benchmarking			2.2357	1.6829			
<b>SE</b>	Pure BU-LRIC	adopted	01/07/2013	0.8159	0.7426	0.6930	0.6930	0.6294
<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>	BU LRAIC+							
<b>UK</b>	Pure BU-LRIC	adopted	01/04/2013	0.6393	0.6323			

**Notes to Table 8**

**BE:** On 1 January 2013, the last step of the MTR glide path set by the Belgian regulator (BIPT) in June 2010 for the 2010-2013 period entered into force. Since 1 January 2013, MTRs in Belgium have been fully symmetric at a rate of 1.18 euro cents/min (incl. inflation). At present the BIPT reviews the analysis of the mobile termination market and the MTR cost model.

**BG:** With Decision 135 from 14 February 2013 CRC approved cost-oriented mobile termination rates based on Pure Bu-LRIC model as follows:

from 01/07/2013 - 0.023 BGN/minute

from 01/01/2014 - 0.020 BGN/minute

from 01/01/2015 - 0.019 BGN/minute

As of 01.07.2016 the applied tariff of 0.019 BGN/minute is according the cost-oriented mobile terminating rate based on PURE BU-LRIC model (Decision 135 from 14 February 2013). According to CRC's Decision № 357 from 23 June 2016 (due to third review of the market for wholesale voice call termination on individual mobile networks in Bulgaria) this tariff will be applied till the adoption of the updated BULRIC model which is currently in the process of public consultation ([http://www.crc.bg/files/bg/pril2\\_Reshenie\\_388\\_28072016\\_Bulric\\_Mob\\_FINAL.pdf](http://www.crc.bg/files/bg/pril2_Reshenie_388_28072016_Bulric_Mob_FINAL.pdf)).

**CH:** MTRs are not regulated.

**CY:** Note that OCECPR is currently finalizing the results of the pure BULRIC model. Once the results are finalized then they will be applied. Currently the regulated rates are based on a benchmark approach. The EU average of regulated rates based on pure LRIC.

**DE:** No glide path regulation. Current MTR are valid from 01.12.2015 until 30.11.2016. The decision is preliminary and still subject to phase II investigation.

**EL:** EETT is currently preparing the next market review. Until the adoption of the final measure (after the consultation and notification procedures) the price of 1,081 eurocent/min will be applied

**ES:** The final decision and meeting the standards of the TR Recommendation has been applied on 10th May 2012 but the MTR of the BULRIC model came into force on 1/7/2013.

**FI:** FICORA issued new decisions concerning significant market power in the mobile voice call termination markets on 10 August 2015. FICORA has, for the first time, set a cost-oriented maximum price for MTRs. The MTR 1.25 came into effect on 1th of December 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:** In period 3, the glide-path is only valid until 19/12/2017. Regulated MTRs after that date will be subject to next round of market analysis.

**HR:** HAKOM is currently in the process of updating MTR cost model. 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.

**IE:** On 12 February 2016, ComReg published Decision 02/16 and the purpose being to implement MTRs in the Irish market that have been calculated using a BU pure LRIC methodology.

**IS:** Benchmark against BU-LRIC made in august 2016 for validity in 2017. Notified 1.oct to ESA and ratified 1 November.

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

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.

MTR as of May 1, 2016 is 3.9 CHF-cents per minute (Jan 1 until April 30, 2016: 7.65 CHF-cents)

**LT:** The rate was calculated and based on Benchmarking methodology in 2014. In the end of 2015 RRT finalized market research and calculated new rate, based on Benchmarking methodology, the rate is applied from 01/04/2016.

**LV:** Latvian NRA doesn't apply any glide path. MTRs should be revised next year.

**NL:** ACM imposed maximum rates calculated on the basis of Pure BU - LRIC model, however, the court imposed maximum rates calculated on the basis of a BU LRAIC + model. The case is still pending.

**PT:** In August 6, 2015 ANACOM approved a new decision establishing the new MTR also in accordance with the EC Recommendation on Termination rates - pure BU-LRIC.

From 01.07.2017 (and until June next year) the MTR will correspond to the values of the pure LRIC cost model adjusted in accordance with the inflation rate.

**RS:** Price of 2.07 RSD is effective from 01/01/2017, until new RATEL' s decision.

**SE:** Note comment in Period 1, Decision on new MTR is planned to be taken during period 1 and be as in period 2 as of that date.

