

***Fixed and mobile termination rates in the EU  
January 2015***

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## 1. Introduction

This document is an updated version of the benchmark of fixed, mobile and SMS termination rates across Europe prepared by the BEREC Benchmarking Expert Working Group in cooperation with the BEREC Termination Rates 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.

The present overview of FTRs is based upon the results of a request for information sent to all NRAs in January 2015, referring – if not differently indicated – to data as of 1st January 2015. It includes rates from the thirty six (36) NRAs that provided responses to our request.

## 2. Interconnection in fixed networks

Fixed and mobile termination services in Europe are subject to price regulation. The European Commission Recommendation on relevant product and service markets (2014 identifies call termination on individual public telephone networks provided at a fixed location as a relevant market susceptible of ex-ante regulation (market 1. Because of the call termination market structure, 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 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 incumbent's networks, called layers. Even though some peculiarities in specific countries are present, in general three main layers for interconnection are defined: i) layer 1, 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).

### 2.1. Assumptions

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: nominal rates

In the next table the interconnection prices of operators listed by countries are presented. For each country, the NRA has provided information on the incumbent and some other alternative or cable operators offering interconnection services. Peak and off-peak rates are differentiated, as well as the layer of interconnection. In the last column a weighted average of peak/off-peak prices is provided.

**Table 1**

Country	Operator	Layer	Price per operator €cents		
			peak	Off-peak	Total
AT	Telekom Austria	Layer 1	0.137	0.085	<b>0.111</b>
	Other operators	Layer 1	0.137	0.085	<b>0.111</b>
BE	Belgacom	Layer 1	0.613333	0.323333	<b>0.468333</b>
		Layer 2	0.876667	0.456667	<b>0.666667</b>
		Layer 3	1.12	0.59	<b>0.855</b>
	Other operators	Layer 1	0.876667	0.456667	<b>0.666667</b>
		Layer 2	1.12	0.59	<b>0.855</b>
BG	Bulgarian Telecommunication Company	Layer 1	0.26	0.26	<b>0.2556</b>
	Mobiltel	Layer 1	0.26	0.26	<b>0.2556</b>
	Cosmo Bulgaria Mobile	Layer 1	0.26	0.26	<b>0.2556</b>
	Blizoo Media and Broadband	Layer 1	0.26	0.26	<b>0.2556</b>
	Other operators	Layer 1	0.26	0.26	<b>0.2556</b>
CH	Swisscom	Layer 2	0.899388	0.467691	<b>0.702283</b>
		Layer 3	0.699895	0.381901	<b>0.571745</b>
CY	CYTA	Layer 1	N/A	N/A	<b>0.342</b>
		Layer 2	N/A	N/A	<b>0.547</b>
		Layer 3	N/A	N/A	<b>0.632</b>
	PRIMETEL	Layer 2	N/A	N/A	<b>0.632</b>
	CABLENET	Layer 2	N/A	N/A	<b>0.632</b>
MTN FIXED	Layer 2	N/A	N/A	<b>0.632</b>	
CZ	O2 Czech Republic	Layer 1	N/A	N/A	<b>0.1086</b>
		Layer 2	N/A	N/A	<b>0.1086</b>
	GTS Czech	Layer 2	N/A	N/A	<b>0.1086</b>
	UPC Česká republika	Layer 2	N/A	N/A	<b>0.1086</b>
	T-Mobile Czech Republic	Layer 2	N/A	N/A	<b>0.1086</b>
	České radiokomunikace	Layer 2	N/A	N/A	<b>0.1086</b>
Other operators	Layer 2	N/A	N/A	<b>0.1086</b>	

DE	Telekom Deutschland GmbH	Layer 1	0.24	0.24	<b>0.24</b>
DK	TDC	Layer 1	0.054967	0.030835	<b>0.051347</b>
		Layer 2	0.054967	0.030835	<b>0.051347</b>
		Layer 3	0.55414	0.339634	<b>0.521965</b>
EE	Elion	Layer 1	0.883333	0.573333	<b>0.759333</b>
		Layer 2	1.04	0.67	<b>0.892</b>
	Starman	Layer 2	1.04	1.04	<b>1.04</b>
	Elisa	Layer 2	1.1	1.1	<b>1.1</b>
	STV	Layer2	0.833333	0.833333	<b>0.833333</b>
EL	OTE	Layer 1	N/A	N/A	<b>0.0695</b>
		Layer 2	N/A	N/A	<b>0.0695</b>
	Forthnet	Layer 1	N/A	N/A	<b>0.0695</b>
		Layer 2	N/A	N/A	<b>0.0695</b>
	HOL	Layer 1	N/A	N/A	<b>0.0695</b>
		Layer 2	N/A	N/A	<b>0.0695</b>
	WIND	Layer 1	N/A	N/A	<b>0.0695</b>
		Layer 2	N/A	N/A	<b>0.0695</b>
	Other operators	Layer 1	N/A	N/A	<b>0.0695</b>
		Layer 2	N/A	N/A	<b>0.0695</b>
ES	TELEFÓNICA	Layer 1	0.0817	0.0817	<b>0.0817</b>
	ONO	Layer 1	0.728	0.728	<b>0.728</b>
	VODAFONE	Layer 1	0.86	0.52	<b>0.7206</b>
	JAZZTEL	Layer 1	0.728	0.728	<b>0.728</b>
	ORANGE	Layer 1	0.728	0.728	<b>0.728</b>
	Other operators	Layer 1	0.728	0.728	<b>0.728</b>
FI	Elisa Oyj	N/A	N/A	N/A	<b>2.8</b>
	DNA Oyj	N/A	N/A	N/A	<b>2.8</b>
	TeliaSonera Finland Oyj	N/A	N/A	N/A	<b>2.8</b>
	Etelä-Satakunnan Puhelin	N/A	N/A	N/A	<b>2.35</b>
	Ålands Telefonandelslag	N/A	N/A	N/A	<b>2.2</b>
	Average	N/A	N/A	N/A	<b>2.77</b>
FR	Orange	Layer 1	N/A	N/A	<b>0.079</b>
	Other operators	Layer 1	N/A	N/A	<b>0.079</b>
HR	HT	Layer 1	0.3501	0.1744	<b>0.0645</b>
		Layer 2	0.5074	0.2531	<b>0.0645</b>
		Layer 3	0.9611	0.4812	<b>0.0645</b>
	Optima Telekom	Layer 2	0.5074	0.2531	<b>0.0653</b>
	VIPnet	Layer 2	0.5074	0.2531	<b>0.0638</b>
	H1 Telekom	Layer 1	0.5074	0.2531	<b>0.0705</b>
		Layer 2	0.3501	0.1744	<b>0.0705</b>
Other operators				<b>0.0587</b>	
HU	Magyar Telekom	Layer 1	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
		Layer 2	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
		Layer 3	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
	Invitel	Layer 1	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
		Layer 2	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
		Layer 3	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
	UPC	Layer 1	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>

	Other operators	Layer 1	<b>0.1296</b>	<b>0.1296</b>	<b>0.1296</b>
IE	Eircom	Layer 1	0.082667	0.082667	<b>0.085564</b>
		Layer 2	0.6057	0.330057	<b>0.508194</b>
		Layer 3	0.749633	0.414667	<b>0.626397</b>
IS	Siminn	Layer 2	0.543985	0.543985	<b>0.543985</b>
	Vodafone	Layer 2	0.543985	0.543985	<b>0.543985</b>
	Other operators	Layer 2	0.543985	0.543985	<b>0.543985</b>
IT	Telecom Italia S.p.A.	Layer 2	0.075	0.075	<b>0.075</b>
		Layer 1	0.075	0.075	<b>0.075</b>
	Wind Telecomunicazioni S.p.A.	Layer 1	0.075	0.075	<b>0.075</b>
	Fastweb S.p.A.	Layer 1	0.075	0.075	<b>0.075</b>
	TeleTu S.p.A.	Layer 1	0.075	0.075	<b>0.075</b>
LI	Telecom Liechtenstein AG	Layer 2	4.1511	4.1511	<b>4.1511</b>
LT	TEO LT, AB	Layer 1	0.611098	0.611	<b>0.611098</b>
	UAB "CSC Telecom"	Layer 1	0.611098	0.611	<b>0.611098</b>
	AB "Lietuvos geležinkeliai"	Layer1	0.611098	0.611	<b>0.611098</b>
	UAB "Cgates"	Layer 1	0.611098	0.611	<b>0.611098</b>
LU	EPT	Layer 1	0.733333	0.373333	<b>0.553333</b>
		Layer 2	0.963333	0.483333	<b>0.723333</b>
LV	Lattelecom	Layer 1	0.1037	0.1037	0.1037
	Baltcom TV	Layer 1	0.1037	0.1037	0.1037
	CSC Telecom	Layer 1	0.1037	0.1037	0.1037
ME	Crnogorski Telekom	Layer 2	0.94	0.94	<b>0.94</b>
	Crnogorski Telekom	Layer 1	0.74	0.74	<b>0.74</b>
	Mtel	Layer 1	0.94	0.94	<b>0.94</b>
MK	Makedonski Telekom AD	Layer 1	0.004717	N/A	<b>0.004717</b>
		Layer 2	0.00488	N/A	<b>0.00488</b>
		Layer 3	0.005855	N/A	<b>0.005855</b>
	ONE Telecom services	Layer 3	0.005855	N/A	<b>0.005855</b>
	Aicall	Layer 3	0.005855	N/A	<b>0.005855</b>
	Blizoo	Layer 3	0.005855	N/A	<b>0.005855</b>
	Other operators	Layer 3	0.005855	N/A	<b>0.005855</b>
MT	GO plc	Layer 1	N/A	N/A	<b>0.0443</b>
	Melita plc	Layer 1	N/A	N/A	<b>0.0443</b>
	Vodafone	Layer 1	N/A	N/A	<b>0.0443</b>
	Ozone	Layer 1	N/A	N/A	<b>0.0443</b>
	Vanilla	Layer 1	N/A	N/A	<b>0.0443</b>
	SIS	Layer 1	N/A	N/A	<b>0.0443</b>
NL	KPN	Layer 2	N/A	N/A	<b>0.302</b>
	Ziggo	Layer 2	N/A	N/A	<b>0.302</b>
	UPC	Layer 2	N/A	N/A	<b>0.302</b>
	Tele2	Layer 2	N/A	N/A	<b>0.302</b>
NO	Telenor	Layer 1	0.29	0.29	<b>0.29</b>

	Ventelo	Layer 1	0.29	0.29	<b>0.29</b>
	Tele2	Layer 1	0.29	0.29	<b>0.29</b>
	Telio	Layer 1	0.29	0.29	<b>0.29</b>
PL	Orange Polska S.A.	Layer 1	0.65	0.32619	<b>0.488095</b>
		Layer 2	0.77381	0.385714	<b>0.579762</b>
		Layer 3	1.138095	0.569048	<b>0.853571</b>
	NETIA	Layer 1	0.77381	0.385714	<b>0.65</b>
	Multimedia PK S.A.	Layer 1	0.65	0.65	<b>0.65</b>
	Multimedia PK - Południe S.A	Layer 1	0.65	0.65	<b>0.65</b>
	TK Telekom	Layer 1	0.65	0.65	<b>0.65</b>
PT	Meo Group	Layer 1	0.1026	0.1026	0.1026
		Layer 2	0.1411	0.1411	0.1411
		Layer 3	0.1642	0.1642	0.1642
	Nos Group	Layer 1	0.1114	0.1114	<b>0.1114</b>
	Vodafone	Layer 1	0.1114	0.1114	<b>0.1114</b>
	Altice Group	Layer 1	0.1114	0.1114	<b>0.1114</b>
RO	TELEKOM RC S.A. (former Romtelecom)	Layer 1	N/A	N/A	<b>0.14</b>
		Layer 2	N/A	N/A	<b>0.14</b>
		Layer 3	N/A	N/A	<b>0.14</b>
	RCS&RDS S.A.	Layer 1	N/A	N/A	<b>0.14</b>
	UPC Romania S.R.L.	Layer 1	N/A	N/A	<b>0.14</b>
	VODAFONE ROMANIA S.A.	Layer 1	N/A	N/A	<b>0.14</b>
RS	Telekom Srbija	Layer 3	0.92	0.92	<b>0.92</b>
		Layer 2	0.74	0.74	<b>0.74</b>
		Layer 1	0.52	0.52	<b>0.52</b>
	Orion telekom	Layer 3	0.92	0.92	<b>0.92</b>
	Telenor	Layer 1	0.52	0.52	<b>0.52</b>
	SBB	Layer 1	0.52	0.52	<b>0.52</b>
SE	TeliaSonera	Layer 2	N/A	N/A	<b>0.071184</b>
		Layer 3	N/A	N/A	<b>0.073837</b>
	Other operators	Layer 2	N/A	N/A	<b>0.071184</b>
		Layer 3	N/A	N/A	<b>0.073837</b>
SI	Telekom Slovenije	Layer 1	0.0876	N/A	<b>0.0876</b>
		Layer 2	0.0876	N/A	<b>0.0876</b>
		Layer 3	0.0876	N/A	<b>0.0876</b>
	Telemach	Layer 1	0.0876	N/A	<b>0.0876</b>
	T-2	Layer 1	0.0876	N/A	<b>0.0876</b>
	Amis	Layer 1	0.0876	N/A	<b>0.0876</b>
SK	Slovak Telekom	Layer 1	0.1234	0.1234	<b>0.1234</b>
	Orange Slovensko, a.s.	Layer 2	0.1234	0.1234	<b>0.1234</b>
	Swan	Layer 1	0.1234	0.1234	<b>0.1234</b>
	UPC	Layer 1	0.1234	0.1234	<b>0.1234</b>
TR	Türk Telekom	Layer 1	0.5048	0.5048	<b>0.5048</b>
		Layer 2	0.621	0.621	<b>0.621</b>
		Layer 3	0.8135	0.8135	<b>0.8135</b>

	TTNet	Layer 3	1.1621	1.1621	<b>1.1621</b>
	Millenicom	Layer 3	1.1621	1.1621	<b>1.1621</b>
	Turknet	Layer 3	1.1621	1.1621	<b>1.1621</b>
UK	BT	Layer 1	0.057026	0.026612	<b>0.044354</b>
	TalkTalk	Layer 1	0.057026	0.026612	<b>0.044354</b>
	Virgin Media	Layer 1	0.057026	0.026612	<b>0.044354</b>
	Vodafone	Layer 1	0.057026	0.026612	<b>0.044354</b>
	Sky	Layer 1	0.057026	0.026612	<b>0.044354</b>

### Notes to Table 1:

**BE:** Rates are based on the number of lines and distribution of traffic from 1 January 2013 (2014 data not yet available).

**BG:** There is no separation between peak/off-peak or interconnection levels for FTRs.

**CH:** A "clause of reciprocity" is in place, meaning that the tariffs of other operators have to be same as those of Swisscom.

**CY:** There is no separation of rates between peak and off-peak. For CYTA the total number of line termination points are 276,059. 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:** In the Czech Republic, a hypothetical Layer 3 with national coverage can be achieved through transit of traffic between two regional POI. However, this is not supposed to be part of fixed termination and transit prices are not regulated. Currently all OLOs active on the relevant market are interconnected only on Layer 2 (regional coverage).

The date provided is based on the total number of lines at the highest interconnection level. The number of lines is based on figures as of 1 July 2014 – data for the whole of 2014 are not yet available.

**DE:** The number of lines is based on figures from 2013. Source: BNetzA Annual Report 2013

**EL:**

1) Since 1 January 2014 there is separation between peak and off-peak FTRs.

2) Since 28 May 2014:

(a) there is no difference between the FTRs of Layer 1 and Layer 2; and

(b) Layer 3 is a non-regulated interconnection layer (the respective FTR cannot be defined since the transit rate has been deregulated) .

