

**International Roaming
BEREC Benchmark Data Report
April 2017 - September 2017**

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1. Introduction

This BEREC Benchmark Report on International Roaming (the “Report”) presents the results of the 20th round of data collection on European international roaming services undertaken by the Body of European Regulators for Electronic Communications (BEREC). The Report covers the period 1 April 2017 – 30 September 2017, i.e. the 2nd and 3rd quarter 2017. The Report also includes data from previous rounds of data collection conducted by BEREC and its predecessor, the European Regulators Group (ERG), to provide context for the current figures. The earliest data is from the 2nd quarter 2007, when the Roaming Regulation was about to enter into force.

The applicable regulatory framework for this data collection is Roaming Regulation (EU) No. 531/2012, as amended by Regulation (EU) No. 2120/2015¹ and by Regulation (EU) No. 2017/920², applied in the European Union (EU)³, which includes new requirements for the retail and wholesale regulated tariffs for voice, SMS and data roaming. The assessment of the international roaming market was based on the requirements set out in Article 19 (4) of the Roaming Regulation. In order to assess the competitive developments in the Union-wide roaming markets, BEREC has to regularly collect data from national regulatory authorities on the development of retail and wholesale charges for regulated voice, SMS and data roaming services, including wholesale charges applied for balanced and unbalanced roaming traffic respectively. It shall also collect data on the wholesale roaming agreements not subject to the maximum wholesale roaming charges provided for in Articles 7, 9 or 12 and on the implementation of contractual measures at wholesale level aiming to prevent permanent roaming or anomalous or abusive use of wholesale roaming access for purposes other than the provision of regulated roaming services to roaming providers’ customers while the latter are periodically travelling within the Union. On the basis of the collected data, BEREC also has to report regularly on the evolution of pricing and consumption patterns in the Member States for both domestic and roaming services and the evolution of actual wholesale roaming rates for unbalanced traffic between roaming providers and on the relationship between retail prices, wholesale charges and wholesale costs for roaming services. BEREC shall assess how closely those elements relate to each other.

BEREC is coordinating this process of data collection by pursuing the following objectives:

- simplifying the process not only for national regulatory authorities (NRAs) as BEREC acts as a central point for the data collection, but also for the European Commission (EC), as the data are received from a single source and a following uniform data processing;
- coordinating the procedures of individual NRAs, as the data collection exercise uses a single and commonly agreed data collection model, and the process is synchronised

¹ Regulation (EU) No. 2120/2015, hereinafter ‘TSM Regulation’, available at: <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32015R2120>

² Regulation (EU) 2017/920 of the European Parliament and of the Council of 17 May 2017 amending Regulation (EU) No 531/2012 as regards rules for wholesale roaming markets, available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R0920>.

³ The amendments are incorporated in the EEA agreement and is therefore applicable in the three EEA/EFTA states Iceland, Liechtenstein and Norway.

and based on the same collection periods. BEREC consults the market players and the European Commission before finalising the data collection templates;

- providing, as far as possible, a common response to the different questions posed during the collection process by operators and NRAs, as BEREC serves as the forum where these questions are commonly debated and addressed.

2. Regulatory evolution

ERG initially worked on the long-standing issue of high prices for international roaming services. Following its creation in January 2010, BEREC took over responsibility for this work from ERG.

The 2007 Regulation

In 2005, ERG undertook a study on international roaming that concluded that the EC Regulatory Framework did not provide the necessary tool-kit for NRAs to tackle the problems identified. ERG wrote to the European Commission in December 2005 highlighting its concerns.

After significant debate, the first Regulation on international roaming services was published on 29 June 2007. The primary provisions capped wholesale and retail charges for voice calls under Eurotariff and set a number of transparency provisions to help to ensure that consumers were well informed. The provisions of the Regulation entered into force at different times, with retail and transparency provisions taking full effect by the end of September 2007 and wholesale provisions calculated annually from the end of August 2007⁴.

The 2009 amended Regulation

On 22 April 2009, the European Parliament (EP) adopted Regulation (EC) No. 544/2009 at first reading, with a view to amending Regulation (EC) No. 717/2007. Subsequently, on 8 June 2009, the Council of EU Telecoms Ministers formally adopted the new EU roaming rules approved by the European Parliament. The definitive text of Regulation (EC) No. 544/2009 was published in the Official Journal of the European Union on 29 June 2009^{5,6}.

In particular, the Regulation introduced the following measures related to price control, applicable from 1 July 2009 to 30 June 2012:

- an extension of wholesale and retail price regulation for voice services, with yearly decreases in the levels of the caps;
- price regulation of SMS roaming services at both the wholesale and retail level;
- price regulation of data roaming services at the wholesale level.

⁴ In Norway and Iceland the 2007 Regulation was in force from the end of 2007 to the 2nd quarter 2010.

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:167:0012:0023:EN:PDF>

⁶ From the 3rd quarter 2009 to the 1st quarter 2010, Regulation 544/2009 applied in the EU while the first Roaming Regulation (EC) No. 717/2007 remained in force in Norway, Iceland and Liechtenstein, with slightly higher voice caps, no SMS caps and no wholesale data cap.

And from July 2010 to June 2012:

- retail transparency measures to protect consumers from “bill shock” when data roaming.

The 2012 Regulation

On 30 May 2012 the Council of the European Union approved the International Roaming Regulation III⁷, which entered into force on 1 July 2012⁸.

The Regulation introduced the following measures, applicable from 1 July 2012:

- an extension of wholesale and retail price regulation for voice and SMS with yearly decreases in the levels of the caps until 30 June 2014 with those caps to remain in force until 30 June 2022 for wholesale services, and until 30 June 2017 for the Eurotariffs, subject to a further review by 30 June 2016;
- an extension of wholesale price regulation for data with yearly decreases in the levels of the caps until 30 June 2014 with those caps to remain in force until 30 June 2022;
- price regulation of data roaming services at the retail level with a yearly decrease in the level of the cap until 30 June 2014 with the cap to remain in force until 30 June 2017, being subject to a further review by 30 June 2016;
- the obligation for mobile network operators (MNOs) to meet all reasonable requests for wholesale roaming access, which comprises direct wholesale roaming access and wholesale roaming resale access under the rules set out in the Roaming Regulation. The Regulation also included provisions on the separate sale of roaming services which entered into force on 1 July 2014.
- safeguard mechanisms were extended. The Regulation requires providers to make available to their customers one or more maximum financial or volume limits on data roaming use during an agreed specified period, subject to the customer's consent to continue (“cut-off mechanism”). The safeguard mechanisms also apply to data roaming services used by roaming customers travelling outside the EU except when the visited network operator in the visited country outside the EU does not allow the roaming provider to monitor its customer usage on a real-time basis. The cut-off limit should in principle be made available for all tariffs by default. However, when a customer opts for an offer without a cut-off limit, customers are given the right to be provided with a cut-off limit within one working day at their demand.

The 2012 Regulation as amended by Regulation (EU) No. 2120/2015

On 3 April 2014, the European Parliament took up the position, within the framework of the procedure for the adoption of a Regulation for a European Single Market for Electronic Communications (TSM Regulation), to abolish retail roaming surcharges in order to allow customers to “Roam Like at Home” (RLAH) with a fair use limit.

⁷<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:172:0010:0035:EN:PDF>

⁸ With regard to the EEA EFTA countries, it must be noted that the Roaming Regulation applies in these countries as from 7 December (Norway and Liechtenstein) and 21 December (Iceland) 2012.

Regulation (EU) No. 2015/2120⁹, adopted by the European Parliament on 27 October 2015 and published in the Official Journal of 26 November 2015, includes amendments to Roaming Regulation No. 531/2012¹⁰, the main one being the principle of Roam Like At Home, i.e. requiring roaming providers not to levy any surcharge in addition to the domestic retail price on roaming customers as of 15 June 2017 (RLAH tariffs). However, there are several cases (e.g. when a Fair Use Policy (FUP) under the conditions of the Roaming Regulation is breached or a data volume limit is exceeded) where the roaming provider is allowed to apply surcharges. Moreover, according to Article 6c Roaming Regulation, in specific and exceptional circumstances, with a view to ensuring the sustainability of its domestic charging model, a roaming provider may apply for authorisation to apply a surcharge. The Roaming Regulation lays down detailed rules on the methodology for assessing the sustainability of the abolition of retail roaming surcharges and on the application to be submitted by a roaming provider for the purposes of that assessment. For more information on surcharges in excess of or non-compliance with the FUP and derogation mechanism please see BEREC Guidelines on Regulation (EU) No 531/2012, as amended by Regulation (EU) 2015/2120 and Commission Implementing Regulation (EU) 2016/2286 (Retail Roaming Guidelines)¹¹. Furthermore, similar to the provisions set out in the third Roaming Regulation, roaming providers can also offer alternative roaming tariffs as an alternative to RLAH and customers may deliberately choose those alternative tariffs.

It should also be mentioned that the Roaming Regulation also established a transitional period, from the 30th April 2016 to 14th June 2017, where operators could apply a surcharge in addition to the domestic price for the provision of retail roaming regulated services.

The amendments to the Roaming Regulation resulted in an update of the BEREC Benchmark Report and the current Report includes indicators on volumes and revenues for RLAH, RLAH+ (non-compliance with/exceeding the FUP), RLAH+ (derogation) and alternative tariffs offered by operators. BEREC would like to note that some indicators presented in the following figures and its evolution must be carefully evaluated as before the implementation of the Regulation (EU) No. 2120/2015, it was possible to clearly separate domestic revenues from intra-EEA roaming revenues, since the latter had a separate charging mechanism. However, with the implementation of RLAH, roaming is charged at domestic prices, except for alternative tariffs, and they are included therefore under domestic revenues. Only intra-EEA roaming revenues related to the application of surcharges and revenues from alternative tariffs are now reported under roaming revenues (see more details in Annex I).

The 2012 Regulation as amended by Regulation (EU) No. 2017/920

Regulation (EU) No. 2017/920¹² adopted by the European Parliament on 17 May 2017 and published in the Official Journal of 9 June 2017, includes amendments to Roaming Regulation No. 531/2012¹³ the main one regarding new wholesale prices for voice, SMS and data services that entered into force on 15 June 2017. Also, its amendments included new provisions for wholesale agreements to prevent permanent roaming and the requirement to

⁹ Available at: <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32015R2120>

¹⁰ Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R0531>

¹¹ Available at: [BEREC Guidelines on Regulation \(EU\) No 531/2012, as amended by Regulation \(EU\) 2015/2120 and Commission Implementing Regulation \(EU\) 2016/2286 \(Retail Roaming Guidelines\)](https://www.berec.europa.eu/media/press_releases/2015/20151210_berec_guidelines_on_regulation_eu_no_531_2012_as_amended_by_regulation_eu_2015_2120_and_commission_implementing_regulation_eu_2016_2286_retail_roaming_guidelines)

¹² Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R0920>

¹³ Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R0531>

collect data about the evolution of actual wholesale roaming rates for unbalanced traffic between providers of roaming services, and on the relationship between retail prices, wholesale charges and wholesale costs for roaming services.

The amendments to the Roaming Regulation resulted in an update of the BEREC Benchmark Report, and the current Report includes the lowest charged as proxy wholesale costs for roaming services and those new clauses to prevent permanent roaming introduced in the roaming wholesale agreements.

3. Main findings

Over 159 providers of international roaming services provided information for this Report. This number includes virtually all of the mobile network operators in the EEA countries and Switzerland, as well as a significant number of mobile virtual network operators (MVNOs) that provide EEA roaming services. BEREC estimates that this report covers around 95 % of mobile customers in EEA.

Roam Like At Home (RLAH)

The spectacular traffic increase is undoubtedly associated with the introduction of RLAH services on 15 June 2017. In fact, the tremendous growth in traffic has transformed the international roaming market. Data traffic growth increased by 148.43 % in Q3 2017 and by 134.09 % in Q2 2017, respectively, with respect to the previous quarter. In Q1 2017, the increase with respect to the previous quarter was 13.52 %, -19.03 % in Q4 2016 and 123.13 % in Q3 2016¹⁴. Over the same period, the growth of traffic for outgoing international calls also rose by 78.34 % in Q3 2017, compared to 33.17 % in Q2 2017; 2.88 % in Q1 2017; 0.26 % in Q4 2016 and 35.81 % in Q3 2016¹⁵. Quarter to quarter growth of traffic for calls received increased to 44.05 % in Q3 2017, compared with 19.15 % in Q2 2017, 1.48 % in Q1 2017, 0.86 % in Q4 2016 and 24.66% in Q3 2016¹⁶. The growth rates for SMS services are the following: 92.94 % in Q3 2017, 32.71 % in Q2 2017, -5.15 % in Q1 2017, -27.90 % in Q4 2016 and 59.02 % in Q3 2016. The increase in traffic observed in EEA countries in Q3 2017 is related to the RLAH services introduced just before the summer period. Although international roaming services demonstrates the high seasonal variations, the results clearly show that the 2015 update of the Roaming Regulation has significantly contributed to the development of the international roaming market.

Wholesale rates

At the wholesale level, the voice, SMS and data roaming charges set between operators have declined significantly below the regulated average caps.

The applicable price caps and the related EEA average prices during the data collection period were:

¹⁴ EEA percentage change in the previous quarter, Q3'16 excludes: Cyprus, Denmark, Iceland, Spain, UK, Q4, Q4'16 excludes: Cyprus, Iceland, UK, Q1'17 excludes: Cyprus, Iceland, UK

¹⁵ EEA percentage change in the previous quarter, Q3'16 excludes: Denmark, Iceland, UK, Q4'16 excludes: Iceland, Q1'17 excludes: Iceland

¹⁶ EEA percentage change in the previous quarter, Q3'16 excludes: Denmark, Iceland, UK, Q4'16 excludes: Iceland, Q1'17 excludes: Iceland

Service at wholesale level (no VAT)	Q2 2017		Q3 2017 ¹⁷	
	Price Cap	EEA Average	Price Cap	EEA Average
Wholesale voice (€/minute)	5	2.52	3.2	2.41
Wholesale SMS (€/SMS)	2	0.68	1	0.55
Wholesale data (€/MB ¹⁸)	5	0.57	0.77	0.40

Retail domestic prices (ARRPU) for mobile services

BEREC has analysed the retail domestic prices and found that it is hard to disaggregate the different mobile communications services since they are often provided as part of a bundle of several services, including intra-EEA roaming communications and, in several cases, also non-mobile services. Operators are finding it difficult to organize their revenue data by individual service categories (ISCs), such as fixed telephony, mobile telephony, fixed broadband, intra-EEA roaming communications and others and no common methodology is defined for this purpose. Bundles challenge this practice as ISCs require allocating bundle revenues to their components. Therefore, BEREC examined the alternative of presenting data on the evolution of the ARRPU. However, in the context of the BoR (16) 33 BEREC Report on the wholesale roaming market it was emphasized that the ARRPU depends on many different parameters (volumes, handset subsidies, sensitivity to the number of active SIM cards, etc.). In general, the ARRPU is quite a weak index for comparing domestic price levels. Further conclusions on price levels of mobile communications services can be made only by a thorough review of retail prices for mobile communications services. In spite of the limitations and lack of common methodology mentioned above, BEREC has calculated the ARRPU, the results of it should, however, be interpreted with caution. For this calculation BEREC used the data relative to mobile domestic services submitted by operators¹⁹. The domestic monthly ARRPU for Q3 2017 varies considerably between the countries, ranging from 2.31 Euros per month to 29.44 Euros per month, with a weighted EEA average of 11.13 Euros, see Figure 1. Disproportion between individual ARRPU could be caused by different methodologies used by operators to allocate the revenues relative to different domestic mobile services. With regard to Q2 2017, the ARRPU in Q3 2017 remains overall stable.

Wholesale rates for outgoing calls

At the wholesale level (Figures 21-22), the EEA average price was 2.52 Euro cents in Q2 2017 and 2.41 Euro cents in Q3 2017 compared to a cap of 5 Euro cents and 3.2 Euro cents respectively. A constant reduction in the average EEA wholesale prices for intra-EEA roaming voice calls (Figure 23) is observed. BEREC also assessed the prices for balanced and unbalanced traffic (Figure 19-20). The EEA average wholesale price for balanced traffic was

¹⁷ With effect from 15 June 2017

¹⁸ Conversion of gigabytes to megabytes was done in line with Recital 17 of Regulation (EU) 2017/920 of the European Parliament and of the Council of 17 May 2017 amending Regulation (EU) No 531/2012, which results in 1 gigabyte being equal to 1000 megabytes.

¹⁹ The monthly ARRPU was calculated per country by dividing retail revenues (i.e. total revenues related to mobile voice, SMS and data traffic. Any other type of revenue, such as those originating from mobile devices, subscription fees to services etc. are not included) in the respective quarters with the total number of domestic and roaming subscribers per country within the same period and dividing it by 3.

2.70 Euro cents during Q2 2017 and 2.49 Euro cents during Q3 2017. Meanwhile, the EEA average payments for unbalanced traffic were at 2.18 Euro cents during Q2 2017 and 2.27 Euro cents during Q3 2017.

Wholesale rates for SMS

At the wholesale level, a reduction in the average EEA SMS price (Figures 41-42) to 0.68 Euro cents in Q2 2017 and 0.55 Euro cents in Q3 2017 is observed compared to a cap of 2 Euro cents and 1 Euro cents respectively. The average price for balanced traffic was 0.79 Euro cents in Q2 2017 and 0.61 Euro cents in Q3 2017. Over the same time, the average price for unbalanced traffic was 0.55 Euro cents in Q2 2017 and 0.52 Euro cents in Q3 2017 (Figures 39-40).

Wholesale rates for data

At the wholesale level, the data cap of 5 Euro cents in Q2 2017 and 0.77 Euro cents per MB in Q3 2017 applies in the EEA. The EEA average price for wholesale data services (Figures 55-56) fell to 0.57 Euro cents per MB in Q2 2017 and 0.40 Euro cents per MB in Q3 2017, compared to € 1.02 Euro cents and 0.99 Euro cents in Q2 2016 and Q3 2016, respectively. In the context of the wholesale inbound roaming costs, the EEA average price for balanced traffic was 0.65 Euro cents per MB in Q2 2017 and 0.47 Euro cents per MB in Q3 2017, whereas the EEA average price for unbalanced traffic was 0.45 Euro cents per MB in Q2 2017 and 0.34 Euro cents per MB in Q3 2017 (Figures 53-54).

Wholesale agreements (Article 3)

In the case of wholesale agreements based on Article 3 of the Roaming Regulation, only some operators submitted these data. BEREC's International Roaming Compliance Report²⁰ showed that operators negotiated roaming services at the wholesale level individually and that the provision of such services was based on commercial agreements. Some light MVNOs as well as resellers stated that these services continued to be provided on the basis of the existing contracts with national host MNOs.

How wholesale costs and prices relate to each other

In the table below BEREC presents the cost estimates for wholesale roaming services in each of the 29 countries (28 Member States (MS) and Norway) considered in TERA Consultants cost model.

Wholesale roaming services cost estimates in each of the 29 countries considered in the TERA Consultants' cost model²¹

²⁰ BEREC International Roaming Compliance Report (Regulation (EU) No 531/512 of the European Parliament and of the Council of 13 June 2012 on roaming), the link: http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/1482-berec-international-roaming-compliance-report-regulation-eu-no-531512-of-the-european-parliament-and-of-the-council-of-13-june-2012-on-roaming

²¹ These cost estimates include: 1) the total wholesale roaming costs in MS estimated by TERA (including network costs, roaming-specific costs and the impact of seasonality on roaming costs); 2) an allocation for the termination rate that the visited network operator needs to pay the terminating network operator for terminating a call on its network and 3) an allocation for the transit costs that the visited network operator needs to pay for routing a call to the terminating network operator or to send data traffic back to the home network.

	Voice (€/min)	SMS (€/SMS)	Data (€/MB)
AT	2.6	1.00	0.3
BE	1.85	1.00	0.41
BG	2.74	1.00	0.53
CY	1.63	1.00	0.35
CZ	1.86	1.00	0.42
DE	1.7	1.00	0.31
DK	1.86	1.00	0.29
EE	1.82	1.00	0.34
EL	1.94	1.00	0.35
ES	2.81	1.00	0.41
FI	1.65	1.00	0.28
FR	2.79	1.00	0.39
HR	2.31	1.00	0.36
HU	2.39	1.00	0.39
IE	1.24	1.00	0.31
IT	1.75	1.00	0.31
LT	1.62	1.00	0.43
LU	2.63	1.00	0.44
LV	2.81	1.00	0.52
MT	4.2	1.00	0.67
NL	2.57	1.00	0.37
PL	1.72	1.00	0.32
PT	1.78	1.00	0.36
RO	1.79	1.00	0.59
SE	3.22	1.00	0.29
SI	2.52	1.00	0.57
SK	1.63	1.00	0.55
UK	2.65	1.00	0.36
NO	1.96	1.00	0.38
Average²²	2.21	1.00	0.40

BEREC compared the lowest wholesale prices for the unbalanced traffic against TERA's estimated costs (Figure 71 - 74).

EEA average wholesale	Q2 2017					
	paid			charged		
	Voice (€/min)	SMS (€/SMS)	Data (€/MB)	Voice (€/min)	SMS (€/SMS)	Data (€/MB)
	2.22	0.60	0.55	2.08	0.58	0.34
Q3 2017						

Available at: <https://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-202-F1-EN-MAIN-PART-1.PDF>

²² Values are calculated as a simple average

roaming price	paid			charged		
	Voice (€/min)	SMS (€/SMS)	Data (€/MB)	Voice (€/min)	SMS (€/SMS)	Data (€/MB)
	1.99	0.52	0.38	1.99	0.51	0.22

The evidence from the estimates of the lowest wholesale roaming rates paid/charged for the unbalanced traffic shows that the TERA Consultants' cost estimates are all higher in Q3 2017 than the current lowest EEA average wholesale roaming rates paid/charged for voice, SMS and data services. Only in Q2 2017 for two instances paid tariffs are still higher, but at that time RLAH was not in effect (paid voice 2.22 and paid data 0.55).

Rest of the World (RoW) retail prices

With regard to 'Rest of World' retail voice roaming calls (Figures 17-18), the EEA average RoW tariff for calls made was 81.38 Euro cents in Q2 2017 and 66.57 Euro cents in Q3 2017. The EEA average prices for calls received are given in Figure 18. Receiving calls when roaming outside the EEA area cost 39.90 Euro cents in Q2 2017 and 34.82 Euro cents in Q3 2017. At the same time, data from the operators reveals that the average price for data consumption outside EEA (Figure 52) cost 15.21 Euro cents per MB in Q2 2017 and 9.78 Euro cents per MB in Q3 2017.

EEA roaming consumption patterns

The introduction of RLAH services, coupled with the growing demand for data services, has changed the international roaming market. A relevant point could be made that the RLAH services enabled a substantial increase in international roaming traffic. The minutes generated under RLAH tariffs account for the majority of the voice traffic. 91.03 % of minutes of calls made and 91.69 % of minutes of calls received were generated by subscribers of RLAH tariffs (Figures: 28, 33). For text messages sent while roaming within EEA countries RLAH tariffs accounted for 94.53 % of the total volume in Q3 2017 (Figure 47). In Q3 2017 around 90.05 % of data traffic was based on the RLAH data tariff while roaming (Figure 62).

Increased volumes can be exemplified in the relationship between Q3 2016 and Q3 2017. The average EEA subscriber spent 14.23 minutes per month in calls made in Q3 2017 in comparison to 8.8 minutes in Q3 2016 (Figure 30). The number of received call minutes abroad amounted to 11.08 minutes per EEA average roaming subscriber per month in Q3 2017, whereas this was around 9.5 minutes in Q3 2016 (Figure 35). Data traffic has increased by 434.55 % when comparing data from Q3 2016 and Q3 2017. Data roaming consumption ranged from 59.02 to 1616.13 MB per roaming subscriber monthly in Q3 2017 (Figure 64) in comparison to the range from 8 to 342 MB in Q3 2016. In the historical series, data traffic increased 36.17 % from Q3 2015 to Q3 2016, so the total increase of data during the period in which roaming regulation evolved from Eurotariff to RLAH (from Q3 2015 to Q3 2017) has been 627.88 %.

Clauses to prevent permanent roaming and anomalous use

BEREC asked operators if they have updated their wholesale roaming agreements to include clauses to prevent permanent roaming.

Some operators answered that there were cases of permanent roaming traffic that are not easy to monitor or identify and other roaming providers have not updated their agreements yet because they are studying measures to implement.

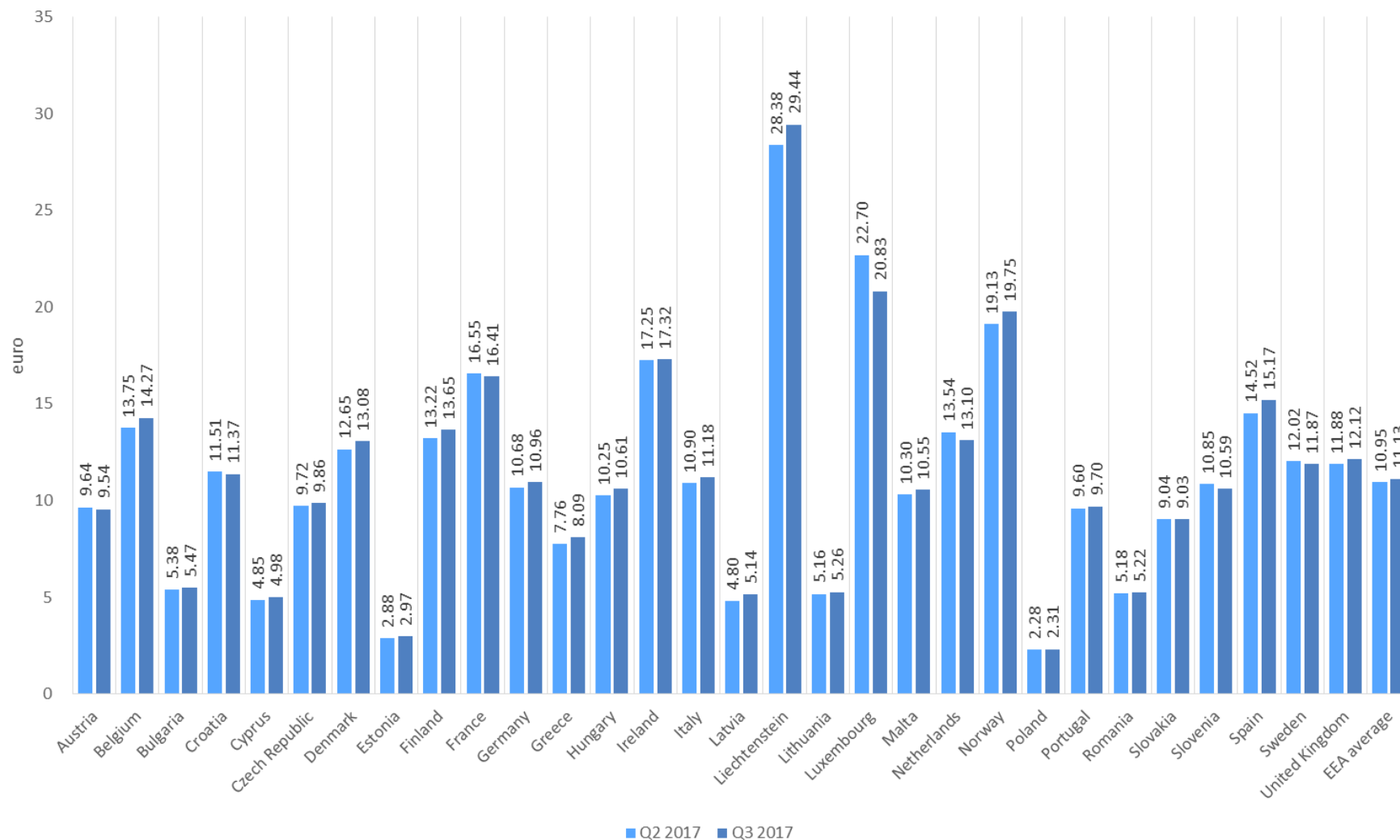
However, other roaming providers have pointed out that they have included general clauses to suspend wholesale services or to terminate the agreement in case of permanent roaming is detected based on Article 3 of the Roaming Regulation.

4. Charts

4.1. Analysis of subscribers and those that use roaming services

4.1.1. Domestic average Retail Mobile Revenue per User (ARRPU)

Figure 1: Domestic mobile service: monthly retail revenue per subscriber (ARRPU)
(prepaid+ postpaid)

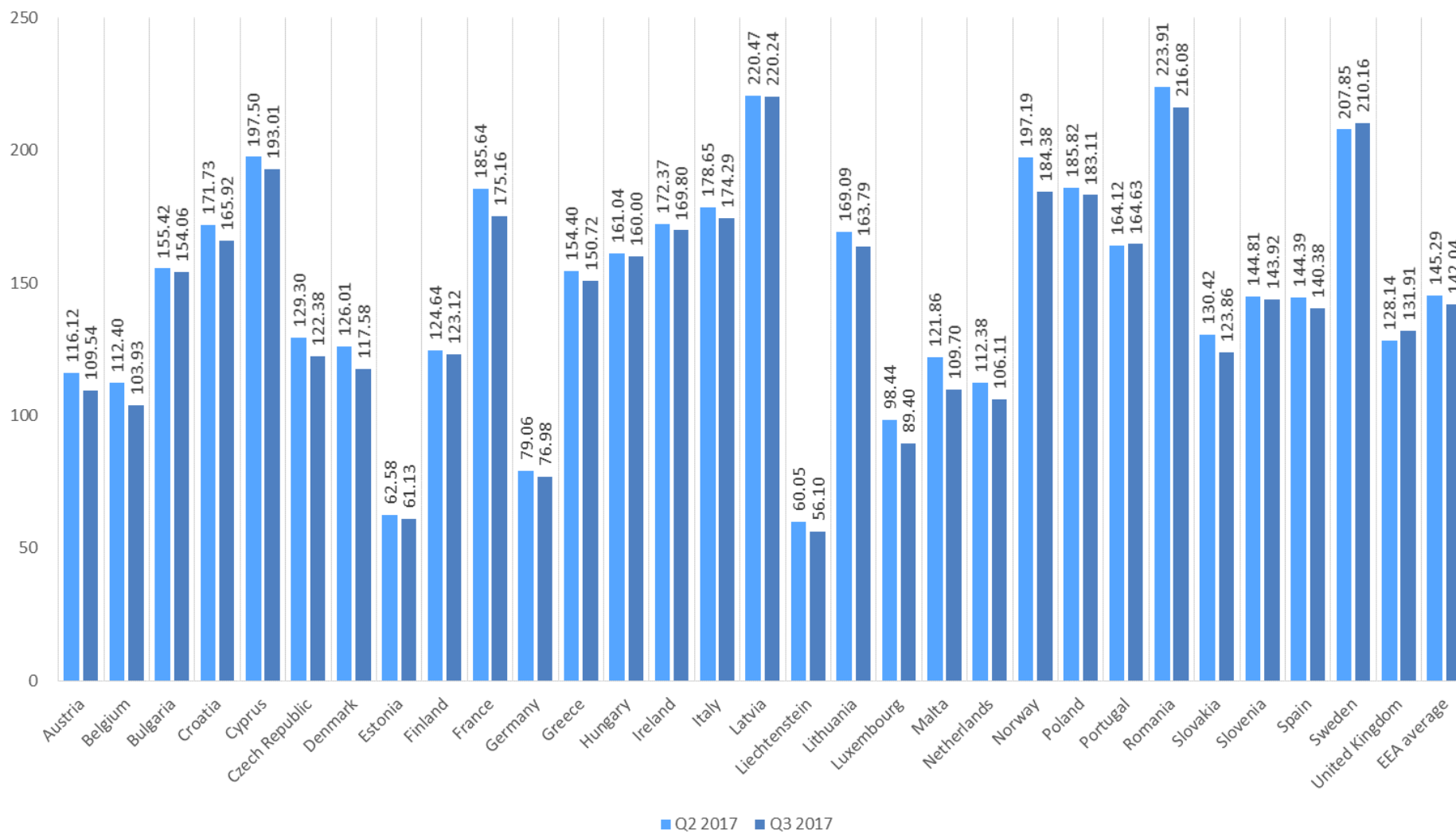


EEA average excludes: Iceland and Portugal

Portugal – estimates for monthly retail revenue per subscriber excluding the subscribers of bundles (Portugal did not present total domestic mobile service values because for bundling offers one of the MNO was not able to estimate revenues only relative to mobile services).

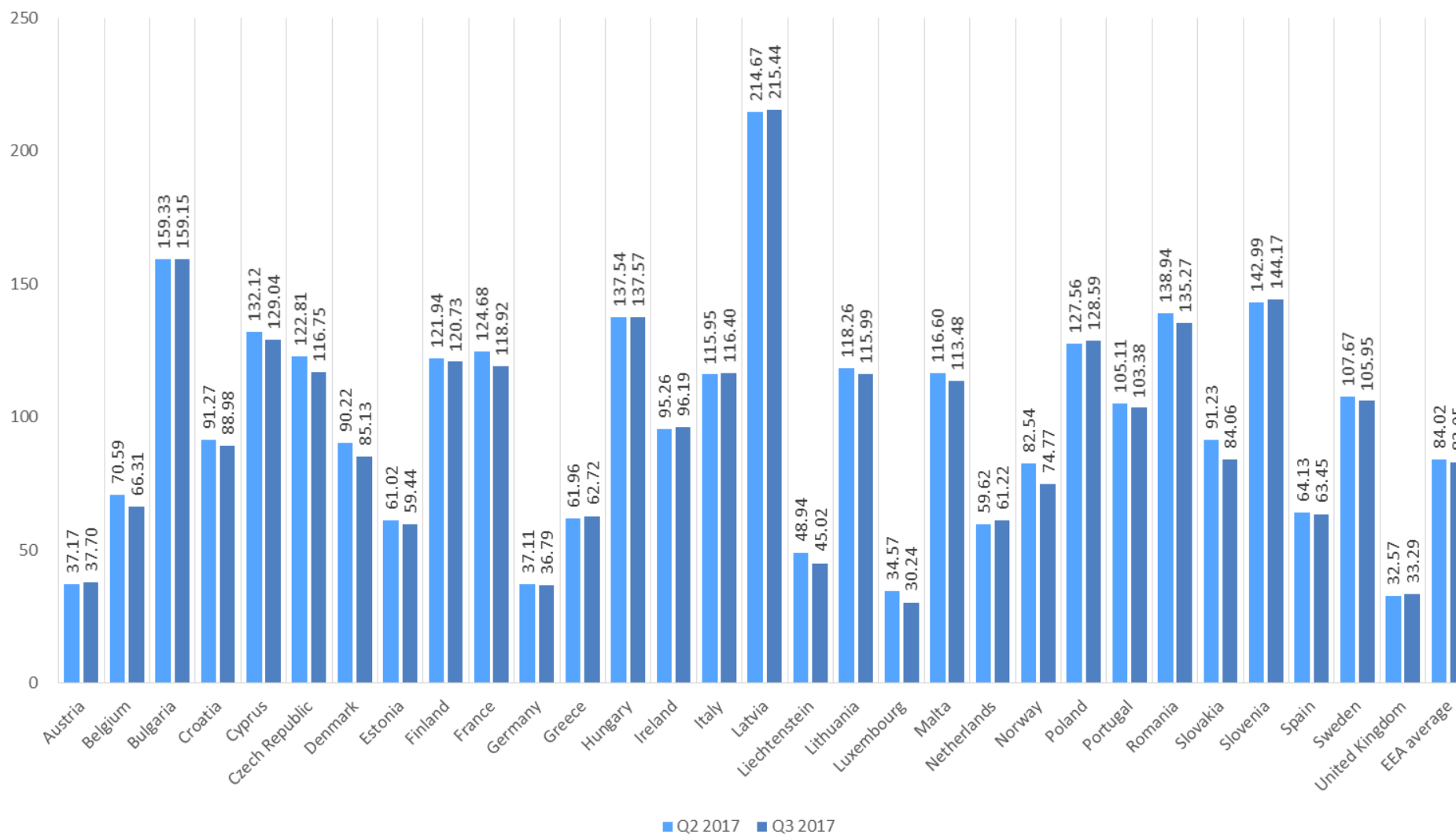
4.1.2. Consumption patterns for domestic mobile retail services

Figure 2: domestic calls made
Average number of minutes per month per subscriber (prepaid+ postpaid)
Q2 2017 and Q3 2017



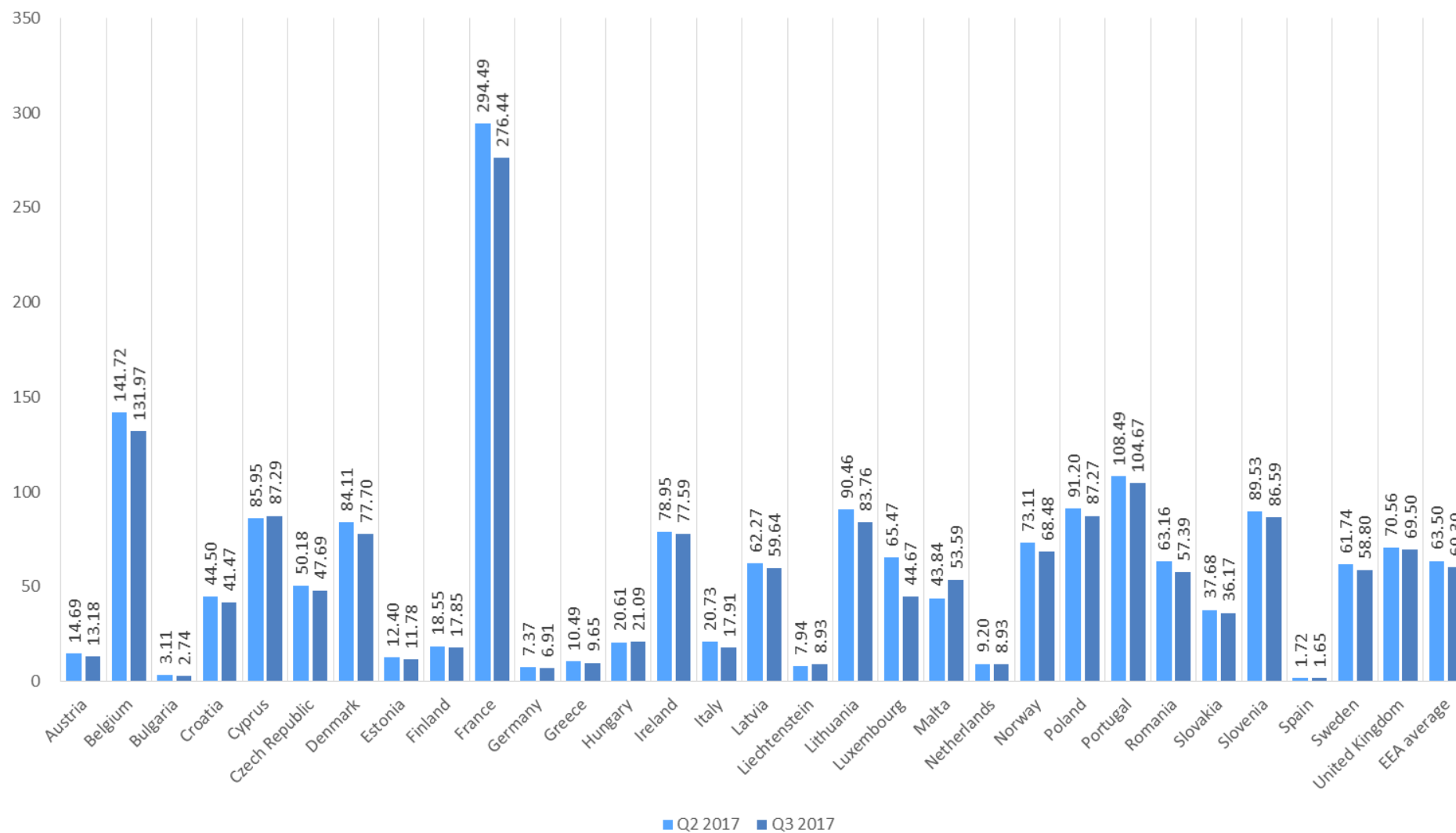
EEA average excludes Iceland

Figure 3: domestic calls received
Average number of minutes per month per subscriber (prepaid+ postpaid)
Q2 2017 and Q3 2017