**TR:** ICTA does not regulate MTRs via glide path, in general MTRs are revised annually.

**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.

## Annex 9 SMS TR per operator as of 1 January 2016

Table 9

Country	Operator	SMS TR (€cent)		Subscribers		Market share
		<i>per operator</i>	<i>WA per country</i>	<i>per operator</i>	<i>Total per country</i>	
AL	Telekom Albania	0.7229	<b>0.7229</b>	1,089,623	3,379,377	<b>32.24%</b>
	Vodafone Albania	0.7229		1,675,744		<b>49.59%</b>
	Albtelecom	0.7229		448,479		<b>13.27%</b>
	Plus Communication	0.7229		165,531		<b>4.90%</b>
AT	A1Telekom Austria	<i>n.a.</i>	<b>3.1100</b>	5,440,700	13,551,020	<b>40.15%</b>
	T-Mobile Austria	<i>n.a.</i>		3,800,100		<b>28.04%</b>
	Hutchison Drei Austria	<i>n.a.</i>		3,704,900		<b>27.34%</b>
BE	Proximus (incl light MVNO)	4.9600	<b>4.9600</b>	<i>confidential</i>	12,938,176	<b>confidential</b>
	Orange Belgium (incl light MVNO)	4.9600		<i>confidential</i>		<b>confidential</b>
	Telenet Group (incl light MVNO)	4.9600		<i>confidential</i>		<b>confidential</b>
BG	Mobiltel	<i>confidential</i>	<b>confidential</b>	<i>confidential</i>	<i>confidential</i>	<b>39.82%</b>
	Telenor Bulgaria	<i>confidential</i>		<i>confidential</i>		<b>33.83%</b>
	BTC	<i>confidential</i>		<i>confidential</i>		<b>26.33%</b>
CH	Swisscom	<i>confidential</i>	<b>4.5943</b>	6,561,442	10,711,066	<b>61.26%</b>
	Sunrise	<i>confidential</i>		2,413,228		<b>22.53%</b>
	Salt	<i>confidential</i>		1,736,396		<b>16.21%</b>
CY	Cyta	0.5500	<b>0.6045</b>	689,406	1,135,324	<b>60.72%</b>
	Primetel	0.7300		60,657		<b>5.34%</b>
	MTN	0.6800		376,504		<b>33.16%</b>
CZ	T-Mobile Czech Republic a.s.	<i>confidential</i>	<b>confidential</b>	<i>confidential</i>	<i>confidential</i>	<b>38.99%</b>

	O2 Czech Republic a.s.	<i>confidential</i>		<i>confidential</i>		<b>30.79%</b>
	Vodafone Czech Republic a.s.	<i>confidential</i>		<i>confidential</i>		<b>23.40%</b>
DE	T-Mobile	n.a.	n.a.	41,138,000	126,445,000	<b>32.53%</b>
	Vodafone	n.a.		41,890,000		<b>33.13%</b>
	Telefónica Germany GmbH & Co. OHG	n.a.		43,417,000		<b>34.34%</b>
DK	TDC	1.3442	1.3442	3,083,416	8,480,723	<b>36.36%</b>
	Telenor	1.3442		1,996,684		<b>23.54%</b>
	Telia	1.3442		1,501,482		<b>17.70%</b>
	Hi3G	1.3442		1,154,432		<b>13.61%</b>
EE	Telia Eesti AS	2.6000	2.3013	767,559	1,906,369	<b>40.26%</b>
	Elisa Eesti AS	2.1000		628,863		<b>32.99%</b>
	Tele2 Eesti AS	2.1000		509,947		<b>26.75%</b>
EL	Cosmote	3.0000	3.0000	6,940,537	15,353,553	<b>45.20%</b>
	Vodafone	3.0000		5,388,793		<b>35.10%</b>
	Wind	3.0000		2,995,322		<b>19.51%</b>
ES	Movistar	confidential	2.6277	15,433,567	51,067,770	<b>30.22%</b>
	Vodafone	confidential		12,792,054		<b>25.05%</b>
	Orange	confidential		10,926,151		<b>21.40%</b>
	Yoigo	confidential		3,313,670		<b>6.49%</b>
FI	DNA	confidential	<i>confidential</i>	2,491,000	9,502,000	<b>26.22%</b>
	Elisa			3,686,000		<b>38.79%</b>
	TeliaSonera			3,258,000		<b>34.29%</b>
FR	Orange	1.0000	1.0000	n.a.	69,332,275	<b>n.a.</b>
	SFR	1.0000		n.a.		<b>n.a.</b>
	Bouygues Telecom	1.0000		n.a.		<b>n.a.</b>
	Free Mobile	1.0000		n.a.		<b>n.a.</b>
HR	HT	<i>n.a.</i>	<i>n.a.</i>	2,060,000	4,376,398	<b>47.07%</b>
	VIPnet	<i>n.a.</i>		1,549,550		<b>35.41%</b>
	Tele2	<i>n.a.</i>		766,848		<b>17.52%</b>