3) Regarding the number of lines and market shares: the figures refer to active telephone access lines as of 30 June 2014. Data per operator (except from the incumbent) is considered confidential.

4) The information for the four operators shown in the table above also applies for other operators.

**FI:** Figures come from the three biggest operators in terms of market share, together with two smaller operators with a different FTR.

**FR:**

The average FTR per minute for the incumbent includes a capacity-based component derived from a unit price of 874,80 euros per E1 per year, divided by an average load of 2.5 million minutes per E1 per year.

**IE:** ComReg Decision D12/12 set fixed termination rates at layer one (i.e. ericom's primary). ComReg Decision D12/12 imposed a 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](http://www.comreg.ie/_fileupload/publications/ComReg12125.pdf)

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

**LT:** The network hierarchy includes only Layer 1 (National) from 1 April 2013.

**LU:** Entreprise des Postes et Télécommunications (EPT) FTR average is based on a traffic distribution assumption of 50% peak and 50% off-Peak. Coverage of Layer 1 is a mix of local and regional network hierarchy. Operators don't provide details on the distribution of traffic nor network layers. EPT has 2 IX layers, other operators generally have only one layer; all use set up fees and peak/off peak differentiation.

**MT:** The number of lines refers to the situation as of Q3 2014.

**NO:** The target prices are listed according to NPT's decisions in market 3 which came into effect on 1 January 2012. NPT does not measure distribution of traffic. Regarding termination on Layer 1, the majority of traffic is



exchanged at this levels, however some direct interconnection agreements exist between the smaller operators where traffic is exchanged on a national level (Layer 1 hierarchy and not Layer 2 like the network of the incumbent) but it is still termination on Layer 1. For practical purposes it is assumed that close to 100 %.

**PT:** Termination rates are charged on a per second basis. There is no separation of prices between peak and off-peak hours. The data concerning the number of lines refers to the situation on 31st December 2014. Altice Group includes Cabovisão and OniTelecom.

**RS:** Data provided are for 2013 (2014 data is not yet available) and include 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.

**SE:** There are no set-up fees nor any distinction between peak and off peak traffic. The number of lines are based on data as of June 30 2014.

**TK:** In Turkey, there is no separation between peak and off-peak. The number of lines for alternative network operators includes the number of wholesale line rental subscribers.

**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, which are presumed to be symmetric to BT.

**LI:** There is no separation between peak and off-peak FTRs. The network of Telecom Liechtenstein AG has two layers, from a technical point of view. Currently Telecom Liechtenstein AG has only active interconnections on the hierarchical top layer, thus on the second closest possible interconnection level to the network termination point. Telecom Liechtenstein AG applies one flat, national termination rate.

### 2.2.a. Interconnection rates (2015): incumbents

In this section the effective average per minute price of each layer of interconnection service provided by each incumbent operator is presented, together with an average for Europe (horizontal line).

Figure1

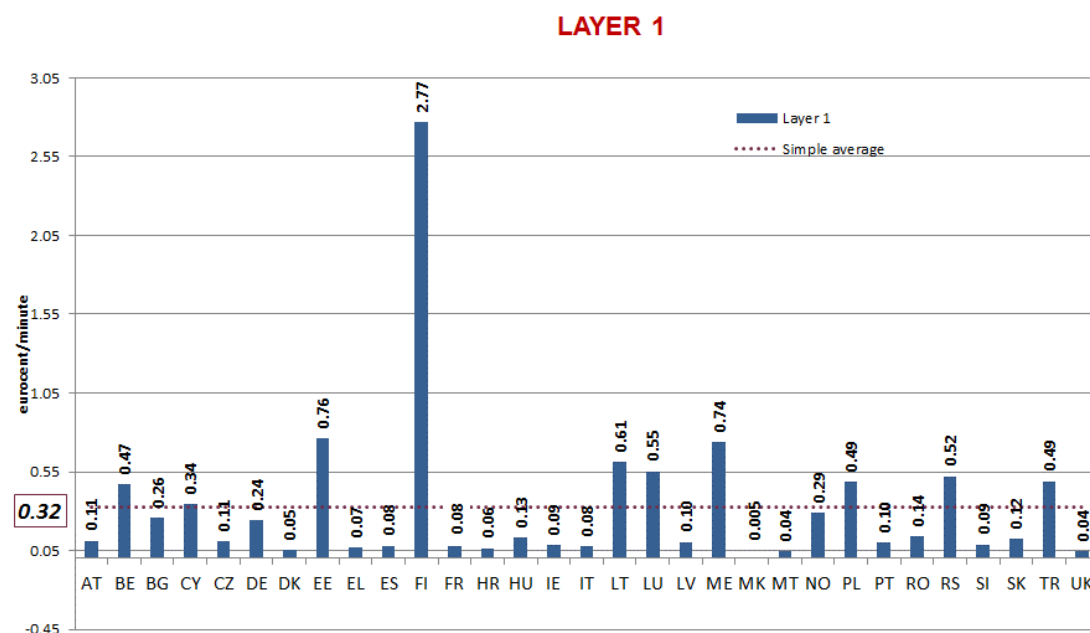


Figure 2

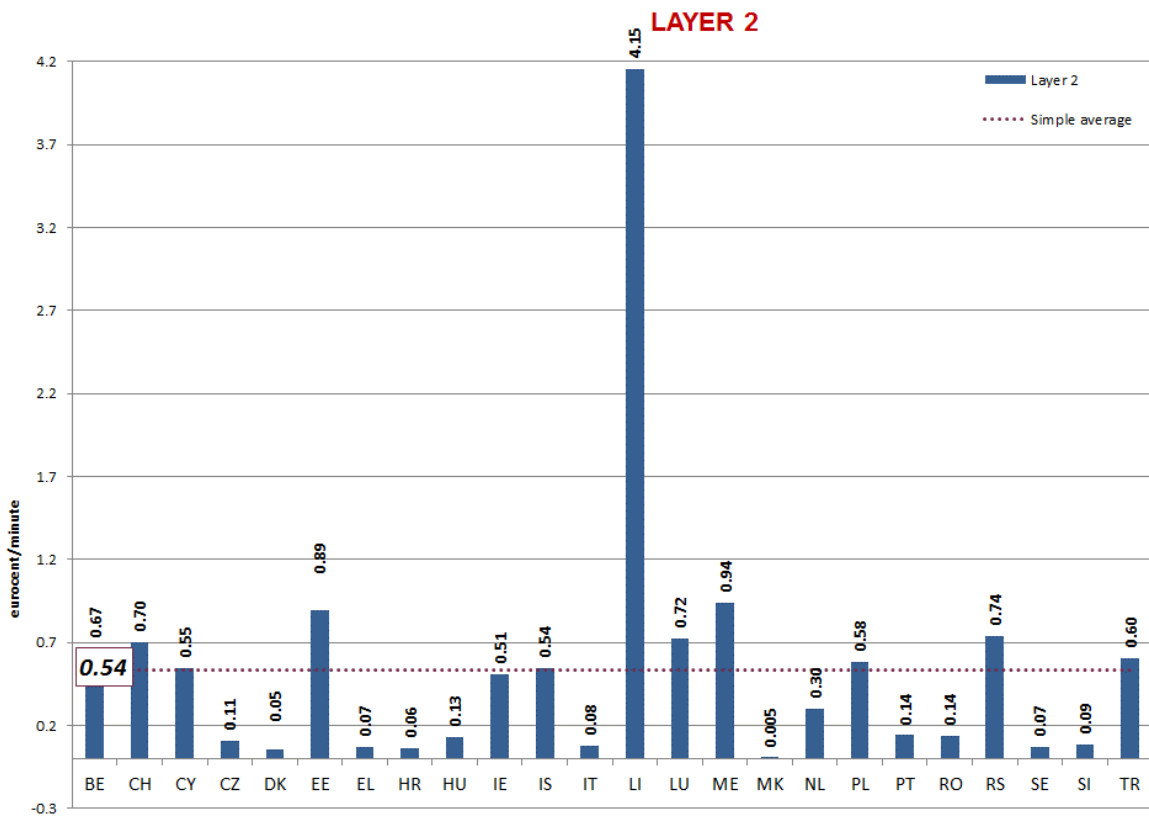
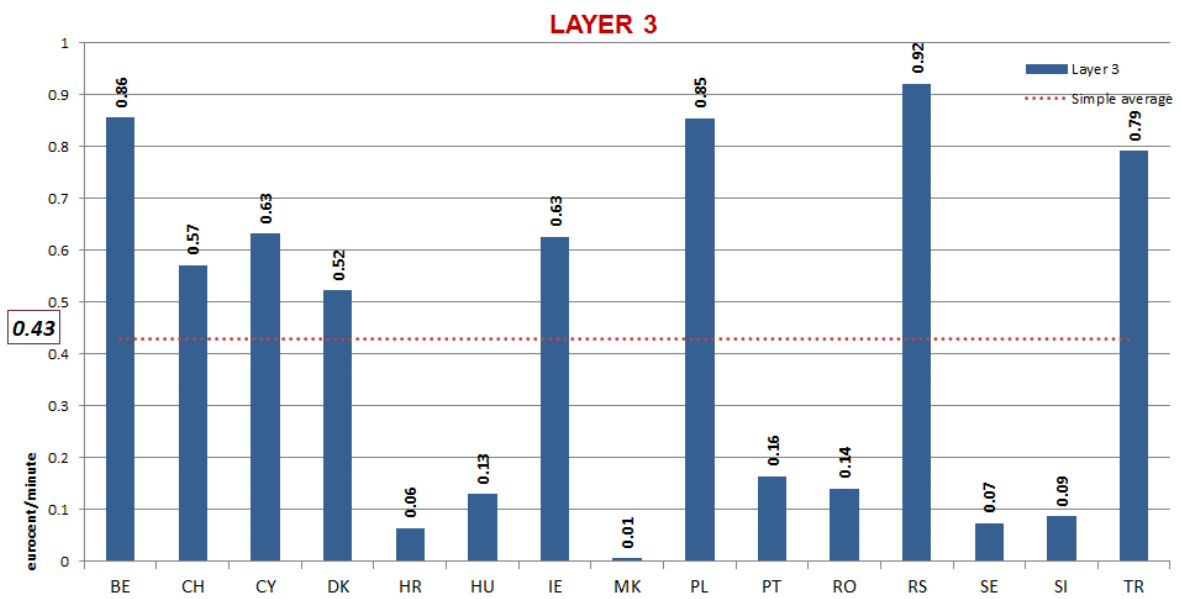


Figure 3



Short term evolution in Incumbent's fixed termination rates – (January 2014/January 2015)

Figure 4<sup>1</sup>

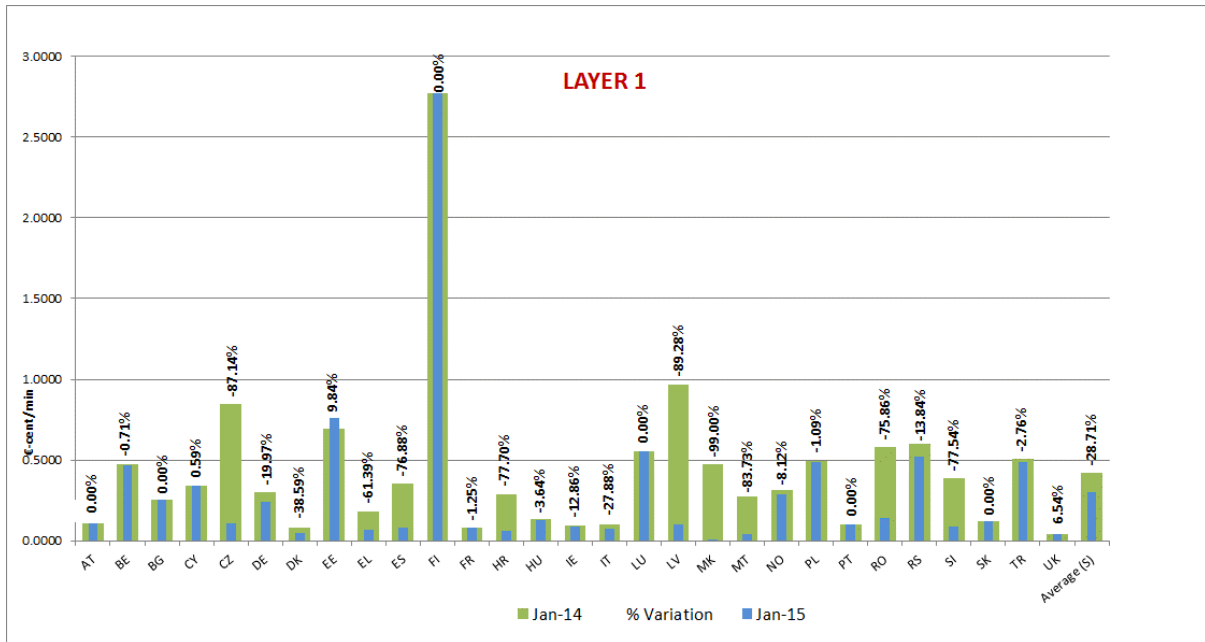
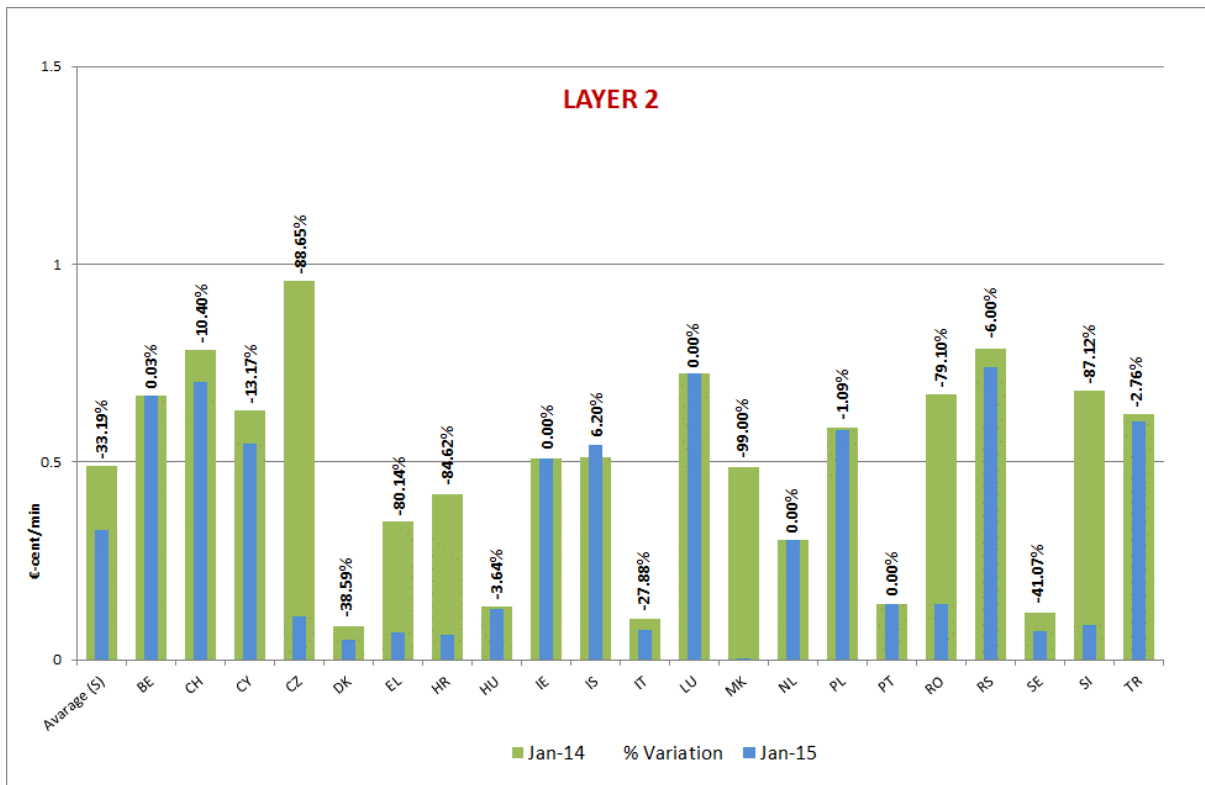
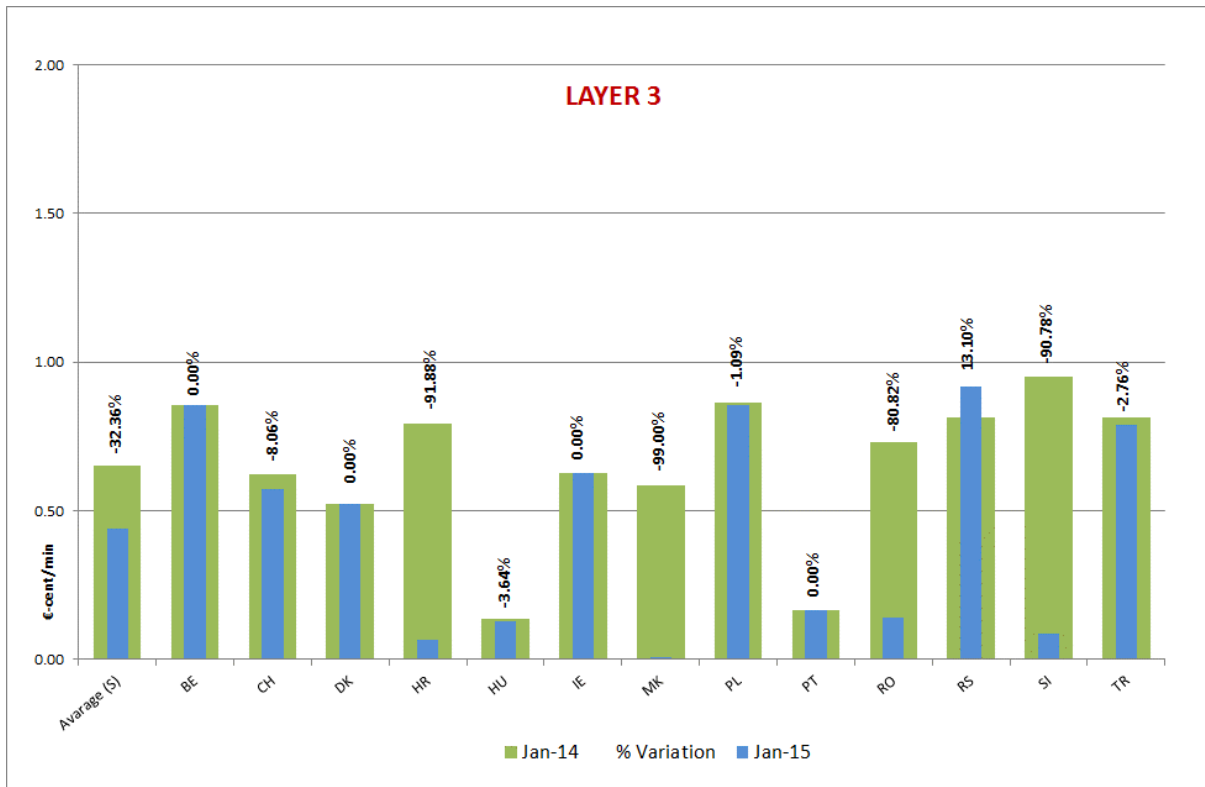