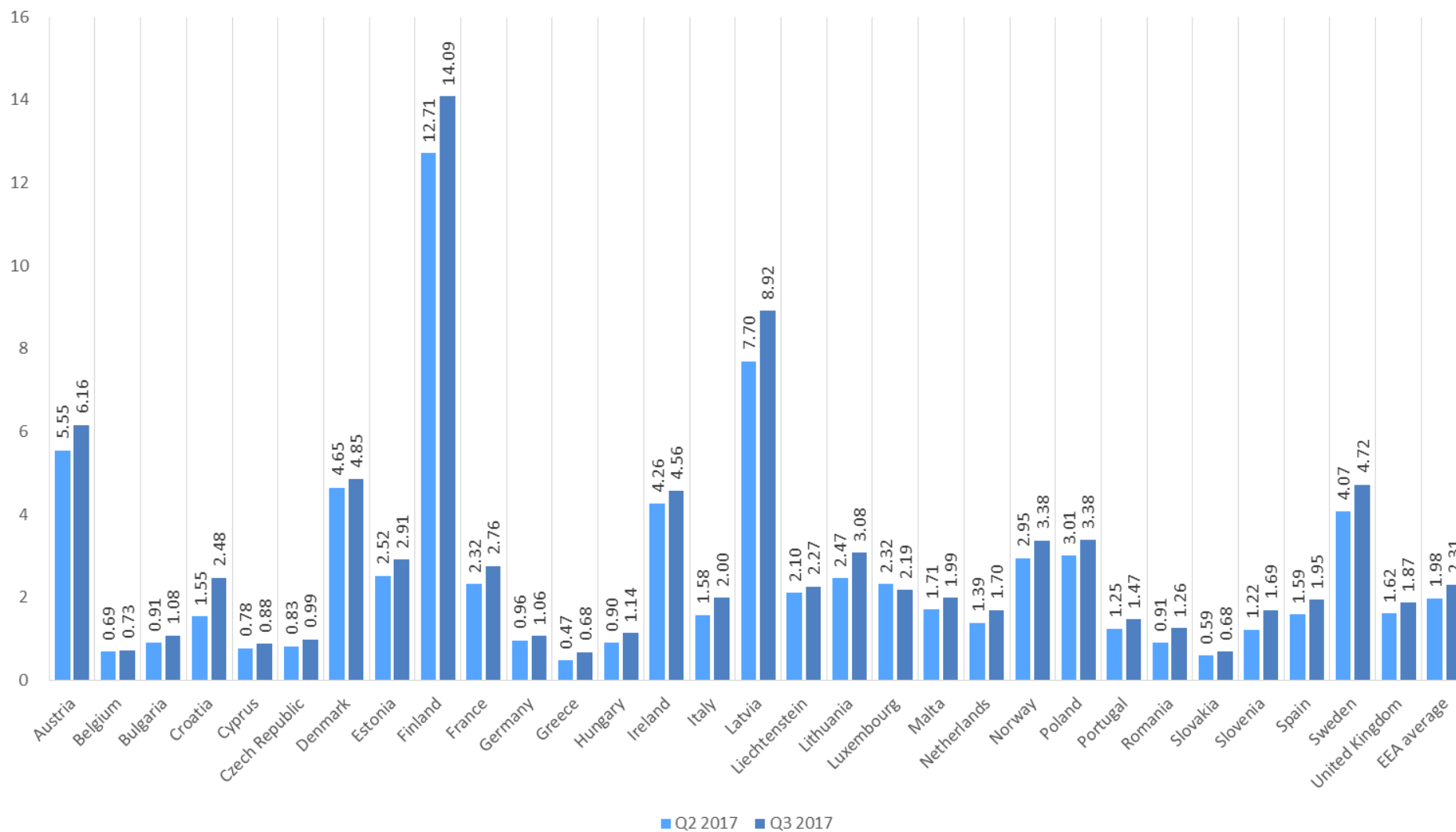
EEA average excludes Iceland

Figure 4: domestic SMS
Average number of SMS per month per subscriber (prepaid+ postpaid)
Q2 2017 and Q3 2017



EEA average excludes Iceland

Figure 5: domestic data services
Average consumption per subscriber per month (Gb, prepaid+ postpaid)
Q2 2017 and Q3 2017



EEA average excludes Iceland

4.1.3. Consumption patterns for RLAH services (voice, SMS and data)

Figure 6
RLAH - Voice services, outgoing calls
(in millions of minutes)
Q2 and Q3 2017

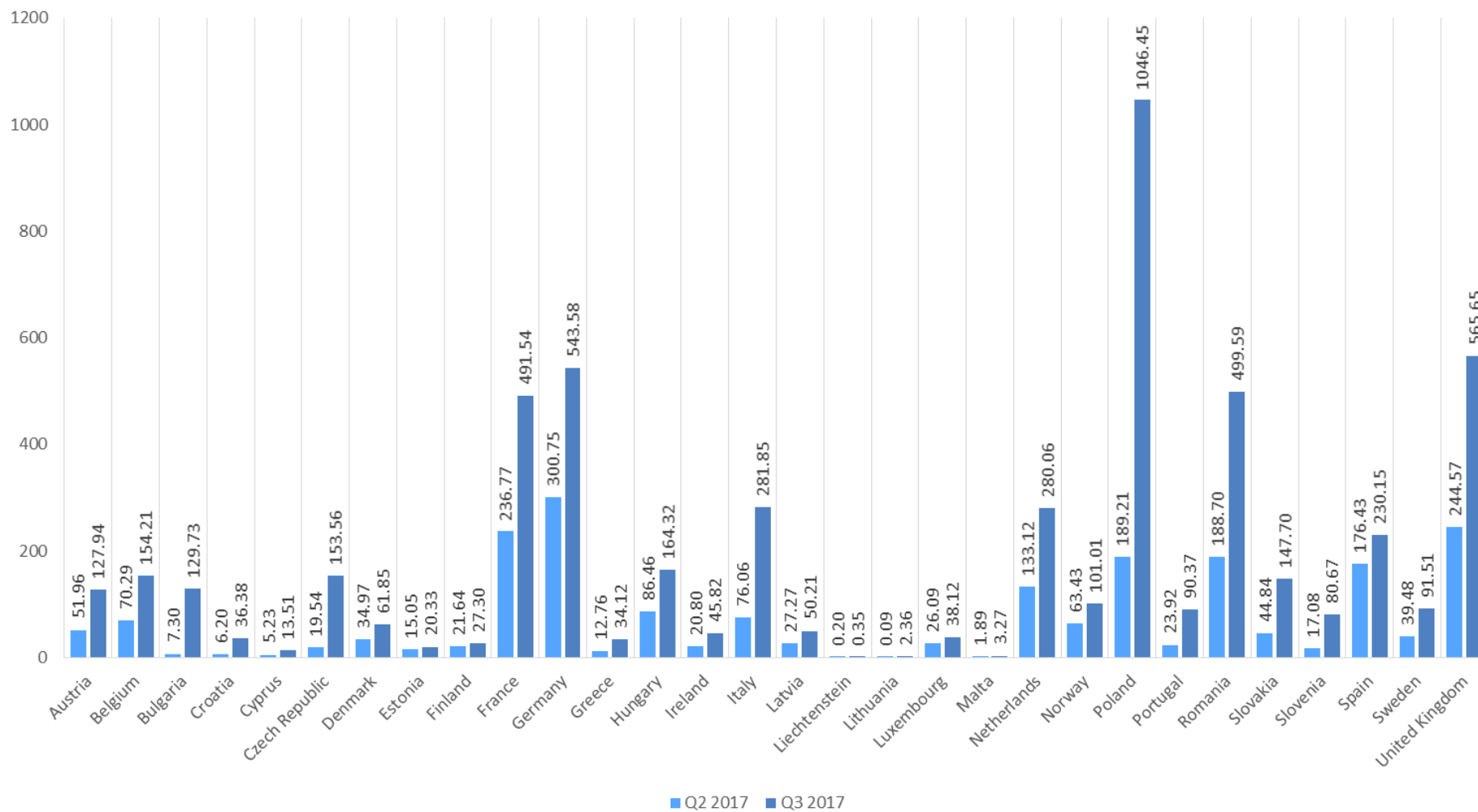


Figure 7
RLAH - Voice services, incoming calls
(in millions of minutes)
Q2 and Q3 2017

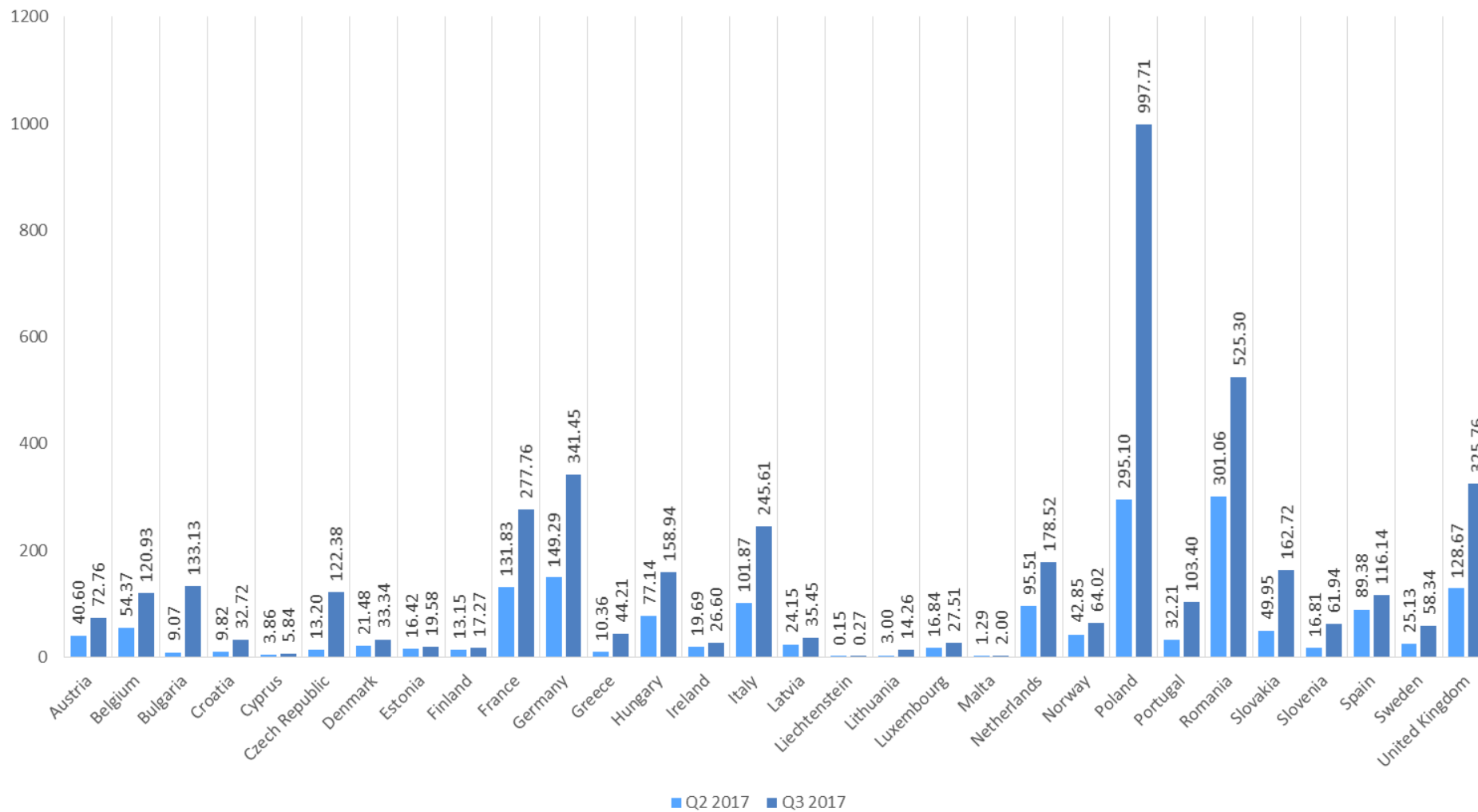
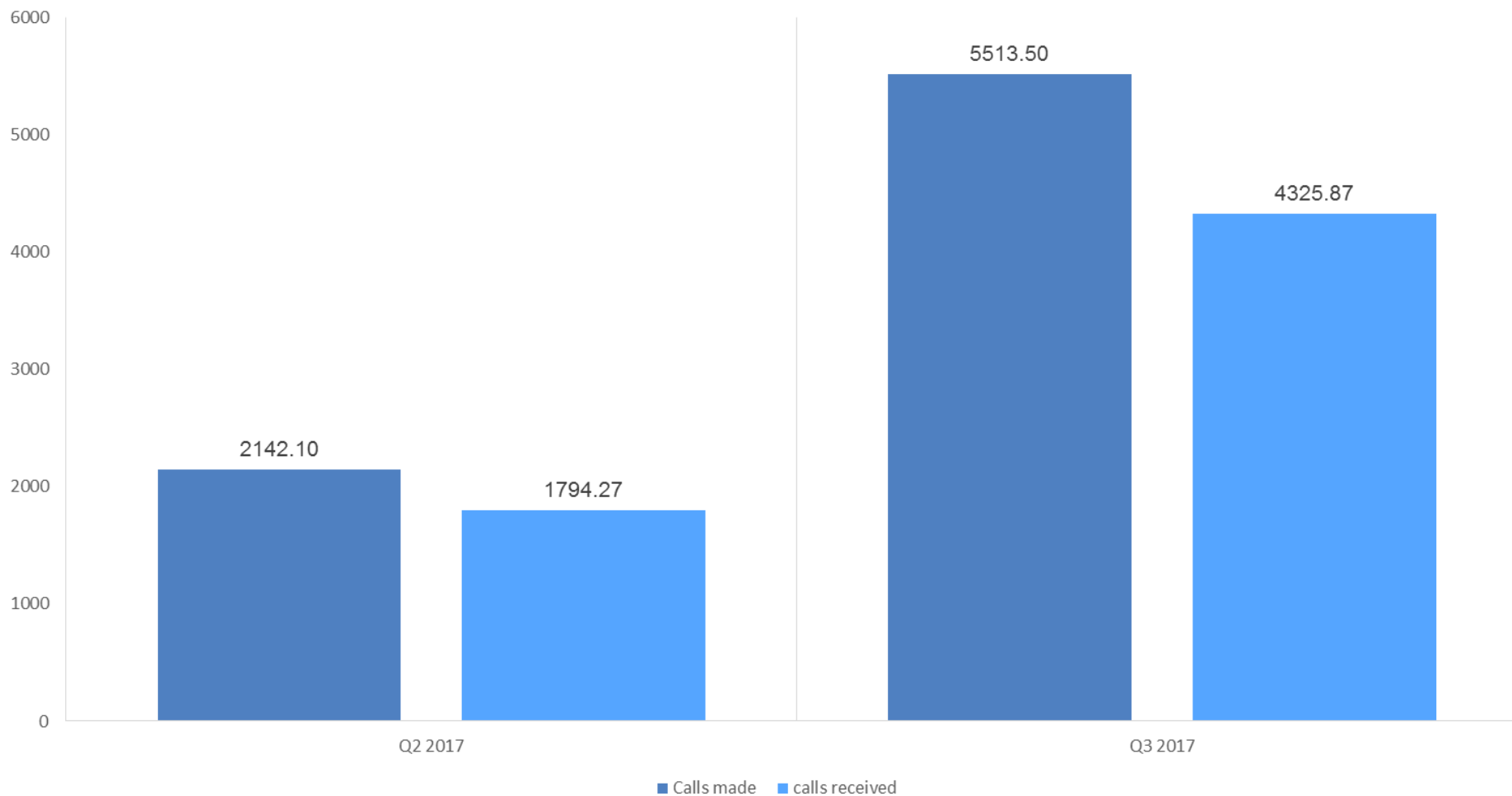


Figure 8
EEA Total traffic - RLAH services
outgoing and incoming calls
(in millions of minutes)
Q2 and Q3 2017



EEA average excludes Iceland

Figure 9
RLAH - SMS services
(millions of SMS sent)
Q2 and Q3 2017

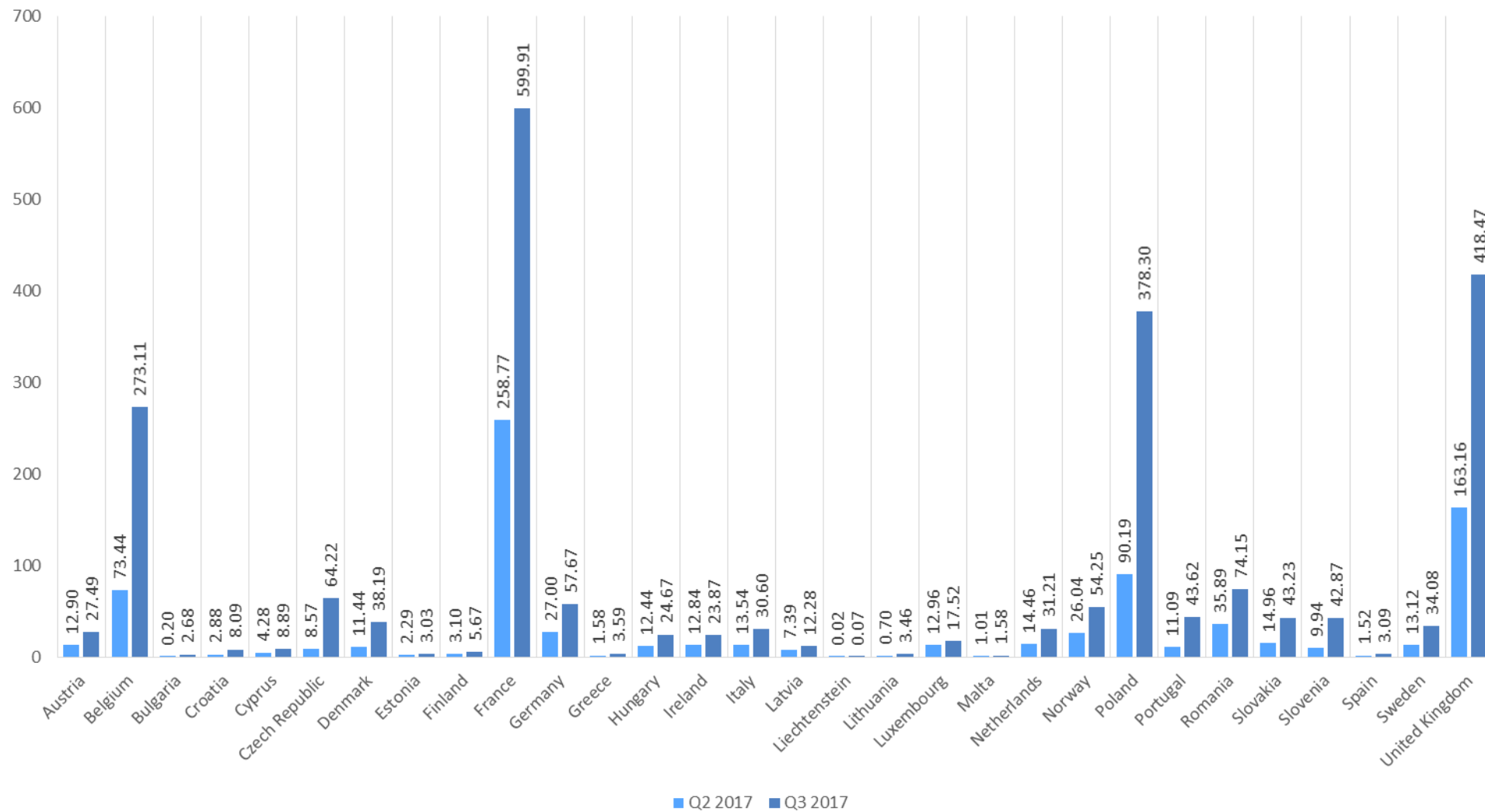
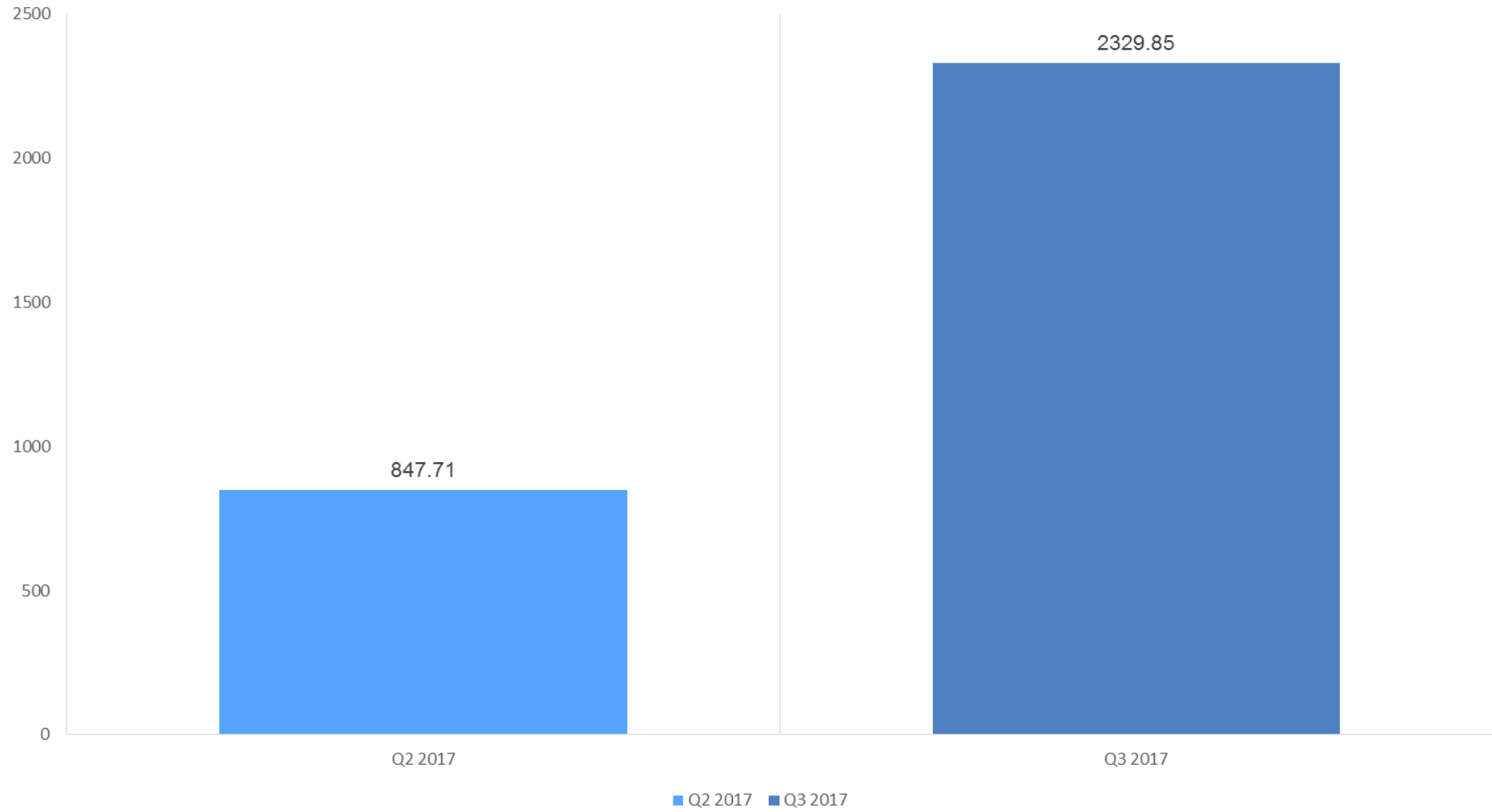


Figure 10
EEA Total traffic - RLAH
SMS services (millions of SMS sent)
Q2 and Q3 2017



EEA average excludes Iceland

Figure 11
RLAH - Data services
(millions of GB)
Q2 and Q3 2017

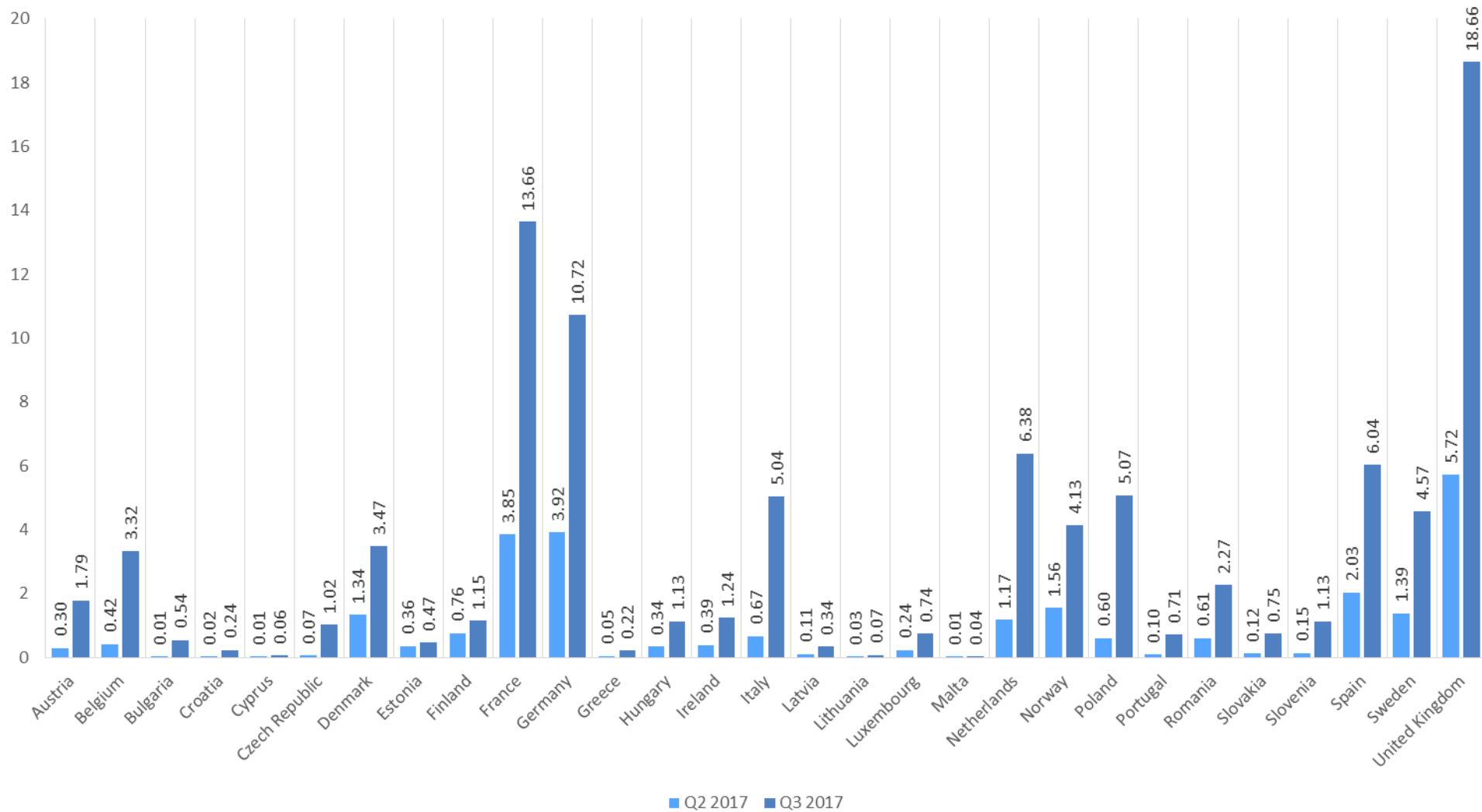
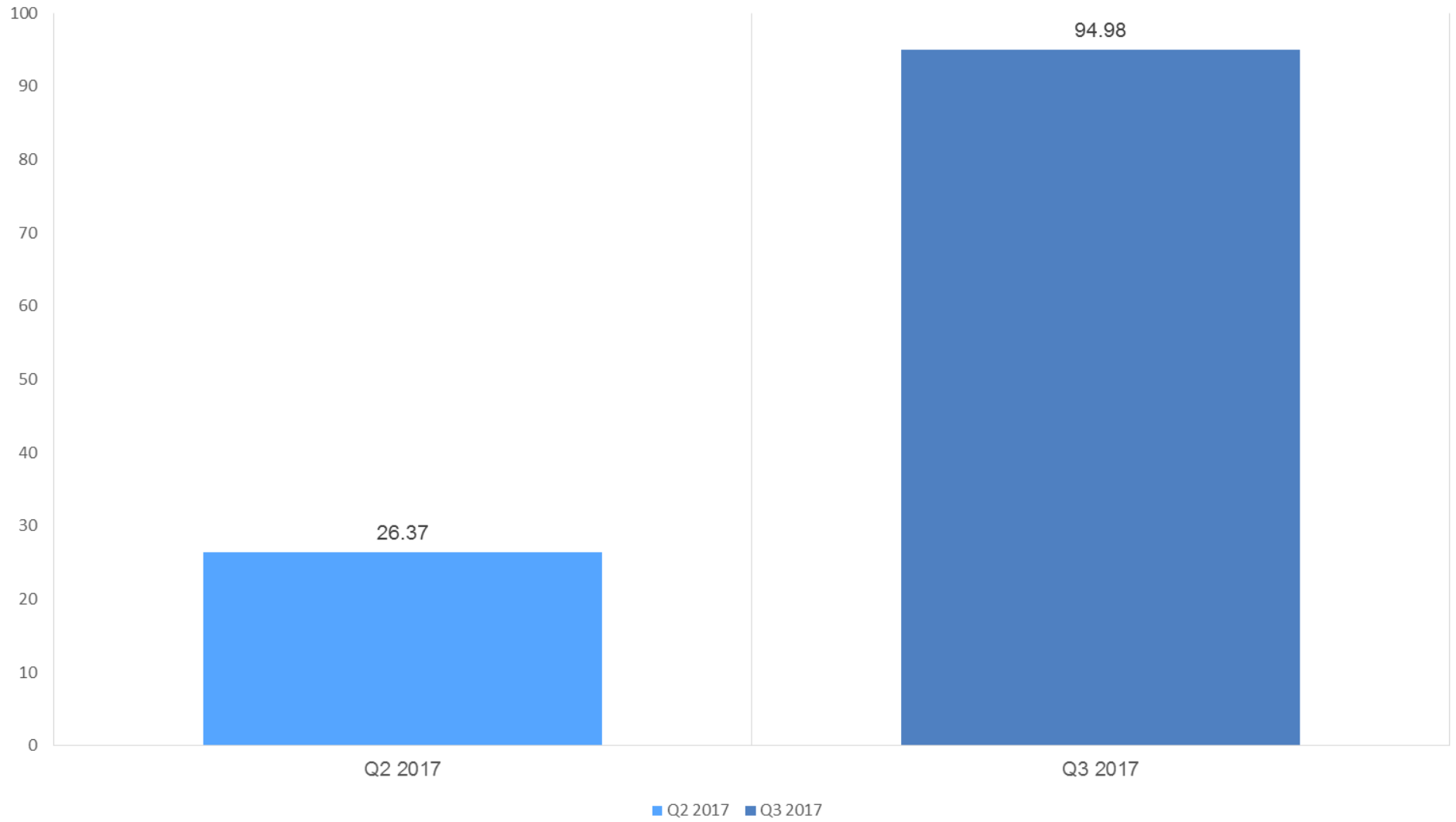
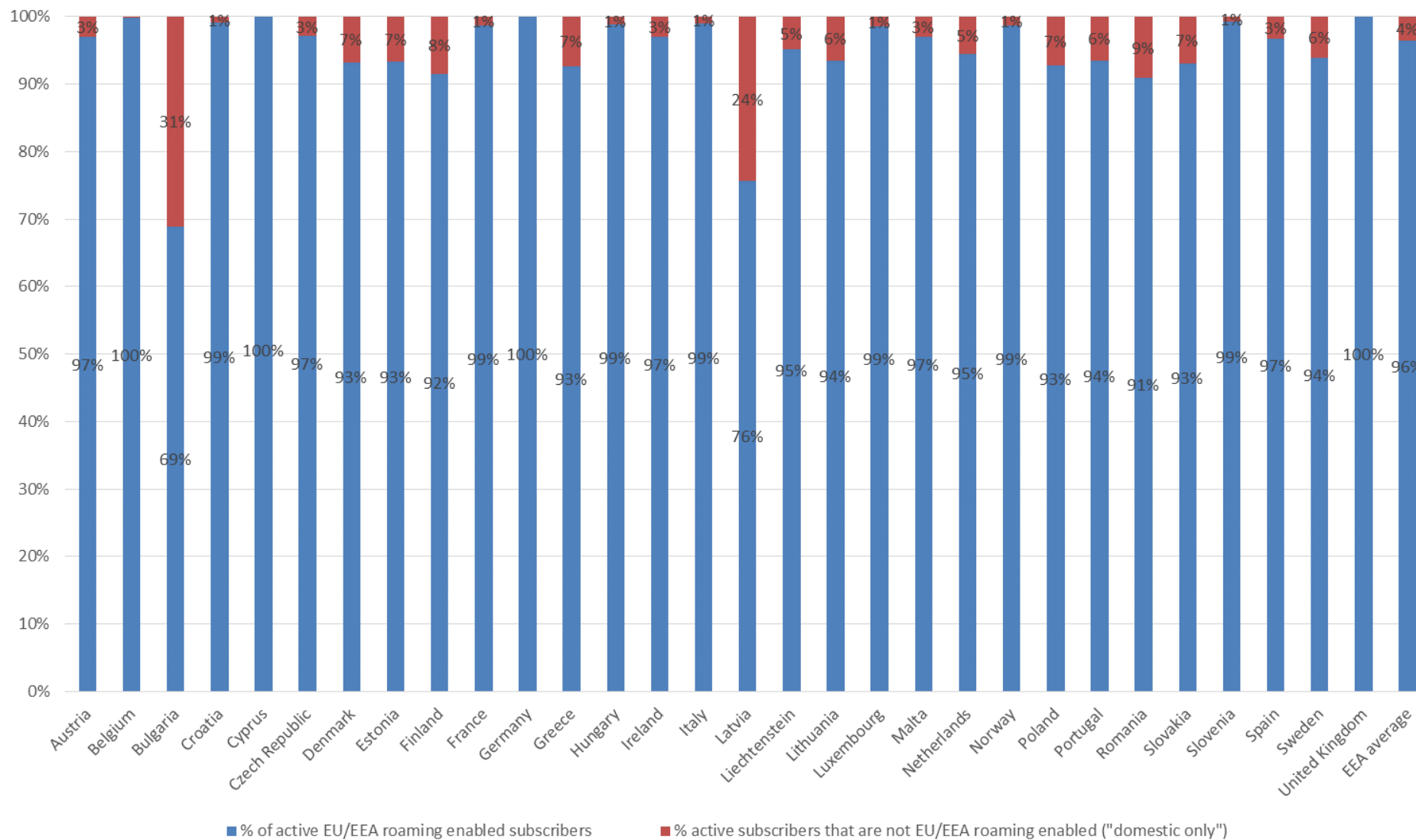


Figure 12: EEA Total traffic - RLAH
Data services (millions of GB)
Q2 and Q3 2017



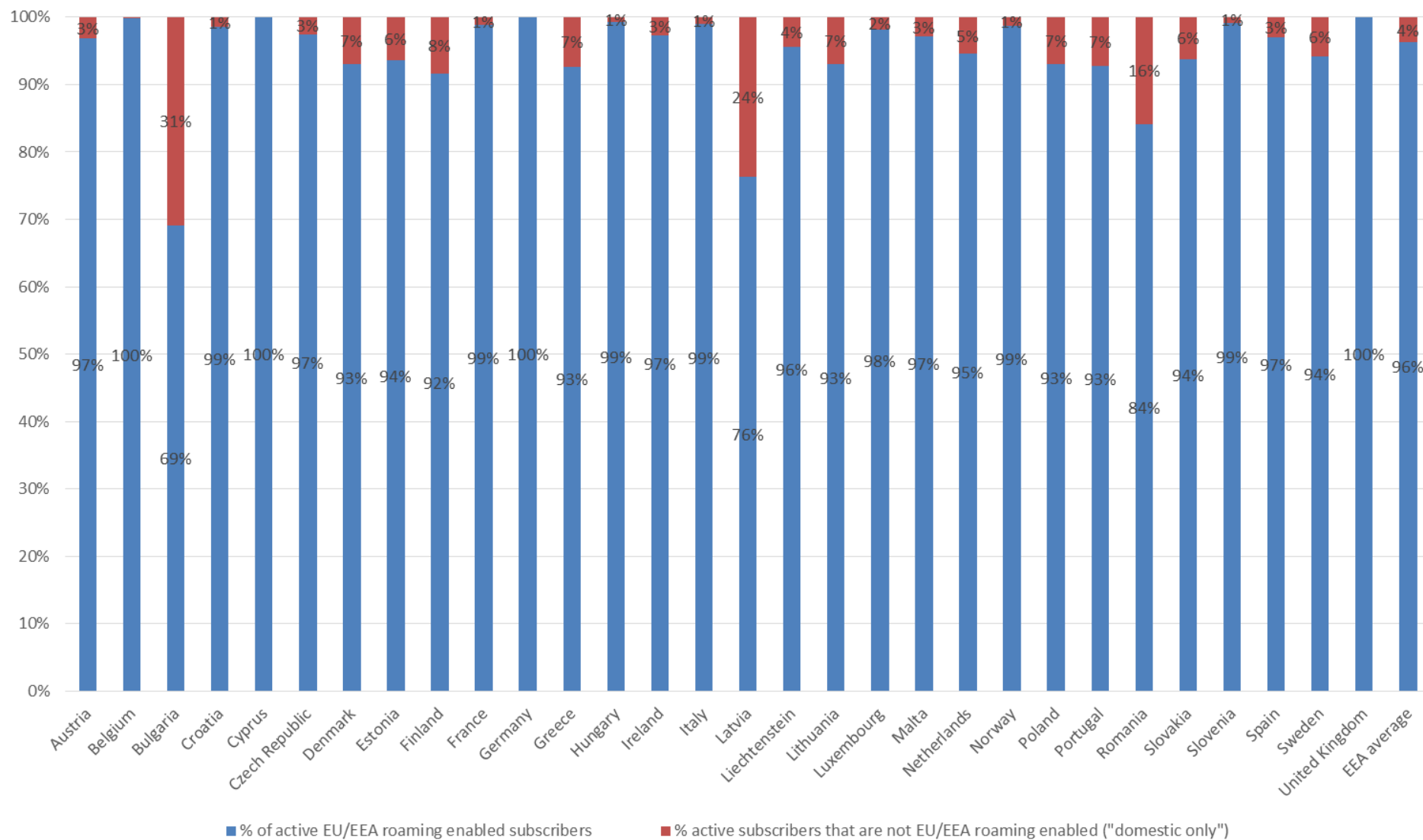
EEA average excludes Iceland

Figure 13: share of total subscribers with UE/EEA roaming enabled
Q2 2017



EEA average excludes Iceland

Figure 14: share of total subscribers with UE/EEA roaming enabled
Q3 2017



EEA average excludes Iceland

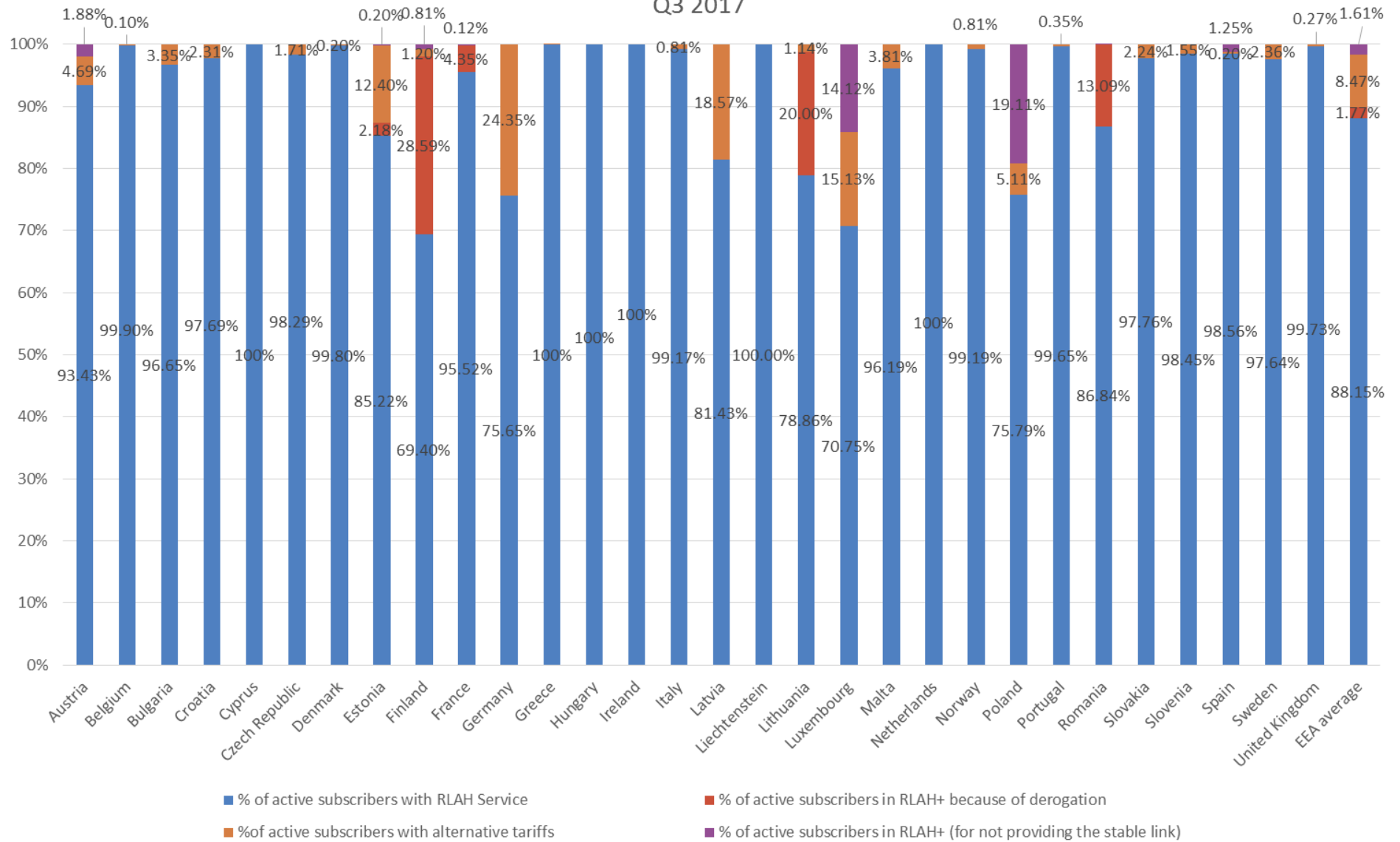
Figure 15: % of subscribers with different tariff plans