HU	T-Mobile	4.4680	4.4680	confidential	confidential	confidential
	Telenor	4.4680		confidential		confidential
	Vodafone	4.4680		confidential		confidential
IE	Vodafone Ireland	3.1700	3.1700	1,840,824	4,867,611	37.82%
	Meteor	3.1700		982,666		20.19%
	Three Ireland	3.1700		1,572,842		32.31%
	Tesco	3.1700		340,750		7.00%
IS	Siminn	2.7587	2.7587	145,126	425,966	34.07%
	Vodafone	2.7587		120,609		28.31%
	Nova	2.7587		145,734		34.21%
	365/Tal	2.7587		14,497		3.40%
IT	Telecom Italia	confidential	3.1024	29,845,763	96,802,548	30.83%
	Vodafone Omnitel N.V.	confidential		27,990,314		28.91%
	Wind Telecomunicazioni	confidential		21,922,137		22.65%
	H3G S.p.A.	confidential		10,082,000		10.42%
	Poste Mobile	confidential		3,625,741		3.75%
LI	Salt (Liechtenstein) AG	confidential	5.0348	confidential	11,738	confidential
	Swisscom (Schweiz) AG	confidential		confidential		confidential
	Telecom Liechtenstein AG	confidential		confidential		confidential
LT	Tele2	0.7250	0.9096	1,776,815	4,077,167	43.58%
	Omnitel	0.7250		1,262,237		30.96%
	Bite Lietuva	1.4500		1,038,115		25.46%
LU	Post Télécom	n.a.	n.a.	438,000	891,700	49.12%
	Tango	n.a.		288,000		32.30%
	Orange	n.a.		138,900		15.06%

	JOIN	n.a.		26,800		3.01%
LV	Latvijas Mobilais Telefons	2.1300	2.1300	923,206	2,588,057	35.67%
	Tele2	2.1300		905,112		34.97%
	Bite Latvija	2.1300		494,711		19.12%
	Zetcom	2.1300		182,596		7.06%
ME	Telenor	2.2000	2.2000	381,074	1,011,882	37.66%
	Crnogorski Telekom	2.2000		344,607		34.06%
	Mtel	2.2000		286,201		28.28%
FYROM	T Mobile Macedonia	0.8118	0.8118	1,001,583	2,083,583	48.07%
	one.VIP	0.8118		1,082,000		51.93%
MT	GoMobile	1.6531	1.8403	216,605	559,830	38.69%
	Melita Mobile	1.6592		90,289		16.13%
	Vodafone	2.0746		242,696		43.35%
NL	KPN	5.6000	5.6000	6,727,000	20,876,000	32.22%
	Vodafone	5.6000		5,032,000		24.10%
	T-Mobile	5.6000		3,584,000		17.17%
	Tele2	5.6000		927,000		4.44%
NO	Telenor	3.7563	3.7563	2,942,184	5,714,890	51.48%
	TeliaSonera	3.7563		2,131,539		37.30%
	Lyca	3.7563		204,542		3.58%
	Phonero	3.7563		108,628		1.90%
PL	Orange Polska S.A.	1.1438	1.1438	confidential	54,537,230	confidential
	Polkomtel sp. z o.o.	1.1438		confidential		confidential
	P4 sp. z o.o.	1.1438		confidential		confidential
	T-Mobile Polska S.A.	1.1438		confidential		confidential
PT	MEO	confidential	0.8300	confidential	16,859,476	confidential
	VODAFONE	confidential		confidential		confidential
	NOS	confidential		confidential		confidential
RO	Vodafone Romania S.A.	confidential	2.3000	confidential		confidential