Figure 5



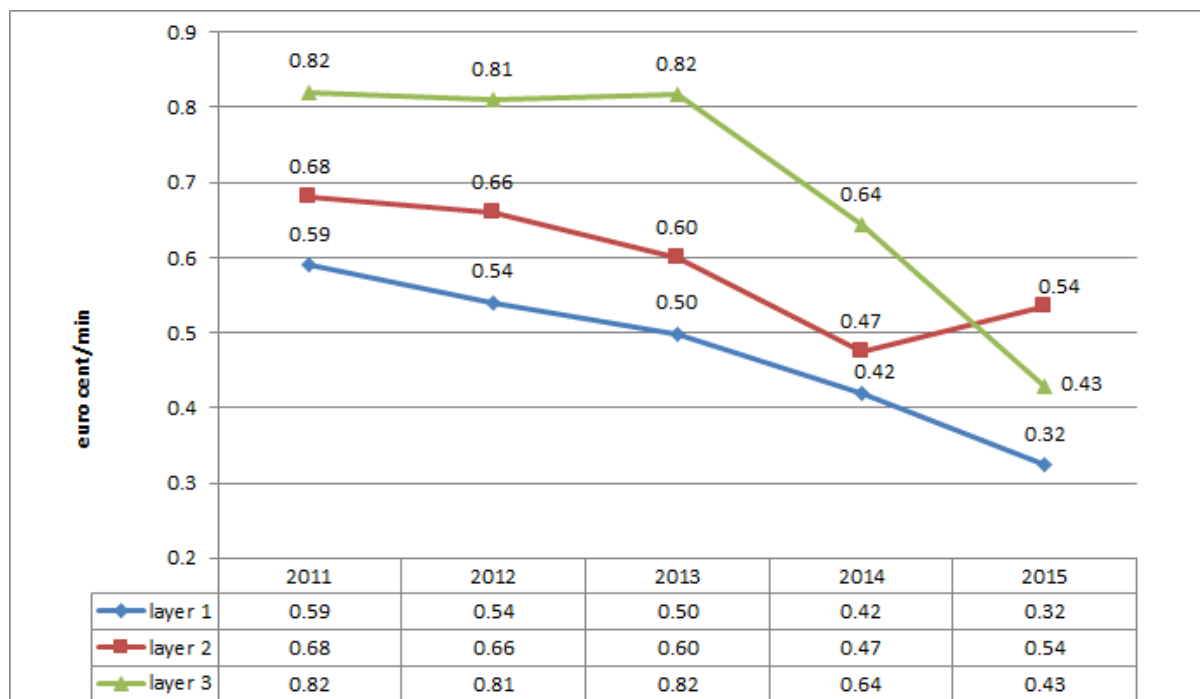
<sup>1</sup> The rates and variation for Finland reflect the average across all operators, rather than the sample of operators that are named elsewhere in the report.

Figure 6



## Glide path of the simple EU average of TRs for incumbent operators' fixed networks

Figure 7<sup>23</sup>



### 2.3. Average revenue per minute (all operators) in 2014

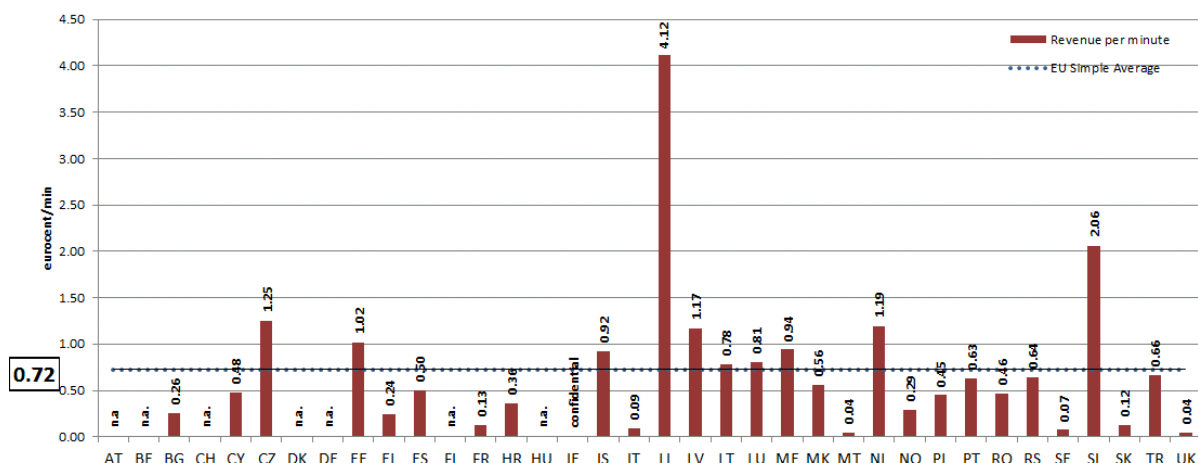
In the next graph (figure 8) the average revenue per minute from interconnection services across all Layers and for all operators is reported, together with the simple average (horizontal line). Note that the average revenues per minute provided are aggregated for each country to: 1) the different existing 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 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.

<sup>2</sup> The average Layer 1 rate calculated for 2014 increased from 0.41 to 0.42 €cents due to retroactive changes regarding FTRs in some of the countries.

<sup>3</sup> The average of Layer 2 is slightly higher in January 2015 compared to January 2014, due to the inclusion of additional countries that did not provide information for January 2014.

Figure 8



## Notes to Figure 8:

**AT:** These data are no longer collected by RTR on a regular basis.

**BG:** The indicator is based on the traffic and revenue from national and international incoming calls terminated on fixed networks. Revenues and traffic terminated for non-geographic numbers on fixed networks are not included.

In 2014 the cost-oriented fixed terminating rates based on Pure Bu-LRIC model came into force – 0,005 BGN/minute. There is no separation between peak/off-peak or interconnection levels.

**CH:** The data are not collected.

**CZ:** The amount of total FTR revenue and minutes correspond to data as of 30 June 2014 (data as of 1 January 2015 are not yet available).

**EE:** Data is available only for the first half of 2014.

**EL:** The data are for the whole of 2014. The FTRs for the period 1/1/2014 - 27/5/2014 were defined by EETT with two decisions, on 13/6/2014 for the incumbent and on 26/3/2013 for the alternative operators, according to the 2nd round of Market Analysis - Decision EETT 573/017/22-7-2010 (Official Gazette 1353/1-09-2010). Additionally the FTRs changed on 28/4/2014 with reference to the period 28/5/2014-31/12/2014, as a result of the 3rd round of Market Analysis - Decision EETT 714/09/10-4-2014 (Official Gazette 1049/28-04-2014).

**ES:** The FTR changed from November 1 2015 onwards. The reported figures are from all operators in 2014. Termination revenues and minutes at local, metropolitan and single & double transit interconnection cannot be split at this stage. CNMC has made an approximation with the weighting factors from 2013 for the values of the four quarters of 2014. The weighting factors in revenues are: local 72.62%; metropolitan (regional) 4.20%; national (single and double transit) 23.18%. The weighting factors in traffic are: local 65.08%; metropolitan (regional) 0.19%; national (single and double transit) 34.73%.

**HR:** Figures for Q4 2014 are not finalised yet because HAKOM is in the process of analysing the data but these are included in any case.

**IE:** The data relates to Eircom's traffic only. There is no separation for National, Regional or Local termination available. Please also note this information is confidential.

**IS:** Data are from the first half of 2014.

**IT:** Data are from 2014 (whole year). All data are estimates.

**LI:** Data are from January and February 2015.

**LT:** Data only from Q1-Q3.

**LV:** Data are from Q1 and Q2 2014. Data for Q3 and Q4 are not available yet. The FTR was changed on 1 July 2014

**LU:** Data are from Q1 and Q2 2014.

**ME:** Data are only for national traffic.

**MK:** Data only from Q1-Q3 2014.

**MT:** Data are from January 2014 to September 2014

**NL:** Data are from Q1-Q3 2014

**NO:** There is insufficient data to provide accurate results. However, an estimate has been made based on the termination volume reported for the 1st half of 2014 and the termination rate on the incumbent's network in 2014. The total volume for 2014 is estimated by doubling the reported volume from the 1st half of 2014.

**PT:** Data are from 2013.

**RO:** Data are from H1 2014. FTRs were changed in April 2014.

**SE:** The latest full year data is for 2013, so the data provided here is a PTS estimate for 2014 based on the incumbent's traffic distribution between national and regional levels.

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

**TK:** Data are from the fixed incumbent operator (Türk Telekom). Total FTR minutes includes only calls that originate and terminate within Turkey regardless of the origin of the call. In the table above total FTR revenues and total FTR minutes include data from the year 2014. FTRs for different Layers have been the same since 1 April 2010. Total FTR revenue and Total FTR minutes are confidential.

## 2.4. Regulatory model implemented as of 1 January 2014

The next tables (2 and 3) provide a summary of the cost orientation model followed by each NRA.

**Table 2**

Country	COST ACCOUNTING MODEL		
	Model	BU LRIC rate (Target rate) €cent	when BU LRIC rate applied
AT	Pure BU LRIC	0.135/0.085	01/11/2013
BE	TD		
BG	Pure BU LRIC	0.2556	01/01/2015
CH	BU LRAIC+		
CY	TD	0,632	
CZ	Pure BU LRIC	0.1086	Second half of May 2014
DE	BU LRAIC+		
DK	Pure BU LRIC		01/01/2013
EE	TD/Benchmark		
EL	Pure BU LRIC	0.0545	01/01/2017

ES	Pure BU LRIC	0,0817	01/11/2014
FI	FDC		
FR	Pure BU LRIC	0.0790	01/01/2013
HR			
HU	Pure BU LRIC	0.1296	01/01/2014
IE	Pure BU LRIC	0.0009	01/07/2014
IS	Other		
IT	Pure BU LRIC	0.0430	01/07/2015
LI	TD		
LT	BU LRAIC+		potentially 01/07/2015
LU	Pure BU LRIC	0.1400	begin of 2015
LV	Benchmark	0.1000	01/07/2014
ME	Other		
MK	TD LRIC		
MT	Pure BU LRIC	0.0443	01/07/2013
NL	BU LRAIC+	0.1080	
NO	BU LRAIC+		
PL	BU LRAIC+		
PT	Benchmark		
RO	Pure BU LRIC	0.1400	01/04/2014
RS	TD-FAC-HC		
SE	Pure BU LRIC	0.12/0.07	01/01/2014
SI	Pure BU LRIC	0.0876	01/11/2014
SK	Pure BU LRIC	0.1234	01/09/2013
TR	BU LRIC+		
UK	Pure BU LRIC	0.0444	01/01/2014



**Notes to table 2:**

**AT:** The information is unchanged since the previous round.

**BG:** With Decision 134 from 14 February 2013 CRC approved cost-oriented fixed termination rates based on a 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

There is no separation between peak/off-peak or interconnection levels.

**CH:** Source of the Swisscom-Tariffs: [https://www.swisscom.ch/dam/swisscom/de/ws/documents/D\\_IC-Dokumente/Handbuch%20Preise\\_IC\\_V1-12.pdf](https://www.swisscom.ch/dam/swisscom/de/ws/documents/D_IC-Dokumente/Handbuch%20Preise_IC_V1-12.pdf), p.11

**CY:** Termination rates are 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). A BU LRIC model is currently being developed.

**CZ:** According to a final determination made in August 2014, the level of FTRs is set to 0,03 CZK per minute. The calculation of FTRs has been based on pure BU-LRIC model. For the purposes of FTR regulation, CTU has determined one level of FTRs without differentiation between peak and off-peak periods.

**DE:** There is no glide path regulation. FTRs are valid from 1 December 2014 until 31 December 2016. The decision is preliminary and still subject to a Phase II investigation.

**EE:** Benchmark: Incumbent's FTR

**EL:** A Pure BU LRIC model has applied since 28 May 2014 as a result of EETT's decision 714/09/10-4-2014 (Official Gazette 1049/28-04-2014).

**ES:** From 1 November 2015 onwards, new regulation for FTR will be applied. There is no separation between peak and off-peak and only the local level is regulated.

**FI:** FDC applied by operators.

**IE:** In relation to fixed termination for Layer 1 (i.e. 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](http://www.comreg.ie/_fileupload/publications/ComReg12125.pdf)

**IS:** The country is a single interconnection area with one pricing structure and single transit. The cost model is based on historical Costs and the target rate was reached by 4 December 2012.