EEA average excludes Iceland

Figure 16: % of subscribers with different tariff plans

Q3 2017



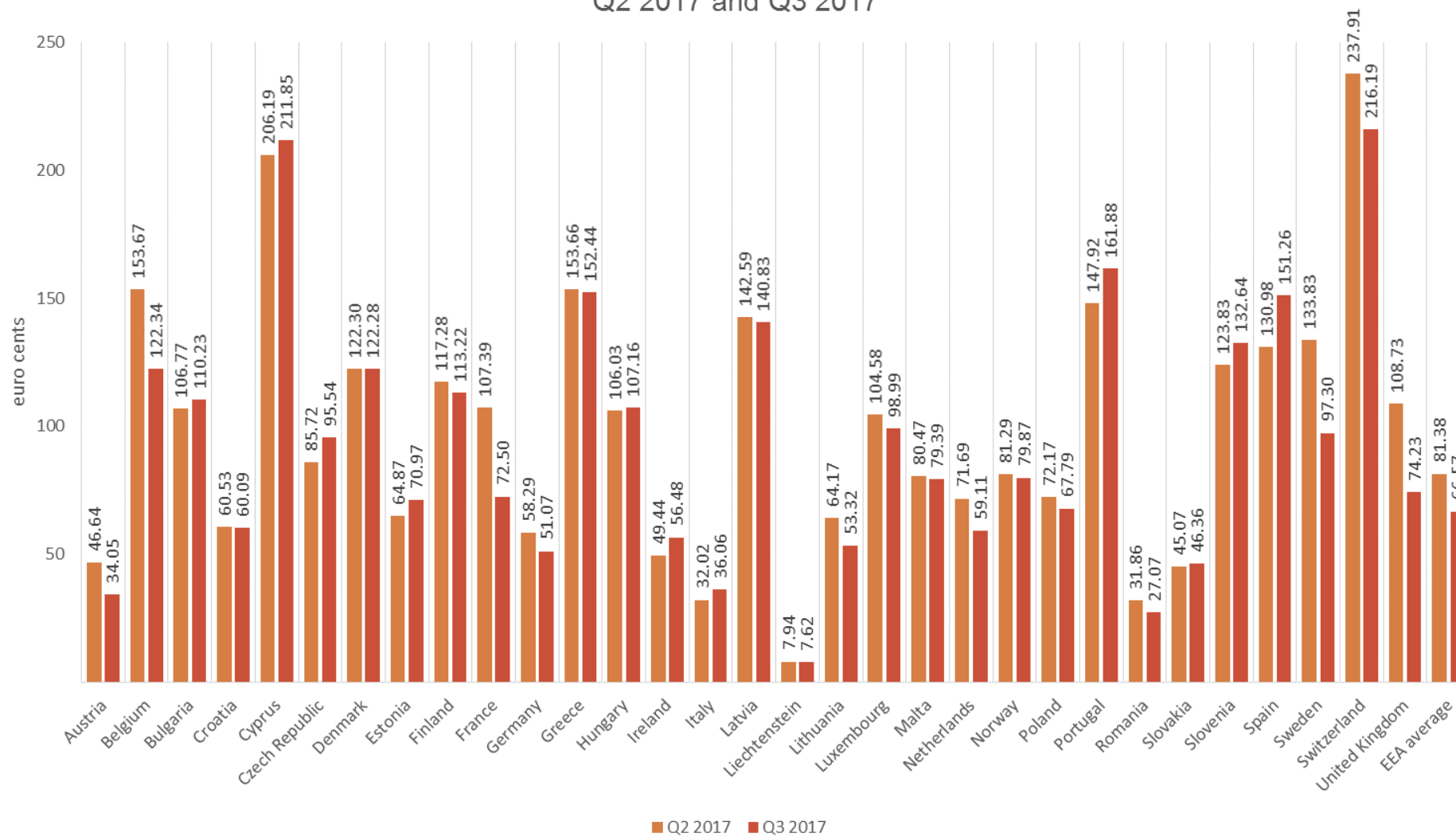
EEA average excludes Iceland

4.2. The development of Roaming Services

4.2.1. Voice roaming services

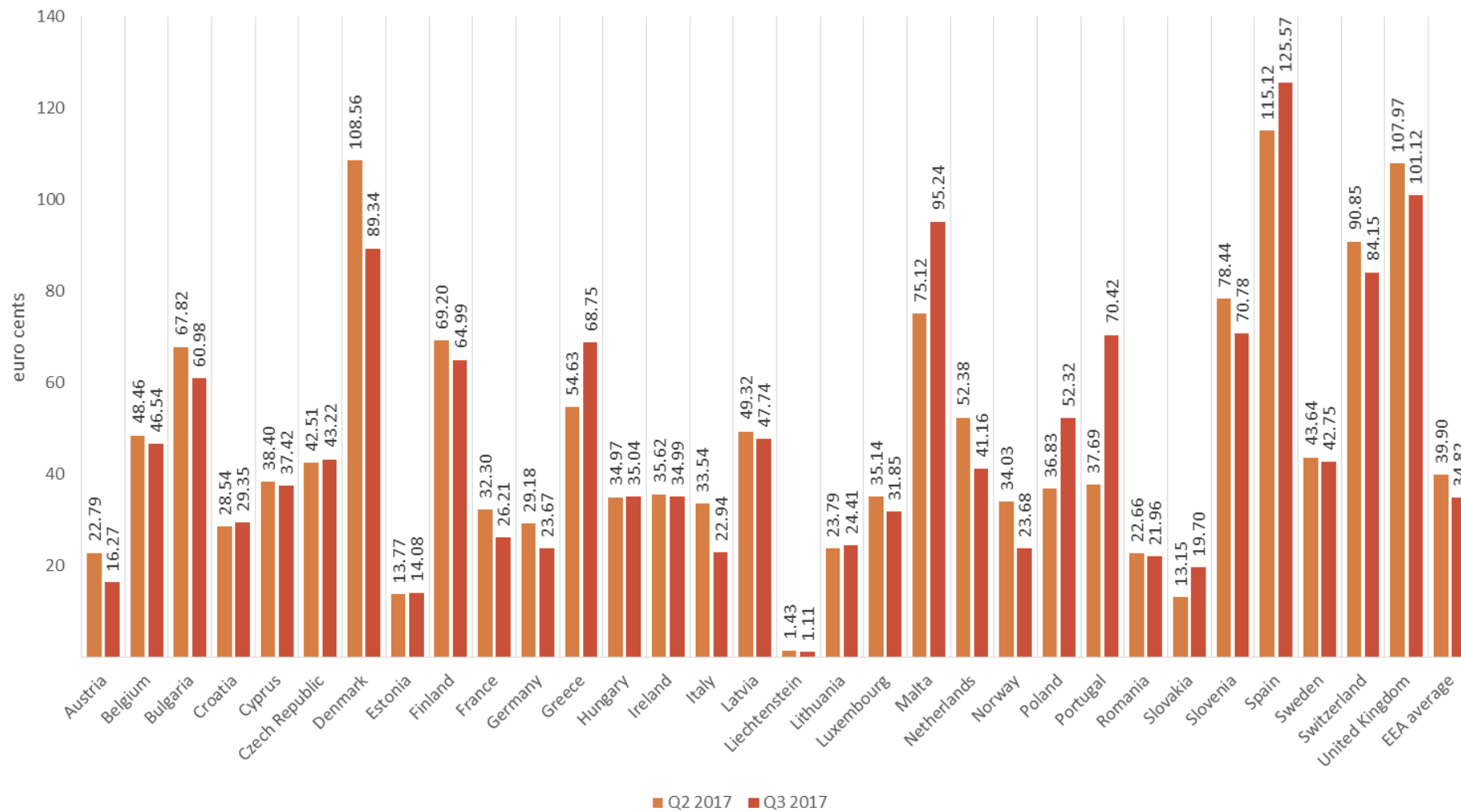
4.2.1.1 RoW retail prices

Figure 17: RoW
Average retail price per minute for RoW roaming voice calls made
(billed minutes, prepaid+ postpaid)
Q2 2017 and Q3 2017



EEA average excludes Iceland

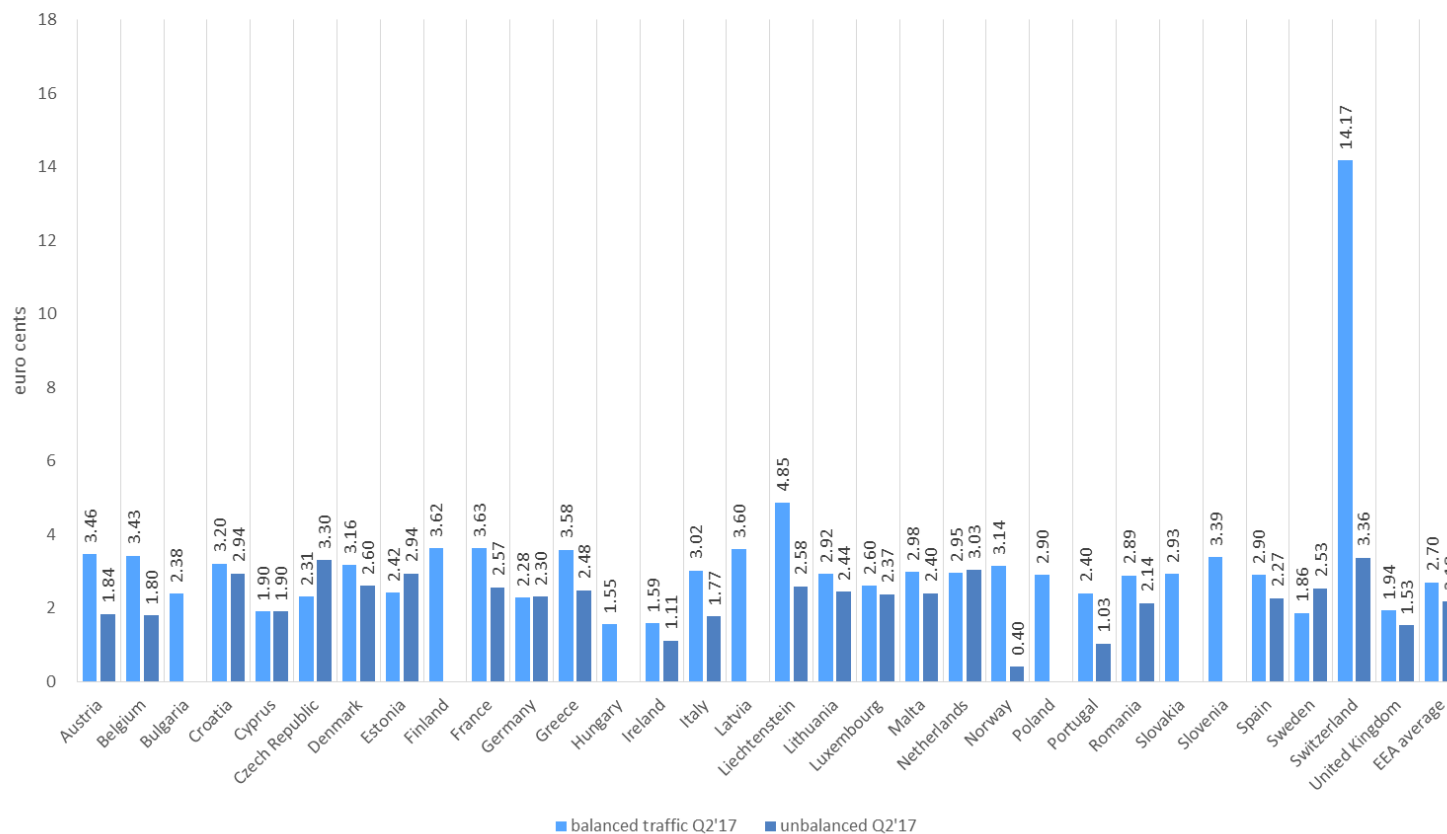
Figure 18: RoW
Average retail price per minute for RoW roaming voice calls received
(billed minutes, prepaid+ postpaid)
Q2 2017 and Q3 2017



EEA average excludes Iceland

4.2.1.2 Wholesale prices

Figure 19: Average wholesale price per minute for intra EEA roaming voice calls:
charges for balanced and unbalanced traffic (wholesale roaming inbound)
Q2 2017



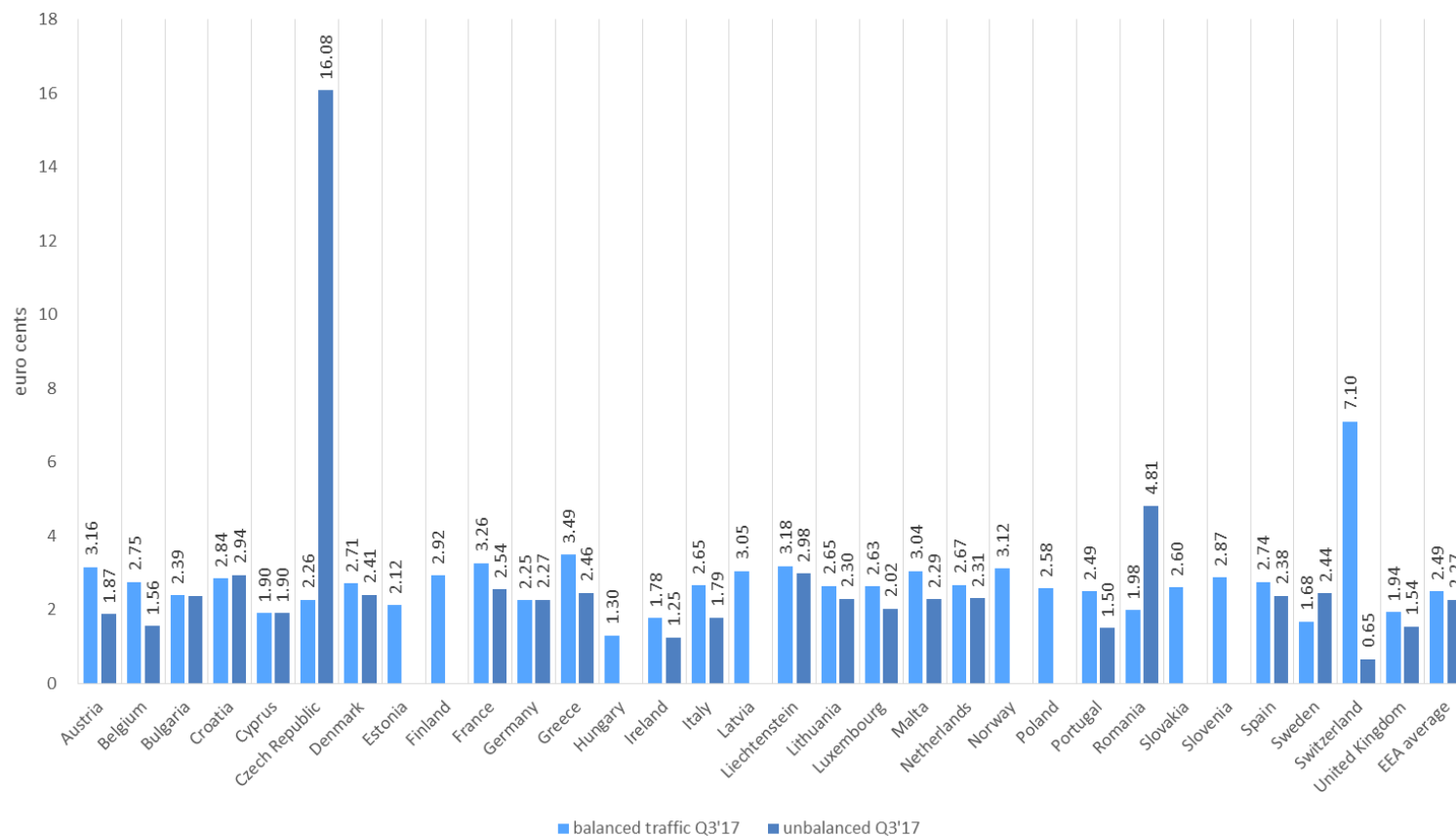
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 19, 20, 21, 22 and 25 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figures 21 and 22.

EEA average (balanced traffic) excludes Iceland

EEA average (unbalanced traffic) excludes Finland, Iceland

Figure 20: Average wholesale price per minute for intra EEA roaming voice calls:
charges for balanced and unbalanced traffic (wholesale roaming inbound)
Q3 2017



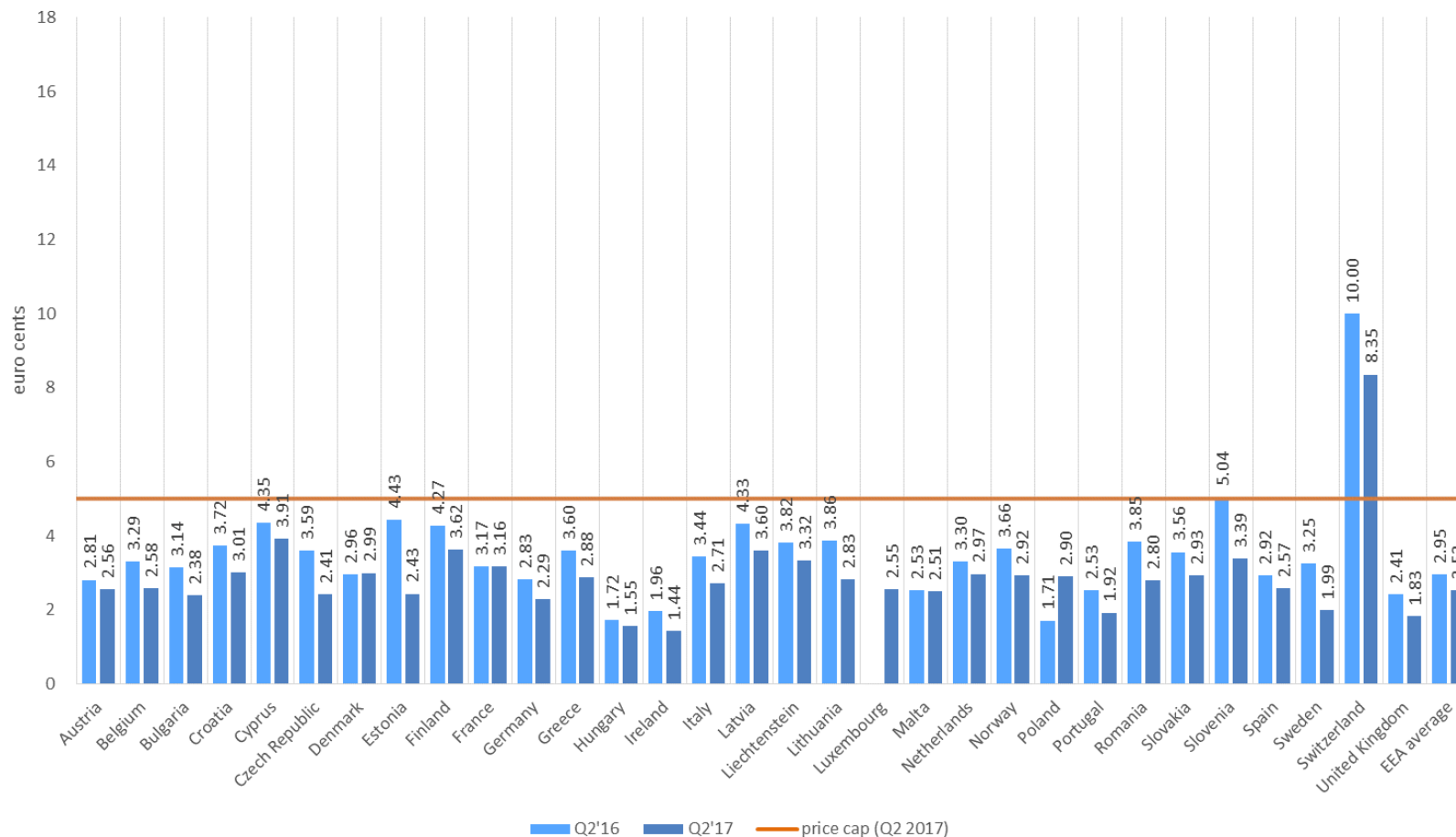
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 19, 20, 21, 22 and 25 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figures 21 and 22.

EEA average (balanced traffic) excludes Iceland

EEA average (unbalanced traffic) excludes Finland, Iceland

Figure 21: Total wholesale traffic (wholesale roaming inbound)
Average wholesale price per minute for intra EEA roaming voice calls
Q2 2016 and Q2 2017

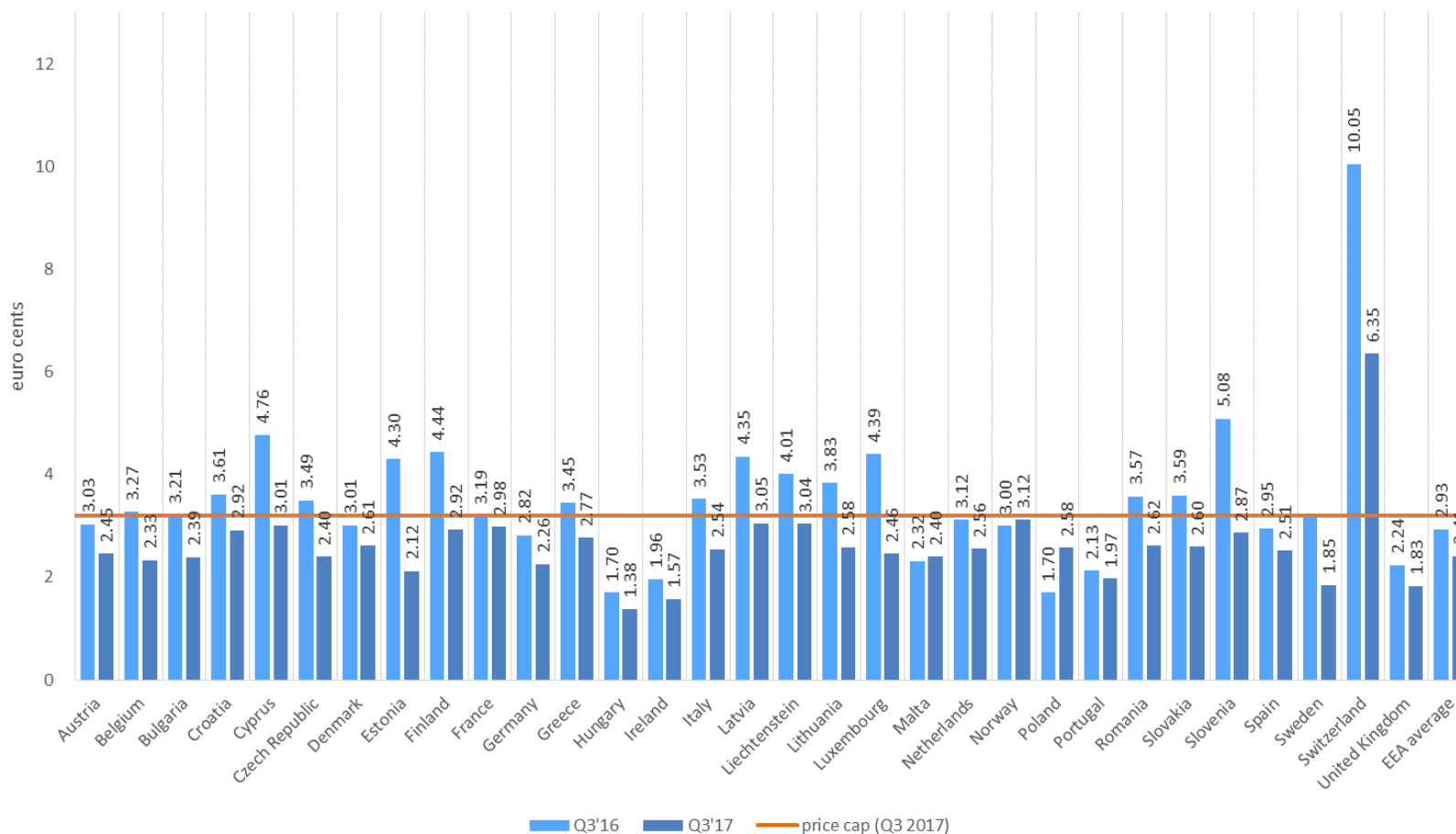


The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 19, 20, 21, 22 and 25 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates is different from the number of operators that reported data for calculating the estimates (disaggregated for balanced and unbalanced traffic) in Figures 19 and 20.

EEA average (Q2 2017) excludes Cyprus, Iceland

Figure 22: Total traffic (wholesale roaming inbound)
Average wholesale price per minute for intra EEA roaming voice calls
Q3 2016 and Q3 2017



The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 19, 20, 21, 22 and 25 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates is different from the number of operators that reported data for calculating the estimates (disaggregated for balanced and unbalanced traffic) in Figures 19 and 20.

EEA average (Q2 2017) excludes Cyprus, Iceland

Figure 23: EEA average wholesale price per minute for wholesale roaming voice calls

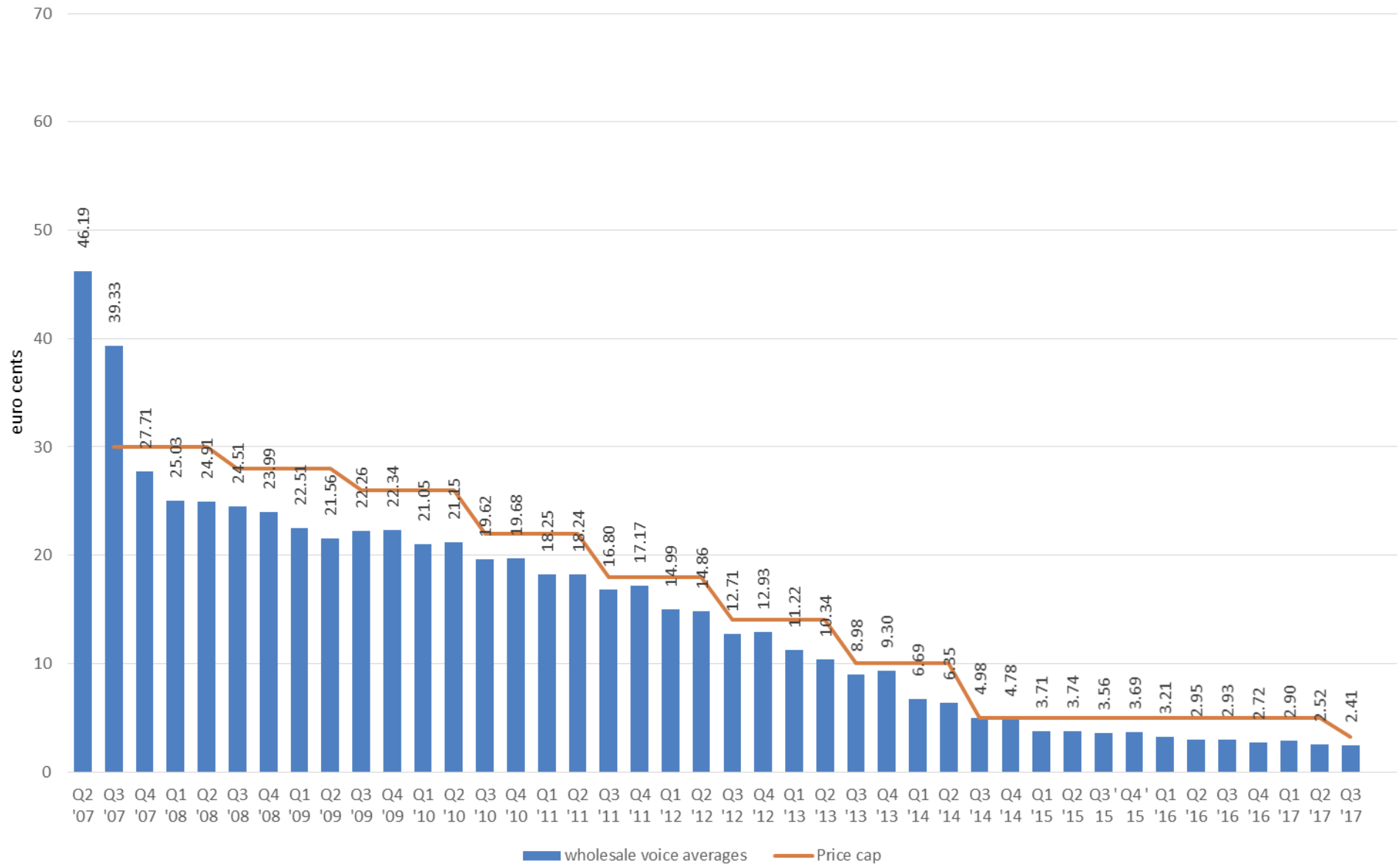
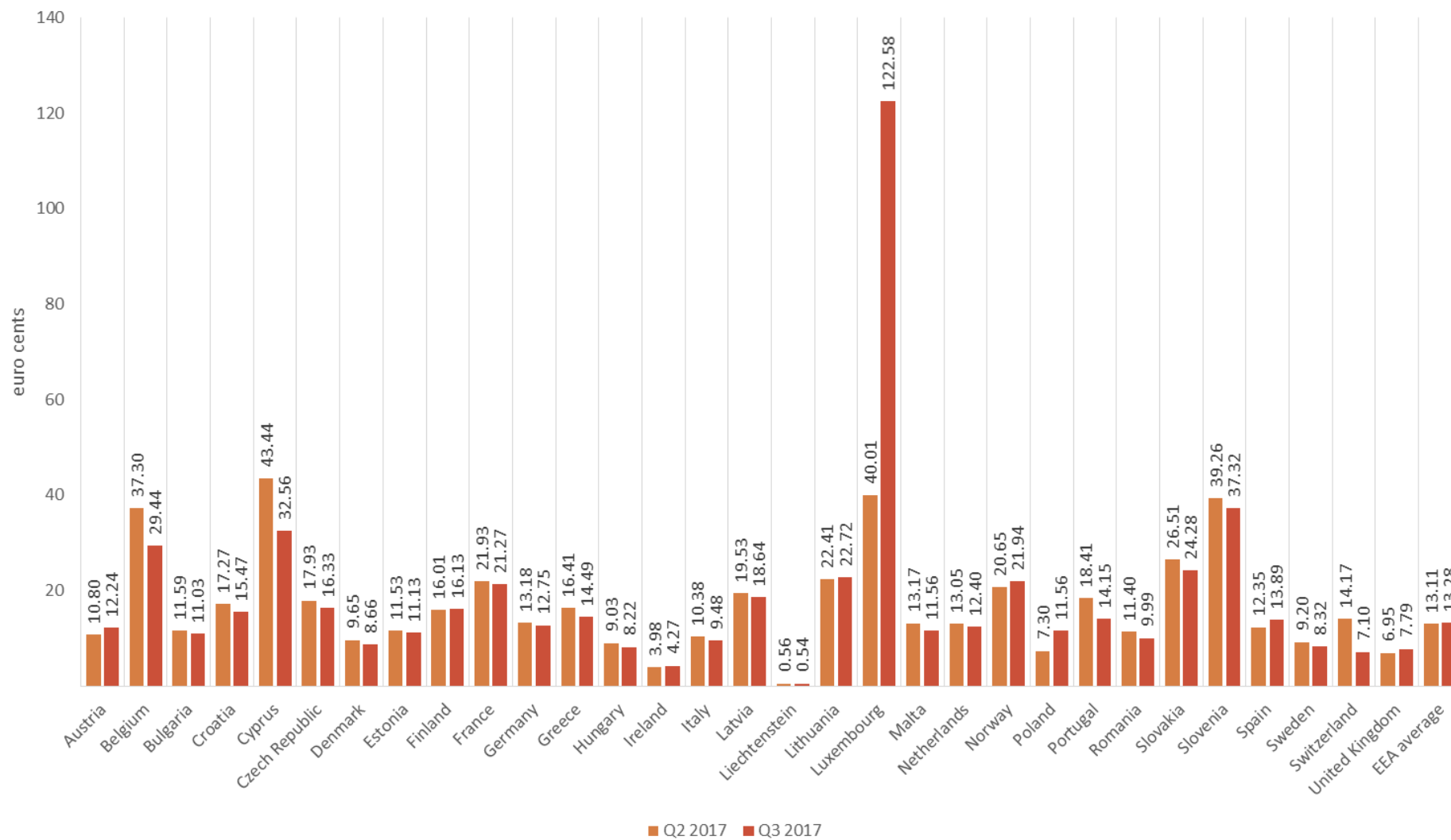
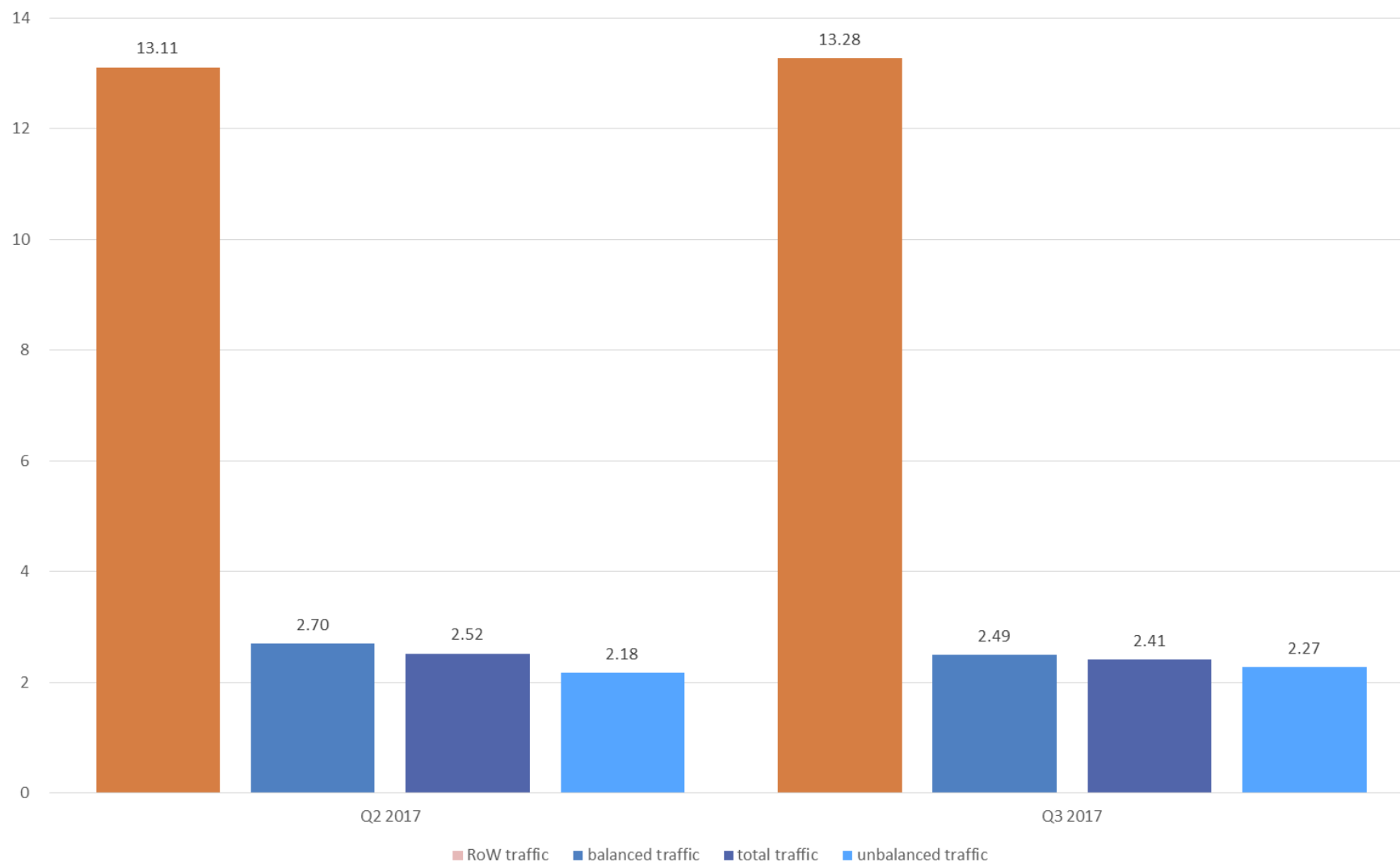


Figure 24: Average wholesale price charged by EEA operators per minute in Q2 2017 and Q3 2017 (prepaid+postpaid) RoW traffic



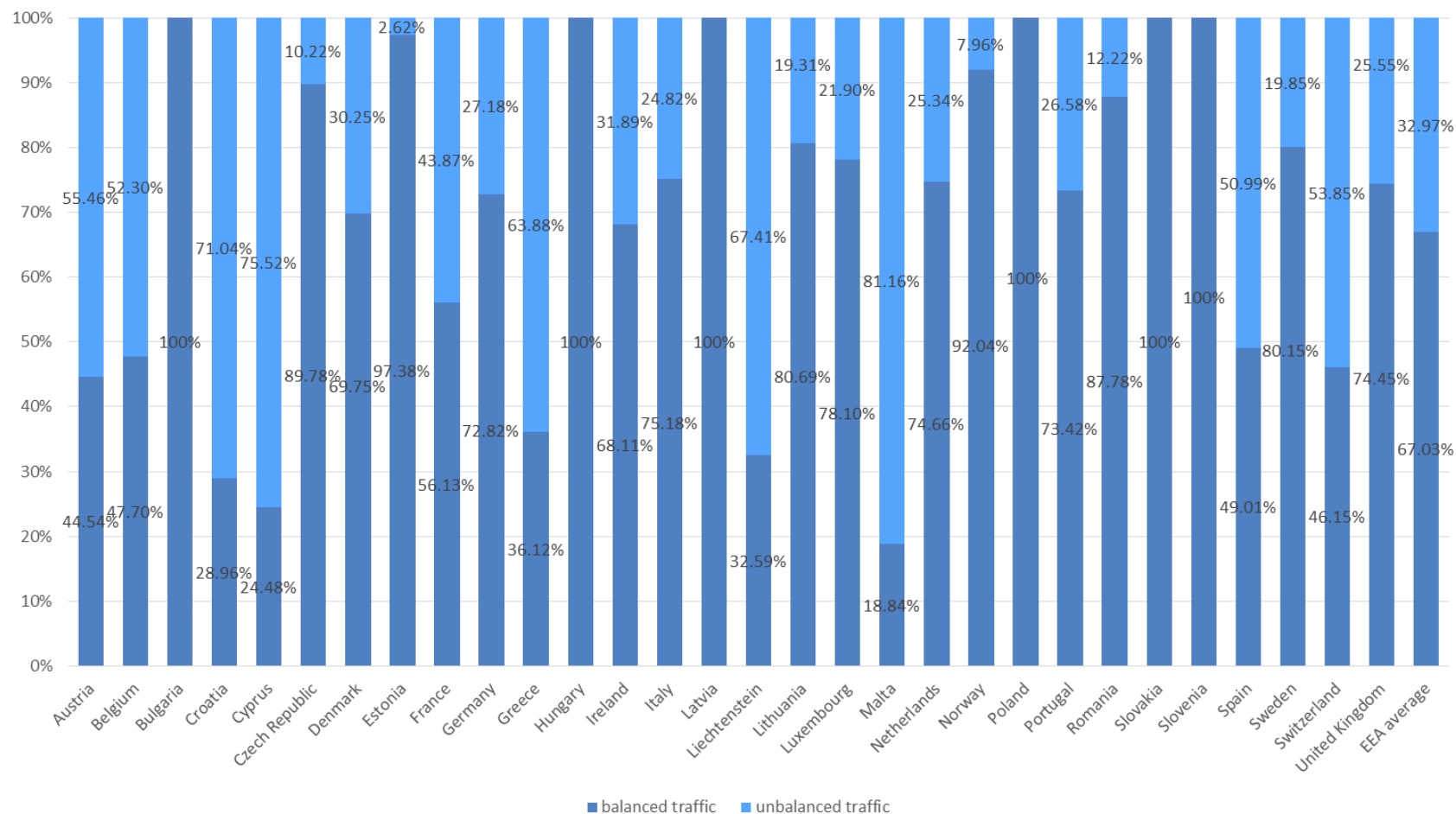
EEA average (Q2 2017 and Q3 2017) excludes Iceland

Figure 25: EEA and RoW average wholesale price per minute



The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 19, 20, 21, 22 and 25 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Figure 26: Wholesale roaming inbound (voice services)
Proportion of balanced/unbalanced traffic within EEA countries
Q2 2017

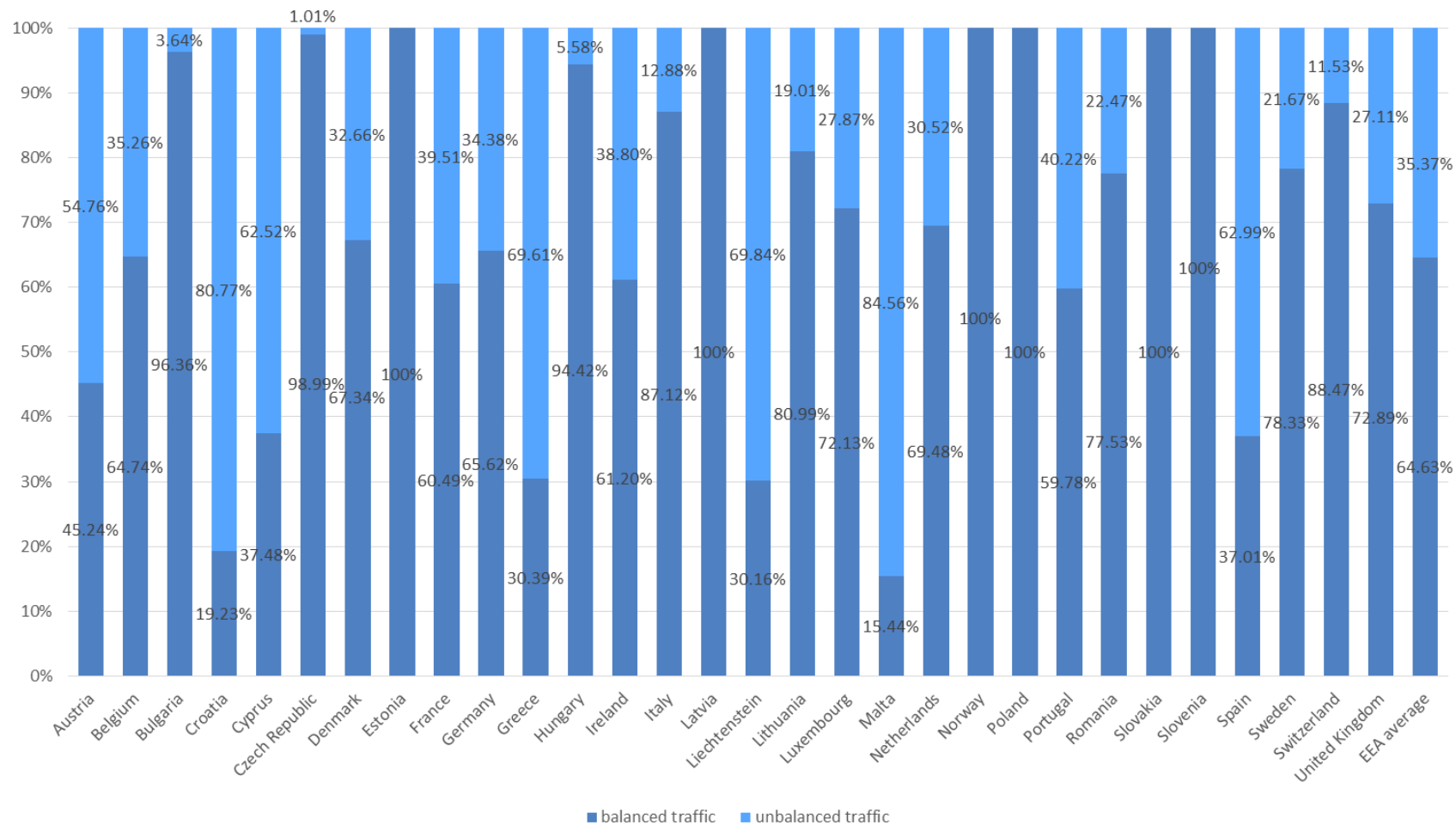


While the measurement of balanced/unbalanced traffic should include volumes from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. Please also read carefully the chapter on the methodology for the data collection on page 95.