	Orange Romania S.A.	<i>confidential</i>		<i>confidential</i>	22,579,060	<i>confidential</i>
	TELEKOM RMC S.A.	<i>confidential</i>		<i>confidential</i>		<i>confidential</i>
	RCS & RDS S.A.	<i>confidential</i>		<i>confidential</i>		<i>confidential</i>
RS	Telekom Srbija	1.6260	1.6260	<i>confidential</i>	9,155,664	46.10%
	Telenor	1.6260		<i>confidential</i>		32.30%
	VIP mobile	1.6260		<i>confidential</i>		21.60%
SE	TeliaSonera	3.2334	3.2334	5,284,601	14,823,000	35.65%
	Tele2	3.2334		4,051,145		27.33%
	Telenor	3.2334		2,548,298		17.19%
	Hi3G	3.2334		1,924,963		12.99%
SI	Telekom Slovenije	Bill & Keep	Bill & Keep	<i>confidential</i>	confidential	50.32%
	Si.mobil			<i>confidential</i>		30.50%
	Telemach			<i>confidential</i>		15.41%
	T-2			<i>confidential</i>		3.76%
SK	Orange Slovensko, a.s.	2.5000	2.500	<i>confidential</i>	6,003,784	<i>confidential</i>
	Slovak Telekom, a.s.	2.5000		<i>confidential</i>		<i>confidential</i>
	O2 Slovakia, s.r.o.	2.5000		<i>confidential</i>		<i>confidential</i>
	Swan Mobile a.s.	2.5000		<i>confidential</i>		<i>confidential</i>
TR	Turkcell	0.1315	0.1345	32,573,556	73,650,996	44.23%
	Vodafone	0.1315		23,044,383		31.29%
	Avea	0.1437		18,033,057		24.48%
UK	EE	<i>confidential</i>	2.0813	<i>confidential</i>	74,768,223	<i>confidential</i>
	Telefonica	<i>confidential</i>		<i>confidential</i>		<i>confidential</i>
	Vodafone	<i>confidential</i>		<i>confidential</i>		<i>confidential</i>
	H3G	<i>confidential</i>		<i>confidential</i>		<i>confidential</i>

**Notes to Table 9**

Notes concerning subscriber numbers see Notes to Table 7

**BE:** National incoming SMS termination. Prices are nominal prices.

**BG:** All data includes number of post-paid and prepaid active mobile subscribers. Number of post-paid active subscribers means number of subscribers with a valid contract. Number of prepaid active subscribers means numbers of subscribers that have made or received a call, sent an SMS or MMS at least once in the last three months. The number of the M2M SIMs is excluded.

**CZ:** All Czech SMP-operators use the same level of SMS call termination rates all the time without any differences between peak time and off peak time.

**DE:** SMS call termination rates are not regulated in Germany

**DK:** In 2015, DBA withdrew all SMP remedies on the wholesale SMS termination market effective as of 1 January 2016. The last regulated SMS termination rate that applied prior to this deregulation was 1.11 Danish øre/SMS. This price was still in effect as of 1 January 2016 but the operators have notified price increases to 10 Danish øre/SMS (1.34 eurocents) that will take effect as of 1 April 2016.

**FI:** SMS termination rates are not regulated in Finland.

**HU:** SMS termination rate in national currency has not changed. The HUF / Eur exchange rate has changed only.

**IS:** SMS TR is unregulated.

**LI:** Salt (Liechtenstein) AG: "We do not charge MT-SMS and in all AA.19 contract the price is 0.0€ therefore we do not have a price list."

Telecom Liechtenstein AG: "SMS interworking fee is an average value and confidential."

**LU:** No data available as not regulated.

**ME:** SMS termination rates are valid only for termination of SMS's that originated from national operators

**NL:** This is the last known commercially agreed SMS-termination rate. Rate is from 2012 and thus 3 years old.

**PL:** Number of subscribers as of 31.12.2015.

**PT:** One MVNO applies a different rate (1.27 euro cents) in a reciprocal way, but it only has around 1% of market share.

**SE:** PTS does not monitor the SMS wholesale termination rates. The current reference offers indicates a termination rate of SEK 0.30.

**SK:** Termination rates continue to vary with respect to terminated traffic volumes.

**SI:** SMS termination rates are not regulated. Operators apply "bill and keep" system.

## Annex 10 Abbreviations and Exchange rates

Table 10 – 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 11 – Exchange Rates<sup>12</sup>

<b>COUNTRY</b>	<b>1 EURO</b>
<b>AL</b>	138.33
<b>BG</b>	1.96
<b>CH</b>	1.10
<b>CZ</b>	27.04
<b>DK</b>	7.44
<b>HR</b>	7.50
<b>HU</b>	313.34
<b>IS</b>	139.56
<b>LI</b>	1.10
<b>FYROM</b>	61.69
<b>NO</b>	9.32
<b>PL</b>	4.37
<b>RO</b>	4.50
<b>RS</b>	123.00
<b>SE</b>	9.28
<b>TR</b>	3.27
<b>UK</b>	0.79

<sup>12</sup> ECB website:

For IS at <http://www.cb.is/exchange-rate/>

For AL at [https://www.bankofalbania.org/web/pub/rpm\\_t1\\_2016\\_shqip\\_shtojca\\_8434\\_1.pdf](https://www.bankofalbania.org/web/pub/rpm_t1_2016_shqip_shtojca_8434_1.pdf)

For 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 10 Glossary

<b>A(s)</b>	Simple average
<b>A(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>HCA</b>	Historical Cost Accounting
<b>FDC</b>	Fully Distributed Cost