**IT:** AGCOM has developed a BU-LRIC model for determining IP termination rates, which will be applied from 1 July 2015. The current rates are a weighted average between the IP rate determined by the model and a pure LRIC TDM rate. The weights are 33% IP and 67% TDM for the period between 1 July 2013 and 30 June 2014. AGCOM has estimated the number of lines.

**LI:** A benchmark is used as an efficiency check for TD-FDC calculated FTRs.

**LT:** Currently prices of fixed termination market are not regulated, but SMP operators apply the same rates as were set previously (0,61 euro cent/min). RRT is finalising its market research (market 3) and new prices, based on BU-LRAIC, will be set after completion of this analysis. There is no separation between peak and off-peak FTRs

**LU:** There was a new decision made on 6 January 2014 (Règlement 14/170/ILR du 6 janvier 2014 M3/2007). Some operators consulted on new tariffs at the end of 2014. Symmetrical prices are not mandatory as the ILR has introduced a price control obligation in the form of price caps. [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), consultation nationale et internationale finalisée]

**LV:** The benchmark is based on PURE BU LRIC countries only.

**ME:** Current prices are regulated according to the HCA FDC costing methodology.

**MK:** The current prices are calculated according to Top Down LRIC for the incumbent operator and approved by the Agency.

**MT:** The relevant publication is available at:

<http://www.mca.org.mt/sites/default/files/attachments/decisions/2012/decision-on-bucm-2-ftr-2012.pdf>

**NO:** We have updated our calculations of LRIC FTRs. A draft decision in markets 1, 2 and 3 is in national consultation and the industry had until 13 February to provide a response. Nkom expects to notify a decision in Q2 2015.

**PT:** ANACOM has set the fixed termination rates by benchmarking against BU pure LRIC prices in Denmark, France, Ireland, Malta, Bulgaria, Austria and Slovakia.

These prices have been in place 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 euro 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 euro cents.

**RO:** For Telekom RC S.A. (former Romtelecom S.A.) the 0.14 euro cents/min FTR applies irrespective of the interconnection level.

**SE:** The regulation is based on the incumbent's different level of interconnection, i.e. regional and national interconnection. The rates in table 1.3 above reflects those levels. SEK 1,07 is the national interconnect/termination rate and SEK 0,66 is the regional interconnect/termination rate.

**SK:** No glide path is in use.

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

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 3**

Country	Symmetry	Comments
AT	YES	Symmetric pure LRIC charges apply since 1 November 2013.
BE	YES	The alternative operators' termination rates were set at the incumbent's national rate.
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	The alternative operators' termination rate was set at the incumbent's (CYTA) national rate (0,632 euro cents).
CZ	YES	
DK	YES	Price levels are symmetric. Regardless of the amount of interconnection point(s) and at which level (regional or local) the SMP operator provides access to the alternative operators, the FTRs are the same as the ones charged at a local level. This is to ensure that price levels are symmetrical, and that operators, regardless of topology and level of access, are able to terminate PSTN- and ISDN-traffic to prices at a local level.  With regard to (managed and unmanaged) VoIP-traffic, the SMP operator is not limited to give access at the location or interconnection point nearest the end-user,

		but has to provide access to all its interconnection points, since the terminating operator is able to choose a random point of interconnection where it wants to terminate VoIP-traffic to prices at a local level.
DE	YES	More than 50 alternative fixed network operators (i.e. BT Germany, Telefónica Germany, Verizon, Versatel, Vodafone et al) have applied to have their FTR approved symmetrically, based on a tariff comparison with the approved Telekom Deutschland GmbH FTR.
EE	YES	Symmetry is ensured on the basis of a calculation of a per minute call charge through a 3 minute call duration.
EL	YES	Symmetry applies since 28 May 2014.
ES	YES	The FTR is symmetric 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's network, the interconnected operator should be connected at 21 Points of Interconnection (PoI), if TDM based interconnection is used. If the operator connects to less than these 21 PoI, then a transit for terminating at the other PoIs should be paid. For IP interconnection a decision on the number of PoI for termination in the incumbent operator's network is still pending. For the termination in alternative operators' networks, there is no remedy concerning the minimum number of PoI for FTRs – it is subject to commercial negotiation, as it was in the past.
FI		In Finland there are no price caps on FTRs. FTRs are symmetrical among most of fixed operators.
FR	YES	Symmetric termination rates apply since 1 October 2011.
HR	YES	Symmetry in fixed network is prescribed for all operators as of the 1 January 2013.
HU	YES	
IE	PARTIALLY	ComReg Decision D12/12 set fixed termination rates at layer one (i.e. 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. No symmetry considerations employed.
LT	YES	FTRs of all fixed operators with SMP are symmetric, i.e. the FTRs are the same irrespective of the number of customers, the difference in network topologies, the level of interconnection and so on.
LU	YES	New relevant decision : Règlement 14/170/ILR du 6 janvier 2014 M3/2007. Some operators consulted on new tariffs at the end of 2014. Symmetric prices are not mandatory as the ILR has introduced a price control obligation in the form of price caps.
LV	YES	

ME	YES	
MK	YES	
MT	YES	Symmetry is ensured on the basis of geographical coverage from certain points of interconnection (e.g. regional termination is priced the same both ways regardless on actual network hierarchy). Symmetry is evaluated on the basis of average FTRs (i.e. pricing flexibility is left for operators).
NL	YES	There is no differentiation in rates.
NO	YES	
PL	YES	Partially, for FTR in T1 only.
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: Local, single and double transit prices were weighted according to traffic volumes and the average price is 0,1114 eurocents.</p> <p>For the other SMP operators: If the operator offers a pricing structure with several levels of interconnection prices, the applicable termination prices may not exceed the maximum prices established for the local, single and double transit charged by MEO. If the operator decides to offer a simplified pricing structure with only one level of prices, the termination rate may not exceed 0.1114 EUR cents per minute.</p> <p>All SMP operators shall apply a per second billing system that does not include any set-up fee.</p>
RO	YES	Symmetric FTRs for all SMP operators.
RS	YES	Operators have different topologies and different numbers of the various levels of interconnection. Telekom Srbija and Orion telekom have 3 levels of interconnection. Telenor and SBB 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 (symmetric) with the cost oriented price of the incumbent.
SI	YES	Rates are based on a national coverage layer.
SK	YES	
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.

## 2.5. Number of lines and market shares

In Table 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.

**Table 4**

	Operator	Number of lines	Total number of lines	Market shares
AT	A1 Telekom Austria	2,199,696	3,266,500	67.30%
	Operator 2	468,206		14.30%
	Operator 3	222,167		6.80%
	Operator 4	47,906		1.50%
	Operator 5	47,001		1.40%
	Operator 6	31,279		1.00%
	Other operators (4)	250,245		7.70%
BE	Belgacom	2,835,480	4,596,402	61.70%
	Other operators	1,760,922		38.30%
BG	Bulgarian Telecommunication Company (incumbent)	Confidential	Confidential	70.08%
	Mobiltel	Confidential		10.93%
	Telenor Bulgaria	Confidential		10.57%
	Blizoo Media and Broadband	Confidential		7.58%
	Other operators	Confidential		0.83%
CH	N/A	N/A	N/A	N/A
	N/A	N/A		N/A
CY	CYTA	46820600.00%	331 569	83.26%
	PRIMETEL	22216700.00%		9.11%
	CABLENET	4790600.00%		7.02%
	MTN FIXED	4700100.00%		0.61%
	Other operators			
CZ	O2 Czech Republic	Confidential	Confidential	52.74%
	UPC Česká republika	Confidential		9.73%
	GTS Czech	Confidential		4.96%
	České radiokomunikace	Confidential		3.76%
	T-Mobile Czech Republic	Confidential		3.71%
	Other operators	Confidential		25.09%
DE	Telekom Deutschland GmbH	21,490,000	37,160,000	57.8%

	Other operators	15,670,000		42.17%
DK	TDC	N/A		N/A
	Other operators	N/A		N/A
EE	Elion	338,055	399,795	84.56%
	Elion			
	Starman	35,330		8.84%
	Elisa	12,105		3.03%
	STV	14,305		3.58%
EL	OTE	2808775	4,772,844	58.85%
	FORTHNET	confidential		confidential
	HOL	confidential		confidential
	WIND	confidential		confidential
	Other operators	confidential		confidential
ES	Telefónica de España	10,575,626	18,879,297	56.02%
	Orange	1,925,385		10.20%
	Vodafone	1,755,077		9.30%
	Ono	2,122,936		11.24%
	Jazztel	1,682,758		8.91%
	Other operators	817,515		4.33%
FI	Elisa Oyj	N/A	N/A	N/A
	DNA Oyj			
	TeliaSonera Finland Oyj			
	Etelä-Satakunnan Puhelin Oyj			
	Ålands Telefonandelslag			
FR	Orange	Confidential	38,699,365	Confidential
	Other operators			
HR	HT	946,455	1,500,250	63.09%
	OPTIMA	158,966		10.60%
	VIPnet	149,422		9.96%
	H1	91,286		6.08%
	Other operators	154,121		10.27%
HU	Magyar Telekom	1,701,156	3,045,040	55.90%
	Invitel	387,411		12.70%
	UPC	476,321		15.60%
	Other operators	480,152		15.80%
IE	Eircom	N/A	N/A	N/A
IS	Siminn	91,658	146,361	62.62%
	Vodafone	37,147		25.38%

	Other operators	17,556		11.99%
IT	Telecom Italia S.p.A.	12,126,478	21,461,995	56.50%
	Wind Telecomunicazioni	2,475,368		11.53%
	Fastweb S.p.A.	2,209,834		10.30%
	Vodafone Omnitel B.V. (including TeleTu S.p.A.)	2,343,109		10.92%
	Other operators	2,307,205		10.75%
LI	Telecom Liechtenstein AG	17,785	17,785	100.00%
LT	TEO LT, AB	500,956	543,357	92.20%
	UAB „CSC Telecom“	10,356		1.91%
	AB “Lietuvos geležinkeliai”	5,420		1.00%
	UAB “Cgates”	6,174		1.14%
	Other operators	20,451		3.76%
LV	Lattelecom	300,000	337,000	89.02%
	Telekom Baltija	14,000		4.15%
	Baltcom TV	12,000		3.56%
	Megatel	9,000		2.67%
	Other operators	2,000		0.59%
LU	EPT	207,000	267,700	77.53%
	Other operators	60,000		22.47%
ME	Crnogorski Telekom	Confidential	Confidential	Confidential
	Mtel			
MK	Makedonski Telekom AD	229,691	386,380	59.45%
	ONE Telecom services	60,613		15.69%
	Robi	23,717		6.14%
	Blizoo	41,655		10.78%
	Other operators	30,704		7.95%
MT	Go plc	155,232	232,213	66.85%
	Melita plc	75,555		32.54%
	Vodafone	306		0.13%
	Ozone	837		0.36%
	SIS	228		0.10%
	Vanilla	55		0.02%
NL	KPN	N/A	N/A	N/A
	Ziggo			
	UPC			
	Tele2			
NO	Telenor	791,274	1,156,968	68.39%
	Ventelo	61,311		5.30%

	Tele2	54,371		4.70%
	Telio	55,528		4.80%
	Other operators	194,484		16.81%
PL	Orange Polska S.A.	Confidential	5,477,447	Confidential
	NETIA	Confidential		Confidential
	Multimedia Polska S.A.	Confidential		Confidential
	Multimedia Polska Poludnie S.A.	Confidential		Confidential
	TK Telekom	Confidential		Confidential
	Other operators	746545		14%
PT	MEO Group (incumbent)	Confidential	4,582,033	54.11%
	NOS Group	Confidential		30.61%
	Vodafone	Confidential		9.61%
	Altice Group	Confidential		5.15%
	Other operators	Confidential		0.52%
RO	TELEKOM RC S.A.	2,355,405	4,607,967	51.12%
	RCS&RDS S.A.	1,485,215		32.23%
	UPC Romania S.R.L.	314,474		6.82%
	VODAFONE ROMANIA S.A.	186,798		4.05%
	Other operators	266,075		5.77%
RS	Telekom Srbija	N/A	N/A	N/A
	Orion telekom			
	Telenor			
	SBB			
SE	TeliaSonera	2,796,600	3,837,000	72.89%
	Comhem	328,300		8.56%
	Telenor	274,200		7.15%
	Alltele	114,400		2.98%
	TelaVox	78,100		2.04%
	Other operators	245,400		6.40%
SI	Telekom Slovenije	Confidential	Confidential	59.61%
	Telemach	Confidential		18.34%
	T-2	Confidential		10.94%
	Amis	Confidential		5.80%
	Other operators	Confidential		5.31%
SK	Slovak Telekom*	Confidential	Confidential	84.56%
	Orange Slovensko	Confidential		8.01%
	Swan	Confidential		1.52%
	UPC	Confidential		5.91%



TR	Türk Telekom	11,199,851	12,740,000	87.91%
	TTNet	1,168,350		9.17%
	Millenicom	200,559		1.57%
	Turknet	59,732		0.47%
	Other operators	111,508		0.88%
UK	BT	Confidential	26,657,939	Confidential
	TalkTalk	Confidential		Confidential
	Sky	Confidential		Confidential
	Virgin Media	Confidential		Confidential
	Vodafone	Confidential		Confidential

**Notes to table 4:**

**BG:** There is no separation between peak/off-peak or interconnection levels. Data concerning number of lines (network termination points) per operator is confidential. Data in the field "Number of lines" refer to the number of fixed telephone subscribers as of 1 July 2014.

**CH:** There exists a "clause of reciprocity", meaning that the tariffs of other operators have to be same as those of Swisscom.

**CY:** There is no separation between peak and off-peak. For CYTA the total number of line termination points are 276,059. 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:** In the Czech Republic hypothetic Layer 3 with national coverage can be achieved through transit of traffic between two regional POI. However, this is not supposed to be part of fixed termination and transit prices are not regulated. Currently all OLOs active on the relevant market are interconnected only on Layer 2 (regional coverage). Total number of lines respond to date as of 30 June 2014 (data as of 1 January 2015 are not yet available).

The data provided is based on the total number of lines at the highest interconnection level. The number of lines is based on figures as of 1 July 2014 – data for the whole year 2014 are not yet available.

**DE:** The number of lines is based on figures from 2013. Source: BNetzA Annual Report 2013.

**EL:** Data refer to the number of active telephone access lines on 30 June 2014.

**FI:** Figures come from the three biggest operators in terms of market share, together with two smaller operators with a different FTR.

**FR:** The number of lines at the of end of 2014 is estimated based on data for Q1, Q2 and Q3 2014.

The average FTR per minute for the incumbent includes a capacity-based component derived from a unit price of 874,80 euros per E1 per year, divided by an average load of 2.5 million minutes per E1 per year.

**IE:** ComReg Decision D12/12 set fixed termination rates at layer one (i.e. ericom's primary). ComReg Decision D12/12 imposed a symmetrical blended rate of 0.098 cent per minute for all SMP fixed operators from 1 July 2013. This blended FTR will reduce to 0.085 cent per minute from 1 July 2014 and 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](http://www.comreg.ie/_fileupload/publications/ComReg12125.pdf)

**IT:** The data are based on estimates

**LT:** The network hierarchy includes only Layer 1 (National) from 1 April 2013 . The number of lines is based on the situation in Q3 2014.

**LU:** Entreprise des Postes et Télécommunications (EPT) FTR average is based on a traffic distribution assumption of 50% peak and 50% off-Peak. Coverage of Layer 1 is a mix of local and regional network hierarchy. Operators don't provide details on the distribution of traffic nor network layers. EPT has 2 IX layers, other operators generally have only one layer; all use set up fees and peak/off peak differentiation.