Portugal: estimates are based on partial information provided by two operators

EEA average excludes Iceland

Figure 27: Wholesale roaming inbound (voice services)
 Proportion of balanced/unbalanced traffic within EEA countries
 Q3 2017



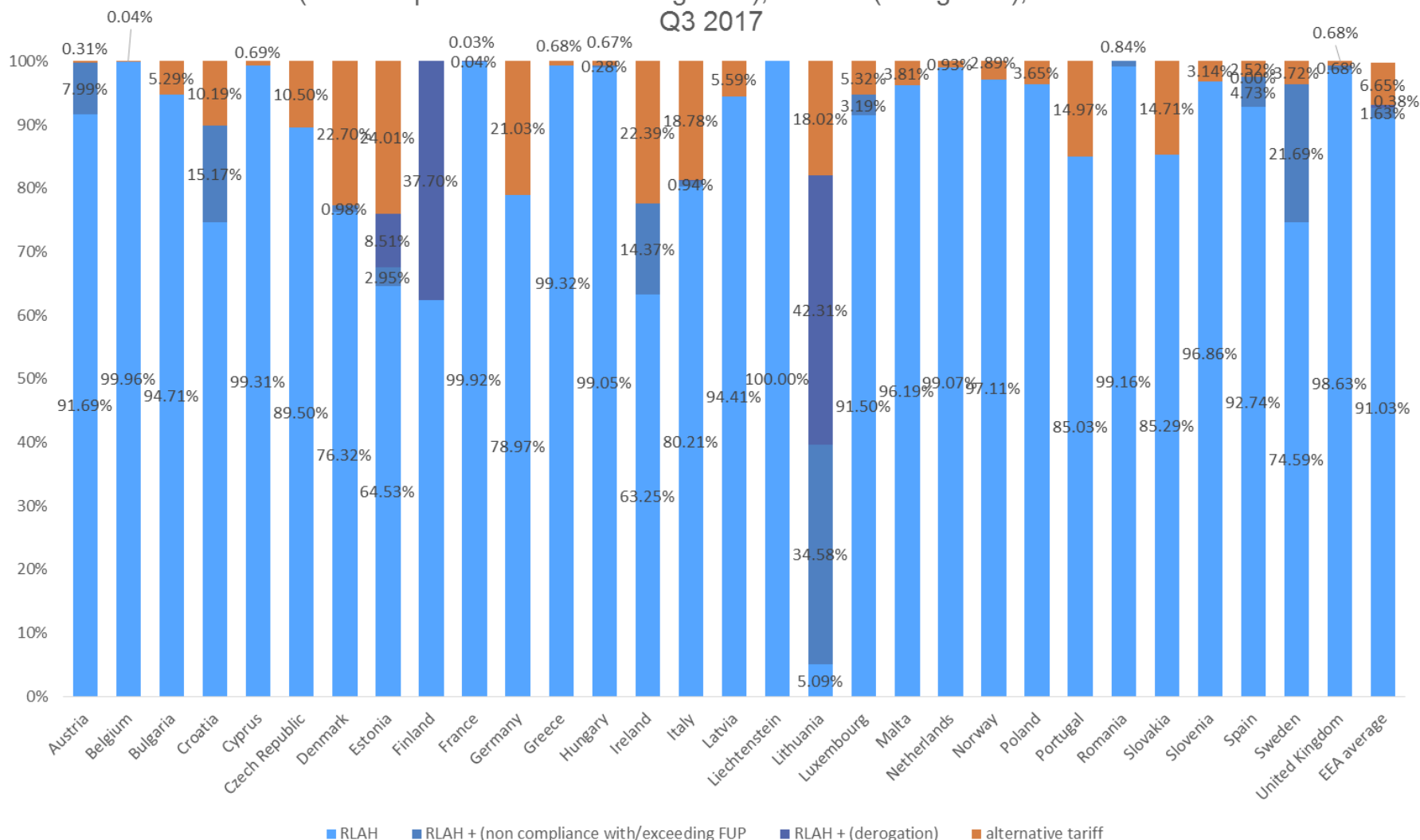
While the measurement of balanced/unbalanced traffic should include volumes from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. Please also read carefully the chapter on the methodology for the data collection on page 95.

Portugal: estimates are based on partial information provided by two operators

EEA average excludes Iceland

4.2.1.3 Consumption patterns

Figure 28: Percentage of total minutes of calls made: RLAH, RLAH +(non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff Q3 2017



Finland: RLAH+ (derogation) and RLAH+ (non-compliance with/exceeding FUP) has been combined as RLAH+ (derogation), alternative tariffs are not reported due to confidentiality reasons
 EEA average excludes Finland, Iceland

Figure 29: EEA percentage and volumes of total minutes of calls made: RLAH, RLAH + (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff (millions of minutes)

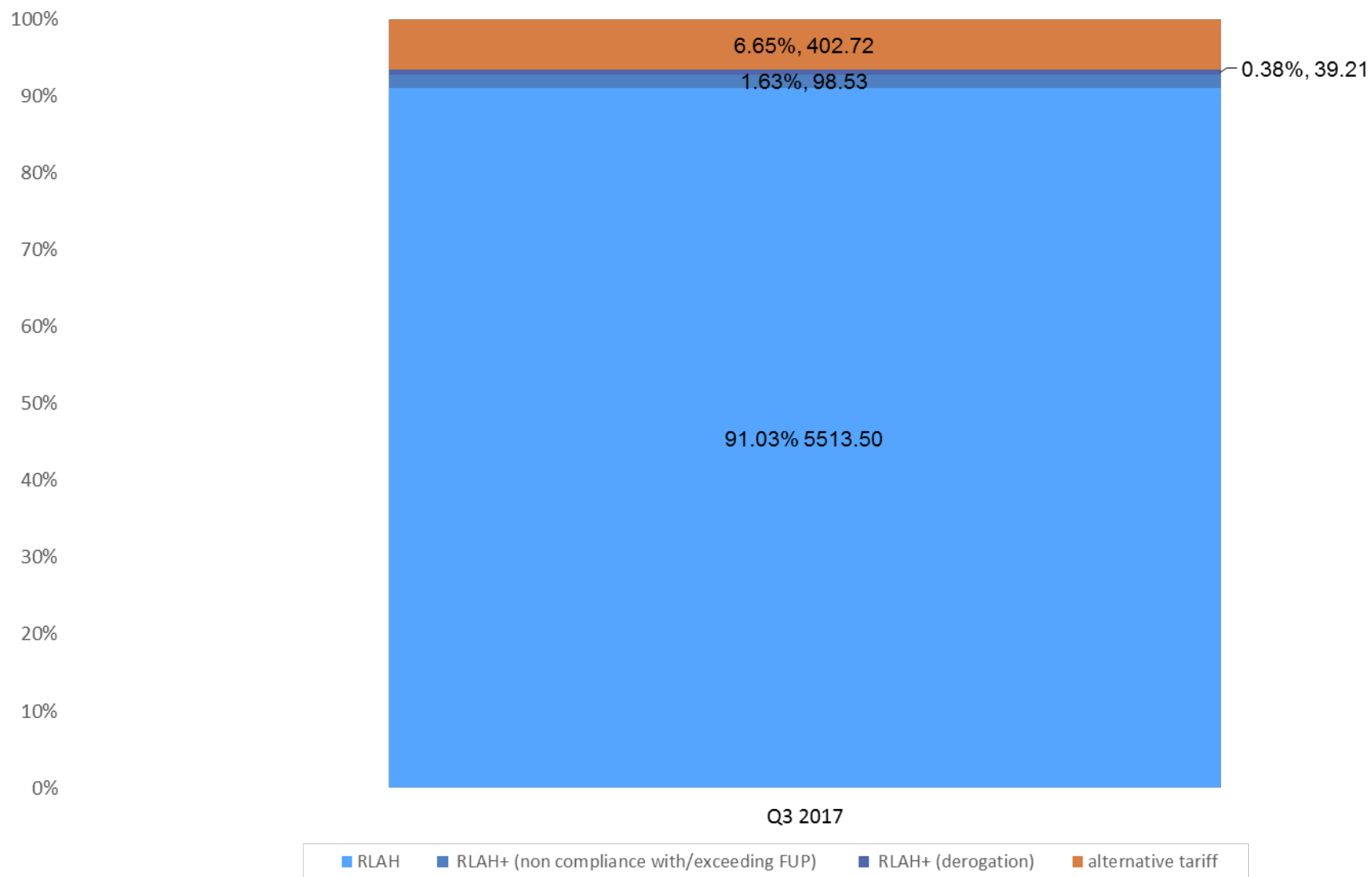
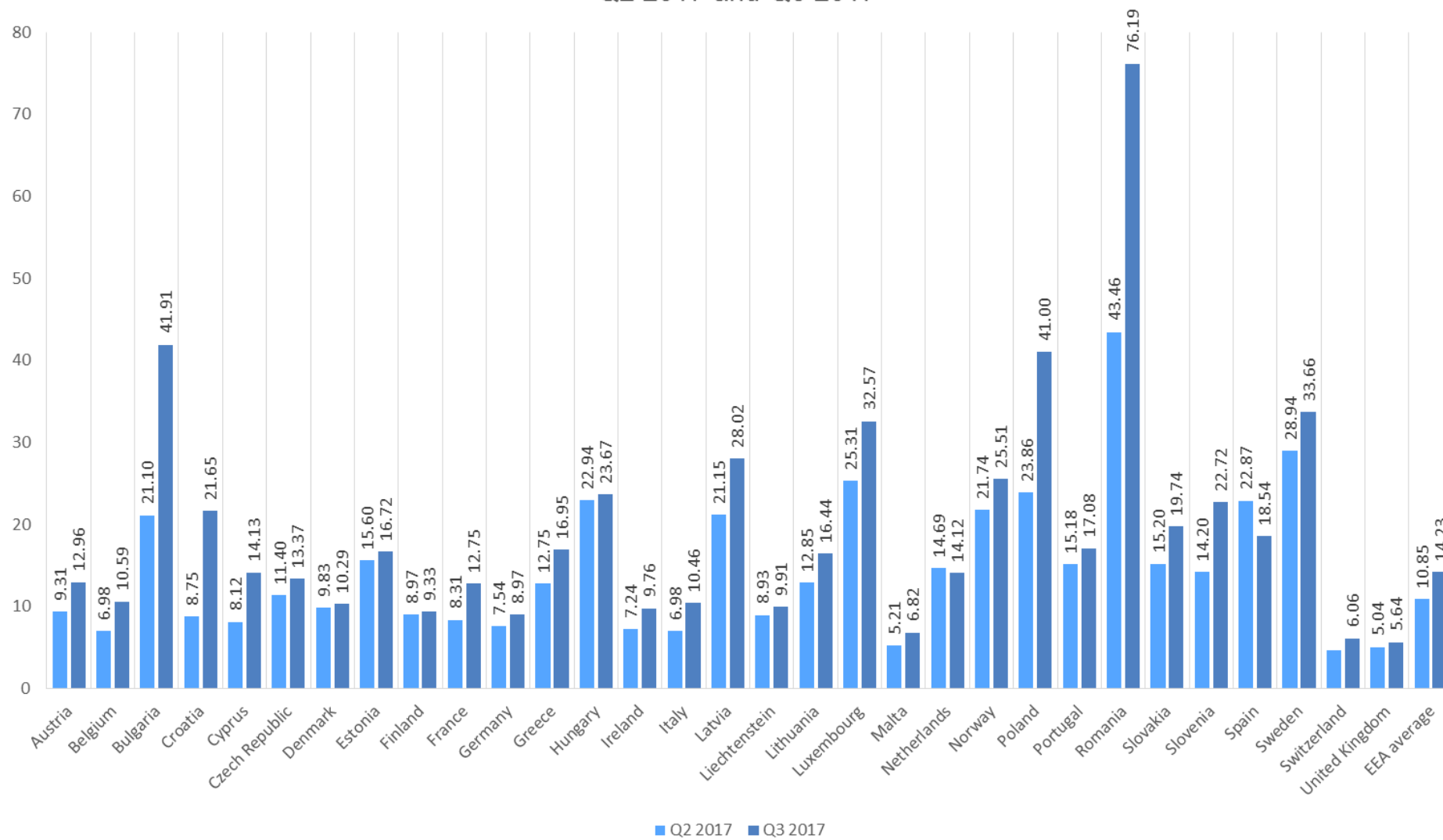
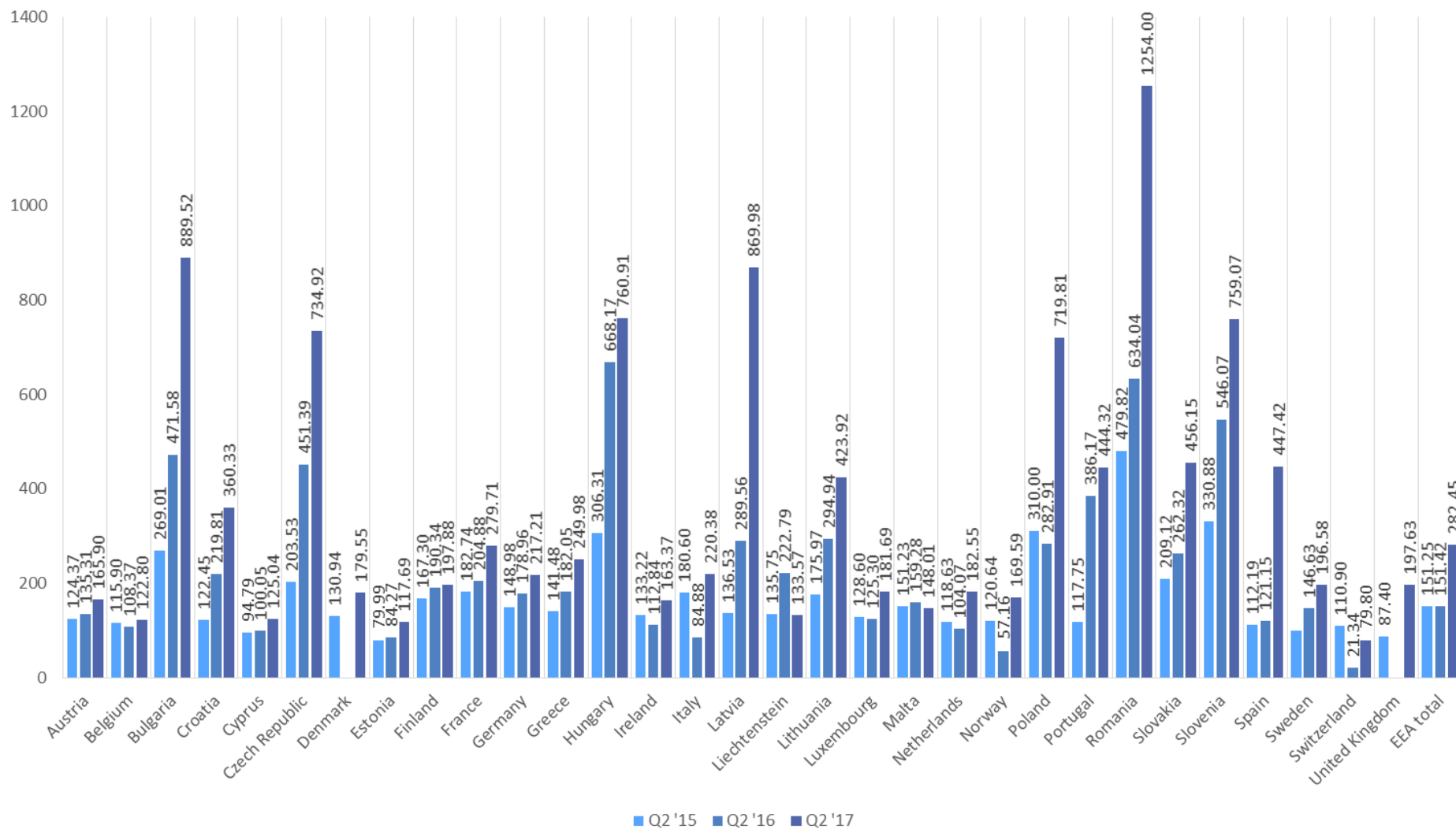


Figure 30: roaming calls made
Average number of minutes per month per roaming subscriber
Q2 2017 and Q3 2017



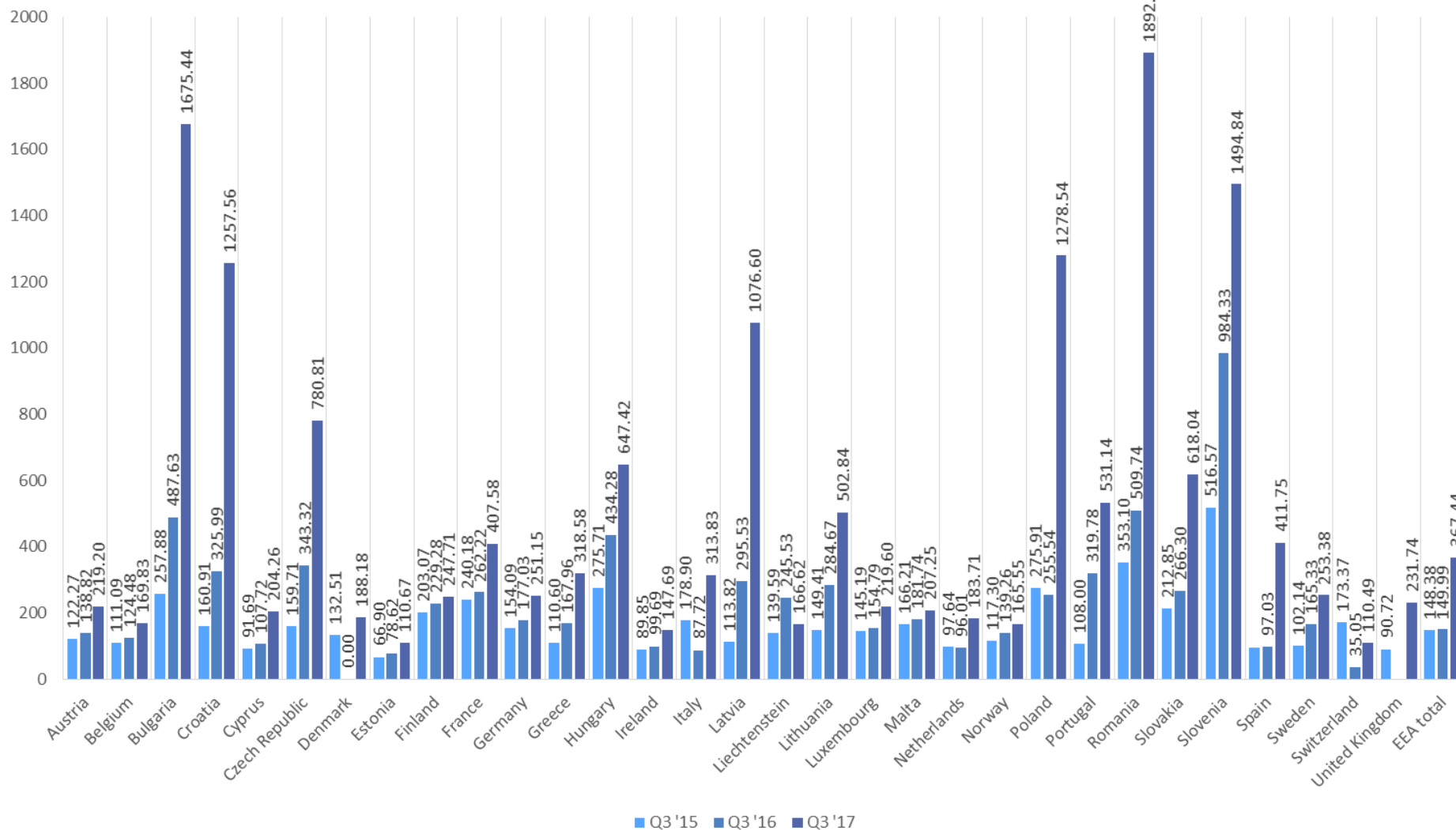
EEA average excludes Iceland

Figure 31: Outgoing international roaming traffic Index, intra-EEA roaming calls in Q2 2017 (Q2 2012 = 100, Croatia Q2'13 = 100)



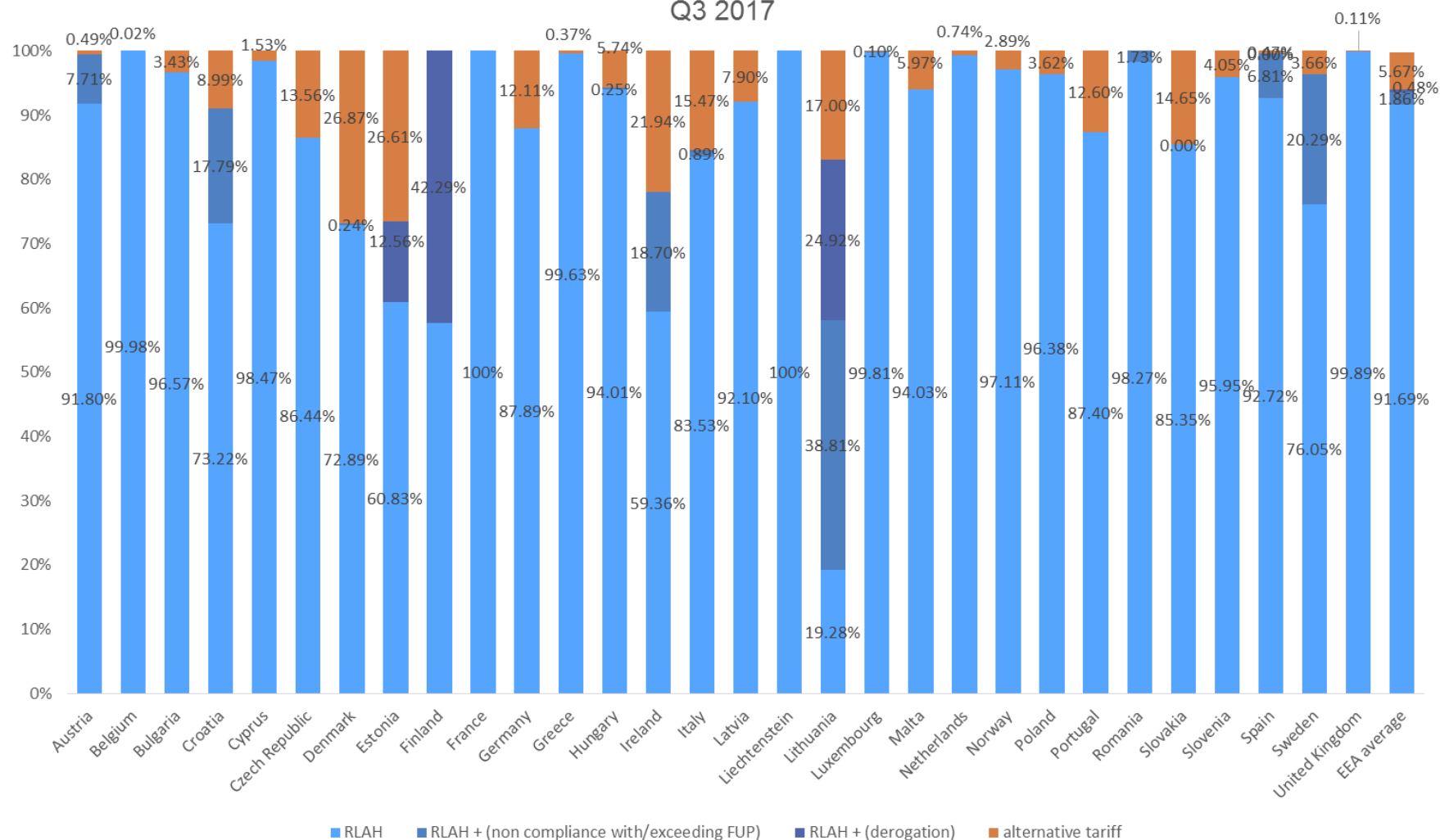
EEA average excludes Iceland

Figure 32: Outgoing international roaming traffic Index, intra-EEA roaming calls in Q3 2017
(Q3 2012 = 100, Croatia: Q3'14 = 100, Liechtenstein: Q3'13 = 100)



EEA average excludes Iceland

Figure 33: Percentage of total minutes calls of received: RLAH, RLAH + (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff Q3 2017



Finland: RLAH+ (derogation) and RLAH+ (non-compliance with/exceeding FUP) has been combined as RLAH+ (derogation), alternative tariffs are not reported due to confidentiality reasons.

EEA average excludes Finland, Iceland

Figure 34: EEA Volumes and percentage of total minutes calls received: RLAH, RLAH + (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff (millions of minues)

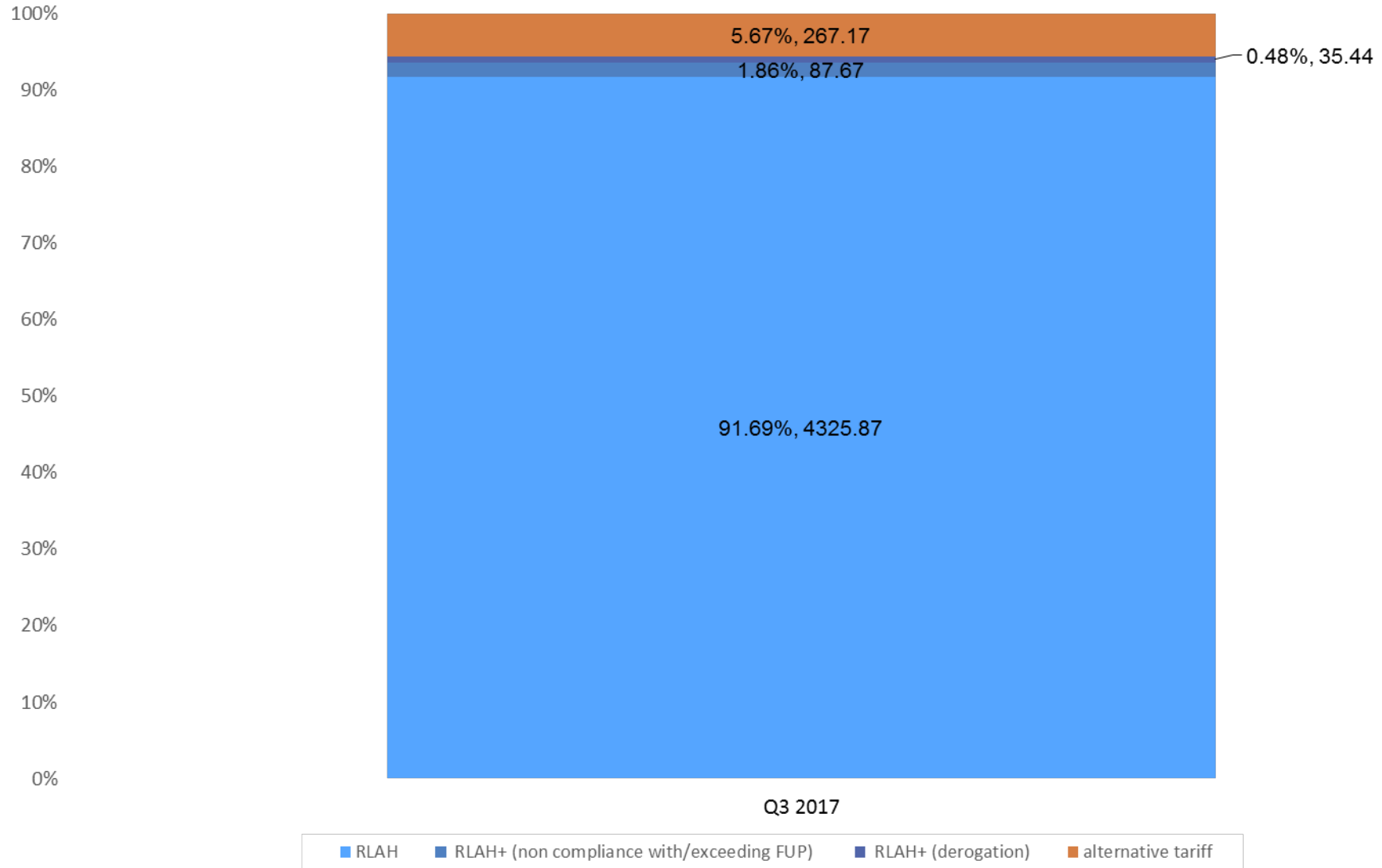
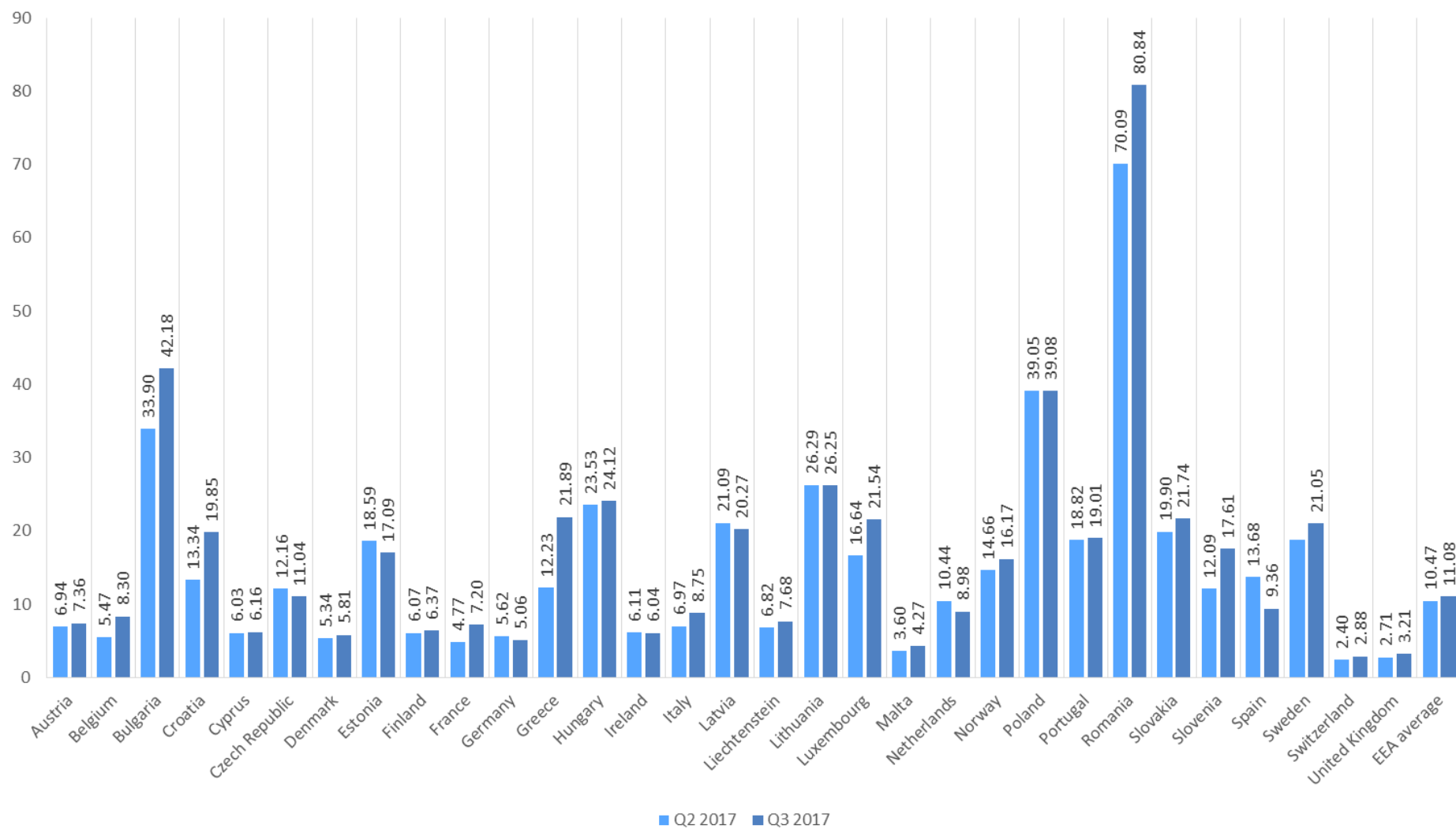
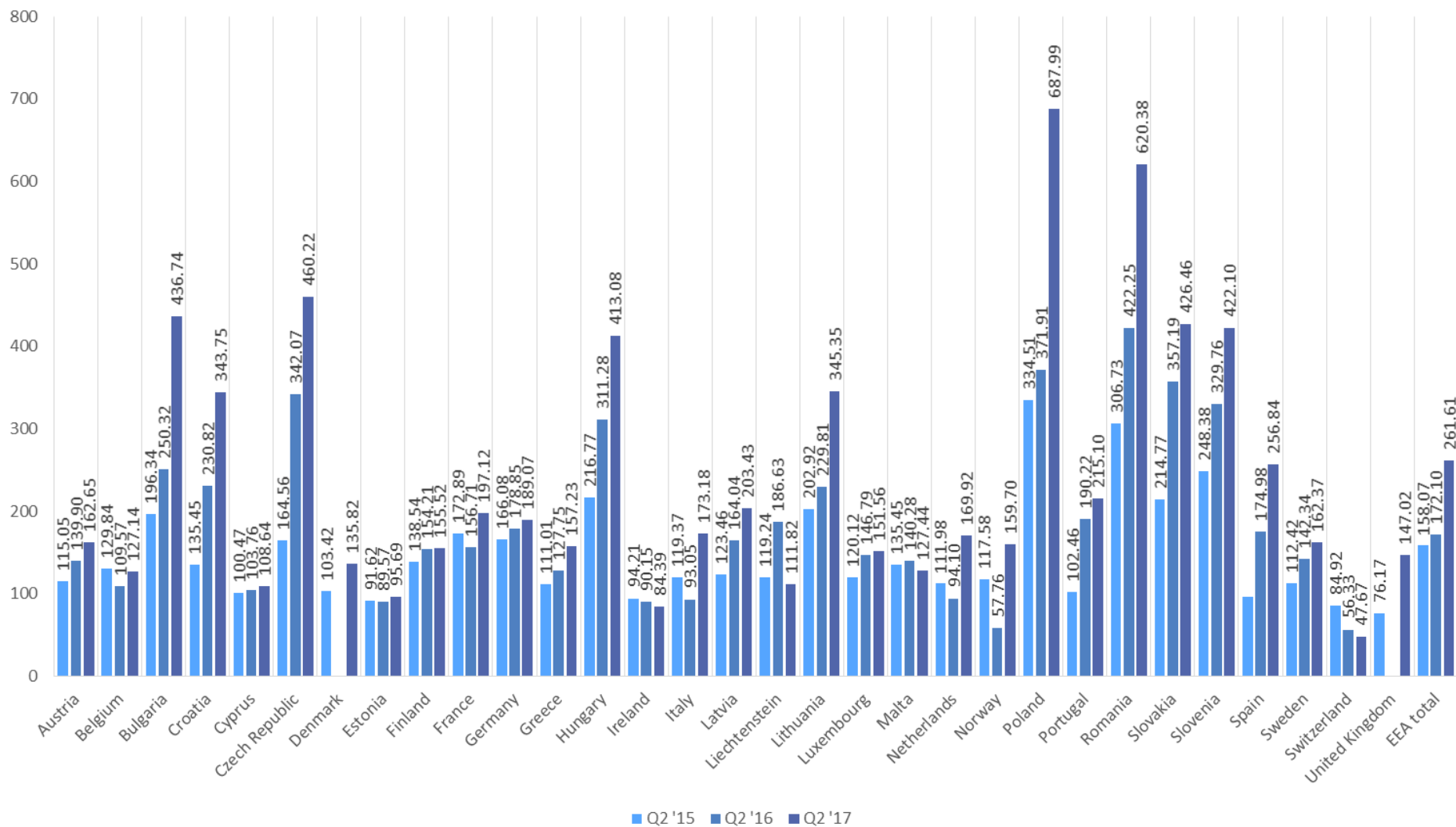