**MT:** The number of lines is based on the situation in Q3 2014.

**NO:** Number of lines are provided from 30 June 2014. The total number of lines according to 1 January 2015 will not be available before Q2 2015. The deadline for the operators reporting is in the middle of March 2015.

**PL:** The number of lines (network termination points) include own POTS, ISDN BRA, ISDN PRA lines. Data are for 2013.

**RO:** The number of lines are from 30 June 2014

**RS:** Data provided are for 2013 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.

**SE:** There are no set-up fees nor any distinction between peak and off peak traffic in terms of the level of FTRs. The number of lines are based on data as of June 30 2014.

**SI:** The absolute number of lines per operator is confidential.

**SK:** The number of lines of Slovak Telekom includes the following type of access: TP1, ISDN BRA, ISDN PRA, TP2M, VoBB access, VoIP access.

**TR:** In Turkey, there is no separation between peak and off-peak. The number of lines for alternative network operators includes the number of wholesale line rental subscribers.

### 3. Interconnection in mobile networks

#### 3.a. Voice interconnection

This section presents the benchmark of mobile termination rates (MTR) with data as of 1 January 2015 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 analysis of the future evolution of MTRs. Finally, information about average wholesale termination revenues is provided.

The present overview of MTRs is based upon the results of a request for information sent to all NRAs in January 2015. It includes data from thirty-six (36) NRAs that provided responses.

##### 3.a.1 Assumptions made for the benchmarking

For the present benchmarking exercise the following assumptions have been made in order to make tariffs comparable<sup>4</sup>:

- Operators with a market share below 1.5% have been excluded from the MTR average calculation.
- Only nominal tariffs are represented in the report, defining them as “the price (in eurocent/minute) set out by the regulator that represents the maximum price per minute which operators may charge each other (without any adjustment for purchasing power parity or real effects – inflation).”
- Average MTRs per country have been obtained by weighting the MTR 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 rate with the share of the country’s subscribers (total subscribers per country / total subscribers in all countries). In the case of the weighted average, only the countries that reported the number of subscribers are taken into account.
- VAT is not included in the revenues.
- For non-Euro countries, the average exchange rate for the fourth quarter of the year, Q4 2014, was used to convert the currencies. The exchange rates used are reported in the Annex.

Regarding the short-term MTR evolution (from July 2014 to January 2015), some variation may be a consequence of any of the following reasons:

- i. Modifications in the tariff structure (for instance, disappearance of the set-up charge or initial period);
- ii. Currency exchange rate variations in non-Euro countries<sup>5</sup>;

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<sup>4</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>5</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.

- iii. Changes in operators' market shares 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.a.2. Average MTR per country: nominal rates per voice minute (as of January 2015)

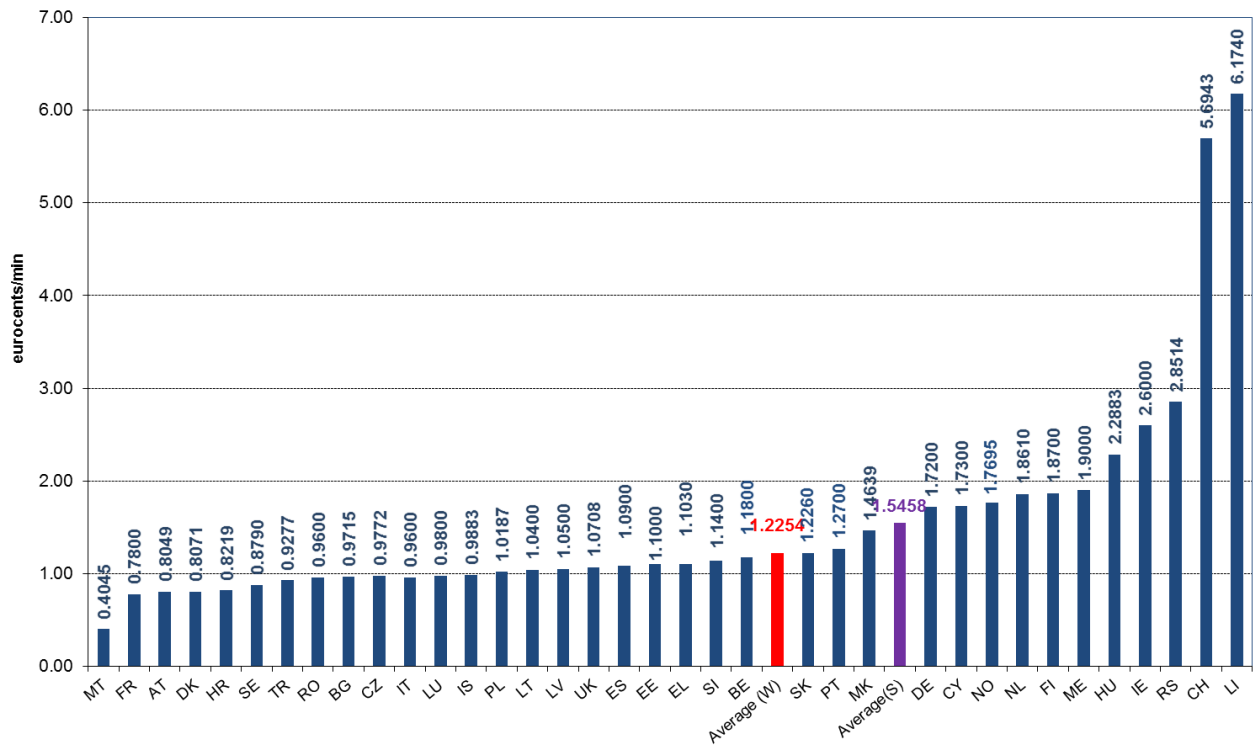
Table 5

Country	Average MTR per country (€cent)
AT	0.8049
BE	1.1800
BG	0.9715
CH	5.6943
CY	1.7300
CZ	0.9772
DE	1.7200
DK	0.8071
EE	1.1000
EL	1.1030
ES	1.0900
FI	1.8700
FR	0.7800
HR	0.8219
HU	2.2883
IE	2.6000
IS	0.9883
IT	0.9600
LI	6.1740
LT	1.0400
LU	0.9800
LV	1.0500
ME	1.9000
MK	1.4639
MT	0.4045
NL	1.8610
NO	1.7695
PL	1.0187
PT	1.2700
RO	0.9600
RS	2.8514
SE	0.8790
SI	1.1400
SK	1.2260
TR	0.9277
UK	1.0708
<b>Average(S)</b>	<b>1.5458</b>
<b>Average (W)</b>	<b>1.2254</b>

**Note to Table 5:** the Weighted Average (W) is calculated taking into account only countries providing the total number of subscribers.

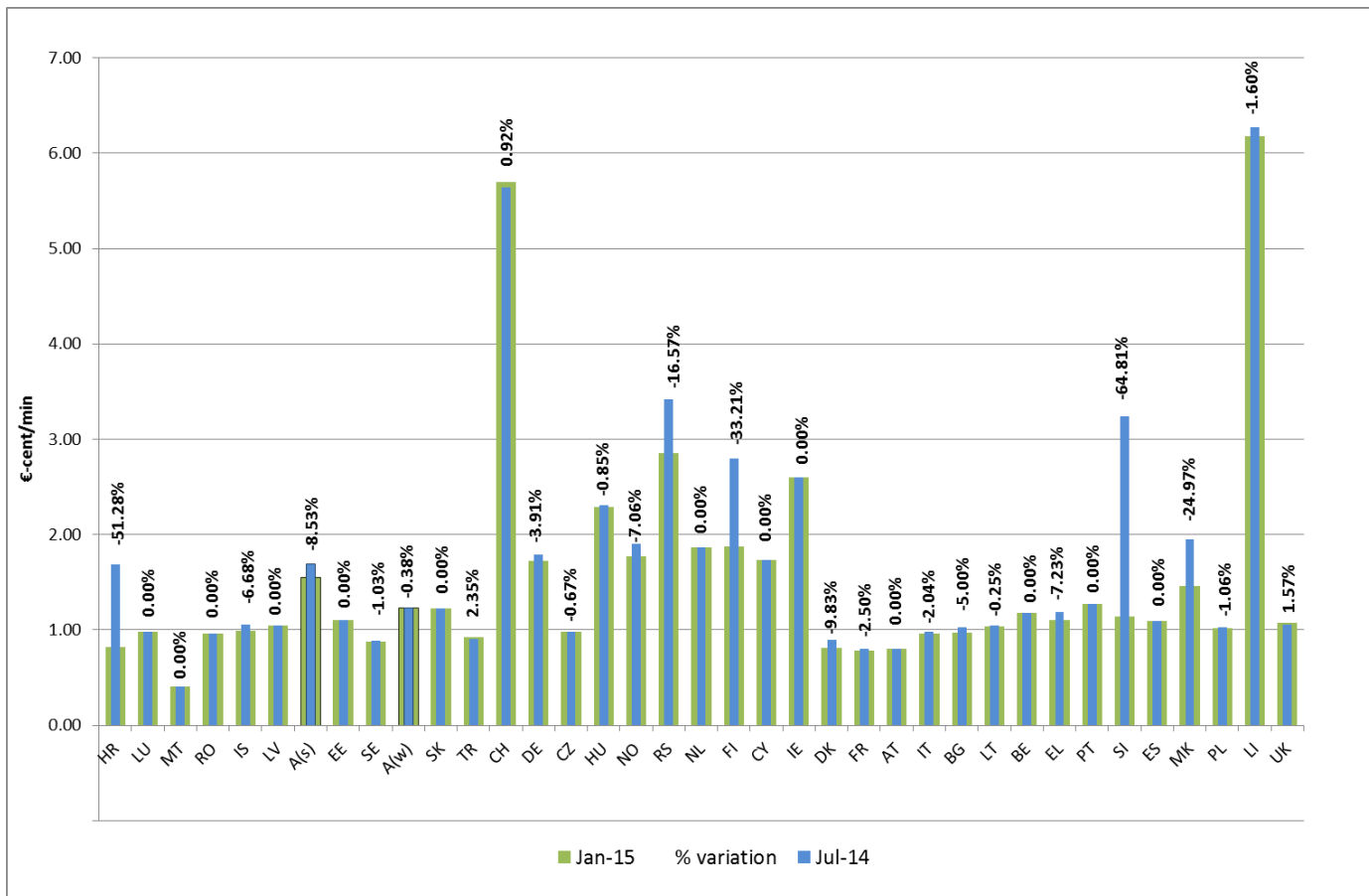
Average MTR per country (January 2015), based on nominal rates (Euro cents per minute of service)

Figure 9



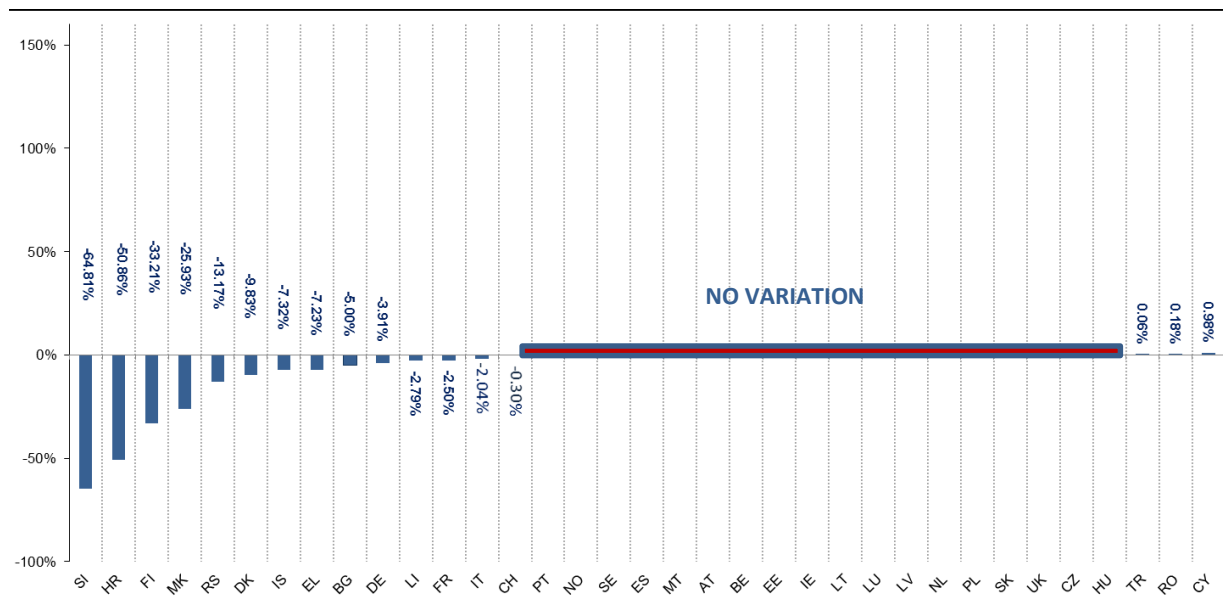
**Short-term evolution of average MTRs per country (from July 2014 to January 2015, in Euro cent)**

**Figure 10**



## Percentage variation of average MTRs in national currency per country (from July 2014 to January 2015)

Figure 11



### 3.a.3. Average MTR per operator: nominal rates

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.

Table 6

Country	Operator	Average effective prices (€cent)	Subscribers	Country total subscribers	Market Share %
AT	A1Telekom Austria	0.8049	5,500,000	13,050,000	42.15%
	T-Mobile	0.8049	4,060,000		31.11%
	H3G (including Orange)	0.8049	3,490,000		26.74%
BE	Belgacom	1.1800	confidential	12.734.724	40,2 %
	Mobistar	1.1800	confidential		23,1 %
	Base	1.1800	confidential		23,0 %
BG	Mobitel	0.9715	confidential	confidential	37.40%
	Telenor Bulgaria	0.9715	confidential		37.51%
	BTC	0.9715	confidential		25.09%
CH	Swisscom	5.1889	6,540,000	11,007,980	59.41%