Figure 35: roaming calls received
Average number of minutes per month per roaming subscriber
Q2 2017 and Q3 2017



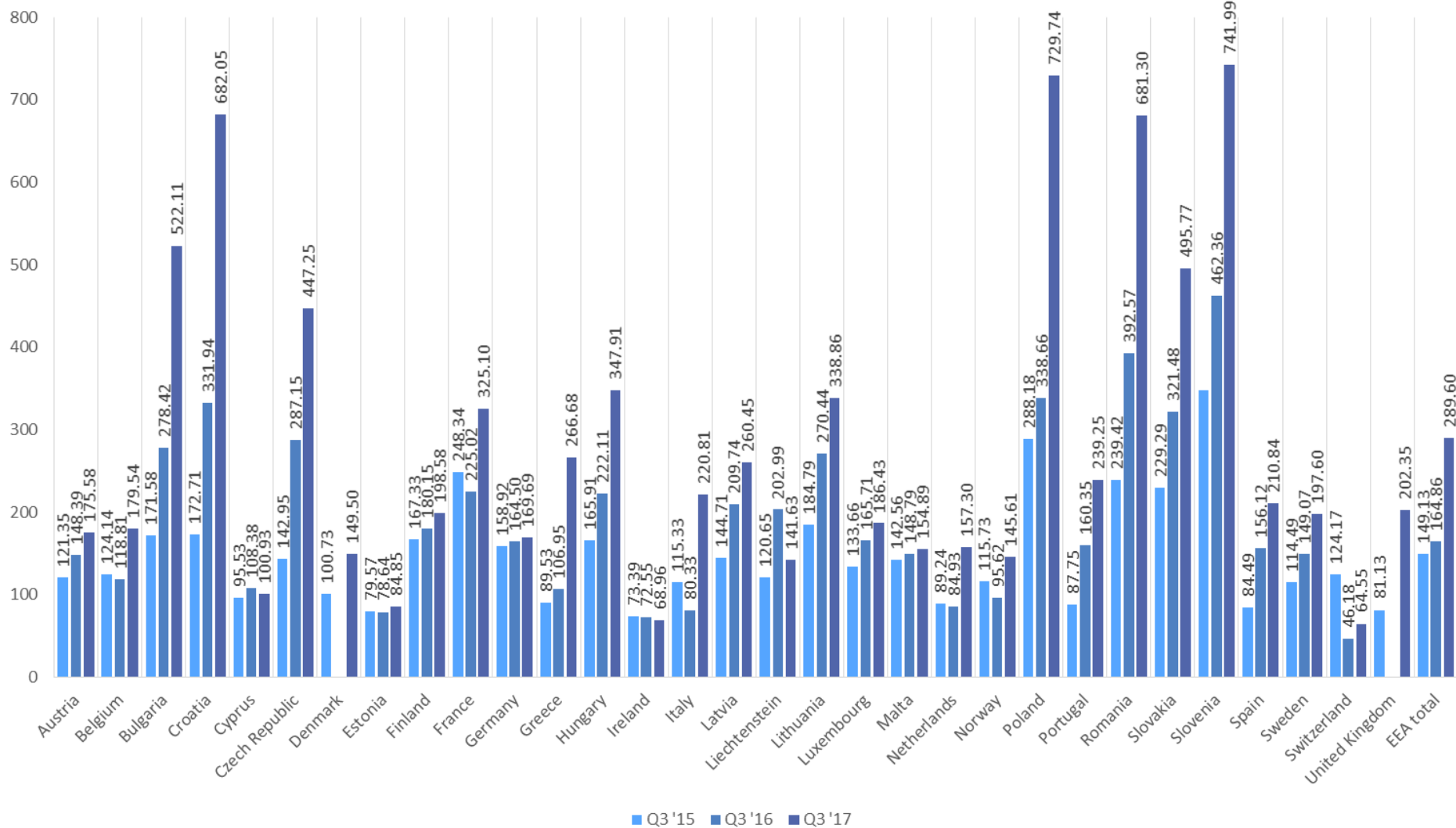
EEA average excludes Iceland

Figure 36: Incoming international roaming traffic Index, intra-EEA roaming calls in Q2 2017 (Q2 2012 = 100, Croatia: Q2'13 = 100)



EEA average excludes Iceland

Figure 37: Incoming international roaming traffic Index, intra-EEA roaming calls in Q3 2017
(Q3 2012 = 100, Croatia: Q3'14 = 100, Liechtenstein: Q3'13 = 100)

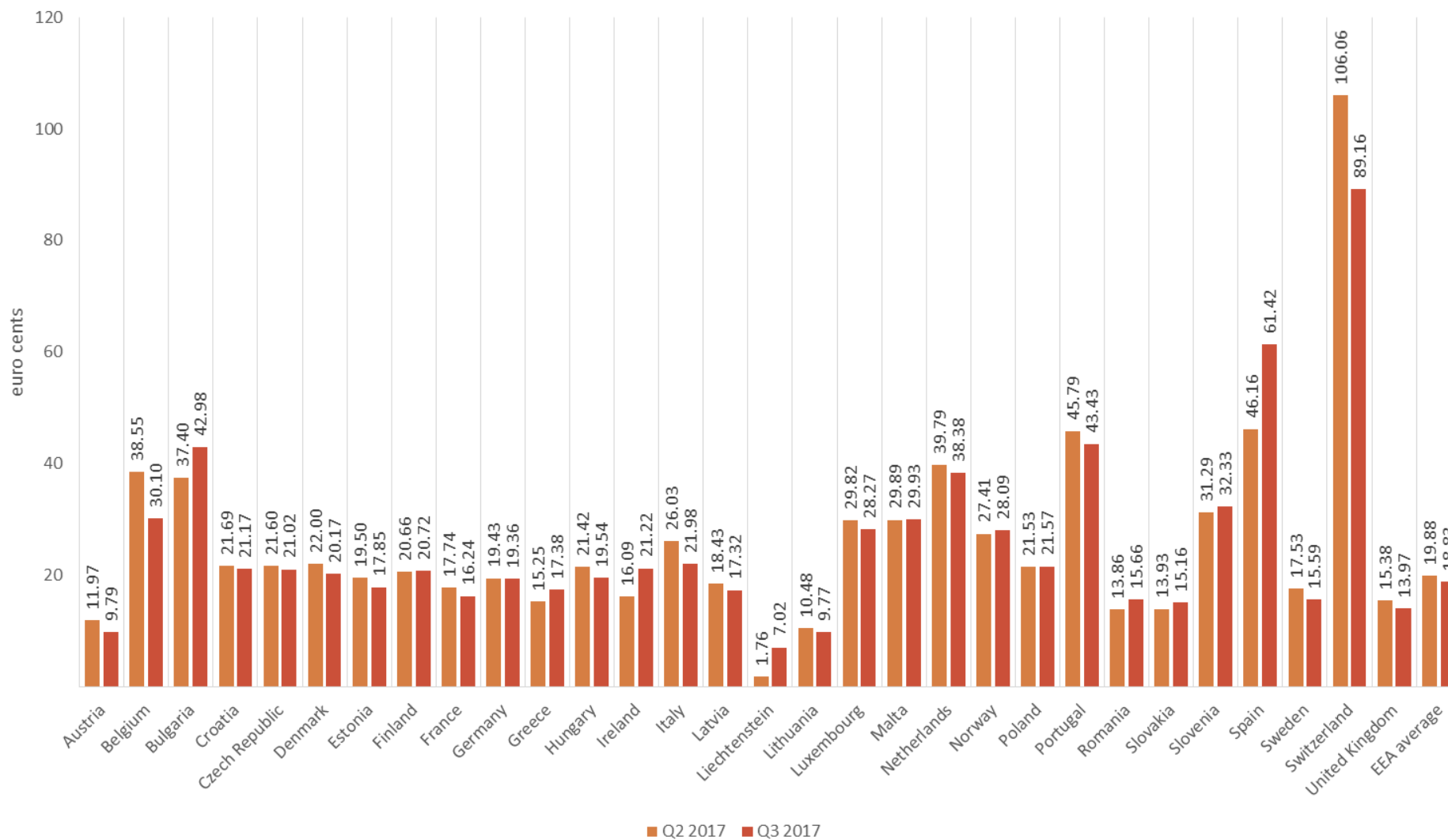


EEA average excludes Iceland

4.2.2. SMS roaming services

4.2.2.1 RoW retail prices

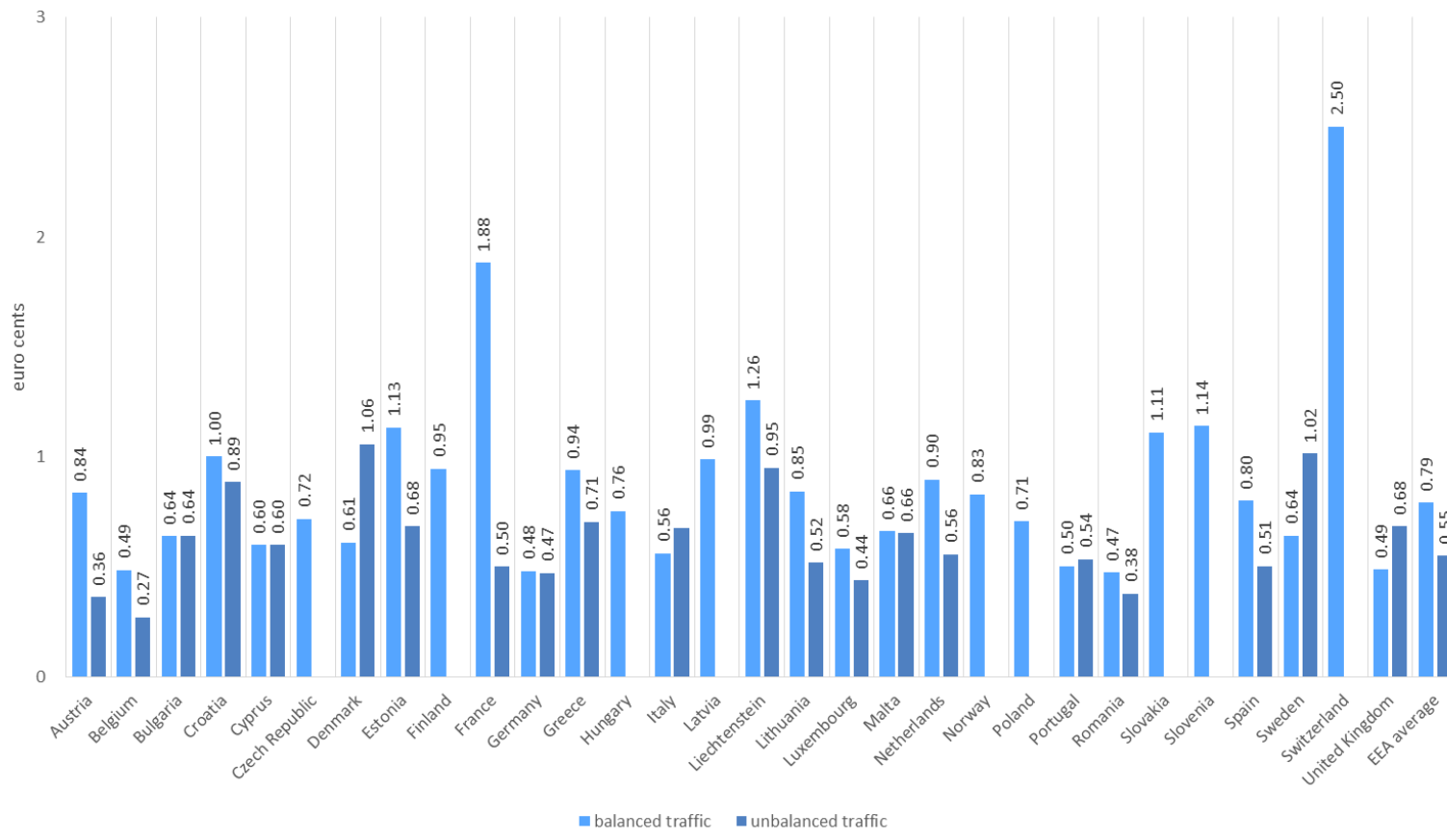
Figure 38: RoW
 Average retail price per SMS for RoW roaming SMS services (prepaid+postpaid)
 Q2 2017 and Q3 2017



EEA average excludes Iceland

4.2.2.2 Wholesale prices

Figure 39: Average wholesale price per intra EEA roaming SMS charges for balanced and unbalanced traffic
Q2 2017



While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 39, 40, 41, 42 and 43 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

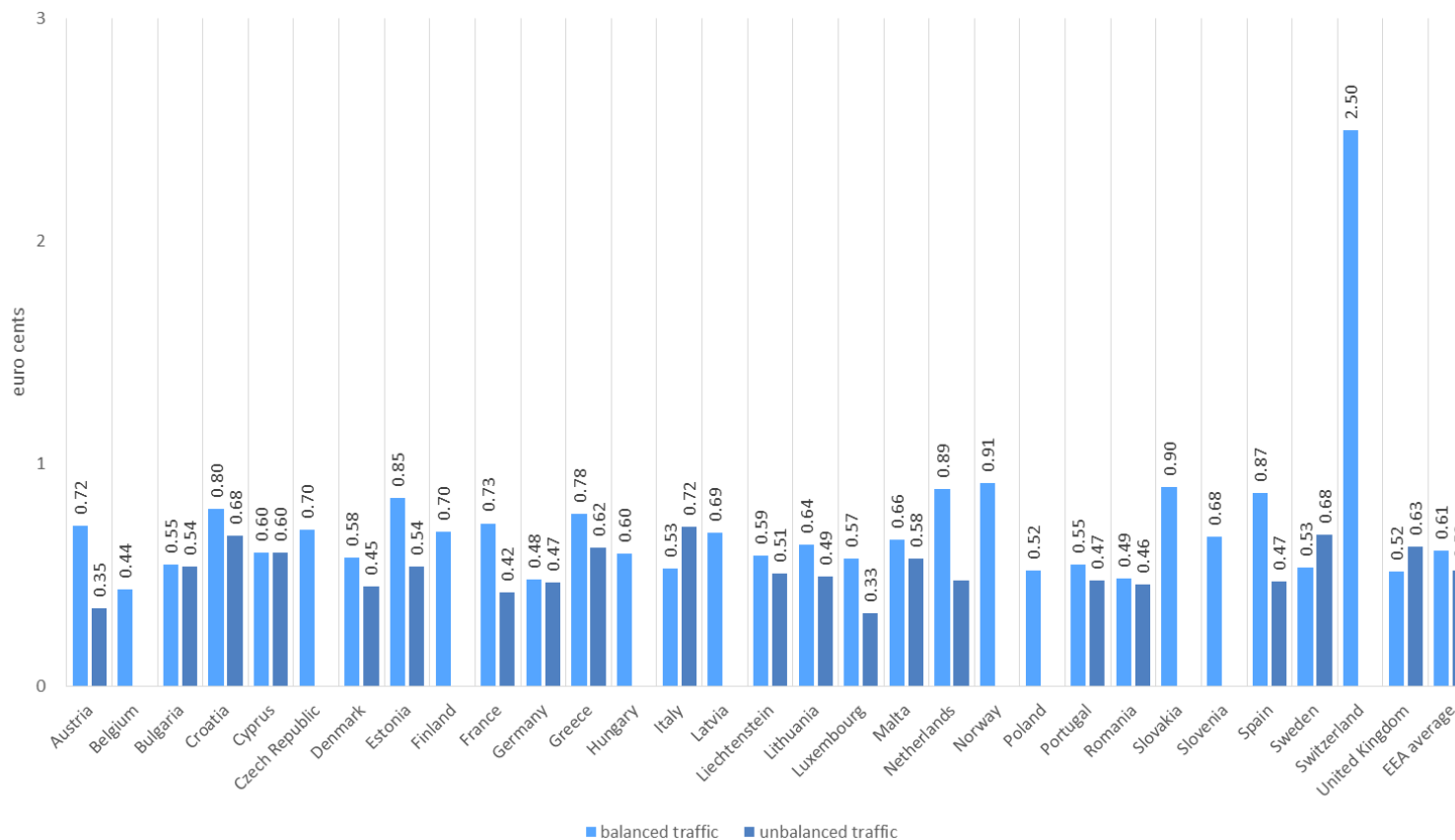
Cyprus, Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figures 41 and 42.

EEA average (balanced traffic) excludes Iceland

EEA average (unbalanced traffic) Finland, Iceland

Figure 40: Average wholesale price per intra EEA roaming SMS charges for balanced and unbalanced traffic

Q3 2017



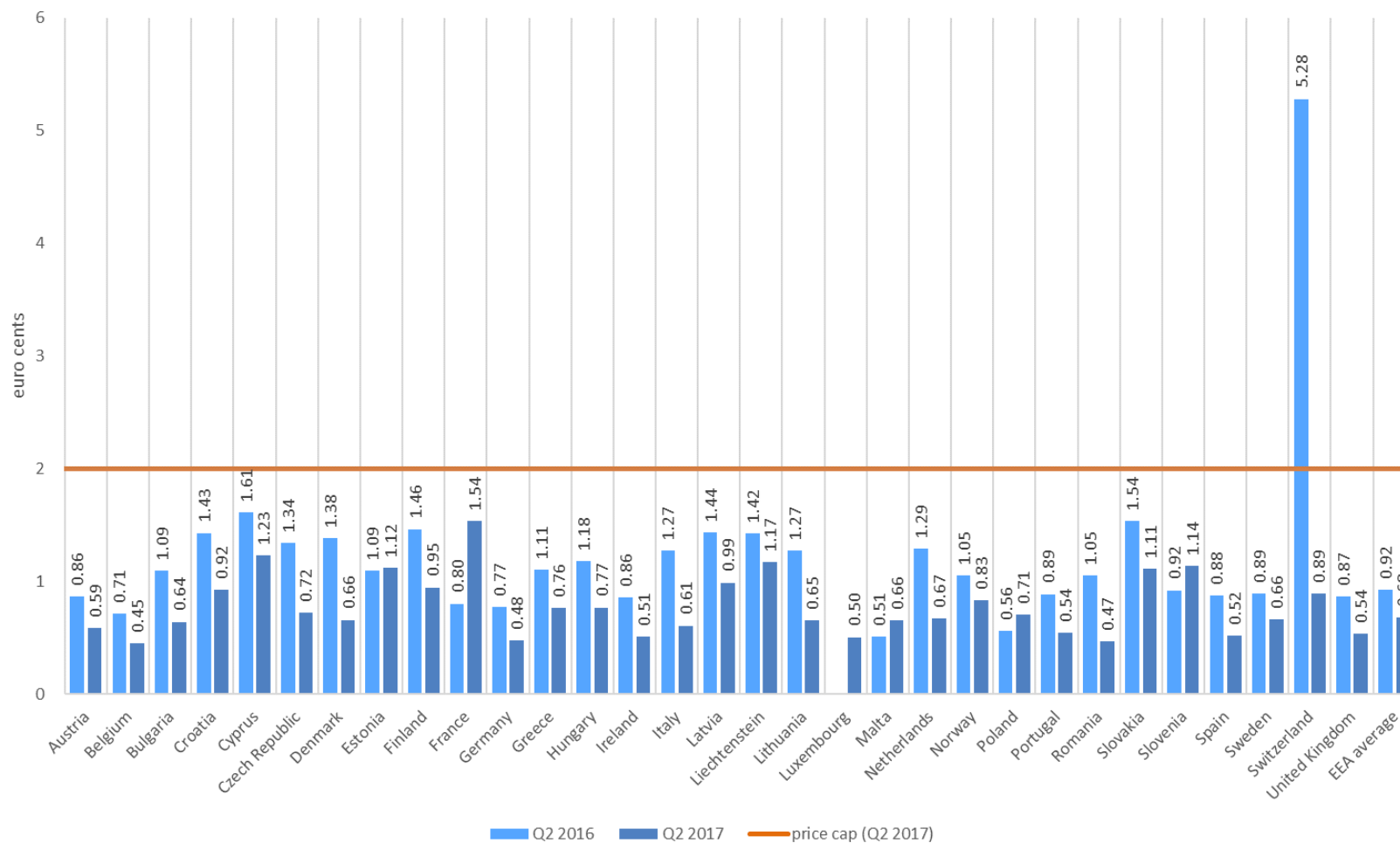
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 39, 40, 41 42 and 43 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figures 41 and 42

EEA average (balanced traffic) excludes Iceland,

EEA average (unbalanced traffic) excludes Finland, Iceland

Figure 41: Average wholesale price per intra-EEA roaming SMS (Total traffic)
Q2 2016 and Q2 2017

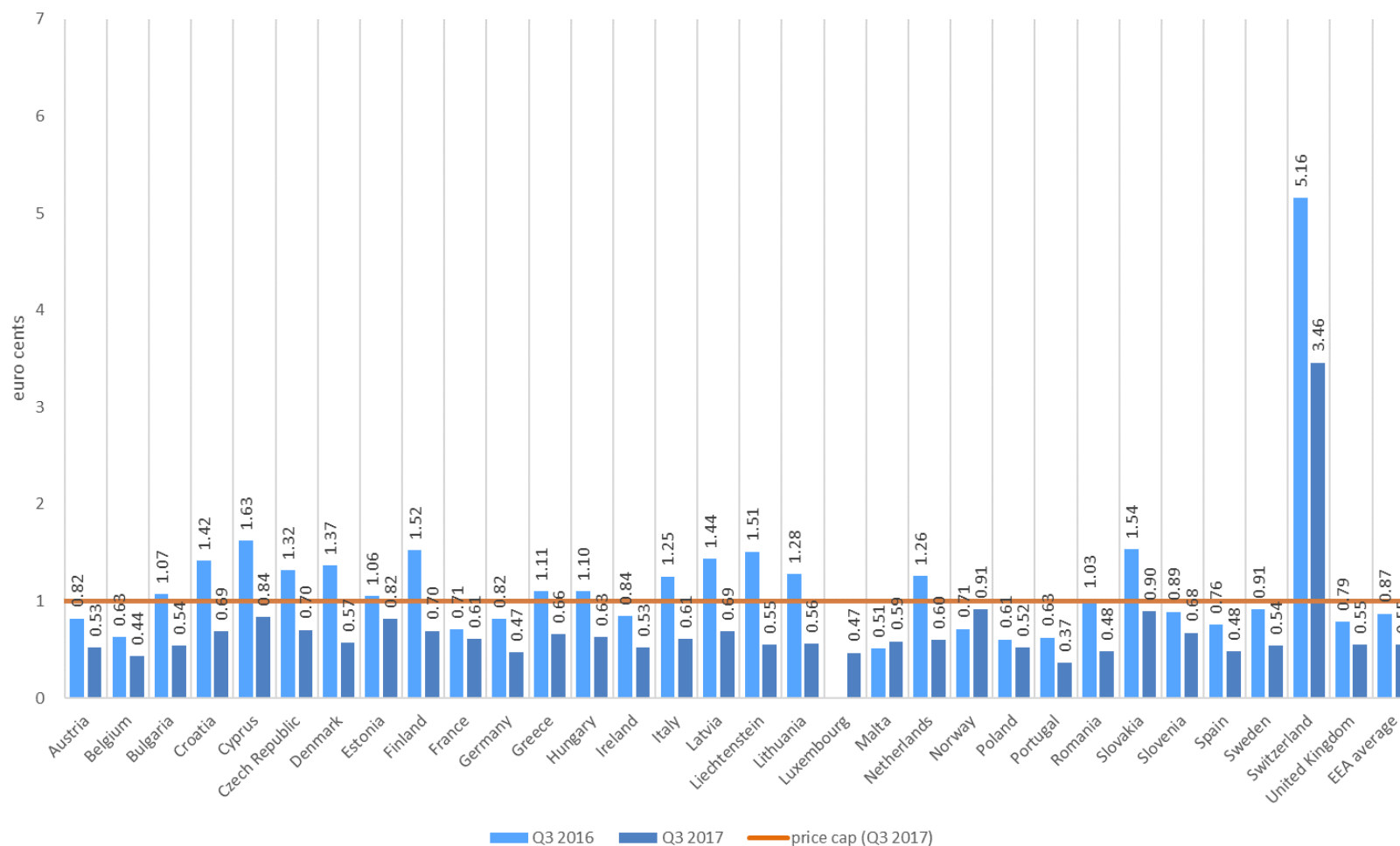


The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 39, 40, 41 and 42 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates is different from the number of operators that reported data for calculating the estimates (disaggregated for balanced and unbalanced traffic) in Figures 39 and 40.

EEA average (Q4 2016) excludes Cyprus, Iceland

Figure 42: Average wholesale price per intra-EEA roaming SMS (Total traffic)
Q3 2016 and Q3 2017

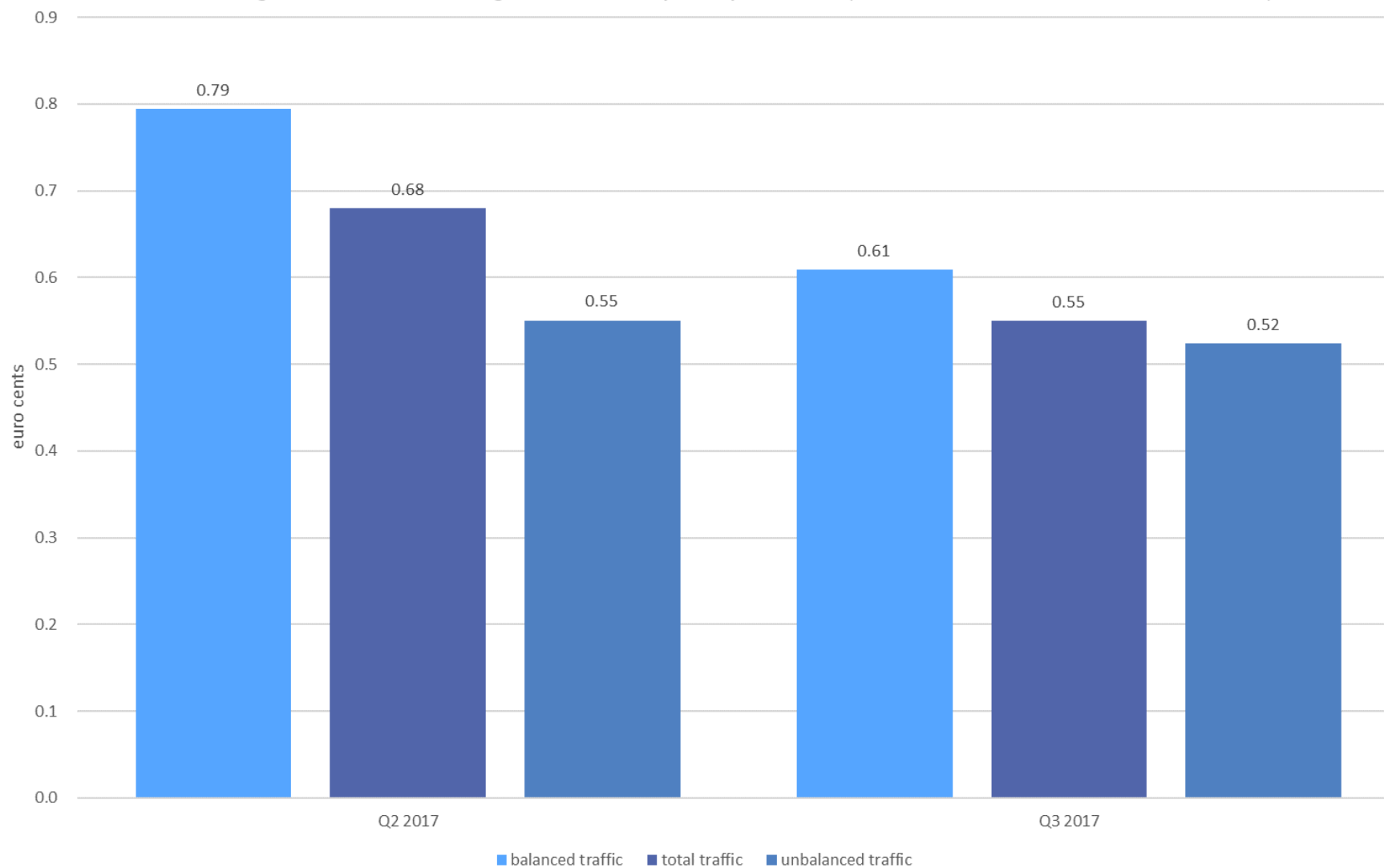


The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 39, 40, 41 and 42 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, Portugal: the number of operators that reported data for calculating these estimates is different from the number of operators that reported data for calculating the estimates (disaggregated for balanced and unbalanced traffic) in Figures 39 and 40.

EEA average excludes Cyprus, Iceland

Figure 43: EEA average wholesale price per SMS (balanced, unbalanced, total traffic)



The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 39, 40, 41 42 and 43 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Figure 44: Average wholesale price per intra-EEA roaming SMS
(Q2 2007 - Q3 2017 - charges to non groups only)

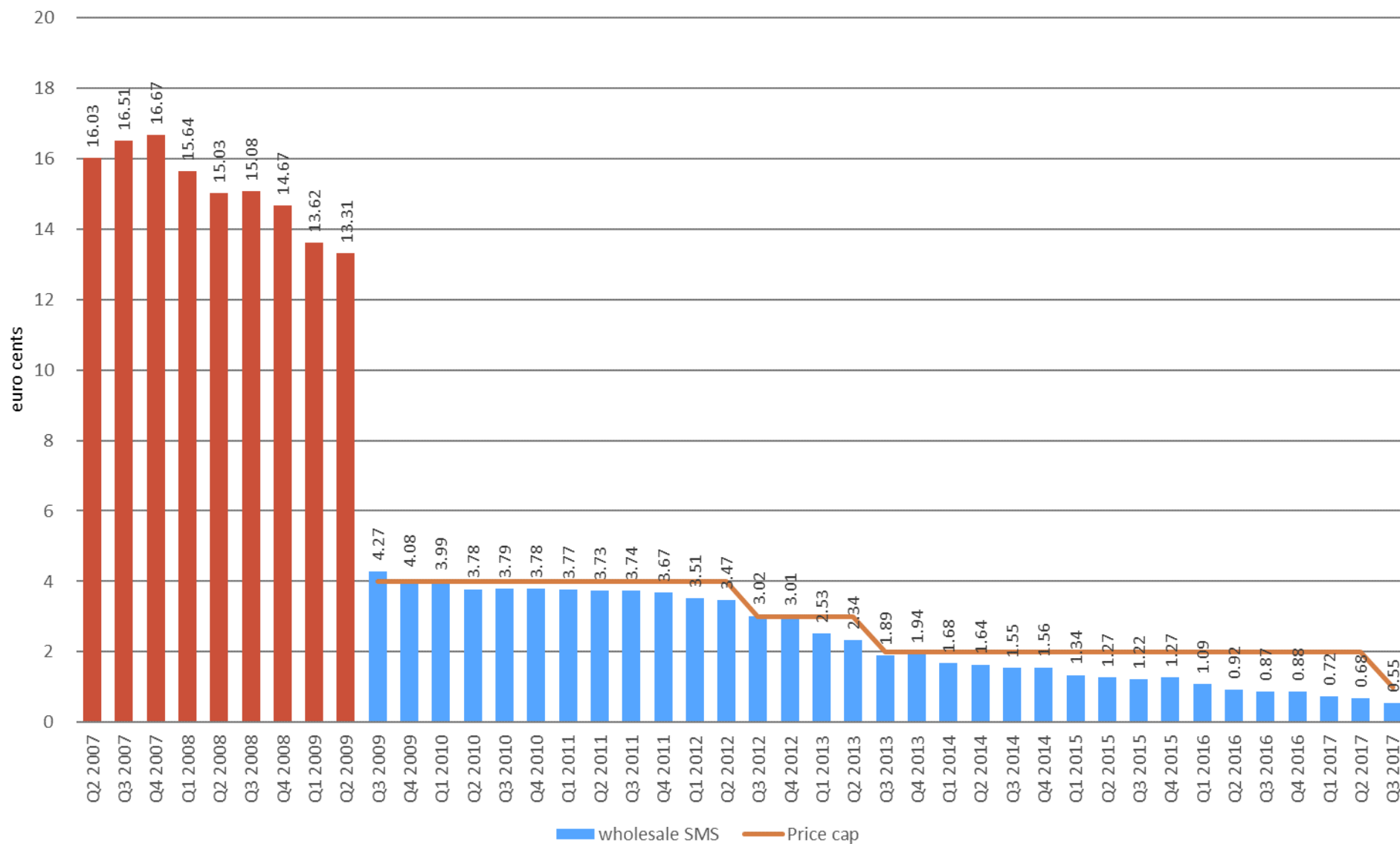
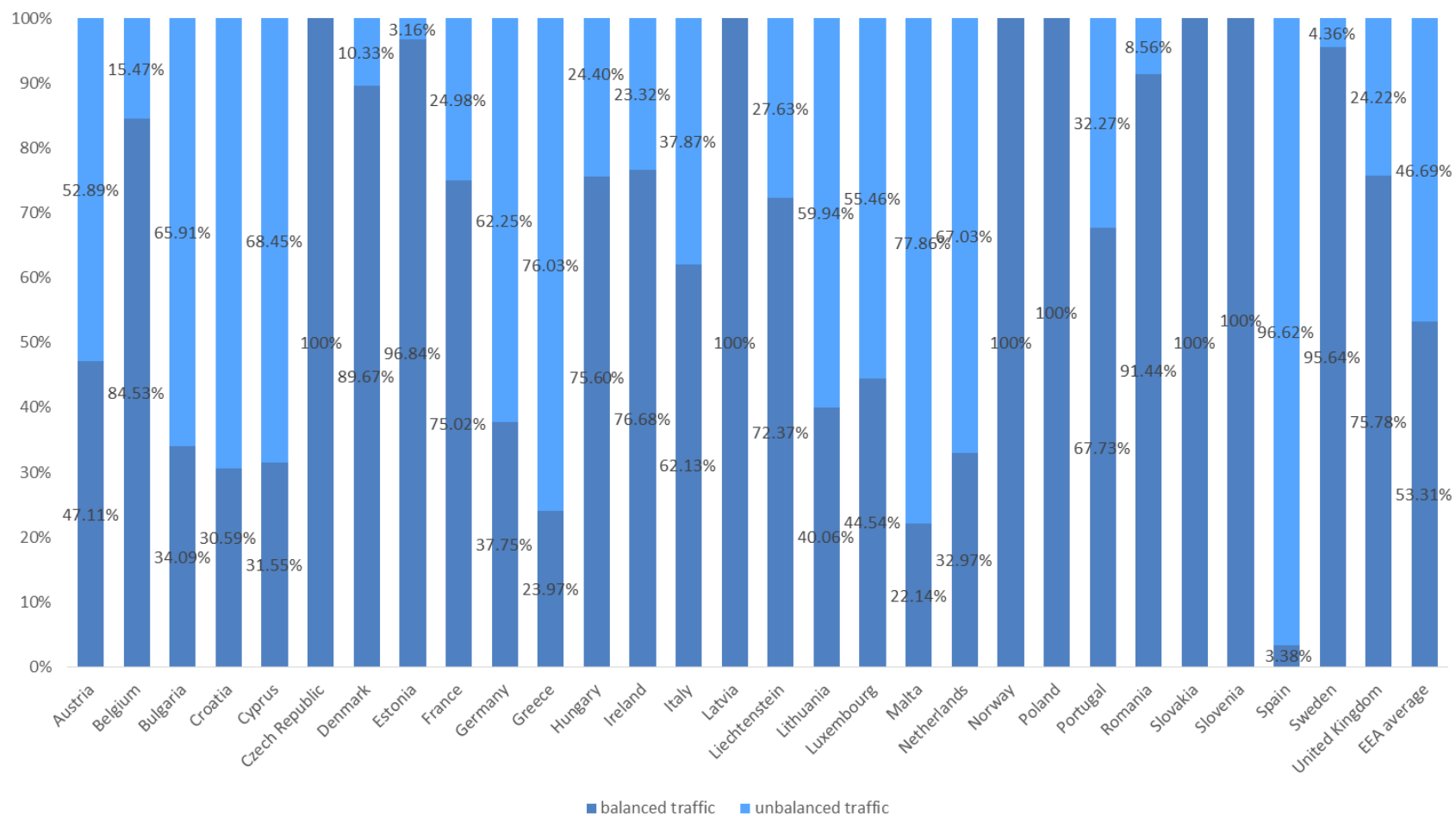


Figure 45: Proportion of balanced/unbalanced traffic within EEA countries (SMS services)
Wholesale roaming inbound
Q2 2017

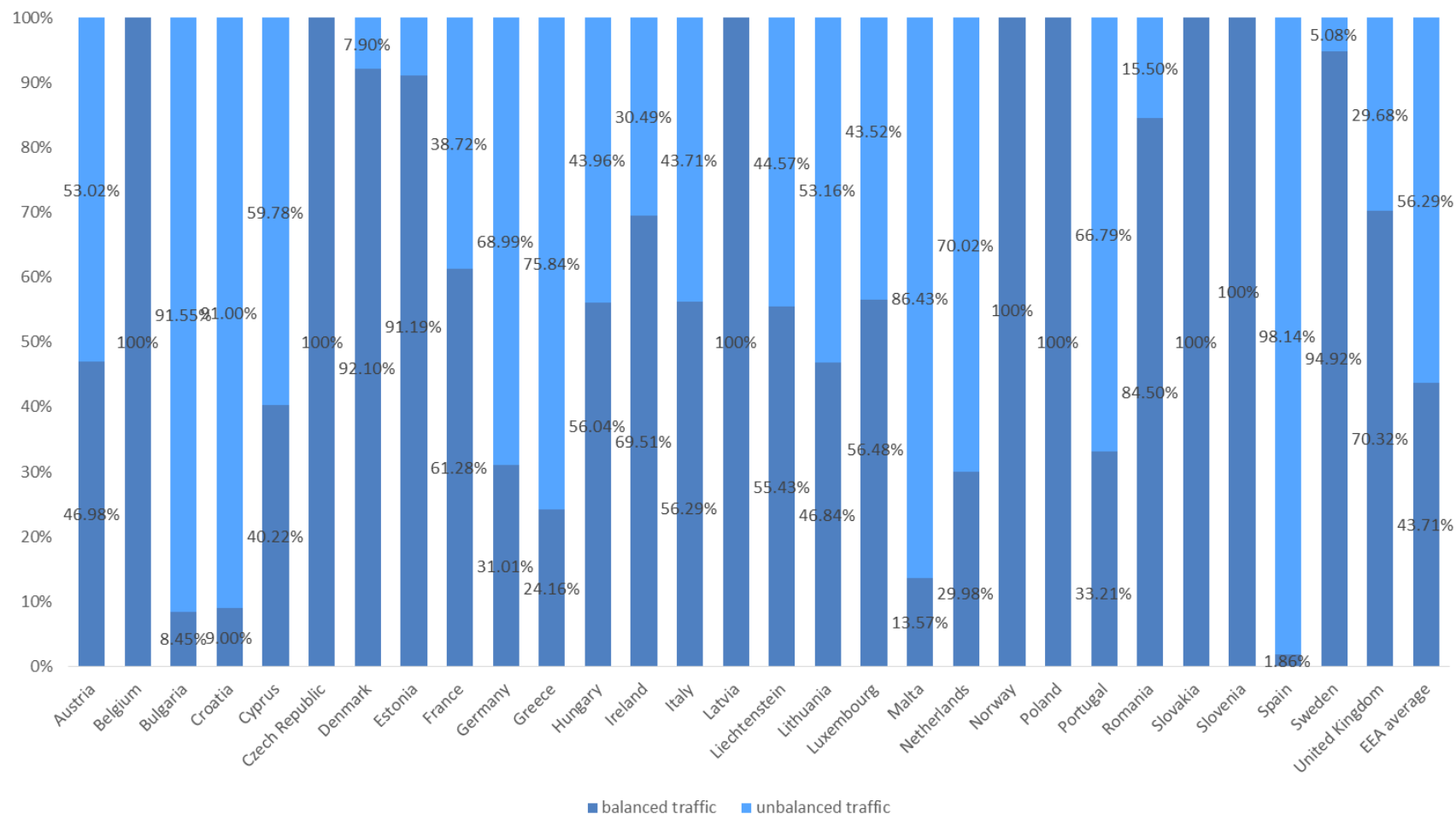


While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. Please also read carefully the chapter on the methodology for the data collection on page 100.