	Sunrise	<b>6.4342</b>	2,465,000		<b>22.39%</b>
	Orange	<b>6.4342</b>	2,002,980		<b>18.20%</b>
CY	Primetel PLC	<b>2.9100</b>	39,000	1,123,289	<b>3.45%</b>
	MTN	<b>1.7090</b>	337,406		<b>29.84%</b>
	CYTA	<b>1.7090</b>	739,398		<b>65.39%</b>
CZ	T-Mobile	<b>0.9772</b>	<i>confidential</i>	<i>confidential</i>	40.45%
	O2 Czech Republic a.s.	<b>0.9772</b>	<i>confidential</i>		36.28%
	Vodafone	<b>0.9772</b>	<i>confidential</i>		20.41%
DE	T-Mobile	<b>1.7200</b>	38,989,000	112,629,000	<b>33.80%</b>
	Vodafone	<b>1.7200</b>	31,515,000		<b>27.03%</b>
	E-plus Mobilfunk / Telefónica Germany	<b>1.7200</b>	42,125,000		<b>16.75%</b>
DK	TDC	<b>0.8071</b>	2,846,941	7,062,646	<b>40.31%</b>
	Telia	<b>0.8071</b>	1,303,122		<b>18.45%</b>
	Telenor	<b>0.8071</b>	1,698,104		<b>24.04%</b>
	Hi3G	<b>0.8071</b>	686,841		<b>9.72%</b>
EE	Telekom (EMT)	<b>1.1000</b>	877,868	2,062,864	<b>42.56%</b>
	Elisa	<b>1.1000</b>	666,888		<b>32.33%</b>
	Tele2	<b>1.1000</b>	518,108		<b>25.12%</b>
EL	Cosmote	<b>1.1030</b>	7,279,669	16,358,327	<b>44,50%</b>
	Vodafone	<b>1.1030</b>	5,100,254		<b>31,18%</b>
	Wind	<b>1.1030</b>	3,966,399		<b>24,25%</b>
ES	TME	<b>1.0900</b>	15,777,630	49,147,939	<b>32.10%</b>
	Vodafone	<b>1.0900</b>	11,019,343		<b>22.42%</b>
	Orange	<b>1.0900</b>	11,430,000		<b>23.26%</b>
	Xfera	<b>1.0900</b>	3,402,372		<b>6.92%</b>
FI	DNA	<b>1.8700</b>	n.a.	n.a.	<b>24.0%</b>
	Elisa	<b>1.8700</b>	n.a.		<b>40.0%</b>
	TeliaSonera	<b>1.8700</b>	n.a.		<b>35.0%</b>
FR	Orange	<b>0.7800</b>	<i>confidential</i>	77,236,000	<i>confidential</i>
	SFR	<b>0.7800</b>	<i>confidential</i>		<i>confidential</i>
	Bouygues Telecom	<b>0.7800</b>	<i>confidential</i>		<i>confidential</i>
	Free Mobile	<b>0.7800</b>	<i>confidential</i>		<i>confidential</i>
HR	HT	<b>0.8219</b>	2,087,839	4,461,352	<b>46.80%</b>
	VIPnet	<b>0.8219</b>	1,568,912		<b>35.17%</b>
	Tele2	<b>0.8219</b>	804,601		<b>18.03%</b>
HU	T-Mobile	<b>2.2883</b>	5,346,509	11,540,058	<b>46.33%</b>
	Telenor	<b>2.2883</b>	3,580,880		<b>31.03%</b>
	Vodafone	<b>2.2883</b>	2,612,669		<b>22.64%</b>
IE	Vodafone Ireland	<b>2.6000</b>	1,908,076	4,894,239	<b>39.0%</b>
	Three Ireland Hutchison (formerly Hutchison 3G Ireland Limited)	<b>2.6000</b>	1,570,006		<b>32.1%</b>
	Meteor Mobile Communications	<b>2.6000</b>	1,029,010		<b>21.0%</b>
	Tesco Mobile Ireland	<b>2.6000</b>	291,341		<b>6.0%</b>
	Lycamobile Ireland	<b>2.6000</b>	81,271		<b>1.7%</b>

IS	Siminn	<b>0.9883</b>	132,556	365,010	<b>36.32%</b>
	Vodafone	<b>0.9883</b>	96,578		<b>26.46%</b>
	Nova	<b>0.9883</b>	119,453		<b>32.73%</b>
	365/Tal	<b>0.9883</b>	13,686		<b>3.75%</b>
IT	Telecom Italia	<b>0.9600</b>	31,328,184	93,068,939	<b>33.66%</b>
	Vodafone Omnitel	<b>0.9600</b>	28,002,198		<b>30.09%</b>
	Wind Telecomunicazioni	<b>0.9600</b>	23,764,534		<b>25.53%</b>
	H3G	<b>0.9600</b>	9,974,023		<b>10.72%</b>
LI	Orange (Liechtenstein) AG	<b>6.1740</b>	<i>confidential</i>	11.588	<i>confidential</i>
	Swisscom (Schweiz) AG		<i>confidential</i>		<i>confidential</i>
	Telecom (Liechtenstein) AG		<i>confidential</i>		<i>confidential</i>
LT	Tele2	<b>1.0400</b>	1,881,976	4,474,544	<b>42.06%</b>
	Omnitel	<b>1.0400</b>	1,506,028		<b>33.66%</b>
	Bite Lietuva	<b>1.0400</b>	1,009,059		<b>22.55%</b>
LU	EPT	<b>0.9800</b>	n.a.	n.a.	<b>n.a.</b>
	Tango	<b>0.9800</b>	n.a.		<b>n.a.</b>
	Orange	<b>0.9800</b>	n.a.		<b>n.a.</b>
LV	Tele2	<b>1.0500</b>	940,000	2,547,000	<b>36.91%</b>
	Latvijas Mobilais Telefons	<b>1.0500</b>	920,000		<b>36.12%</b>
	Bite Latvija	<b>1.0500</b>	470,000		<b>18.45%</b>
	Zetcom	<b>1.0500</b>	150,000		<b>5.89%</b>
ME	Telenor	<b>1.9000</b>	<i>confidential</i>	<i>confidential</i>	<i>confidential</i>
	Crnogorski Telekom	<b>1.9000</b>	<i>confidential</i>		<i>confidential</i>
	Mtel	<b>1.9000</b>	<i>confidential</i>		<i>confidential</i>
MK	T Mobile Macedonia	<b>1.4639</b>	1,008,358	2,223,260	<b>45.35%</b>
	ONE Telecommunication services	<b>1.4639</b>	558,882		<b>25.14%</b>
	VIP Macedonia	<b>1.4639</b>	628,367		<b>28.26%</b>
MT	Go plc	<b>0.4045</b>	221,703	563,335	<b>39.36%</b>
	Melita plc	<b>0.4045</b>	81,420		<b>14.45%</b>
	Vodafone	<b>0.4045</b>	249,897		<b>44.36%</b>
	Redtouch fone	<b>0.4045</b>	10,259		<b>1.82%</b>
NL	KPN	<b>1.8610</b>	6,016,800	19,561,374	<b>30.76%</b>
	T-Mobile	<b>1.8610</b>	3,913,113		<b>20.00%</b>
	Vodafone	<b>1.8610</b>	4,867,400		<b>24.88%</b>
NO	Telenor	<b>1.7695</b>	2,947,007	5,932,761	<b>49.67%</b>
	TeliaSonera	<b>1.7695</b>	1,359,444		<b>22.91%</b>
	Network Norway	<b>1.7695</b>	709,855		<b>11.97%</b>
	Tele2	<b>1.7695</b>	389,660		<b>6.57%</b>
	Ventelo	<b>1.7695</b>	125,436		<b>2.11%</b>
PL	T-Mobile Polska S.A.	<b>1.0187</b>	<i>confidential</i>	56,972,803	<b>confidential</b>

	Polkomtel sp. z o.o.	<b>1.0187</b>	<i>confidential</i>		<b>confidential</b>
	Orange Polska S.A.	<b>1.0187</b>	<i>confidential</i>		<b>confidential</b>
	P4. sp. z o.o.	<b>1.0187</b>	<i>confidential</i>		<b>confidential</b>
	T-Mobile Polska S.A.	<b>1.0187</b>	<i>confidential</i>		<b>confidential</b>
PT	MEO	<b>1.2700</b>	<i>confidential</i>	16,731,949	<b>48 %</b>
	VODAFONE	<b>1.2700</b>	<i>confidential</i>		<b>33 %</b>
	NOS	<b>1.2700</b>	<i>confidential</i>		<b>19 %</b>
RO	Vodafone Romania S.A.	<b>0.9600</b>	<i>confidential</i>	22,920,000	<b>confidential</b>
	Orange Romania S.A.	<b>0.9600</b>	<i>confidential</i>		<b>confidential</b>
	TELEKOM RMC S.A. (former Cosmote RMT)	<b>0.9600</b>	<i>confidential</i>		<b>confidential</b>
	RCS & RDS S.A.	<b>0.9600</b>	<i>confidential</i>		<b>confidential</b>
RS	MTS (Telekom Srbija)	<b>2.8514</b>	n.a.	n.a.	<b>44.56%</b>
	Telenor	<b>2.8514</b>	n.a.		<b>33.27%</b>
	Vip mobile	<b>2.8514</b>	n.a.		<b>22.17%</b>
SE	TeliaSonera	<b>0.8790</b>	5,398,400	14,130,000	<b>38.21%</b>
	Tele2	<b>0.8790</b>	4,050,300		<b>28.66%</b>
	Telenor	<b>0.8790</b>	2,473,300		<b>17.50%</b>
	Hi3G	<b>0.8790</b>	1,706,300		<b>12.08%</b>
SI	Telekom Slovenije	<b>1.1400</b>	<i>confidential</i>	<i>confidential</i>	<b>54.62%</b>
	Si.mobil	<b>1.1400</b>	<i>confidential</i>		<b>29.30%</b>
	Tušmobil	<b>1.1400</b>	<i>confidential</i>		<b>13.26%</b>
	T-2	<b>1.1400</b>	<i>confidential</i>		<b>2.83%</b>
SK	Orange Slovensko	<b>1.2260</b>	<i>confidential</i>	<i>confidential</i>	<b>39.42%</b>
	Slovak Telekom	<b>1.2260</b>	<i>confidential</i>		<b>31.70%</b>
	O2 Slovakia	<b>1.2260</b>	<i>confidential</i>		<b>28.88%</b>
TR	Turkcell	<b>0.8828</b>	34,732,127	71,908,742	<b>48.30%</b>
	Vodafone	<b>0.9110</b>	20,945,830		<b>29.13%</b>
	Avea	<b>1.0452</b>	16,230,785		<b>22.57%</b>
UK	EE	<b>1.0708</b>	<i>confidential</i>	83,931,384	<b>confidential</b>
	O2	<b>1.0708</b>	<i>confidential</i>		<b>confidential</b>
	Vodafone	<b>1.0708</b>	<i>confidential</i>		<b>confidential</b>
	H3G	<b>1.0708</b>	<i>confidential</i>		<b>confidential</b>

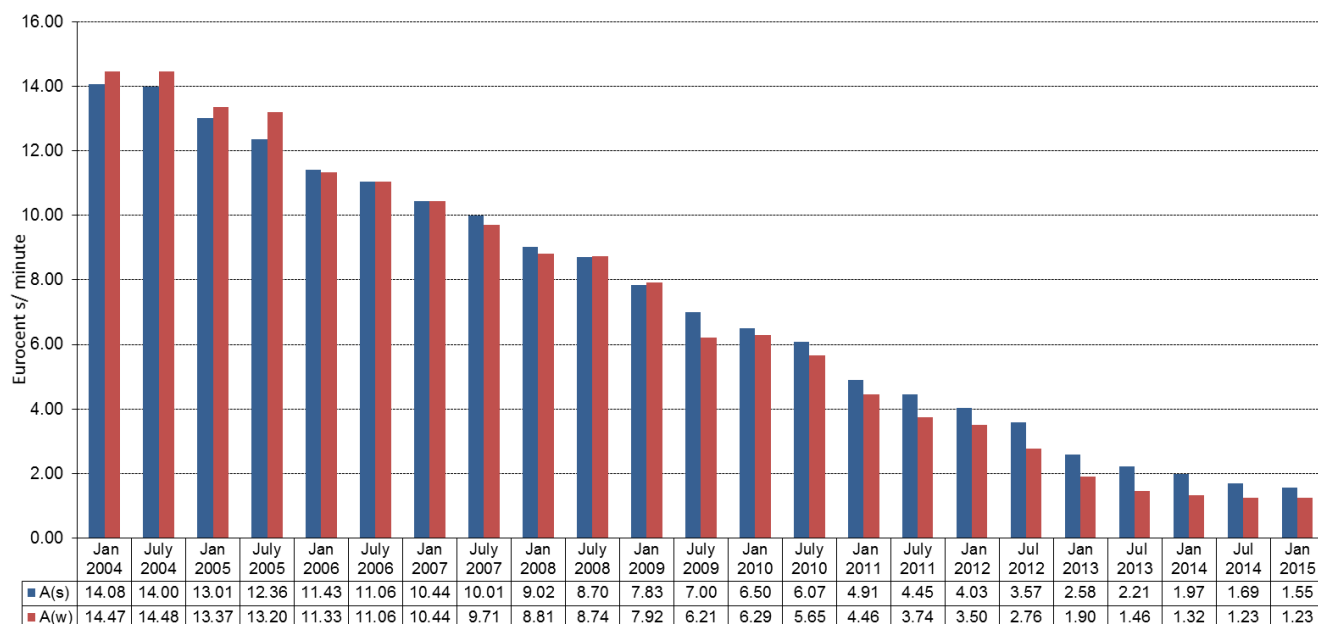
**Notes to Table 6:**

- BG:** Data as of 1 October 2014.  
Figures include post-paid and pre-paid active mobile subscribers. The number of post-paid active subscribers means the number of subscribers with a valid contract. The number of pre-paid active subscribers includes the number of subscribers that have made or received a call, sent an SMS or MMS or used data services at least once in the last three months. The number of M2M SIMs is excluded.
- CH:** Figures based on the subscriber base as of 31 December 2014.
- CZ:** Market Shares as of 30 June 2014 (data as of 1 January 2015 are not yet available).

4. **DE:** Current MTRs are valid from 1 December 2014 until 30 November 2015. They are preliminary and still subject to a Phase II investigation.  
The number of subscribers are as of Q4 2014. After the merger of Telefónica and E-Plus joint subscriber numbers are reported from Q4 2014.
5. **EL:** The number of subscribers is from 31 December 2014
6. **FI:** The number of subscribers if from 30 June 2014. Altogether, the market share of the three biggest operators is 99%.
7. **HU:** The number of subscribers is from July 2014
8. **IE:** Telefonica Ireland Limited subscriptions data is incorporated with Hutchison 3G Ireland Limited subscriptions data. 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)). The appeal was heard in the high Court in May 2013. On 17 August the Order of the High Court included a provision for a maximum weighted average MTR of 2.60 cent per minute until the final determination of the Appeal or further order.  
On 21 November 2013, the High Court refused to grant any stay on its Order of 17 October 2013. The High Court also provided a further statement of reasons for its decision to postpone any ruling on Vodafone's challenge to the validity of ComReg's choice of pure LRIC as the relevant cost standard for regulating MTRs. In addition, the High Court clarified that the maximum rate of 2.60 cent per minute referred to in its Order of 17 October 2013 applies from 1 July 2013.
  - a. Judgment of the Irish High Court dated 14 August 2013  
<http://www.courts.ie/judgments.nsf/6681dee4565ecf2c80256e7e0052005b/005d4340da18896480257bc7003cd090?OpenDocument&Highlight=0,vodafone>
  - b. ComReg Information Notice 13/80: [http://www.comreg.ie/\\_fileupload/publications/ComReg1380.pdf](http://www.comreg.ie/_fileupload/publications/ComReg1380.pdf)
  - c. ComReg Information Notice 13/97: [http://www.comreg.ie/\\_fileupload/publications/ComReg1397.pdf](http://www.comreg.ie/_fileupload/publications/ComReg1397.pdf)
  - d. ComReg Information Notice 13/97a: [http://www.comreg.ie/\\_fileupload/publications/ComRegHCO1397a1.pdf](http://www.comreg.ie/_fileupload/publications/ComRegHCO1397a1.pdf)  
The High Court judgment is currently under appeal to the Supreme Court and the High Court refused to grant any stay on its Order of 17 October 2013 (i.e. refused to grant any stay on the application of the 2.60 cent MTR) pending the outcome of the Supreme Court appeal. In this regard, please refer to:
    - e. ComReg Information Notice 13/99 [http://www.comreg.ie/\\_fileupload/publications/ComReg1399.pdf](http://www.comreg.ie/_fileupload/publications/ComReg1399.pdf)
    - f. ComReg Information Notice 13/108 [http://www.comreg.ie/\\_fileupload/publications/ComReg13108.pdf](http://www.comreg.ie/_fileupload/publications/ComReg13108.pdf)
9. **IS:** The number of subscribers is from 30 June 2014.
10. **IT:** AGCOM has estimated the number of subscribers. The rate for 2015 is under review. The value of 0.96 €cent/min has been proposed during the national public consultation.
11. **LI:** Operator specific data on MTRs are confidential
12. **LT:** The number of subscribers is from Q3 2014.
13. **MT:** The number of subscribers is from Q3 2014. The MTRs are applicable from 1 April 2014 and are based on pure BU LRIC.
14. **NL:** The number of subscribers are from Q3 2014.
15. **NO:** The numbers of subscribers are from 30 June 2014.
16. **PL:** The number of subscribers are from 31 December 2013 (subscriber data from 31 December 2014 are not available).
17. **RS:** Market shares are for 2014. The quoted price is valid as of 1 January 2015.
18. **SE:** The number of subscribers is based on the latest available data, which is 30 June 2014.
19. **SI:** The absolute number of subscribers per operator is confidential.
20. **TR:** The number of subscribers is from Q3 2014.