Portugal: estimates are based on partial information provided by two operators

EEA average excludes Finland, Iceland

Figure 46: Proportion of balanced/unbalanced traffic within EEA countries (SMS services)
Wholesale roaming inbound
Q3 2017



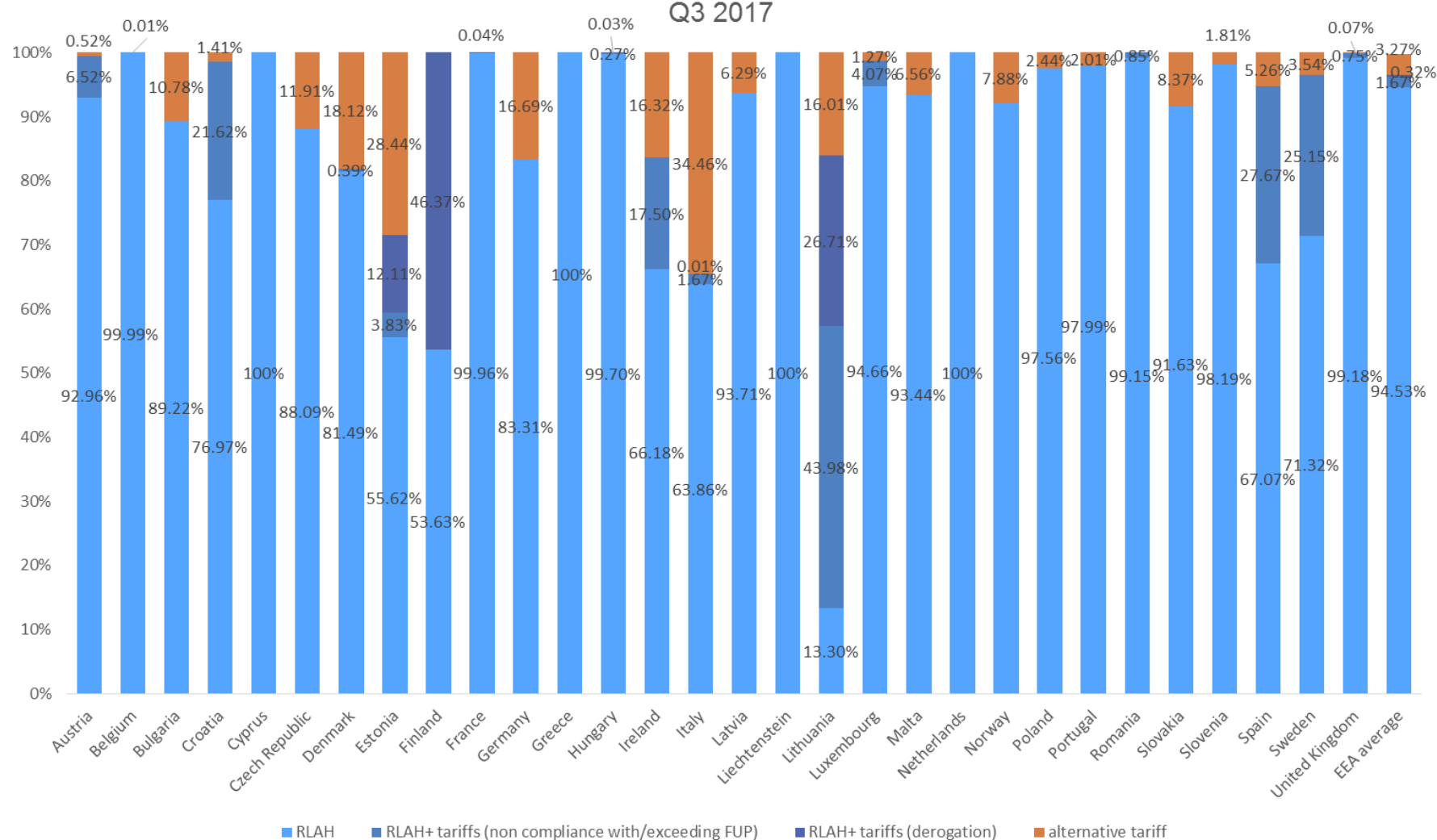
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. Please also read carefully the chapter on the methodology for the data collection on page 100.

Portugal: estimates are based on partial information provided by two operators

EEA average excludes Iceland

4.2.2.3 Consumption patterns

Figure 47: Percentage of EEA roaming SMS: RLAH, RLAH + (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff Q3 2017



Finland: RLAH+ (derogation) and RLAH+ (non-compliance with/exceeding FUP) has been combined as RLAH+ (derogation), alternative tariffs are not reported due to confidentiality reasons
 EEA average excludes Finland, Iceland

Figure 48: EEA percentage of SMS sent: RLAH, RLAH+ (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff (millions of minutes)

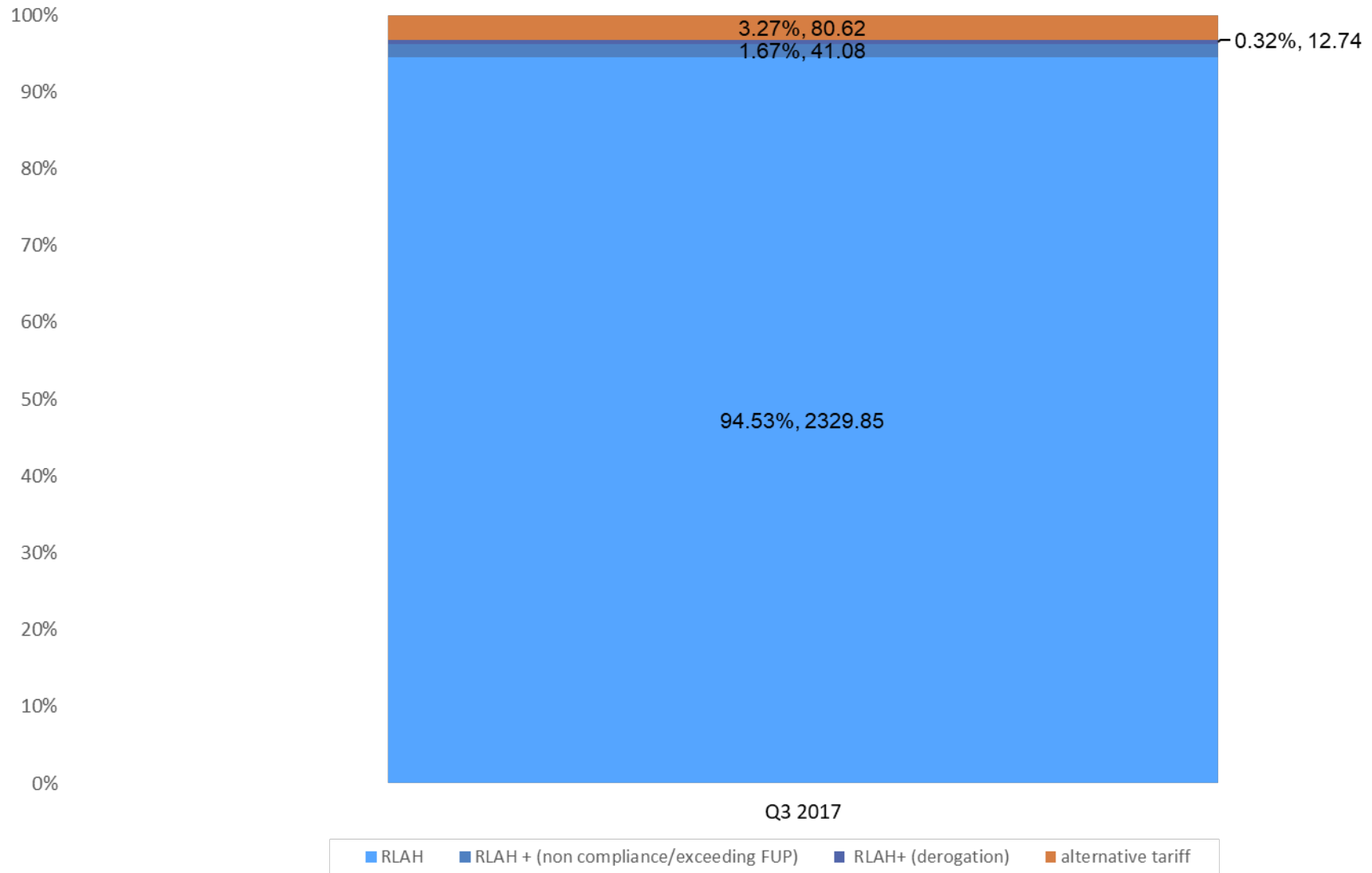
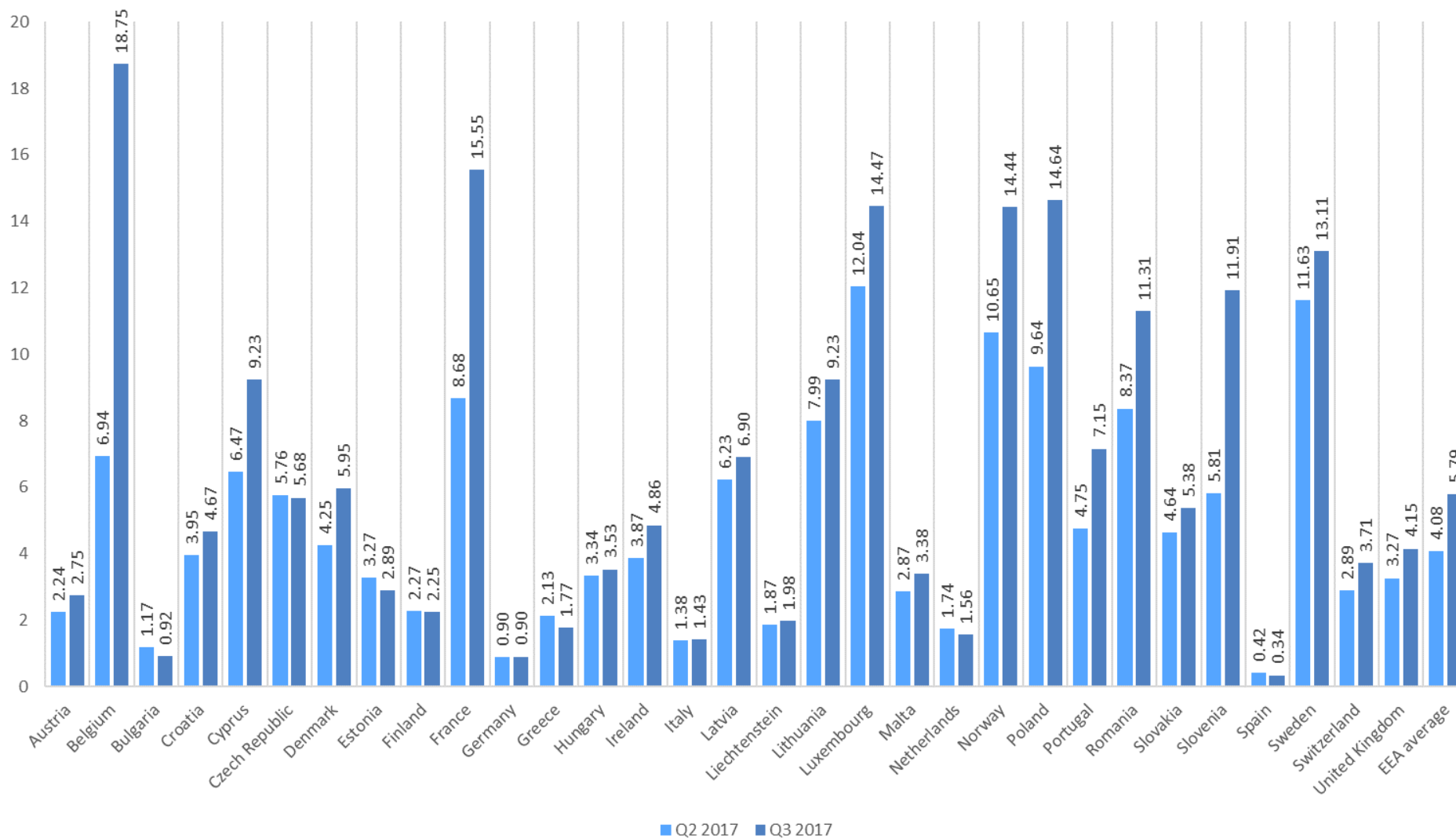
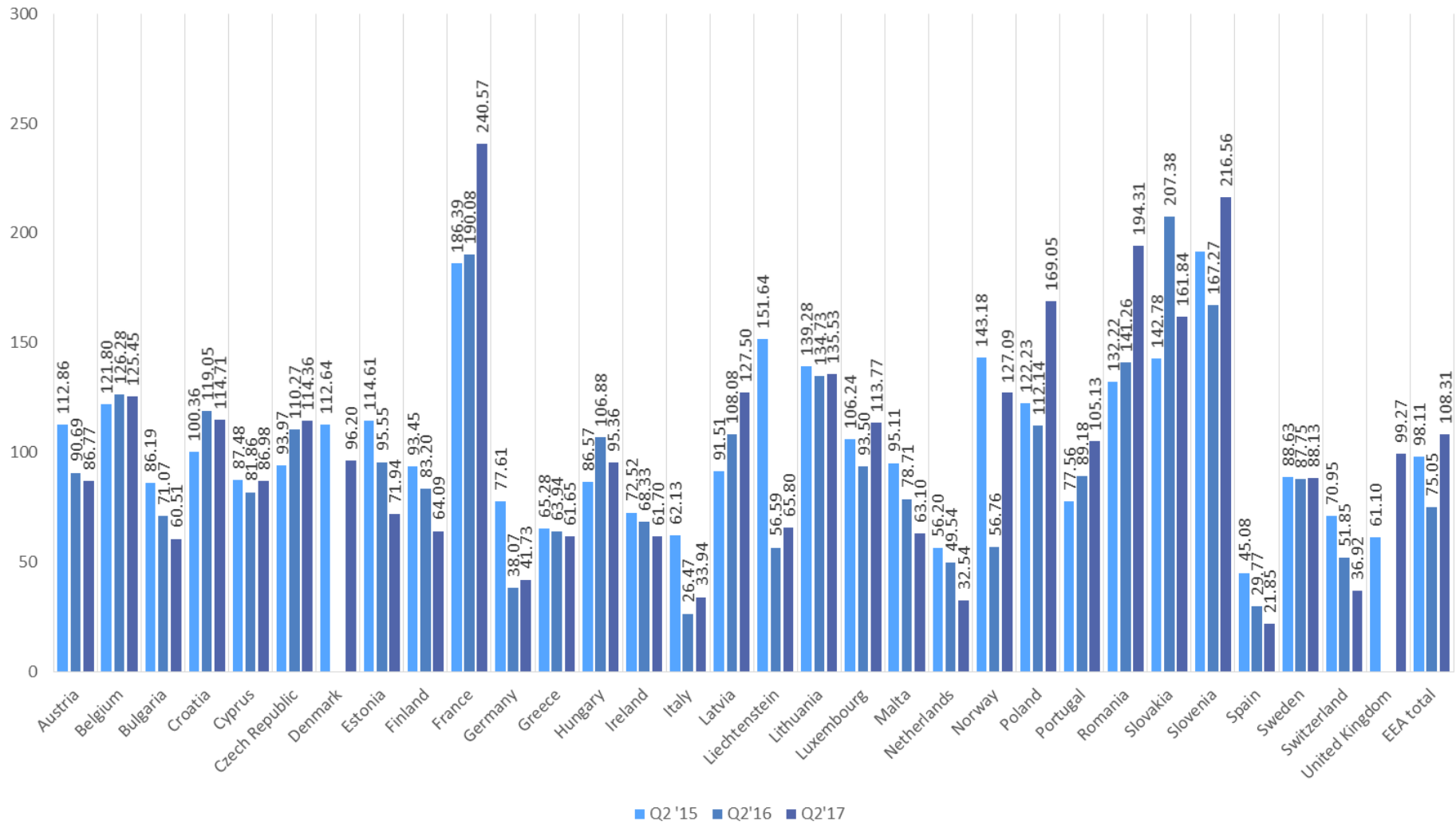


Figure 49: SMS
Average number of SMS per month per roaming subscriber
Q2 2017 and Q3 2017



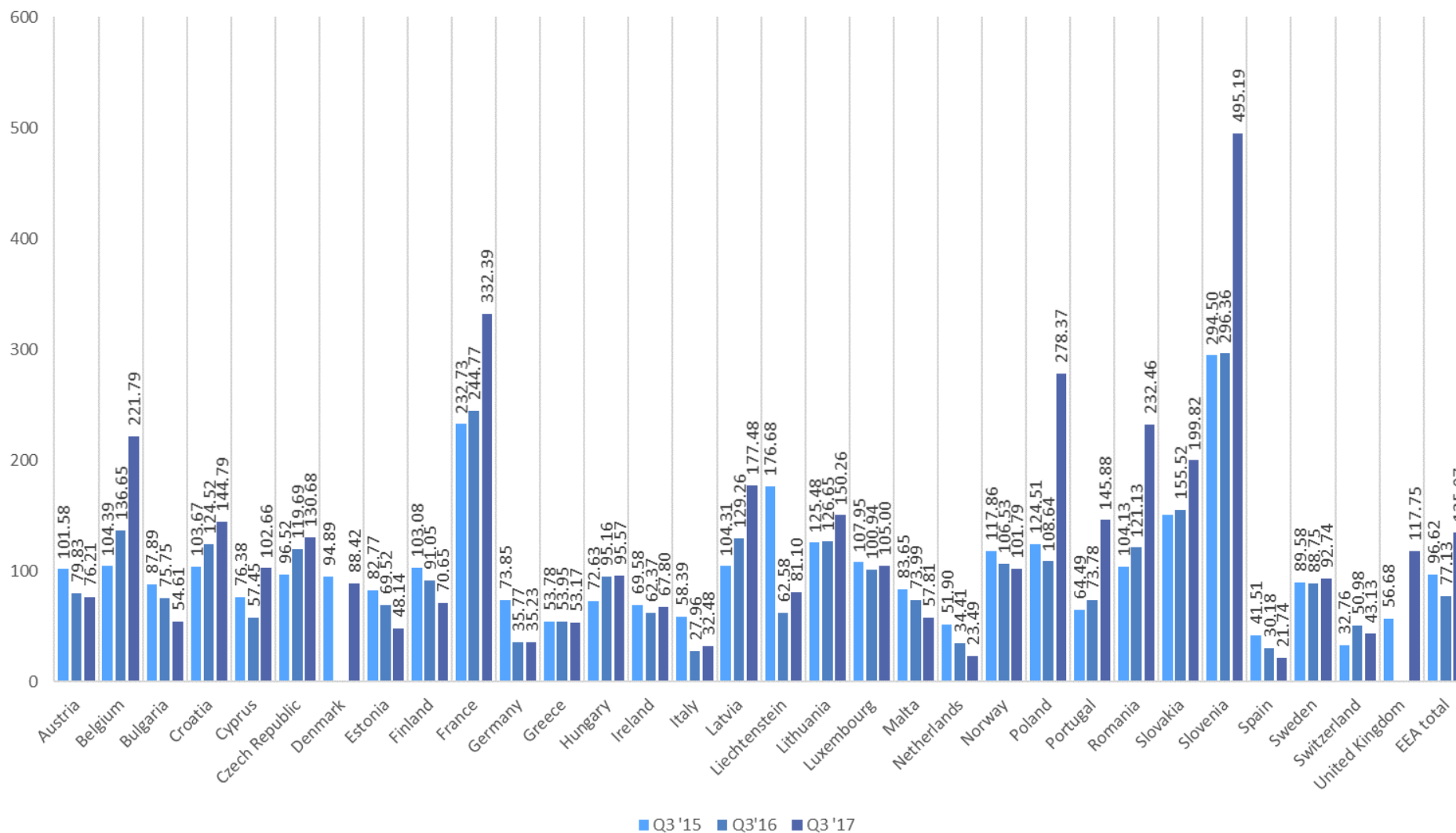
EEA average excludes Iceland

Figure 50: Retail SMS traffic Index, intra-EEA roaming SMS in Q2 2017 (Q2 2012 = 100, Croatia Q2'13 = 100)



EEA average excludes Iceland

Figure 51: Retail SMS traffic Index, intra-EEA roaming SMS in Q3 2017 (Q3 2012 = 100, Croatia Q3'14 = 100, Liechtenstein Q3'13)

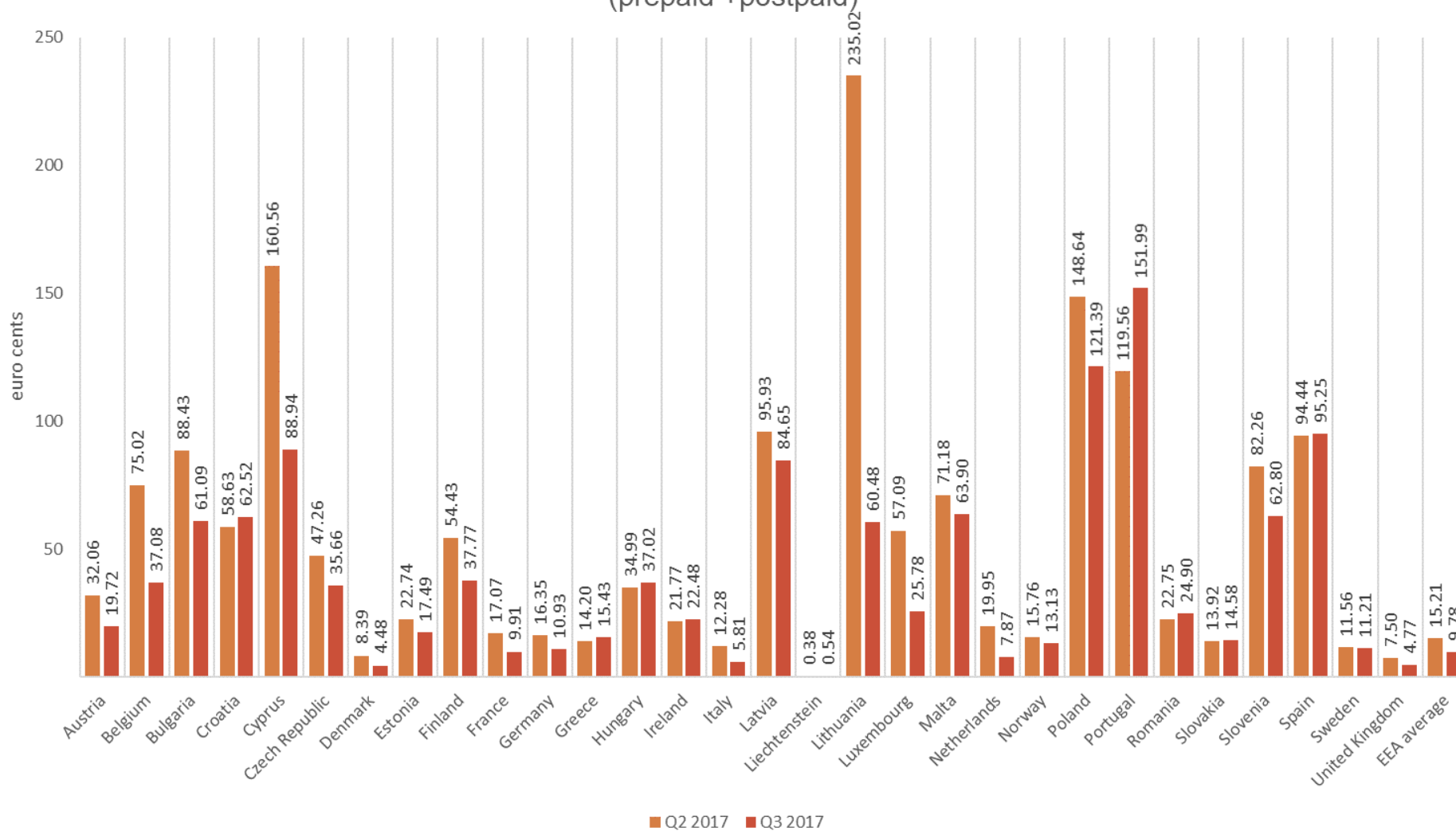


EEA average excludes Iceland

4.2.3. Data roaming services

4.2.3.1 RoW retail prices

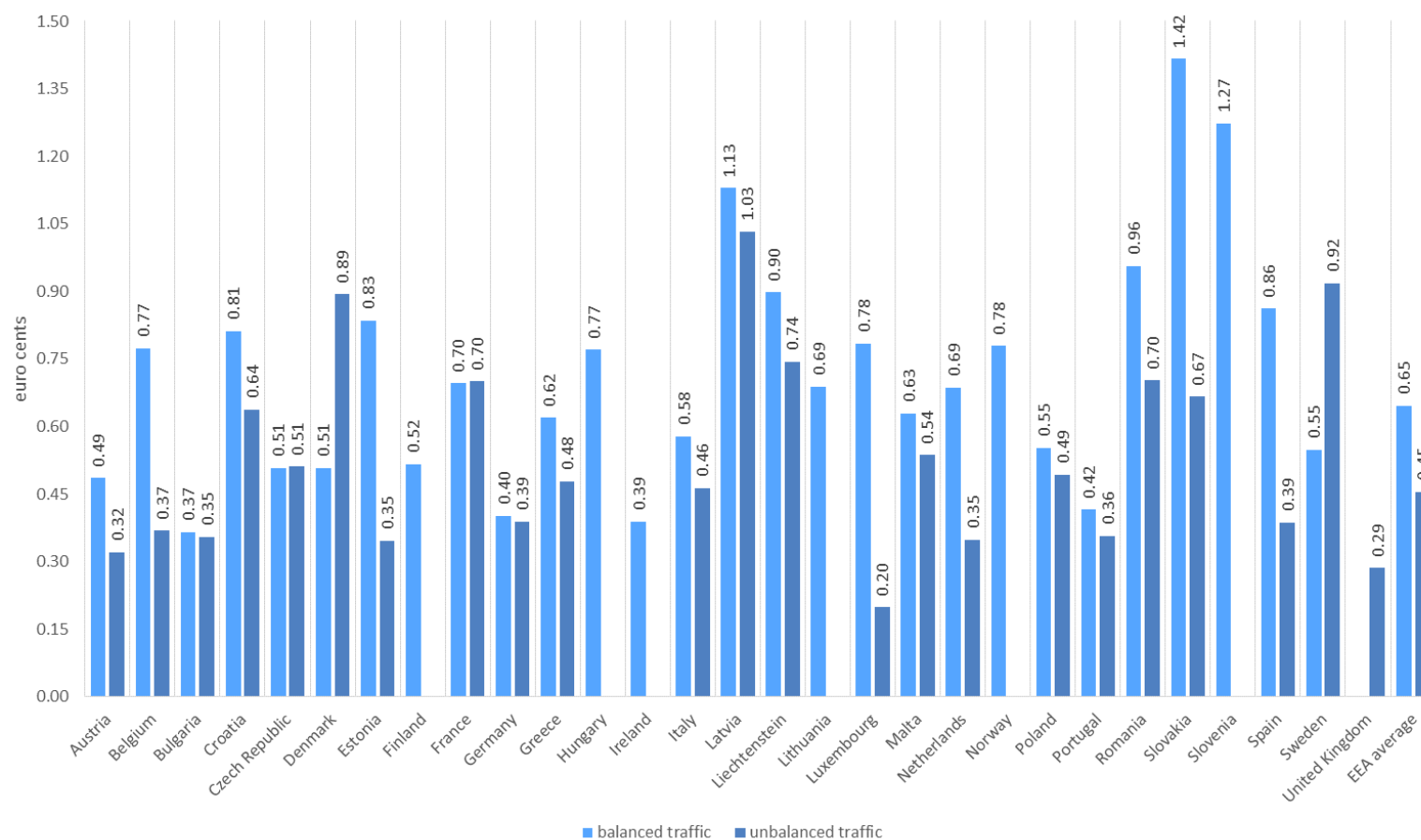
Figure 52: RoW
 Average retail data price per MB for RoW roaming data services
 Q2 2017 and Q3 2017
 (prepaid +postpaid)



EEA average excludes Iceland

4.2.3.2 Wholesale prices

Figure 53: Average wholesale data price per Mb in Q2 2017 (prepaid+postpaid)
balanced traffic and unbalanced traffic



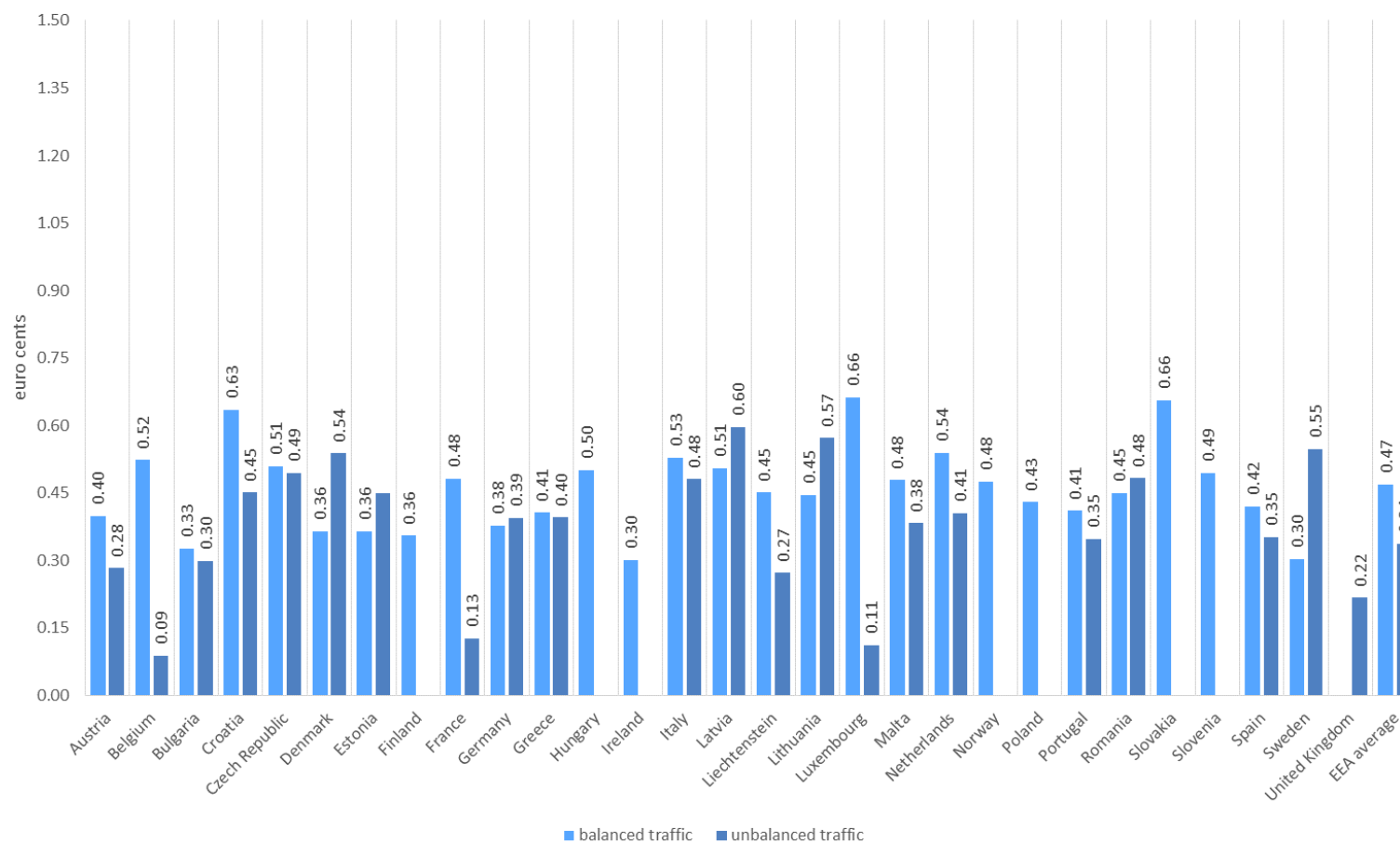
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 53, 54, 55, 56 and 59 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, France, Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figures 55 and 56

EEA average (balanced traffic) excludes Iceland, UK

EEA average (unbalanced traffic) excludes Finland, Iceland

Figure 54: Average wholesale data price per Mb in Q3 2017 (prepaid+postpaid)
balanced and unbalanced traffic



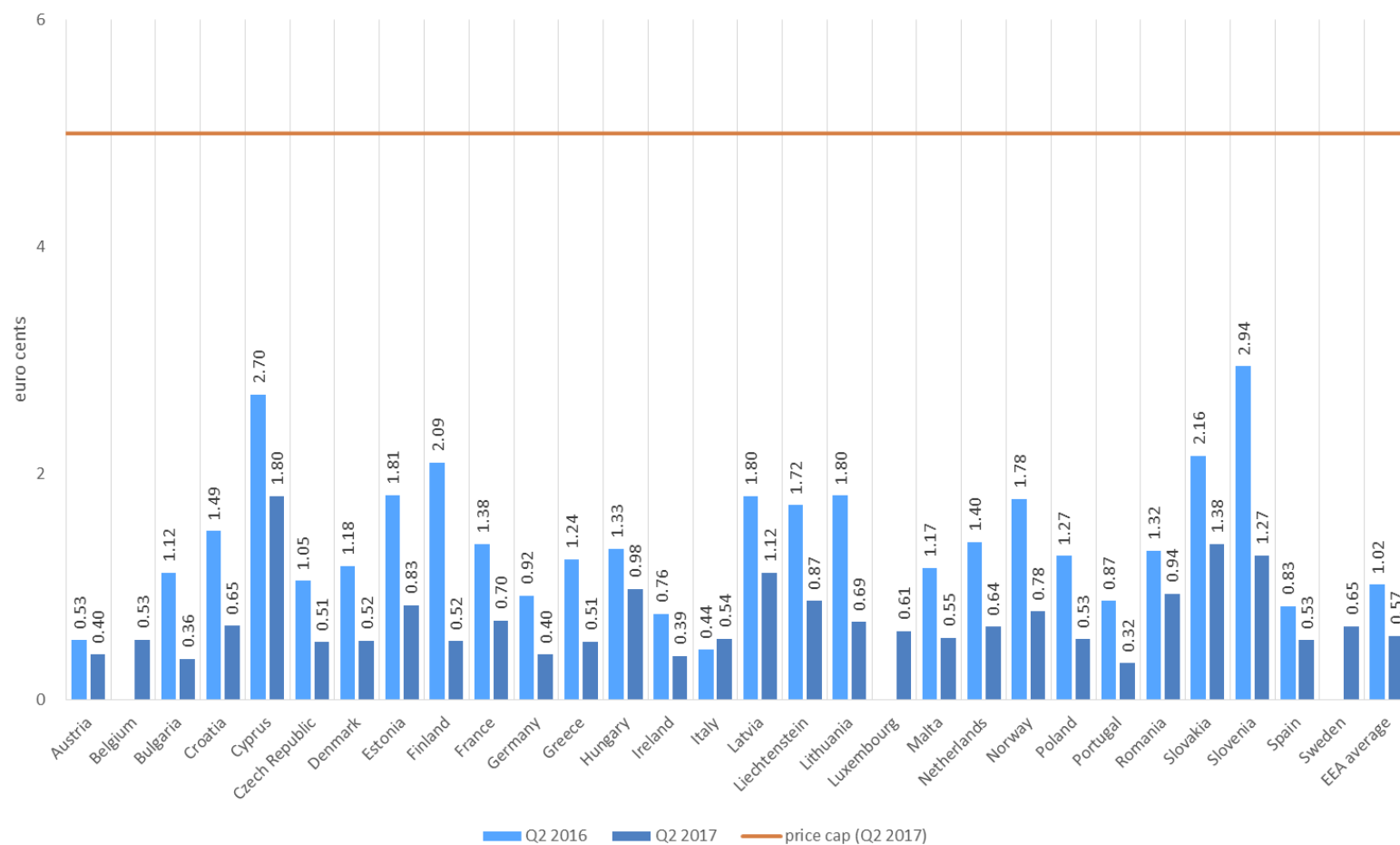
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 53, 54, 55, 56 and 59 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, France, Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figures 55 and 56

EEA average (balanced traffic) excludes Iceland, UK

EEA average (unbalanced traffic) excludes Finland, Iceland, Ireland

Figure 55: Average wholesale data price per Mb in Q2 2016 and Q2 2017 (prepaid+postpaid)
Total traffic

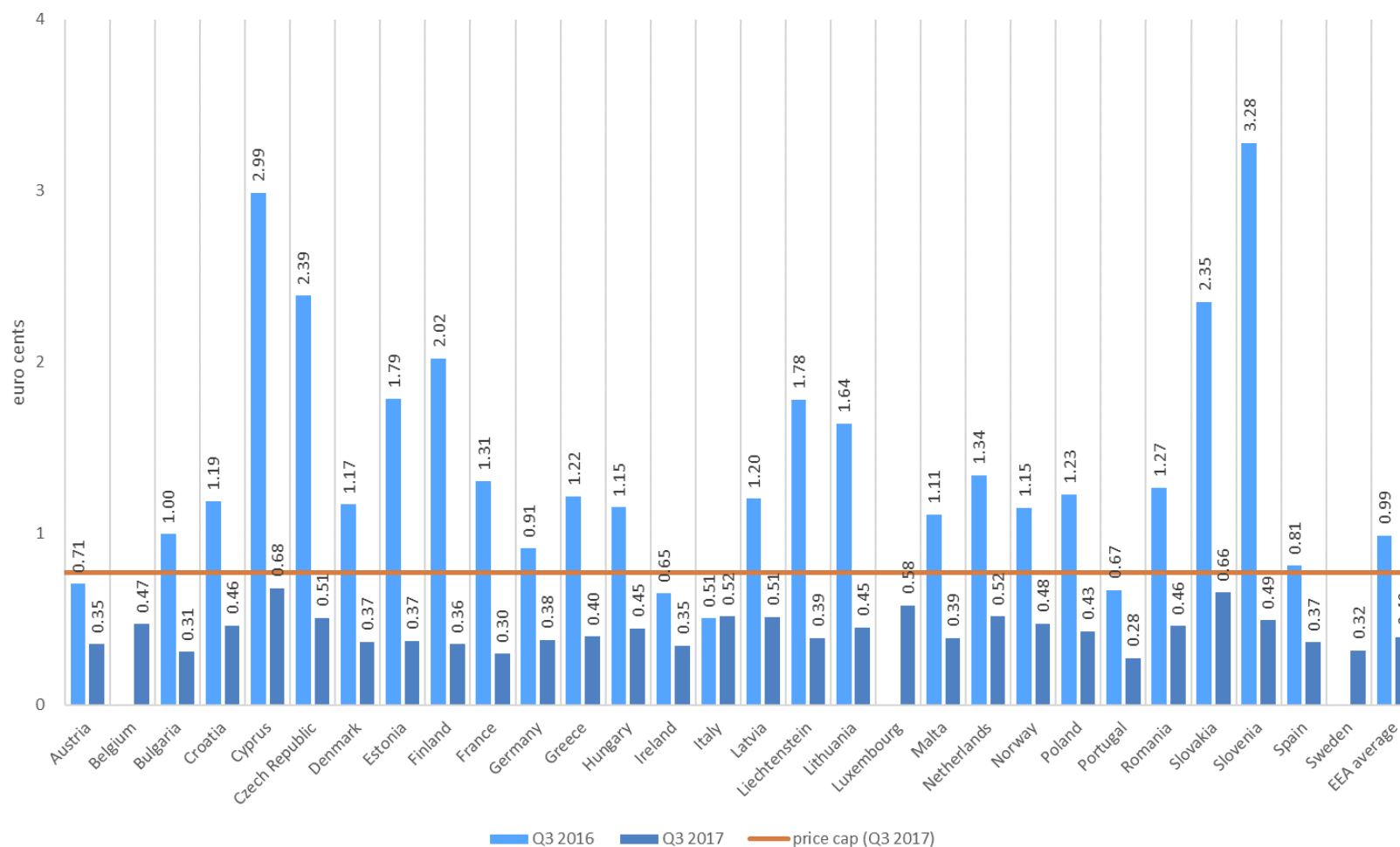


The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 53, 54, 55, 56 and 59 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, France, Portugal: the number of operators that reported data for calculating these estimates is different from the number of operators that reported data for calculating the estimates (disaggregated for balanced and unbalanced traffic) in Figures 53 and 54

EEA average (Q4 2016) excludes Cyprus, Iceland, UK

Figure 56: Average wholesale data price per Mb in Q3 2016 and Q3 2017 (prepaid+postpaid)
Total traffic

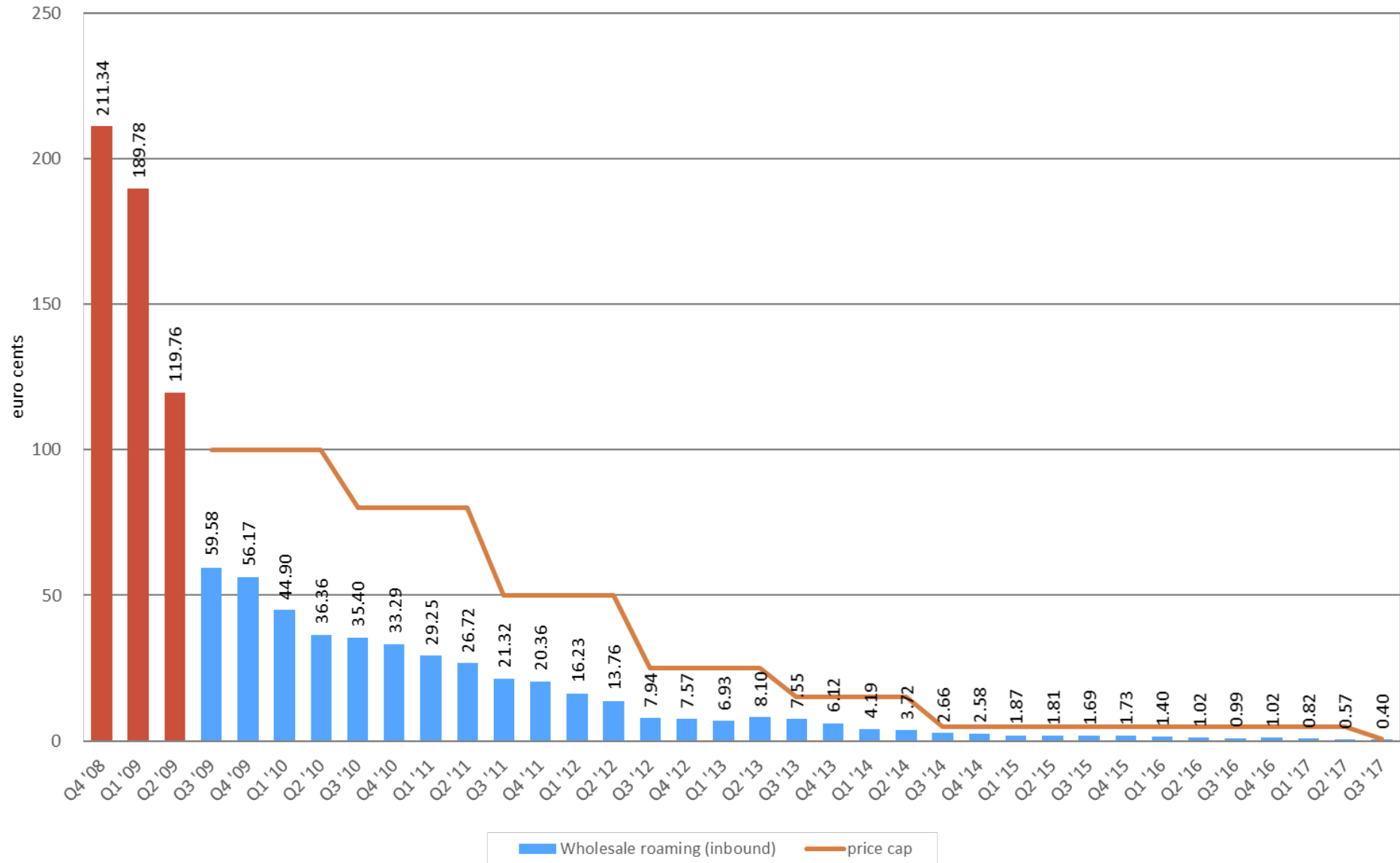


The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 53, 54, 55, 56 and 59 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Cyprus, France, Portugal: the number of operators that reported data for calculating these estimates is different from the number of operators that reported data for calculating the estimates (disaggregated for balanced and unbalanced traffic in Figures 53 and 54)

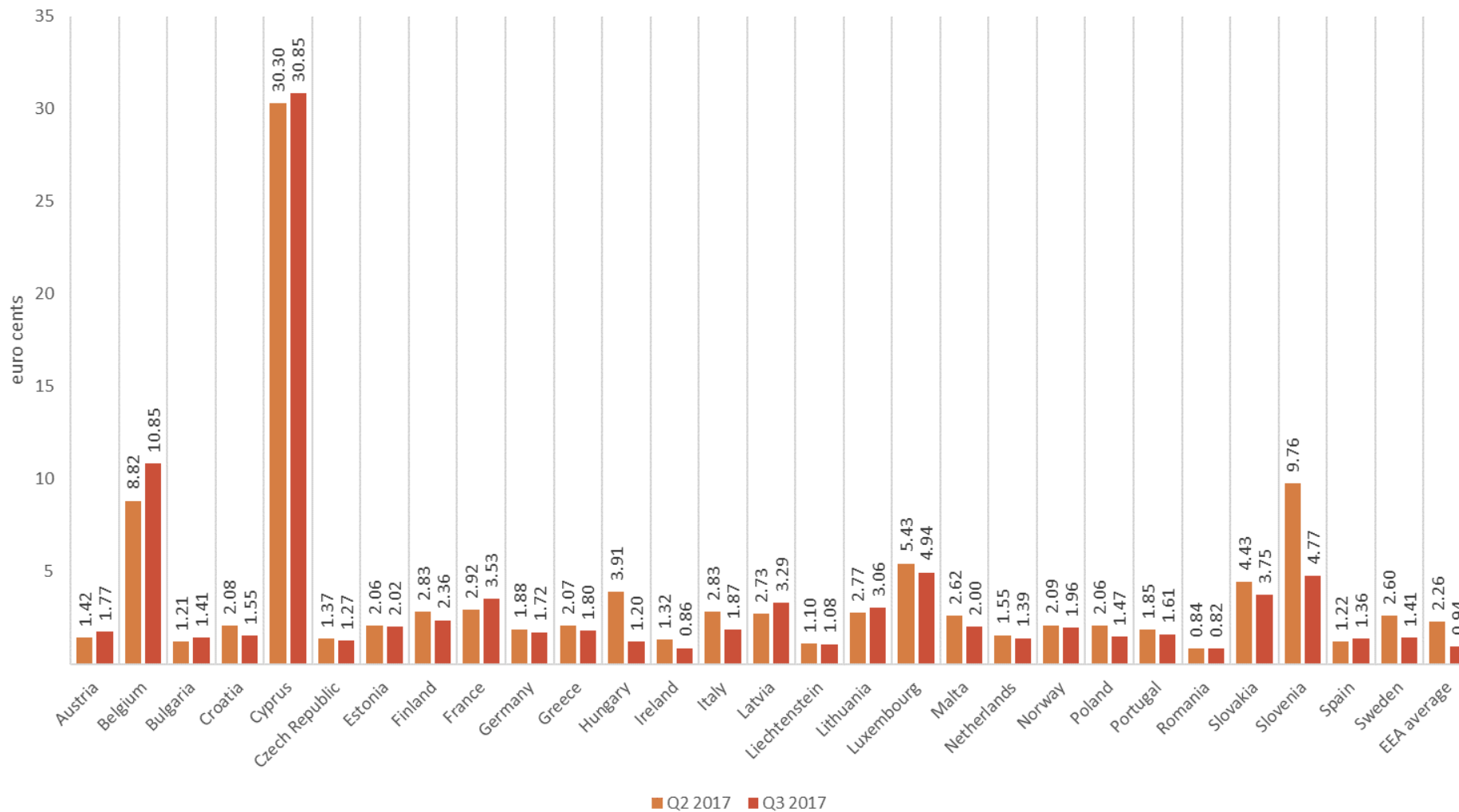
EEA average (Q3 2017) excludes Cyprus, Iceland, UK

Figure 57: EEA average: average wholesale data price per Mb (prepaid+postpaid)



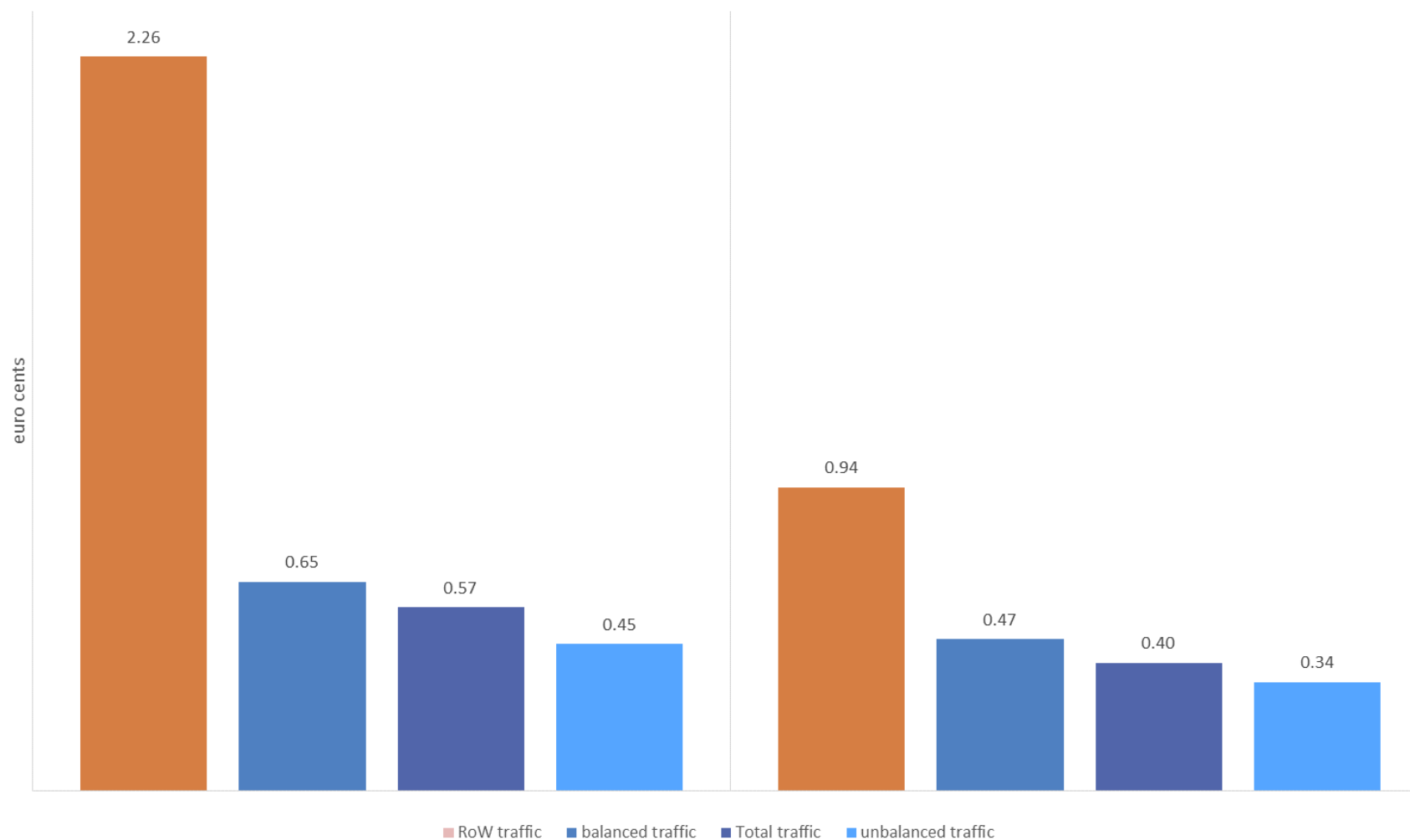
EEA average (Q2 2017 and Q3 2017) excludes Iceland

Figure 58: Average wholesale data price charged by EEA operators per Mb in Q2 and Q3 2017 (prepaid+postpaid, inbound roaming) RoW traffic



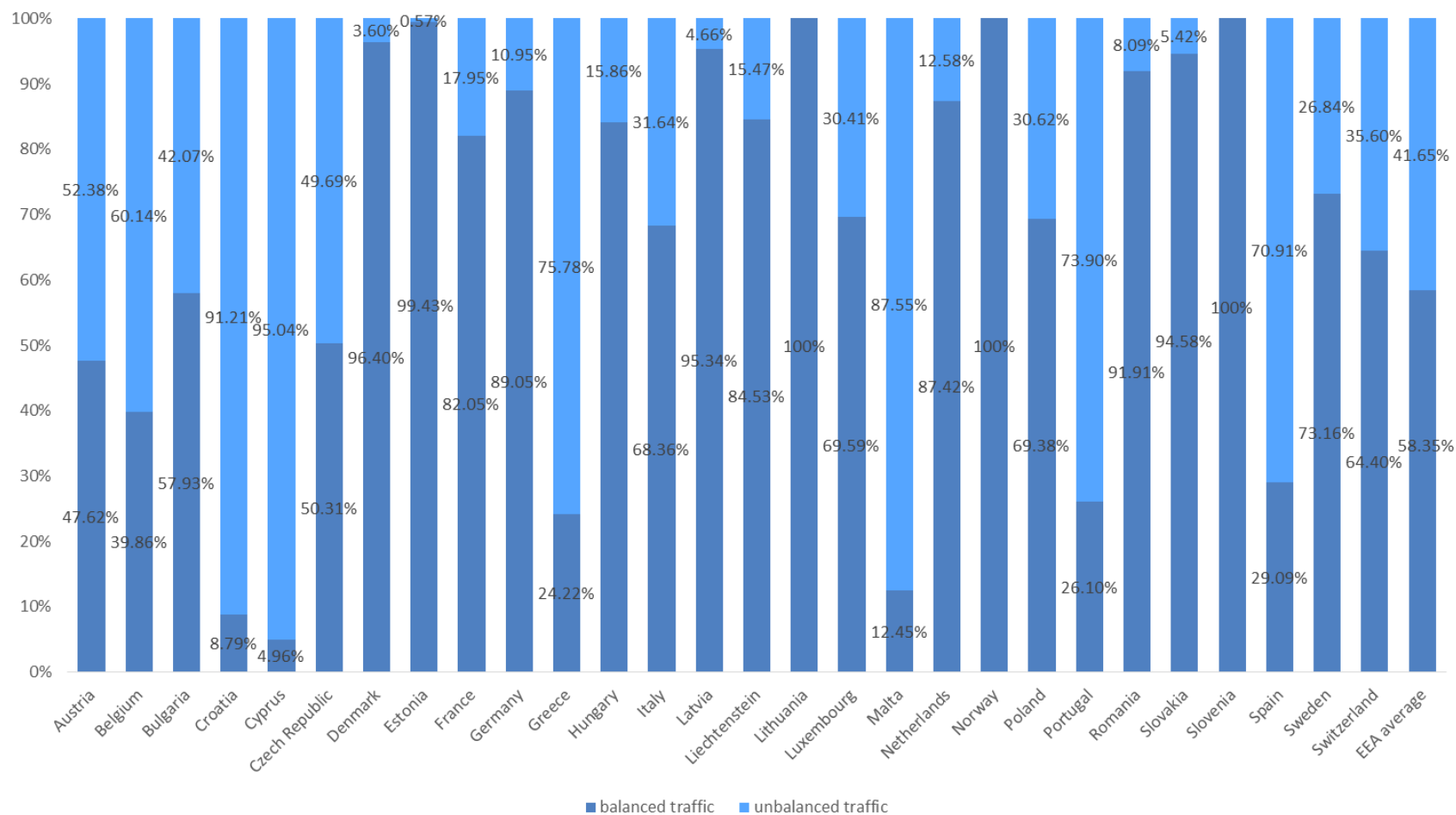
EEA average excludes Denmark, Iceland, UK

Figure 59: EEA average wholesale data price per Mb in Q2 and Q3 2017 (prepaid+postpaid) (balanced, unbalanced, total traffic, RoW traffic)



The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures 53, 54, 55, 56 and 59 may not be directly comparable. Please also read carefully the chapter on the methodology for the data collection on page 100.

Figure 60: Proportion of balanced/unbalanced traffic within EEA countries (data services)
Wholesale roaming inbound
Q2 2017

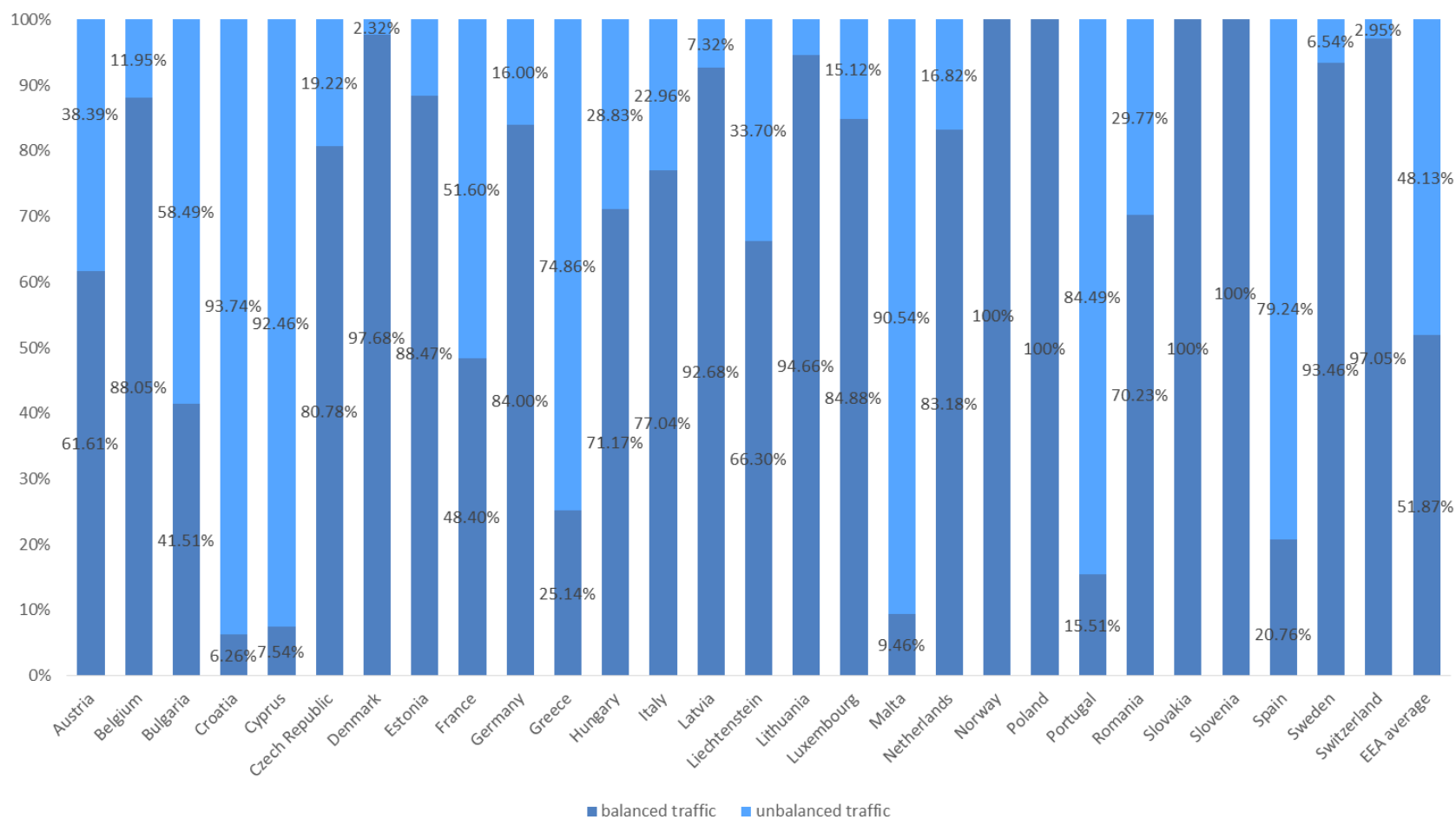


While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. Please also read carefully the chapter on the methodology for the data collection on page 100.

Portugal: estimates are based on partial information provided by two operators

EEA average excludes Finland, Iceland, Ireland, UK

Figure 61: Proportion of balanced/unbalanced traffic within EEA countries (data services)
Wholesale roaming inbound
Q3 2017



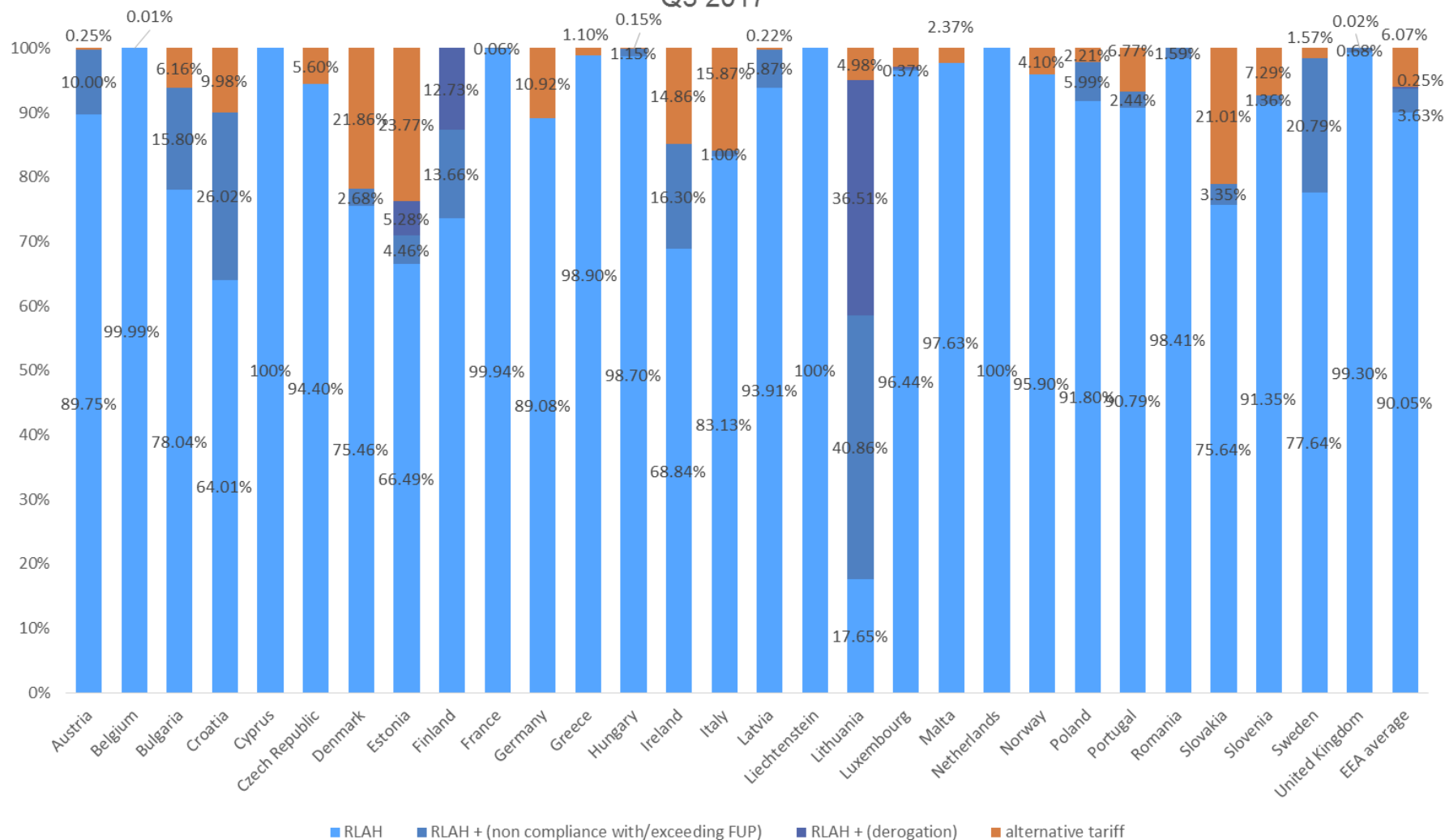
While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. Please also read carefully the chapter on the methodology for the data collection on page 100.

Portugal: estimates are based on partial information provided by two operators

EEA average excludes Finland, Iceland, Ireland, UK

4.2.3.3 Consumption patterns

Figure 62: Percentage of retail data roaming services: RLAH, RLAH+ (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff Q3 2017



Finland: RLAH+ (derogation) and RLAH+ (non-compliance with/exceeding FUP) has been combined as RLAH+ (derogation), alternative tariffs are not reported due to confidentiality reasons
 EEA average excludes Finland, Iceland

Figure 63: EEA percentage of data roaming services: RLAH, RLAH+ (non-compliance with/exceeding FUP), RLAH+ (derogation), alternative tariff (in Gb)

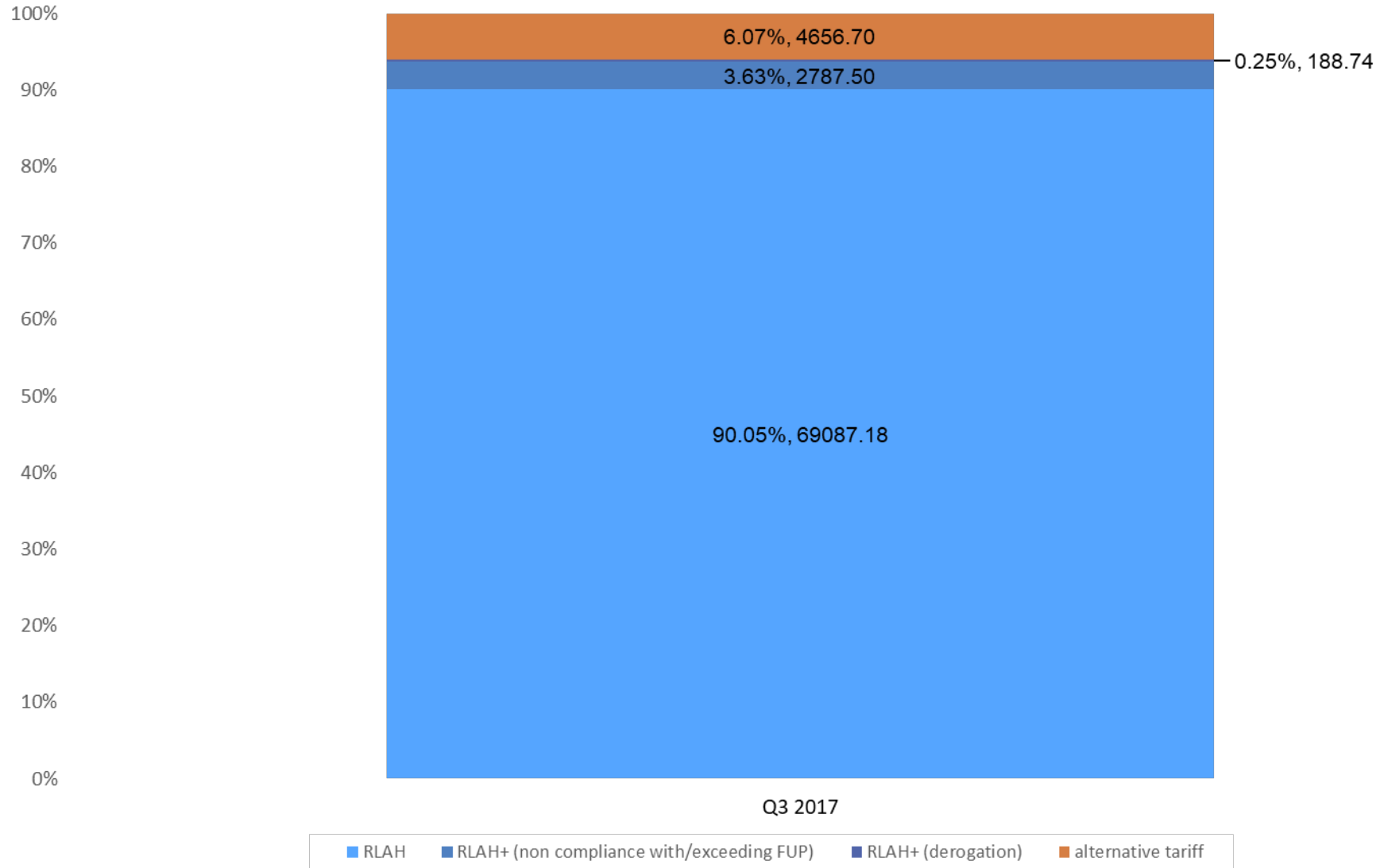
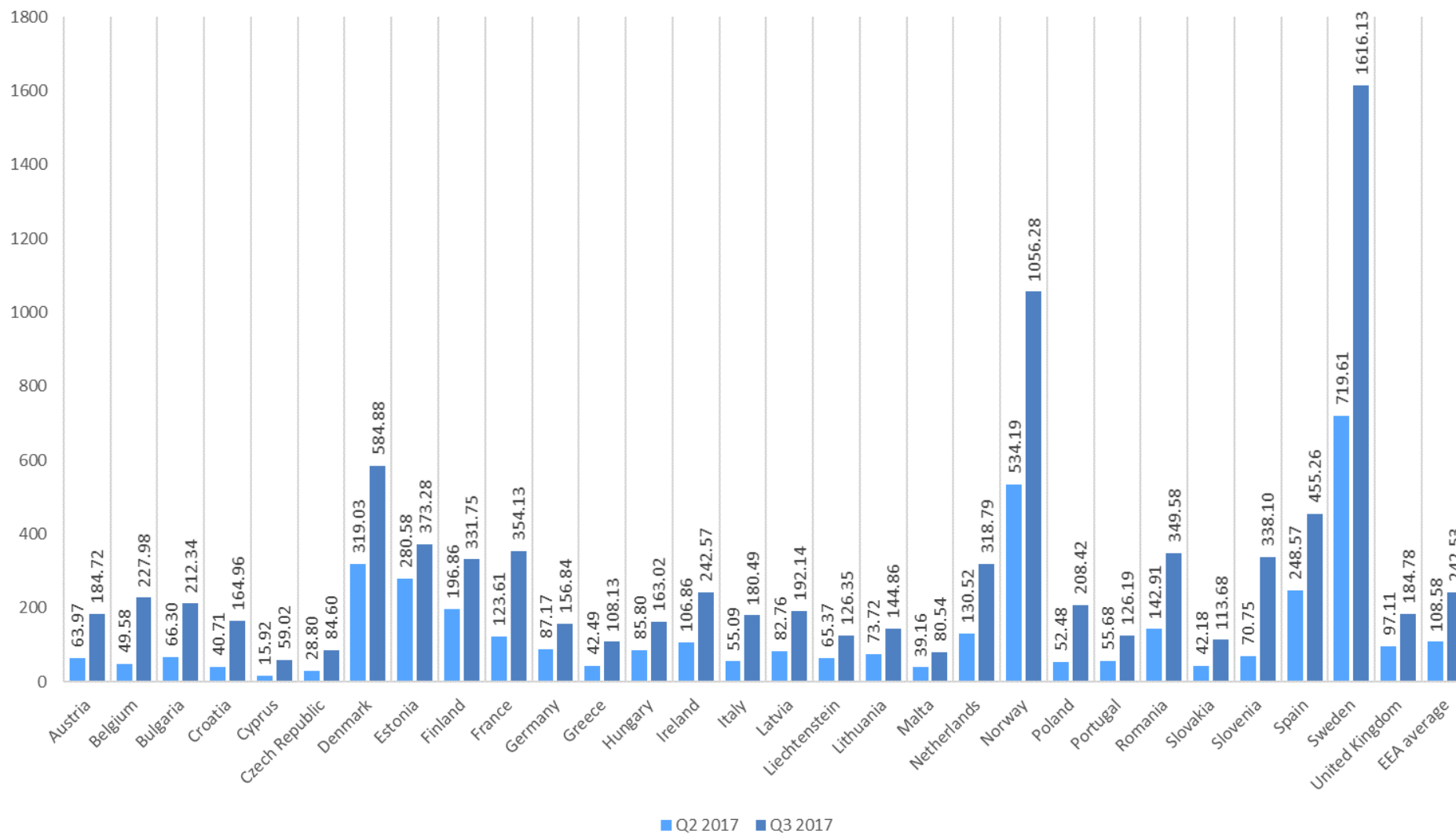
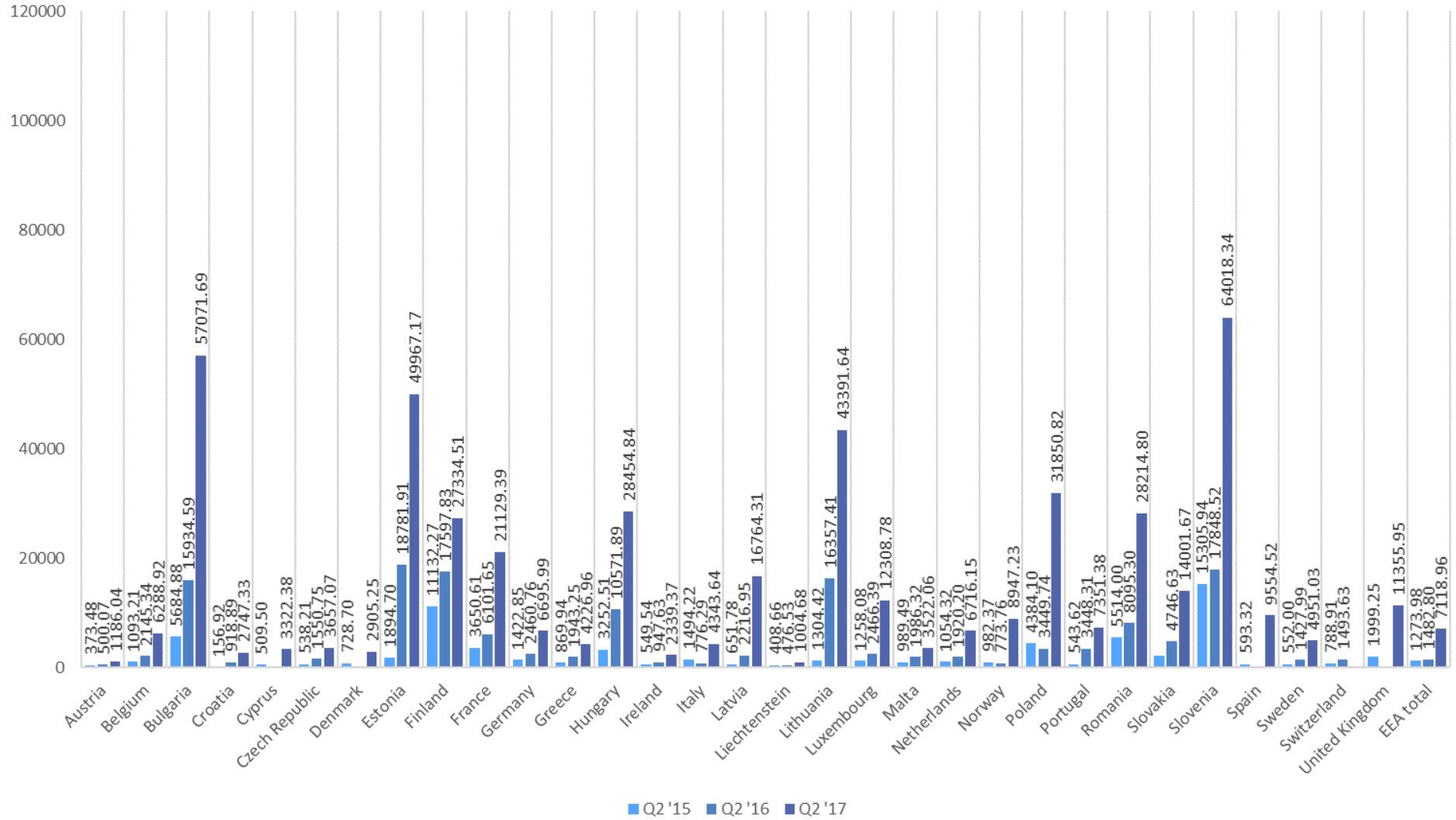


Figure 64: data services
Average consumption per month per roaming subscriber (in MB)
Q2 2017 and Q3 2017



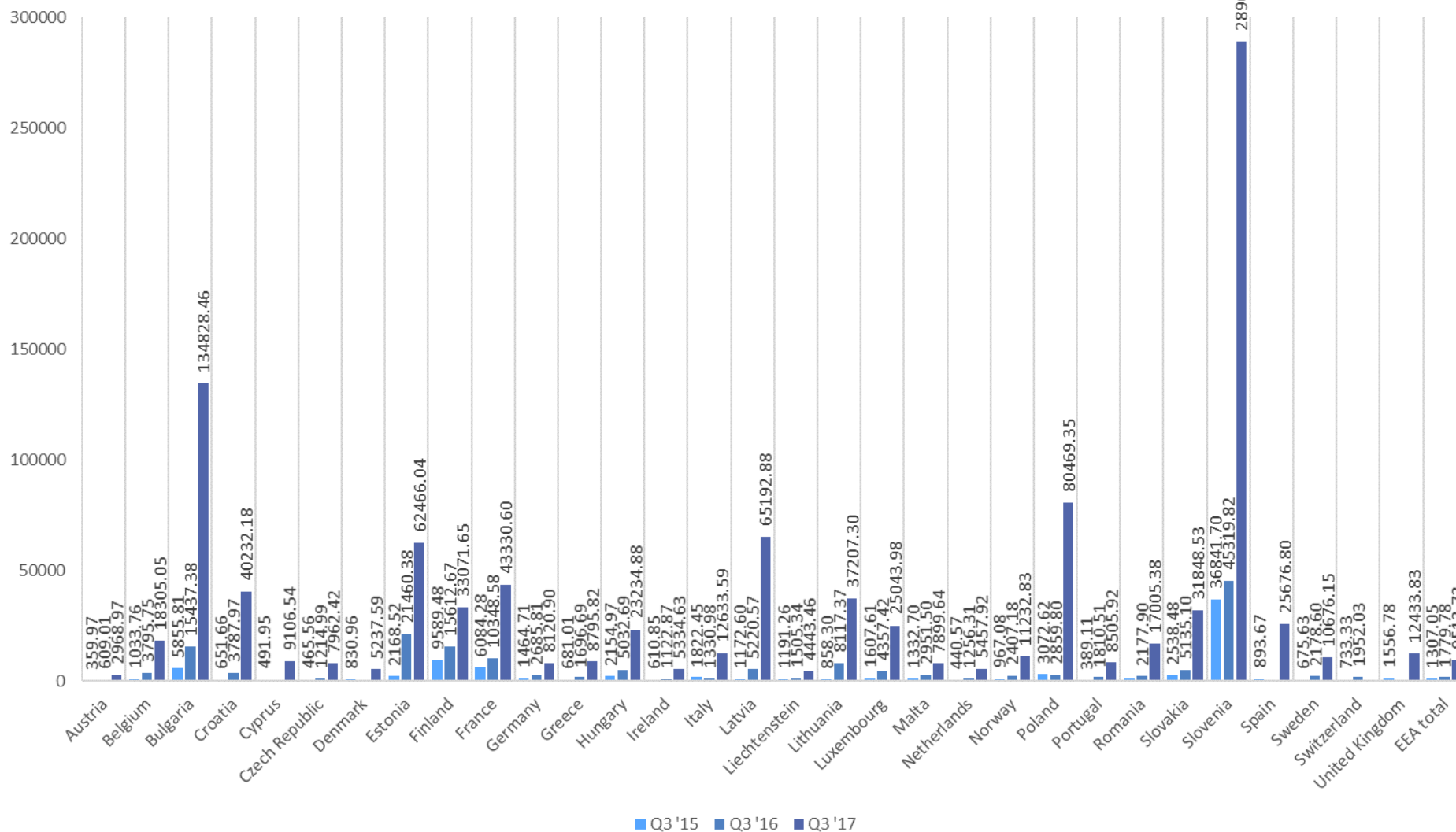
EEA average excludes Iceland

Figure 65: Retail Data traffic Index, intra-EEA data services in Q2 2017 (Q2 2012 = 100, Croatia Q2'13 = 100)