## Average MTR: simple average and weighted average time series

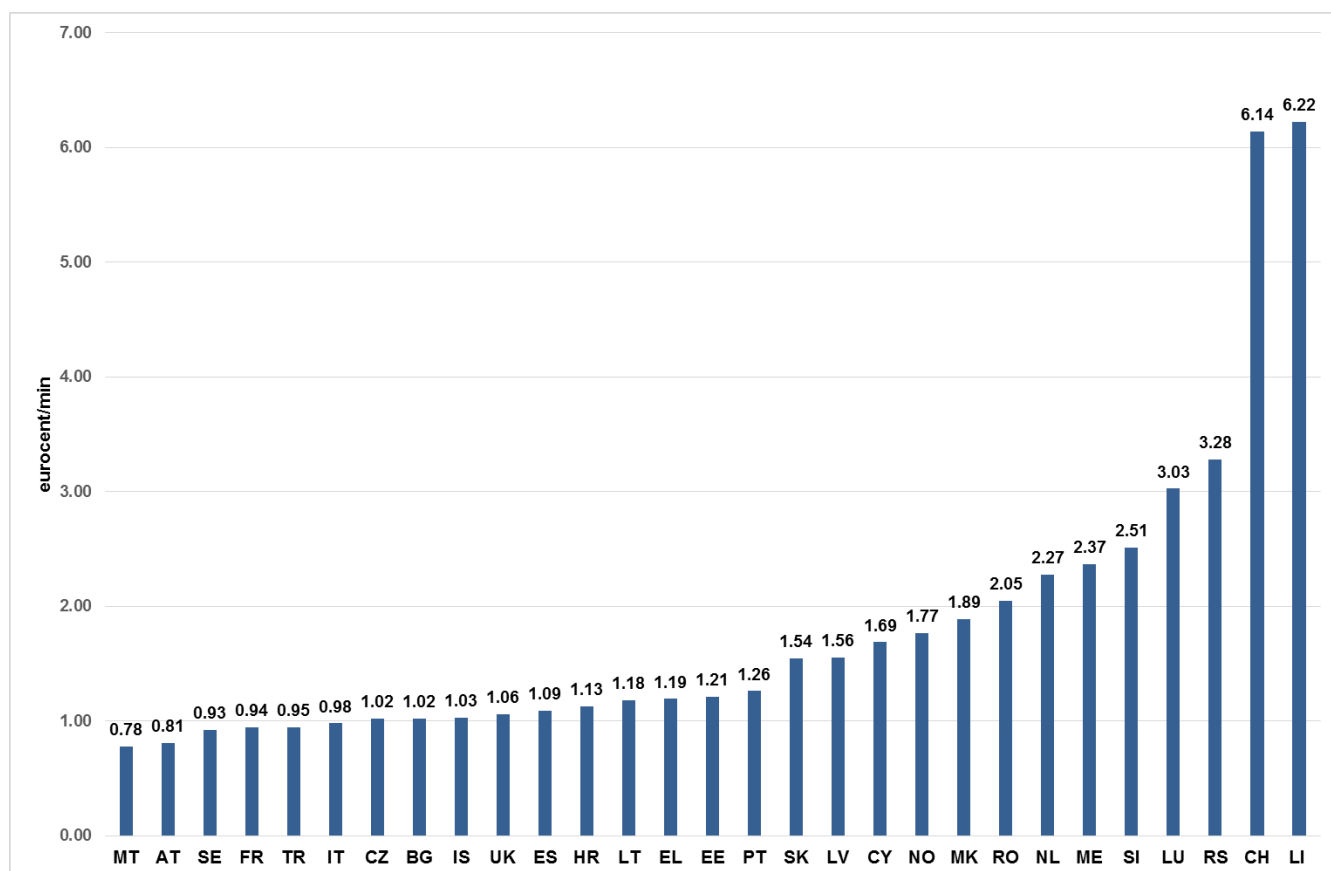
Figure 12



**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.

### 3.a.4. Average wholesale termination revenues per country (euro cent)

Figure 13



#### Notes to figure 13:

1. The average wholesale termination revenue is obtained as a ratio of total revenues from national 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 2014, unless otherwise stated.
2. Some countries do not collect information about termination revenues. Please also note – as indicated – that revenue data mostly refer to 2014 (whole year or part of the year).
3. **BG**: Figures are based on the traffic originated in national fixed networks and terminated in mobiles networks and the corresponding revenue. Excluded are fixed-to-mobile calls when both the fixed and the mobile network are owned and run by the same operator.
4. **CZ**: Data are from 1 July 2014.
5. **FR**: Data are from Q1 to Q3 2014.
6. **IS**: Data are from the first half of 2014.
7. **LT**: Data are from Q3 2014 only.
8. **LU**: Data are from Q1 and Q2 2014. There have been new tariffs since 1 February 2014, based on BU-LRIC.
9. **LV**: Data are from Q1 and Q2 2014. MTRs were changed on 1 July 2014.
10. **ME**: Data are only for national traffic.
11. **MT**: Data are from January to September 2014.
12. **MK**: Data are from Q1-Q3 2014.

13. **NL:** Data are from Q1-Q3 2014.
14. **NO:** Data are from the first half of 2014.
15. **RO:** Provisional unaudited data.
16. **RS:** Data provided are for 2014 and include 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.
17. **SE:** The latest full year data is for 2013, so the data provided here is an estimate for 2014. The average revenue per minute is a result of two different levels applicable during 2014 (SEK 0.09 and SEK 0.0815). SEK 0.0815 is the current MTR applicable as reported in the following sheets in this workbook.
18. **SI:** Including international termination. Self-supply is not included.  
MTR revenues and minutes also include traffic terminated on premium numbers, numbers for tele-voting, mass calling and short dialling numbers.
19. **TR:** Total MTR minutes includes only calls that originate and terminate within Turkey.
20. **UK:** Data are from 2014.

### 3.a.5. Regulatory model implemented and glide paths for MTRs

Table 7

	COST ACCOUNTING MODEL			GLIDE PATH in €cent				
	Model	BU LRIC rate (Target rate) €cent	BU LRIC rate applied from	Period 1 (01/01/2015 - 30/06/2015)	Period 2 (01/07/2015 - 31/12/2015)	Period 3 (01/01/2016 - 30/06/2016)	Period 4 (01/07/2016 - 31/12/2016)	Period 5 01/01/2017 - 30/06/2017)
AT	Pure BU LRIC	0.8049	01/11/2013	0.8049	0.8049			
BE	Pure BU LRIC	1.0800	01/01/2013	1.1800	1.1800			
BG	Pure BU LRIC	0.9715	01/01/2015					
CH	Commercial negotiations							
CY	Benchmark or TD				BU LRIC model	BU LRIC model	BU LRIC model	BU LRIC model
CZ	Pure BU LRIC	0.9772	01/07/2013					
DE	BU LRAIC+		01/01/2013	1.7200	1.6600			
DK	Pure BU LRIC		01/01/2013	0.8071	Not decided	Not decided	Not decided	Not decided
EE	Benchmark			1.1000	1.1000	1.0000	n/a	n/a



EL	Pure BU LRIC	1.1030	01/01/2015	1.1030	1.1030	n/a	n/a	n/a
ES	Pure BU LRIC	1.0900	01/07/2013					
FI	FDC							
FR	Pure BU LRIC	0.7800	01/01/2013 and 01/07/13	0.7800	0.78	0.7600	0.7600	0.7400
HR	Pure BU LRIC	0.8219	01/01/2015	0.8219	0.8219	n/a	n/a	n/a
HU	Pure BU LRIC	0.5542	01.04.2015	2.2883	0.5540	0.5540	0.5540	not defined
IE	other							
IS	Benchmark			0.9883	0.9883			
IT	Pure BU LRIC	0.9800	01/07/2013	0.9600	0.9600	0.9400	0.9400	0.9200
LI	Benchmark			6.3512	6.3512			
LT	Benchmark			1.0400				

LU	Pure BU LRIC	0.9700	s1 or s2 2015					
LV	Benchmark	1.0500	01/07/2014					
ME	HCA FDC	1.9000						
MK	BU LRAIC+	1.4634	01/09/2014					
MT	Pure BU LRIC	0.4045	01/04/2014					
NL	BU LRAIC+	1.0190						
NO	BU LRAIC	0.9179	1st July 2015	0.0177	0.0092	0.0083	0.0083	0.0072
PL	Pure BU LRIC	1.0187	01/07/2013	1.0187	1.0187	1.0187	1.0187	1.0187
PT	Pure BU LRIC	1.2700	31/12/2012	1.2700				
RO	Pure BU LRIC	0.9600	01/04/2014					
RS	Benchmark							
SE	Pure BU LRIC	0.8800	01/07/2013	0,879				
SI	Pure BU LRIC	1.1400	01/09/2014					
SK	Pure BU LRIC	1.2260	01/08/2013					
TR	BU LRAIC+							

<b>UK</b>	Pure BU LRIC	1.0708	01/04/2013	1.0010	0.8620	0.7570	0.6500	0.6460
<b>LI</b>	Benchmark		01/01/2013	6.3512				

**Notes to Table 7:**

- CH:** No glide path.
- CY:** A final decision based on the BU LRIC model results is expected to be applied in summer 2015.
- CZ:** No glide path mechanism was applied for the time period 01/01/2015 - 30/06/2017. From July 2014 the level of MTRs has been set at 0.27 CZK per minute for all SMP-operators in relevant market 7. CTU currently doesn't assume any changes for the time period 01/01/2015 - 30/06/2017. Regulated MTRs have been calculated in accordance with Recommendation 2009/369/ES.
- DE:** No glide path regulation. Current MTRs (as indicated in Period 1) are valid from 01.12.2014 until 30.11.2015. Adjustments in the model lead to MTRs as indicated in in Period 2, which are valid from 01.12.2015. The decision is preliminary and still subject to a Phase II investigation.
- FI:** The MTR of 1.87 has been valid since September 2014. Glide paths have not been implemented.
- HU:** Period 1 - from 01/01/2015 until 31/03/2015, period 2 - from 01/04/2015 until 31/12/2015
- IE:** No glide path is in operation in Ireland.

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)).

The appeal was heard in the high Court in May 2013. On 17 August the Order of the High Court included a provision for a maximum weighted average MTR of 2.60 cent per minute until the final determination of the Appeal or further order.

On 21 November 2013, the High Court refused to grant any stay on its Order of 17 October 2013. The High Court also provided a further statement of reasons for its decision to postpone any ruling on Vodafone's challenge to the validity of ComReg's choice of pure LRIC as the relevant cost standard for regulating MTRs. In addition, the High Court clarified that the maximum rate of 2.60 cent per minute referred to in its Order of 17 October 2013 applies from 1 July 2013.

a. Judgment of the Irish High Court dated 14 August 2013

<http://www.courts.ie/judgments.nsf/6681dee4565ecf2c80256e7e0052005b/005d4340da18896480257bc7003cd090?OpenDocument&Highlight=0,vodafone>

b. ComReg Information Notice 13/80: [http://www.comreg.ie/\\_fileupload/publications/ComReg1380.pdf](http://www.comreg.ie/_fileupload/publications/ComReg1380.pdf)

c. ComReg Information Notice 13/97: [http://www.comreg.ie/\\_fileupload/publications/ComReg1397.pdf](http://www.comreg.ie/_fileupload/publications/ComReg1397.pdf)

d. ComReg Information Notice 13/97a: [http://www.comreg.ie/\\_fileupload/publications/ComRegHCO1397a1.pdf](http://www.comreg.ie/_fileupload/publications/ComRegHCO1397a1.pdf)

Please also note that the High Court judgment is currently under appeal to the Supreme Court and note that the High Court refused to grant any stay on its Order of 17 October 2013 (i.e. refused to grant any stay on the application of the 2.60 cent MTR) pending the outcome of the Supreme Court appeal. In this regard, please refer to:

- e. ComReg Information Notice 13/99 [http://www.comreg.ie/\\_fileupload/publications/ComReg1399.pdf](http://www.comreg.ie/_fileupload/publications/ComReg1399.pdf)
- f. ComReg Information Notice 13/108 [http://www.comreg.ie/\\_fileupload/publications/ComReg13108.pdf](http://www.comreg.ie/_fileupload/publications/ComReg13108.pdf)
8. **IS:** The benchmark will be reset annually. The benchmark resulting in ISK 1.52 for 2015 will be revisited before the end of the year to set prices for 2016.
  9. **IT:** The glide path is currently under review.
  10. **LI:** The last step of glide path, effective since 1 January 2013: 0.0765 CHF/min.
  11. **LT:** RRT finished the market analysis and set mobile termination rates for SMP operators in August 2014. RRT used a benchmark method for establishing the rates and used countries that have pure BU-LRAIC only. The average was calculated as 1.04 Euro cent/min.
  12. **LU:** ILR/Luxembourg doesn't use a glide path to lower MTR tariffs.
  13. **LV:** SPRK doesn't apply a glide path. MTRs were adopted by the final decision on 1 July, 2014.
  14. **ME:** A glide path is not foreseen in the present regulation.
  15. **NO:** In our current regulation MTRs are determined by a BU LRAIC model (without the +).  
Nkom made a new decision in market 7 on 13 January 2015, and maximum prices for call termination based on pure LRIC will be in effect from 1 July 2015.  
The maximum prices are based on the efficient costs for each individual year and do not represent a glide path towards a future efficient price.
  16. **PT:** By a decision approved on 30 April 2012, ANACOM set a glide path for the evolution of the MTR in Portugal. The MTR that was set was in full accordance with the EC Recommendation, as it was based on a pure LRIC model. The glide path reached the pure LRIC value by 31 December 2012, with an MTR of 1.27 eurocents per minute. Currently a new market analysis on the mobile termination markets is being developed and the pure LRIC cost model is being updated in order for ANACOM to determine a new MTR.
  17. **RS:** The price of 3.43 RSD is effective from 1 January 2015, until RATEL's new decision.
  18. **SE:** The current MTR is based on pure-LRIC, hence no glide path is foreseen. However, any future update of the model might change the level of MTRs.
  19. **SK:** No glide path is in use.
  20. **TR:** ICTA does not regulate MTRs via a glide path, in general MTRs are revised annually.
  21. **UK:** Ofcom's MTR charge control runs from 1 April to 1 April. The above charges have been calculated as a time weighted average over the relevant period. Charges are nominal estimates taken from Table 1 of Ofcom's final 2015 MCT Statement at [http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/statement/MCT\\_final\\_statement.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/statement/MCT_final_statement.pdf)

### 3.b. 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 inputs received by NRAs in S1 2015, referring to data as of January 2015. Thirty-six (36) 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>6</sup>).

#### 3.b.1. Assumptions and benchmarking methodology

The SMS TRs collected in this report reflect nominal 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’s 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 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 and Serbia are the only countries 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.

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

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<sup>6</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.

peculiarities in setting SMS TRs could emerge and require additional assumptions (as compared to the exercise of benchmarking 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 are used.