EEA average excludes Iceland

Figure 66: Retail Data traffic Index, intra-EEA roaming data services in Q3 2017 (Q3 2012 = 100, Croatia, Liechtenstein: Q3'13 = 100, Liechtenstein Q3'13 = 100)



EEA average excludes Iceland

4.3. Wholesale roaming (outbound): Agreements

Figure 67: Wholesale averages outbound roaming: Voice: Agreements applying Article 3
Roaming Regulation

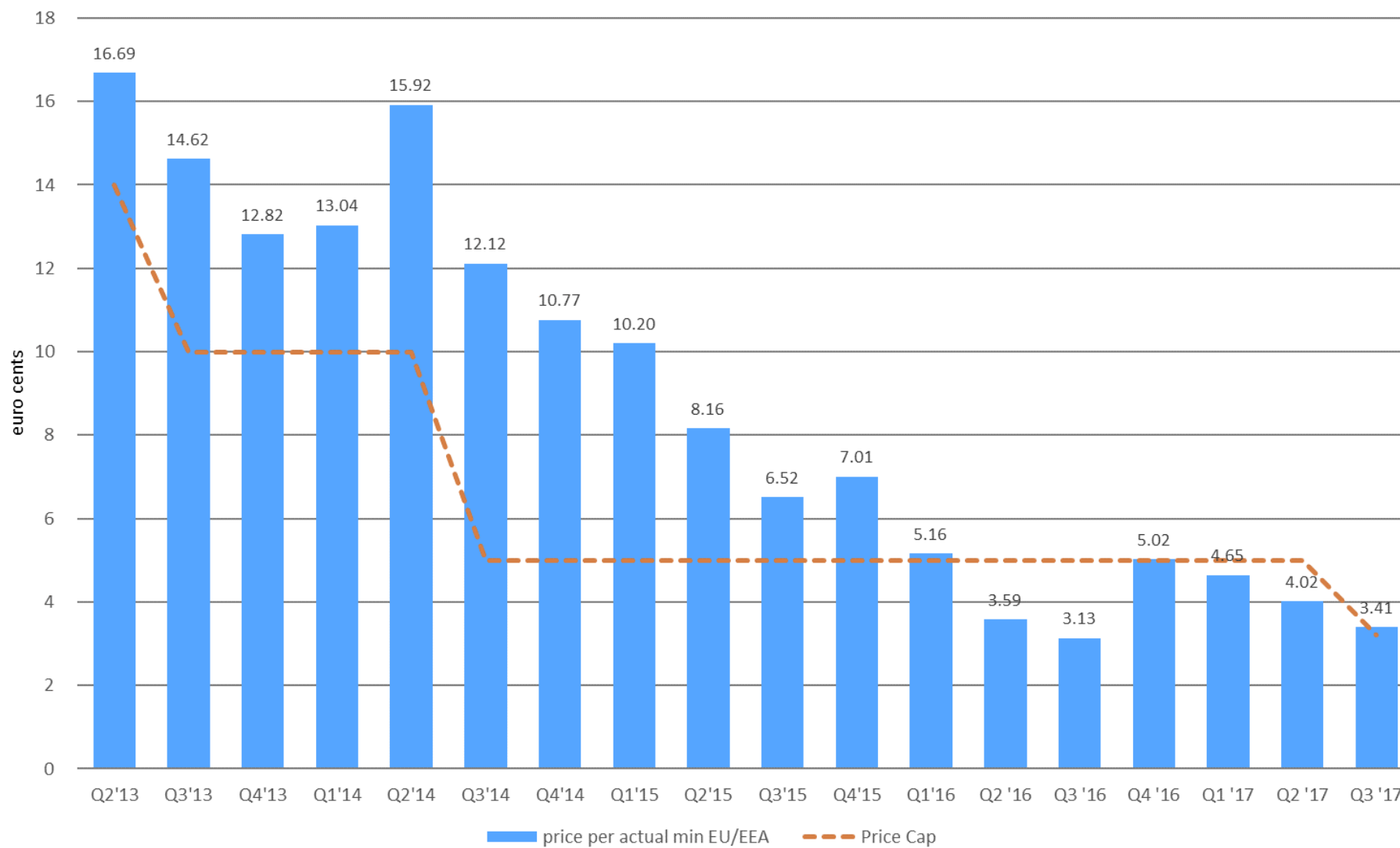


Figure 68: Wholesale averages outbound roaming: SMS Agreements applying Article 3 Roaming Regulation

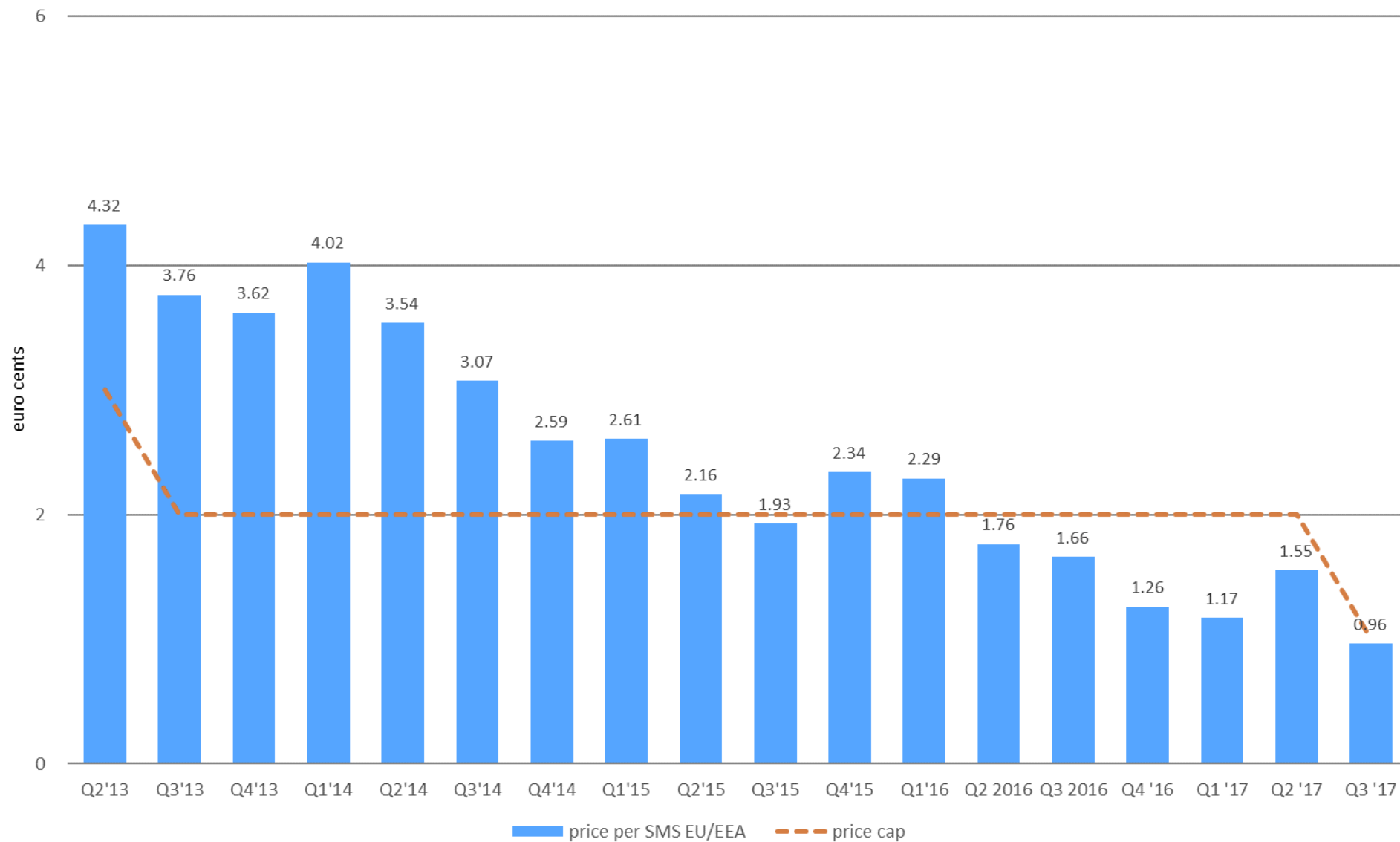
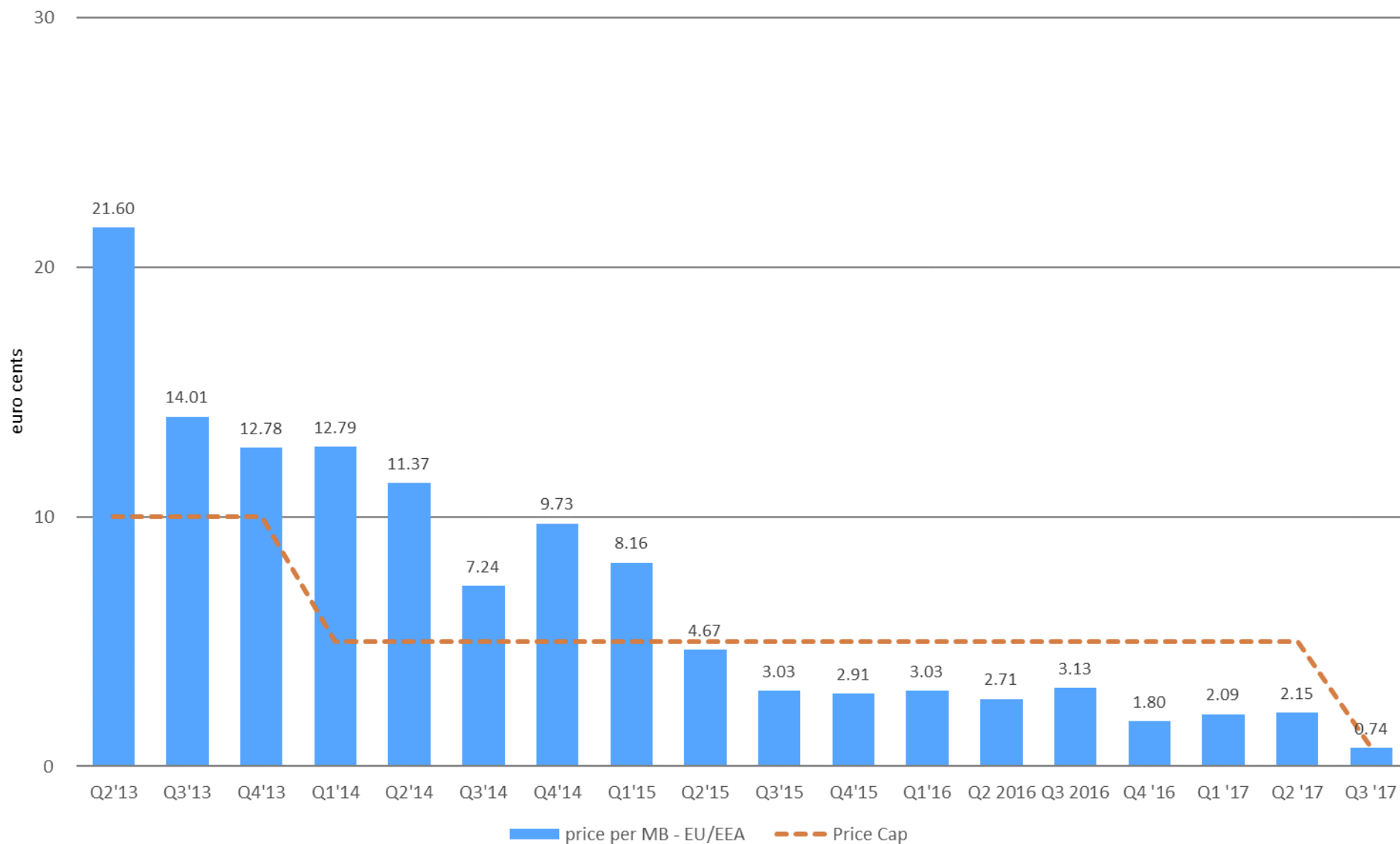


Figure 69: Wholesale EEA average outbound roaming: DATA, Agreements applying Article 3 Roaming Regulation



4.4. Rates for unbalanced wholesale roaming traffic

Figure 70: Voice services
 Lowest paid/charged unbalanced rates
 (number of operators)
 Q2 and Q3 2017

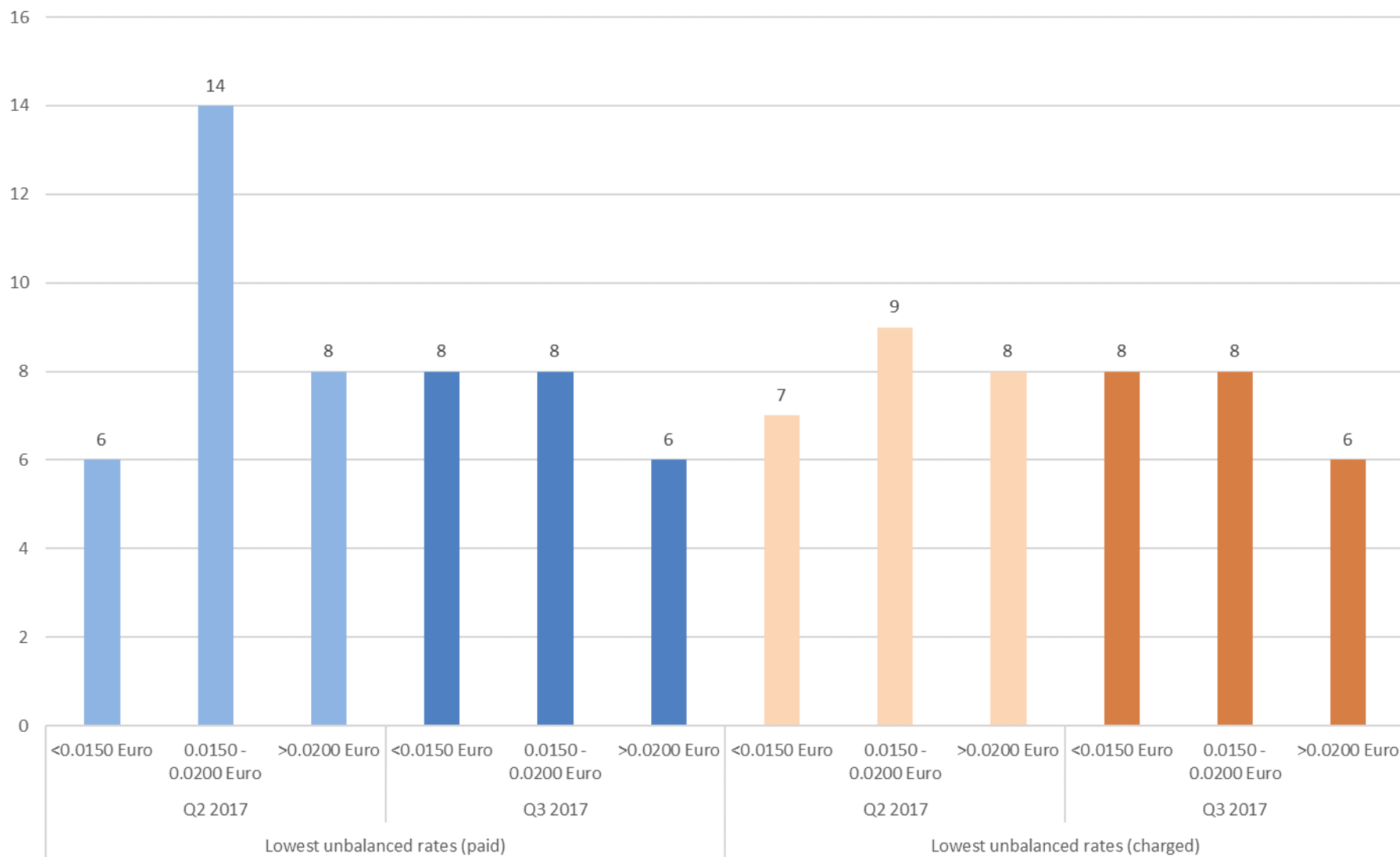


Figure 71: SMS services
 Lowest paid/charged unbalanced rates
 (number of operators)
 Q2 and Q3 2017

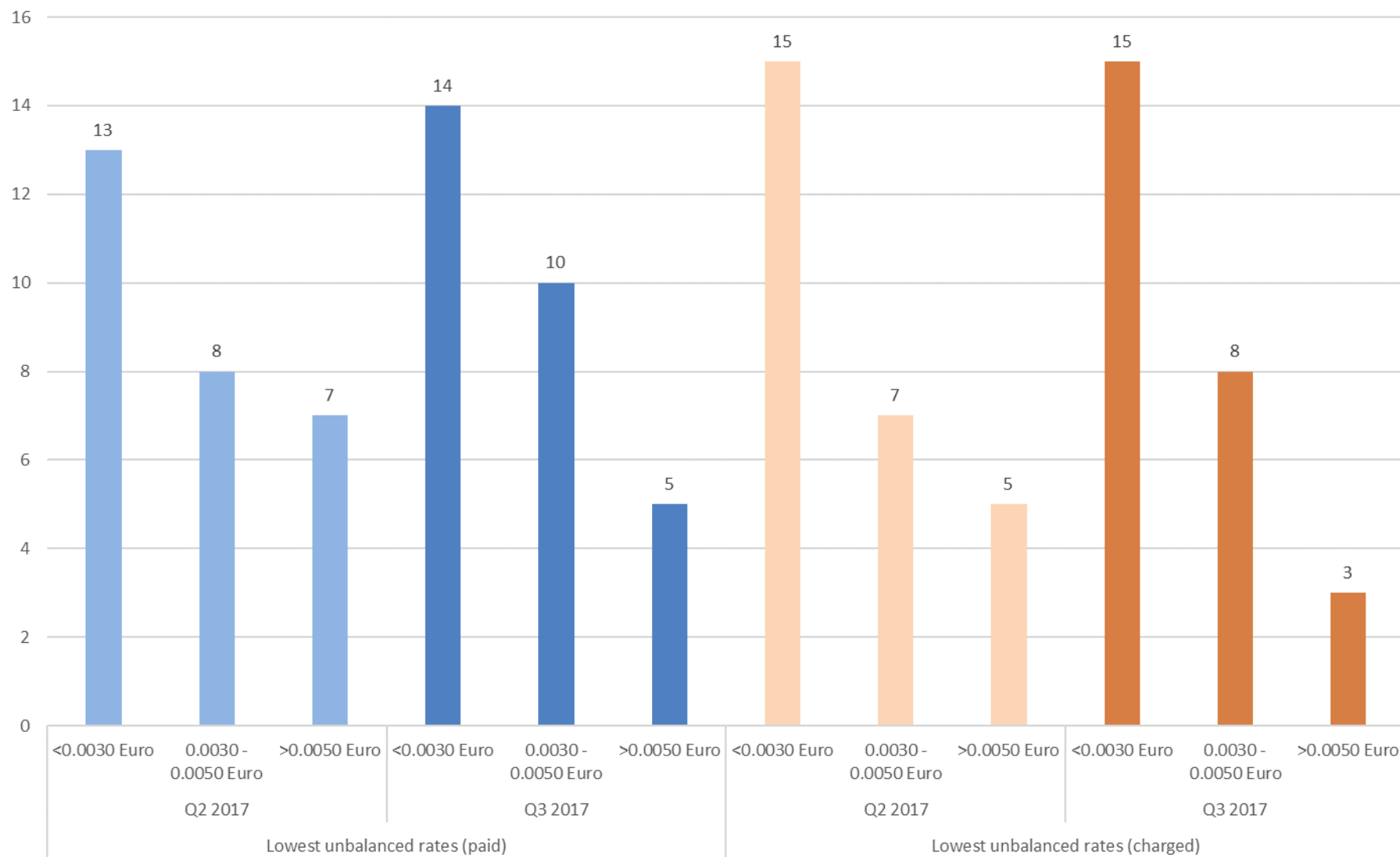


Figure 72: Data services
 Lowest paid/charged unbalanced rates per GB
 (number of operators)
 Q2 and Q3 2017

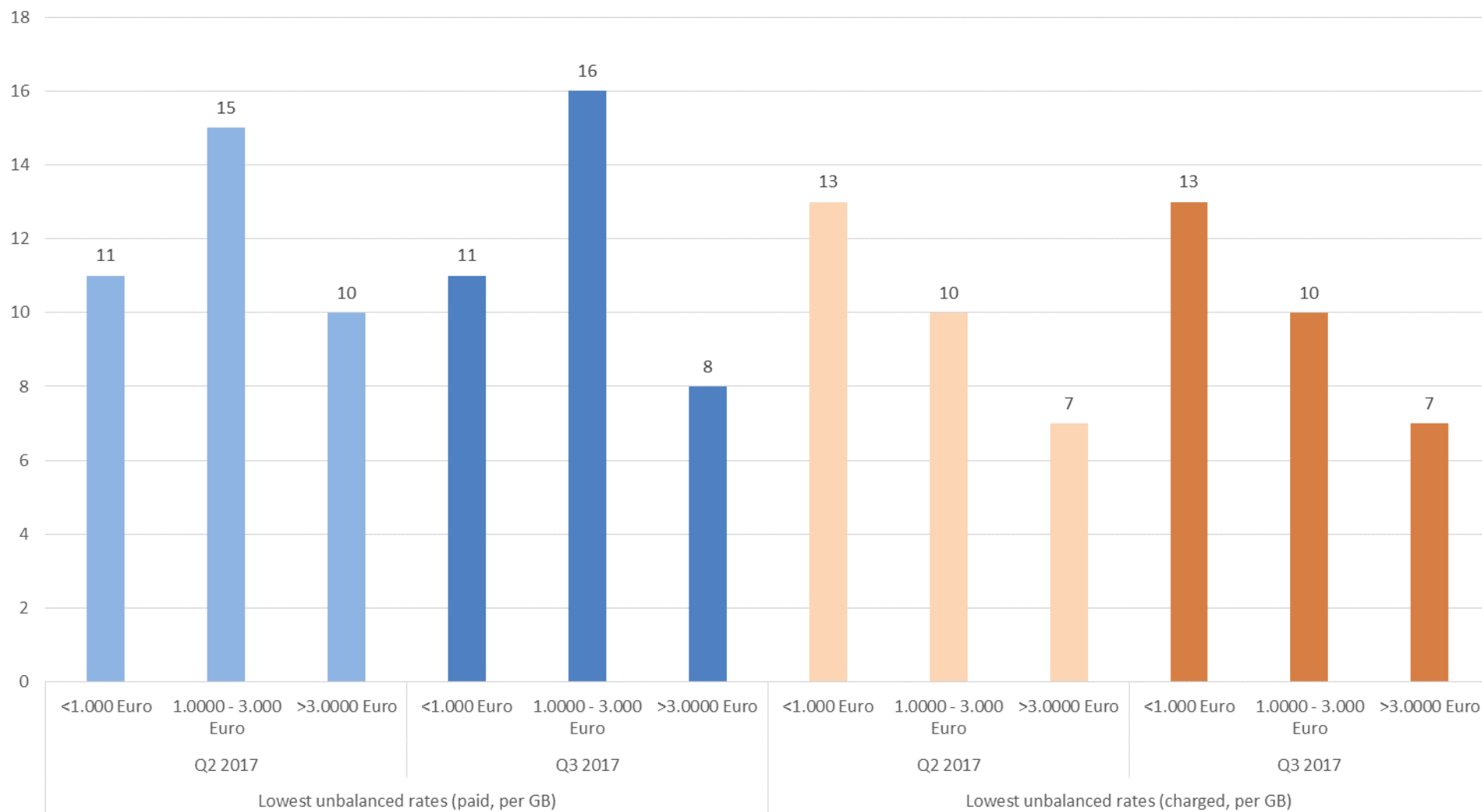
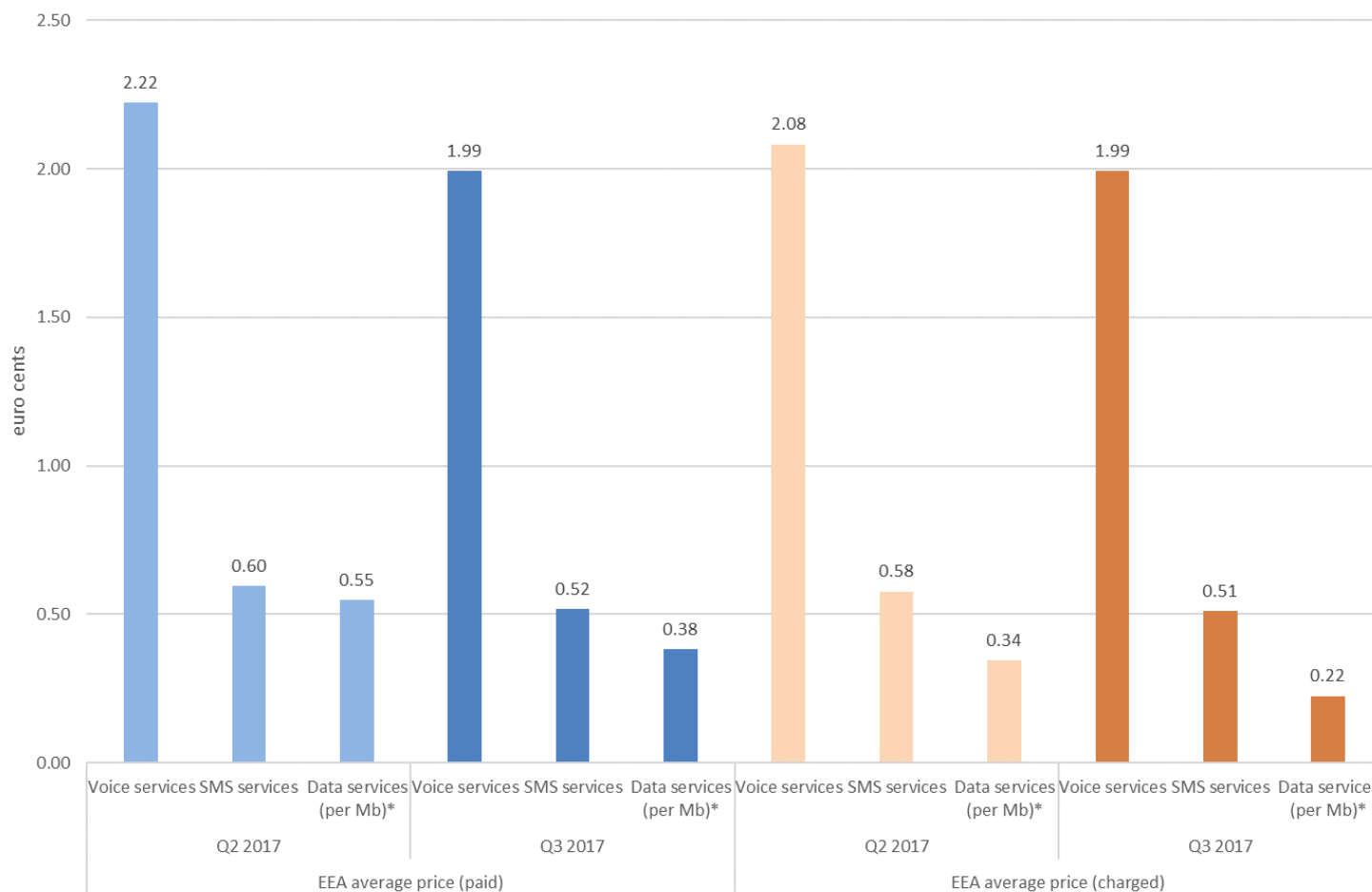


Figure 73: EEA average: wholesale roaming prices paid/charged by operators
(calculated based on the average of the 5 lowest unbalanced rates provided by each operator)



*Conversion of gigabytes to megabytes was done in line with Recital 17 of the Regulation (EU) 2017/920 of the European Parliament and of the Council of 17 May 2017 amending Regulation (EU) No 531/2012, which results in 1 gigabyte being equal to 1000 megabytes. Operators may apply a different formula which can slightly affect the accuracy of data.

Sample: 31 operators (voice services), 36 operators (data services) and 36 operators (SMS services) from the EEA countries (Austria, Belgium, Bulgaria, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Norway, Poland Portugal, Romania, Slovenia, Spain, UK)

Annex I: Methodology for the data collection

Because of the broad scope and complexity of the new requirements stemming from the Roaming Regulation, new key indicators have been developed for the data collection. In addition, while the results are derived from the same questionnaire, the methodology used for some data from these new key indicators can differ between countries for a number of reasons. Particularly relevant are the following reasons:

- Differences in the methods used by operators to allocate volumes for the different roaming services. Therefore, comparability of data between different tariffs is affected by a number of reporting criteria, including roaming consumption from the volumes in the domestic mobile tariff plan (RLAH), the use of roaming services exceeds the limits of the FUP or if roaming is not periodic (RLAH non-compliance with/exceeding FUP).
- Difficulties in estimating the actual revenues for the roaming services and the mobile domestic services. As most of the operators provide domestic bundled services:
 - it is therefore difficult to allocate revenues to the different domestic individual services (e.g.: fixed voice, mobile, internet, TV).
- Besides, after the introduction of Roam Like at Home rules, it is therefore difficult to determine, for these bundled tariff plans, the part of the domestic revenues only relative to intra-EEA roaming communications. For these tariffs, it is only possible to separate the revenues relative to the roaming surcharge applied (eg. when the roaming Fair use Policy is exceeded).

Therefore, considering these difficulties, in the Report the following assumptions were considered:

- all revenues resulting from bundles that include mobile services are allocated to domestic services regardless of whether the mobile service is provided in the domestic network (domestic service) or in a visited network (roaming service). So, the domestic revenues now include the intra-EEA roaming component from RLAH tariffs. Any other type of revenue (such as those originating from fixed telephone service or fixed internet service, sale of mobile devices, the initial one-time charge for a new/renewed subscription, subscription fees to other non-telecommunication services, etc) should not be considered, despite the difficulties in allocating the revenues only relative to mobile services.. Revenues from international calls could also be included;
- the retail intra-EEA roaming revenues are only relative to the revenues resulting from the roaming surcharges (the domestic price component of the roaming service is excluded from the “retail intra-EEA roaming revenues”) and were included in the “Retail domestic revenues”).

The results presented in the Report should be read with the aforementioned caveats in mind and taking into account the operators’ problems with data reporting. In particular, the comparability of the intra-EEA roaming revenues, before and after the introduction of the Roam Like at Home rules, must be carefully analysed, as well as the evolution of the domestic mobile revenues and of the intra-EEA roaming data (for traffic and for revenues), in terms of the different types of roaming tariffs.

While the measurement of balanced/unbalanced traffic should include volumes and revenues from all operators per country, such information is currently only available for a limited number of NRAs. For some countries, even if a data set is available, not all operators are included. The results related to the EEA average wholesale prices should be subject to cautious interpretation, because some countries were not able to submit comparable data on balanced/unbalanced and total traffic. Therefore, the EEA averages shown at Figures: voice services: 19, 20, 21, 22 and 25; SMS services: 39, 40, 41, 42 and 43; data services: 53, 54, 55, 56 and 59 may not be directly comparable.

The assessment of the international roaming market was based on the requirements set out in Article 19 (4) of the Roaming Regulation. In order to assess the competitive developments in the Union-wide roaming markets, BEREC has to collect data regularly from national regulatory authorities (NRAs) on the development of retail and wholesale charges for regulated voice, SMS and data roaming services. On the basis of the collected data, BEREC also has to report regularly on the evolution of pricing and consumption patterns in the Member States for both domestic and roaming services and the evolution of actual wholesale roaming rates for unbalanced traffic between roaming providers.

With effect from 15 June 2017 roaming providers shall not levy any surcharge in addition to the domestic retail price on roaming customers in any Member State for any regulated roaming service (Article 6 a Roaming Regulation). With the abolition of retail roaming surcharges in the Union, the same tariff conditions apply for the use of mobile services while roaming abroad in the Union and at home (i.e. in the country of the mobile subscription of the customer), subject to the conditions set out in a FUP (Fair Use Policy). Accordingly, wherever regulated roaming services are offered, the implementation of “Roam Like at Home” (RLAH) allows the customer to use services while travelling in other EEA Member States in the same way as in their home country, i.e. that RLAH tariff effectively includes roaming services in the domestic bundle.

Where roaming customers exceed the FUP, they may be required by the roaming provider to pay a surcharge for the consumption of any further regulated roaming service. However, Article 6 e (1) Roaming Regulation limits the amount of any such surcharge.

Moreover, according to Article 6c Roaming Regulation, in specific and exceptional circumstances, with a view to ensuring the sustainability of its domestic charging model, a roaming provider may apply for authorisation to apply a surcharge. The Roaming Regulation lays down detailed rules on the methodology for assessing the sustainability of the abolition of retail roaming surcharges and on the application to be submitted by a roaming provider for the purposes of that assessment.

Due to the complexity of tariffs (RLAH, RLAH+ (non-compliance with/exceeding FUP), RLAH+ derogation) offered by operators, the current BEREC Benchmark Report includes an assessment of these tariffs with respect to consumption patterns.

BEREC also has to report about the evolution of actual wholesale roaming rates for unbalanced traffic between roaming providers. This requirement is also reflected in the current BEREC Benchmark Report.

Furthermore, BEREC also reports about the evolution of pricing and consumption patterns in the Member States for domestic services.

Considering the aforementioned difficulties in obtaining reliable and comparable data, for some indicators, there is a limited number of countries which have opted for not supplying the data relative

to those indicators. This is not at all unusual for a comprehensive data collection of this type. In most cases the NRA was able to work with each company to resolve or alleviate the problem. In other cases, where system upgrades are necessary to comply with the new format of the data collection, the operator was asked to provide the best possible estimate currently available and to complete upgrades in time to provide high quality data for the next data collection. Some NRAs expressed major data quality challenges at the national operators' level as well as the use of different reporting systems by operators. In this context, the terminology for some elements of the questionnaire will be clarified in order to allow operators to make the necessary changes in the reporting systems²³.

At the wholesale level, operators often receive discounts based on variables like volume of traffic, calculated at the end of a 12-month period. When providing data for these reports, operators may estimate the effect of such discounts on data for each quarter. Because the actual discount may vary from the estimate, there may be an apparently 'anomalous' result for the quarter when the discount is actually applied. This should be kept in mind when comparing wholesale figures for different quarters in the same year.

In a few cases, the number of operators changed, which may cause an apparent change in prices between quarters. This can also lead to strong volume changes.

When wholesale prices are above the price caps, in most cases the reason is that the average price to comply with the Regulation is the annual price and not a quarterly one, and in such cases some quarters compensate for others. Another reason may also be inaccuracies in reporting for the data collection itself.

For ease of comparison, the Euro is used throughout this Report. Within the EEA, currency fluctuations between the Euro and other national currencies are likely to have affected the average prices reported for EEA countries outside the Euro zone.

Conversion of gigabytes to megabytes was done in line with Recital 17 of the Regulation (EU) 2017/920 of the European Parliament and of the Council of 17 May 2017 amending Regulation (EU) No 531/2012, which results in 1 gigabyte (GB) being equal to 1000 megabytes (MB). Operators may apply a different formula which can slightly affect the accuracy of data.

All retail prices included in the charts below exclude VAT. They are an average of prices paid by postpaid and prepaid tariff plan customers. All averages are based on billed minutes of voice calls or billed megabytes of data, unless expressly stated otherwise.

With regard to wholesale roaming resale access according to Article 3 (4) of the Roaming Regulation, MNOs may charge fair and reasonable prices for components not covered by para. 3. Thus prices may be higher than the price caps given in Article 7 (1). Some data also include volumes and tariffs coming from roaming in non-EU countries in Europe. It should also be noted that the average wholesale roaming voice tariff for agreements applying Article 3 of the Roaming Regulation might be above the cap because the calculation is based on actual minutes (the Regulation permits to invoice 30 seconds for calls that are shorter).

²³ ANACOM took the option not to ask the operators to adapt their systems before a common set of consistent assumptions is defined to be applied in all the countries for allocating revenues to roaming services and to mobiles domestic services and to allocate volumes for the different roaming tariff types.

The EU Roaming Regulation also applies to the EEA EFTA States Norway, Iceland and Liechtenstein.

In addition, Switzerland contributed to the data collections, although the 2007, 2009 and 2012 Roaming Regulation is not applicable there²⁴.

Annex II: List of respondents

Operators that provided data for the period 1 April 2017
– 30 September 2017:

Austria

A1 Telekom Austria
ATK
HoT Telekom
Hutchison 3G Austria
LTK
Lycamobile
Mass Response
RTK
Russmedia
Tele2
T-Mobile Austria
UPC

Belgium

Belgacom Mobile
KPN Group Belgium (Base)
Mobistar

Bulgaria

Bulgarian Telecommunication Company
(Vivacom)
Telenor Bulgaria
Mobiltel

Croatia

Hrvatski Telekom
Vipnet
Tele2

Cyprus

Cyta
MTN Cyprus
Primetel

Czech Republic

O2 Family
Air Telecom
ČEZ Prodej
DH Telecom
O2 Czech Republic
SAZKA
TERMS
Tesco Mobile ČR
T-Mobile Czech Republic
Vodafone Czech Republic

Denmark

Hi3G Denmark
TDC
Telenor
TeliaDanmark

Estonia

AS EMT
Elisa Eesti
OÜ Top Connect
TELE 2 Eesti

Finland

Ålands Telekommunikation
DNA

²⁴ Figures from Switzerland are excluded from both “EEA” and “EEA EFTA” averages.

Elisa Corporation
Telia Finland

France

SFR
Orange Caraïbe
Orange France
Free Mobile
EI Telecom
SRR

Germany

Telekom Deutschland GmbH
Telefónica Germany GmbH & Co. OHG
Vodafone GmbH

Greece

COSMOTE Mobile
Vodafone Panafon
Wind HellasTelecommunications
CYTA HELLAS TILEPIKINONIAKI SA

Hungary

Telenor Magyarország
T-Mobile
Vodafone Magyarország
UPC Mobile

Iceland

Nova
Síminn
Vodafone Iceland

Ireland

Eircom Limited/E Mobile
Hutchison 3G Ireland
Meteor Mobile Communications
Telefónica Ireland Limited/(O2)
Tesco Mobile Ireland
Vodafone Ireland

Italy

Digi Italy
ERG Mobile
Fastweb
Tre
Lycamobile
Poste Mobile

Tim
Tiscali
Vodafone
Wind

Latvia

Bite Latvia
LatvijasMobilaisTelefons
Tele2

Liechtenstein

Salt (Liechtenstein)
Telecom Liechtenstein
Swisscom (Schweiz)

Lithuania

BitėLietuva
Eurocom
Omnitel
Tele2
Teledema

Luxembourg

Entreprise des postes et télécommunications
Post Télécom
Tango
Orange Communications Luxembourg
Luxembourg Online Mobile
Transatel Lux.

Malta

Melita Mobile,
Mobisle Communications (GO Mobile)
Vodafone Malta

Netherlands

KPN
Lebara
Lycamobile Distribution
Tele2 Netherlands
T-Mobile Netherlands
Vodafone Libertel

Norway

Lycamobile
Phonero
Telenor
TeliaSonera Norge

Poland

P4
 Polkomtel
 T-Mobile Polska
 Orange Polska

Portugal

CTT – Correios de Portugal
 NOS Comunicações, S.A
 MEO – Serviços de Comunicações e
 Multimédia, S.A.
 Vodafone Portugal – Comunicações
 Pessoais, S.A.
 NOWO Communications, S.A
 ONITELECOM - Infocomunicações, S.A
 Lycamobile Portugal, Lda
 Vectone Mobile (Portugal) Limited

Romania²⁵

Orange Romania
 RCS&RDS
 Vodafone Romania
 Lycamobile

Slovak Republic

O2 Slovakia
 Orange Slovensko
 Slovak Telekom
 SWAN Mobile

Slovenia

TELEKOM SLOVENIJE, D.D.
 A1 Slovenija d.d.
 TELEMACH D.O.O.
 T-2 d.o.o.
 IZI mobil, d.d.
 HOT mobil, telekomunikacije in storitve d.o.o.
 Mega M d.o.o.
 SoftNET d.o.o.

Spain

Euskaltel
 Orange
 TelefónicaMóviles de España

Vodafone
 Yoigo

Sweden

Hi3G Access
 Telenor Sverige
 Telia Company
 Tele2 Sverige

Switzerland

Orange Communications
 Sunrise Communications
 Swisscom (Schweiz)

United Kingdom

Vodafone UK
 O2 UK
 Everything Everywhere
 Three UK
 Tesco Mobile

²⁵ Romania - the values for Q2 & Q3 2017 are calculated without considering the 2 operators which have not provided their data until 16.02.2018: Telekom RMC and Telekom RC