### 3.b.2. SMS TR per operator

Table 8

Country	Operator	SMS TR (€cent)		Subscribers		Market share
		per operator	per country	per operator	per country	
AT	Mobilkom	<i>n.a.</i>	<b>3.11</b>	5,500,000	13,050,000	<b>42.15%</b>
	T-Mobile	<i>n.a.</i>		4,060,000		<b>31.11%</b>
	Orange (H3G)	<i>n.a.</i>		3,490,000		<b>26.74%</b>
BE	Belgacom	4.96	<b>4.96</b>	<i>confidential</i>	12.734.724	<b>40,2 %</b>
	Mobistar	4.96		<i>confidential</i>		<b>23,1 %</b>
	KPN	4.96		<i>confidential</i>		<b>23,0 %</b>
BG	Mobitel	<i>confidential</i>	<b>confidential</b>	<i>confidential</i>	<i>confidential</i>	<b>37.40%</b>
	Telenor Bulgaria	<i>confidential</i>		<i>confidential</i>		<b>37.51%</b>
	BTC Mobile	<i>confidential</i>		<i>confidential</i>		<b>25.09%</b>
CH	Swisscom	<i>confidential</i>	<b>4.2473</b>	6,540,000	11,007,980	<b>59.41%</b>
	Sunrise	<i>confidential</i>		2,465,000		<b>22.39%</b>
	Orange	<i>confidential</i>		2,002,980		<b>18.20%</b>
CY	Cytamobile Vodafone	0.5500	<b>0.5970</b>	739,398	1,123,289	<b>65.39%</b>
	MTN	0.6800		337,406		<b>29.84%</b>
	PrimetelMobile	0.7300		39,000		<b>3.45%</b>
CZ	T-Mobile	<i>confidential</i>	<b>confidential</b>	<i>confidential</i>	<i>confidential</i>	<b>40.45%</b>
	O2 Czech Republic	<i>confidential</i>		<i>confidential</i>		<b>36.28%</b>
	Vodafone	<i>confidential</i>		<i>confidential</i>		<b>20.41%</b>
DE	T-Mobile	N/A	<b>n.a.</b>	38,989,000		<b>33.80%</b>
	Vodafone	N/A		31,515,000		<b>27.03%</b>

	E-plus Mobilfunk / Telefónica Germany	N/A		42,125,000	112,629,000	16.75%
DK	TDC	0.1475	0.1475	2,846,941	7,062,646	40.31%
	Telia	0.1475		1,303,122		18.45%
	Telenor	0.1475		1,698,104		24.04%
	Hi3G	0.1475		686,841		9.72%
EE	EMT AS	2.6000	2.3128	877,868	2,062,864	42.56%
	Elisa Eesti AS	2.1000		666,888		32.33%
	Tele2 Eesti AS	2.1000		518,108		25.12%
EL	Cosmote	3.0000	3.0000	7,279,669	16,358,327	44.50%
	Vodafone	3.0000		5,100,254		31.18%
	Wind	3.0000		3,966,399		24.25%
ES	Movistar	2.7000	2.7304	15,777,630	49,147,939	32.10%
	Vodafone	2.4000		11,019,343		22.42%
	Orange	3.1000		11,430,000		23.26%
	Yoigo	2.7000		3,402,372		6.92%
FI	TeliaSonera Finland	confidential	confidential	N.A.	n.a.	24.0%
	Elisa			N.A.		40.0%
	DNA			N.A.		35.0%
FR	Orange	1.0000	1.0000	confidential	77,236,000	confidential
	SFR	1.0000		confidential		confidential
	Bouygues Telecom	1.0000		confidential		confidential
	Free Mobile	1.0000		confidential		confidential
HR	HT	n.a.	n.a.	2,087,839	4,461,352	46.80%
	VIPnet	n.a.		1,568,912		35.17%
	TELE2	n.a.		804,601		18.03%
HU	T-Mobile	4.5765	4.5765	5,346,509	11,540,058	46.33%
	Telenor	4.5765		3,580,880		31.03%
	Vodafone	4.5765		2,612,669		22.64%
IE	Meteor	3.17	3.17	1,908,076	4,894,239	39.0%
	Telefonica Ireland	3.17		1,570,006		32.1%
	Tesco Mobile	3.17		1,029,010		21.0%
	Vodafone	3.17		291,341		6.0%
	Hutchinson 3G	3.17		81,271		1.7%
IS	Siminn	2.5032	2.5032	132,556	365,010	36.32%
	Vodafone	2.5032		96,578		26.46%
	Nova	2.5032		119,453		32.73%
	365/Tal	2.5032		13,686		3.75%
IT	Telecom Italia	confidential	3.2530	31,328,184	93,068,939	33.66%
	Vodafone Omnitel N.V.	confidential		28,002,198		30.09%
	Wind Telecomunicazioni	confidential		23,764,534		25.53%
	H3G	confidential		9,974,023		10.72%

LI	Orange (Liechtenstein) AG	confidential	4.2312	confidential	confidential	confidential
	Swisscom (Schweiz) AG	confidential		confidential		confidential
	Telecom (Liechtenstein) AG	confidential		confidential		confidential
LT	Omnitel	0.7250	0.8687	1,881,976	4,474,544	42.06%
	Tele2	0.7250		1,506,028		33.66%
	Bitė Lietuva	1.4500		1,009,059		22.55%
LU	EPT	n.a.	n.a.	n.a.	n.a.	n.a.
	Tango	n.a.		n.a.		n.a.
	Orange	n.a.		n.a.		n.a.
LV	LMT	2.1300	2.1300	940,000.00	2,547,000	36.91%
	Tele2	2.1300		920,000.00		36.12%
	Bite Latvija	2.1300		470,000.00		18.45%
ME	Telenor	2.200	2.200	confidential	confidential	confidential
	Crnogorski Telekom	2.200		confidential		confidential
	Mtel	2.200		confidential		confidential
MK	T Mobile Macedonia	0.8129	0.8129	1,008,358	2,223,260	45.35%
	ONE Telecommunication services	0.8129		558,882		25.14%
	VIP Macedonia	0.8129		628,367		28.26%
MT	GoMobile	1.8300	1.7767	221,703	563,335	39.36%
	Melita Mobile	1.5600		81,420		14.45%
	Vodafone	1.8000		249,897		44.36%
NL	KPN	5.6000	5.6000	6,016,800	19,561,374	30.76%
	T-Mobile	5.6000		3,913,113		20.00%
	Vodafone	5.6000		4,867,400		24.88%
NO	Telenor	3.8708	3.8708	2,947,007	5,932,761	49.67%
	TeliaSonera	3.8708		1,359,444		22.91%
	Network Norway	3.8708		709,855		11.97%
	Tele2	3.8708		389,660		6.57%
	Ventelo	3.8708		125,436		2.11%
PL	T-Mobile Polska	1.1873	1.1873	confidential	56,972,803	confidential
	Polkomtel	1.1873		confidential		confidential
	PTK Centertel	1.1873		confidential		confidential
	P4	1.1873		confidential		confidential
PT	MEO (ex TMN)	confidential	1.2700	confidential	16,731,949	48 %
	VODAFONE	confidential		confidential		33 %
	NOS (ex OPTIMUS+ZON)	confidential		confidential		19 %
RO	Vodafone Romania S.A.	2.4218	2.4127	confidential	22,920,000	confidential
	Orange Romania S.A.	2.4004		confidential		confidential



	TELEKOM RMC S.A. (former Cosmote RMT)	2.4373		confidential		confidential
	RCS & RDS S.A.	2.3692		confidential		confidential
RS	MTS (Telekom Srbija)	Bill & Keep	Bill & Keep	confidential	confidential	44.56%
	Telenor			confidential		33.27%
	Vip mobile			confidential		22.17%
SE	TeliaSonera	3.2356	3.2356	5,398,400	14,130,000	38.21%
	Tele2	3.2356		4,050,300		28.66%
	Telenor	3.2356		2,473,300		17.50%
	Hi3G	3.2356		1,706,300		12.08%
SI	Telekom Slovenije	Bill & Keep	Bill & Keep	confidential	confidential	54.62%
	Si.mobil			confidential		29.30%
	Tušmobil			confidential		13.26%
	T-2			confidential		2.83%
SK	Orange Slovensko	2.5000	2.6444	confidential	confidential	39.42%
	Slovak Telekom	2.5000		confidential		31.70%
	O2 Slovakia	3.0000		confidential		28.88%
TR	Turkcell	0.1518	0.1550	34,732,127	71,908,742	48.30%
	Vodafone	0.1518		20,945,830		29.13%
	Avea	0.1660		16,230,785		22.57%
UK	EE	confidential	2.0733	confidential	83,931,384	confidential
	O2	confidential		confidential		confidential
	Vodafone	confidential		confidential		confidential
	H3G	confidential		confidential		10.18%

#### Notes at Table 8:

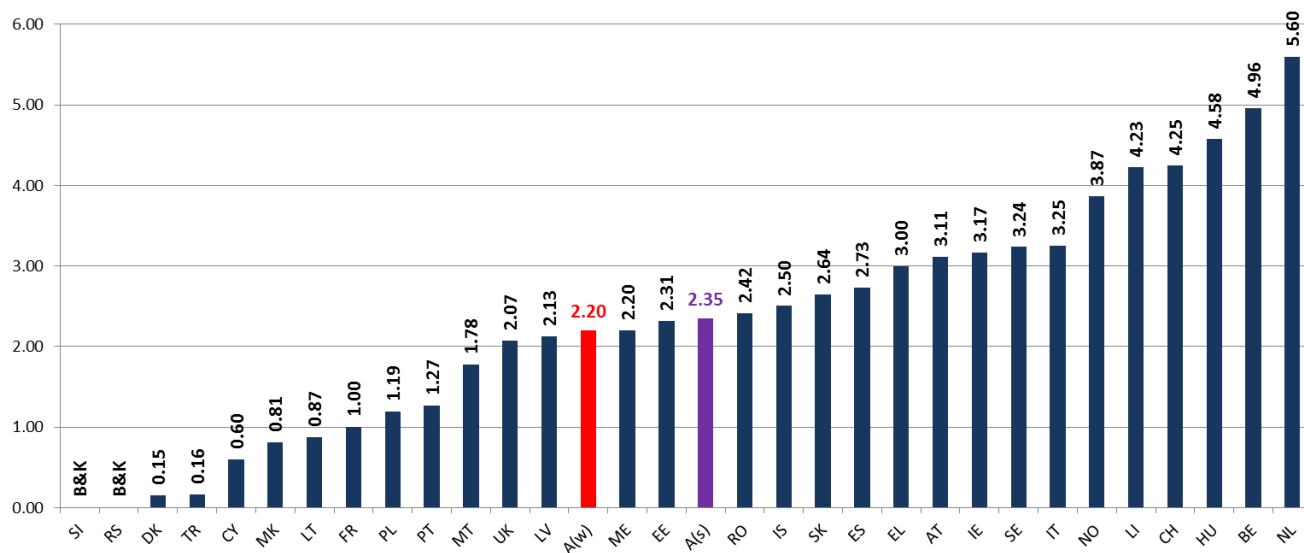
1. The numbers of subscribers used in the table come from the MTR benchmark in this report (January 2015).
2. **AT:** Only the average rate is indicated.
3. **BG:** Data comes from 1 October 2014 and include post-paid and pre-paid active mobile subscribers. The number of post-paid active subscribers means the number of subscribers with a valid contract. The number of pre-paid active subscribers includes the number of subscribers that have made or received a call, sent an SMS or MMS or used data services at least once in the last three months. The number of M2M SIMs is excluded.
4. **CH:** The subscriber base is from 31 December 2014. Different prices are defined between some operators: the weighted average rate at national level is indicated. A different (lower) price is applied between the operators for unbalanced traffic over 110.
5. **CZ:** Market shares are from 30 June 2014 (data as of 1 January 2015 is not yet available).
6. **DE:** SMS termination rates are not regulated in Germany. The number of subscribers are as of 4th quarter 2014. After the merger of Telefónica and E-Plus joint subscriber numbers are reported from Q4 2014.
7. **EE:** Different prices are defined between pairs of operators: a simple average for each operator is indicated.
8. **EL:** Subscriber data refers to registered subscribers as of 31 December 2014.
9. **HR:** SMS call termination rates are subject to commercial agreement between operators.
10. **HU:** SMS termination rates in the national currency have not decreased, only the HUF / Eur exchange rate has changed. New subscriber data is not available. Subscriber data is from July 2014.

11. **IE:** Telefonica Ireland Limited subscriptions data is incorporated with Hutchison 3G Ireland Limited subscriptions data.
12. **IS:** The number of subscribers is from 30 June 2014.
13. **IT:** AGCOM has estimated the number of subscribers.
14. **LT:** Different prices are defined between pairs of operators (also BAK): a simple average for each operator is indicated. Subscriber numbers are from Q3 2014.
15. **LU:** SMS interconnection is not under a regulatory regime in Luxembourg.
16. **ME:** SMS termination rates are valid only for the termination of national SMSs.
17. **MT:** The data reflects the position from Q1 2014 to Q3 2014 (January to September).
18. **NL:** This is the last known commercially agreed SMS-termination rate. The number of subscribers is based on Q3 2014 data.
19. **NO:** The numbers of subscribers are provided from 30 June 2014.
20. **PL:** The number of subscribers is from 31 December 2013.
21. **RS:** Market shares are for 2013.
22. **SE:** The number of subscribers is based on latest available data, which is 30 June 2014. PTS does not monitor SMS wholesale termination rates. The current reference offers indicate a termination rate of SEK 0.30. However, statistics shows that the average retail revenue per sent SMS was SEK 0.17 in 2013, clearly indicating that a wholesale level of SEK 0.30 is too high.
23. **SI:** SMS termination rates are not regulated. Operators apply a "bill and keep" system.
24. **SK:** Slovak Telekom:
  - up to 100 000 SMS/month = 0.0284 EUR
  - 100 001 - 500 000 SMS/month = 0.0261 EUR
  - from 500 001 SMS/month = 0.0250 EURTermination rates continue to vary with respect to terminated traffic volumes.
25. **TR:** The number of subscribers is from Q3 2014.

### 3.b.3. SMS TR per country

The following graph (figure 14) gives an overview of SMS TRs in January 2015 per country (€cent).<sup>7</sup>

Figure 14



<sup>7</sup> The averages are slightly higher in January 2015 compared to July 2014, due to the inclusion of additional countries that did not provide information for July 2014.

## 4. Annex

TABLE 9 – ABBREVIATIONS

<b>AT</b>	Austria
<b>BE</b>	Belgium
<b>BG</b>	Bulgaria
<b>CH</b>	Switzerland
<b>CY</b>	Cyprus
<b>CZ</b>	Czech Republic
<b>DK</b>	Denmark
<b>DE</b>	Germany
<b>EE</b>	Estonia
<b>EL</b>	Greece
<b>ES</b>	Spain
<b>FI</b>	Finland
<b>FR</b>	France
<b>HR</b>	Croatia
<b>HU</b>	Hungary
<b>IE</b>	Ireland
<b>IS</b>	Iceland
<b>IT</b>	Italy
<b>LI</b>	Liechtenstein
<b>LT</b>	Lithuania
<b>LV</b>	Latvia
<b>LU</b>	Luxembourg
<b>ME</b>	Montenegro
<b>MK</b>	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 10 – EXCHANGE RATES<sup>8</sup>

COUNTRY	1 EURO
<b>BG</b>	1.96
<b>CH</b>	1.23
<b>CZ</b>	27.63
<b>DK</b>	7.46
<b>HR</b>	7.67
<b>HU</b>	308.53
<b>IS</b>	153.80
<b>LI</b>	1.21
<b>LT</b>	3.45
<b>LV</b>	0.70
<b>MK</b>	61.48
<b>NO</b>	9.04
<b>PL</b>	4.21
<b>RO</b>	4.43
<b>RS</b>	120.29
<b>SE</b>	9.27
<b>TR</b>	2.83
<b>UK</b>	0.79

<sup>8</sup> ECB website: <http://sdw.ecb.europa.eu/browseSelection.do?DATASET=0&FREQ=A&node=2018794>  
For IS at <http://www.cb.is/exchange-rate/>.